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(54) **Titre : PLATEFORMES DE TRANSACTION DOTEES DE SYSTEMES COMPRENANT DES ENSEMBLES D'AUTRES SYSTEMES**
(54) **Title: TRANSACTION PLATFORMS WHERE SYSTEMS INCLUDE SETS OF OTHER SYSTEMS**

(57) **Abrégé/Abstract:**
Systems and methods for transaction platforms include various systems interacting with each other and transacting in various ways. A method for configuring and launching a marketplace includes: identifying, by a processing system having one or more processors, an opportunity to facilitate configuration of a new marketplace; receiving marketplace opportunity data, wherein the marketplace opportunity data includes information related to a set of assets of one or more types; determining configuration parameters to be implemented in the new marketplace; determining the feasibility of implementing the configuration parameters in the new marketplace; determining data resources to support the new marketplace; determining an architecture of the new marketplace; determining the configuration of the data resources in a data model for the marketplace; configuring a marketplace object; connecting selected data resources to populate the marketplace object; and launching the new marketplace.

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Abstract:

Systems and methods for transaction platforms include various systems interacting with each other and transacting in various ways. A method for configuring and launching a marketplace includes: identifying, by a processing system having one or more processors, an opportunity to facilitate configuration of a new marketplace; receiving marketplace opportunity data, wherein the marketplace opportunity data includes information related to a set of assets of one or more types; determining configuration parameters to be implemented in the new marketplace; determining the feasibility of implementing the configuration parameters in the new marketplace; determining data resources to support the new marketplace; determining an architecture of the new marketplace; determining the configuration of the data resources in a data model for the marketplace; configuring a marketplace object; connecting selected data resources to populate the marketplace object; and launching the new marketplace.

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TRANSACTION PLATFORMS WHERE SYSTEMS INCLUDE SETS OF OTHER SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application No. 63/282,502, filed, November 23, 2021. This application claims priority to U.S. Provisional Patent Application No. 63/291,306, filed December 17, 2021. This application claims priority to U.S. Provisional Patent Application No. 63/299,703, filed January 14, 2022. This application claims priority to U.S. Provisional Patent Application No. 63/302,014, filed January 21, 2022. This application claims priority to provisional India Patent Application No. 202211008634, filed February 18, 2022. This application claims priority to U.S. Provisional Patent Application No. 63/392,083, filed July 25, 2022. This application claims priority to U.S. Provisional Patent Application No. 63/381,546, filed October 28, 2022. Each patent application referenced above is hereby incorporated by reference as if fully set forth herein in its entirety.

FIELD

[0002] The present disclosure relates to transaction platforms, and more particularly relates to transaction platforms that include systems that include sets of other systems interoperating within the transaction platforms to define the larger systems.

BACKGROUND

Intelligent Data Layers Background

[0003] Brought about by exponentially increasing connectivity and intelligence of devices of all types, the world is experiencing orders-of-magnitude increases in scale and granularity of data, as well as the emergence of entirely new types of data, all available to enable or enhance digital transactions in markets of all types. This expansion brings new challenges to parse, analyze, and derive intelligence from the fractally expanding data layers, as well as regulatory and business requirements to understand and act upon the transactions, transactors, and all corporate, individual, or AI intermediaries that operate on or interact with data.

SUMMARY

Market orchestration

Configuring and launching a marketplace

[0004] In embodiments, a method for configuring and launching a marketplace includes: identifying, by a processing system having one or more processors, an opportunity to facilitate configuration of a new marketplace; receiving, by a processing system, marketplace opportunity data, where the marketplace opportunity data includes information related to a set of assets of one or more types; determining, by the processing system, configuration parameters to be implemented

in the new marketplace; determining, by the processing system, the feasibility of implementing the configuration parameters in the new marketplace; determining, by the processing system, data resources to support the new marketplace; determining, by the processing system, an architecture of the new marketplace; determining, by the processing system, the configuration of the data resources in a data model for the marketplace; configuring, by the processing system, a marketplace object; connecting, by the processing system, selected data resources to populate the marketplace object; and launching, by the processing system, the new marketplace.

RPA for configuring and launching a New Marketplace

[0005] In embodiments, a method for configuring and launching a marketplace includes: taking an identified type of asset and defining an exchangeable marketplace object that represents a set of rights to control the type of asset, where defining the marketplace object includes specifying a data model for the marketplace object and a set of data resources for populating instances of the marketplace object; configuring the mechanism for exchange of instances of the marketplace object, where the mechanism for exchange includes a set of interfaces whereby instances of the objects may be exchanged in defined quantities for defined units of value; and configuring a set of computational and connectivity resources to support a marketplace by which the defined marketplace objects are exchanged; where at least one defining the marketplace object, configuring the mechanism of exchange and configuring the set of computational and connectivity resources is performed by robotic process automation that is trained on a training set of interactions by a set of human users.

Updating properties of market orchestration digital twins

[0006] In embodiments, a method for updating one or more properties of one or more market orchestration digital twins includes: receiving a request to update one or more properties of one or more digital twins; retrieving the one or more digital twins required to fulfill the request; selecting data sources from a set of available data sources; retrieving data from selected data sources; and updating one or more properties of the one or more digital twins based on the retrieved data. In embodiments, the digital twins are selected from the set of marketplace digital twins, asset digital twins, trader digital twins, broker digital twins, environment digital twins, and marketplace host digital twins. In embodiments, the one or more properties of the one or more digital twins relates to asset ownership. In embodiments, the data source is selected from the set of an Internet of Things connected device, a machine vision system, an analog vibration sensor, a digital vibration sensor, a fixed digital vibration sensor, a tri-axial vibration sensor, a single axis vibration sensor, an optical vibration sensor, and a crosspoint switch.

Method of generating a fairness score

[0007] In embodiments, a method for generating a fairness score for a transaction includes: receiving, by a fairness engine, transaction data from a set of transactions from an execution engine; and calculating, by the fairness engine, a fairness score representing the fairness of a

transaction. In embodiments, the fairness engine includes an execution timing fairness engine that determines or receives a set of measures of latency for a set of users. In embodiments, the execution timing fairness engine automatically orchestrates a set of configuration parameters or other features that mitigate unfairness that may be caused by disparate latency. In embodiments, the set of measures of latency are determined by testing network return times. In embodiments, testing network return times includes determining the ping, the upload speed, or the download speed. In embodiments, the set of transactions are executed based upon the fairness score exceeding a predetermined threshold.

Enterprise access layer summary

Enterprise Data Set Exchange

[0008] In embodiments, a computer-implemented method includes: receiving, at an access layer controlled by an enterprise, a data set characterizing one or more attributes associated with a group of assets or resources controlled by the enterprise, where the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets; determining, by a permissions system of the access layer, whether the data set satisfies a set of permission criteria indicating a set of governing rules for assets or resources controlled by the enterprise; in response to the data set satisfying the permission criteria, generating, by a data services system associated with the access layer, an encoded data set that satisfies the set of governing rules; and converting the encoded data set to an exchangeable digital asset by: publishing a representation of the encoded data set to a digital wallet system of the access layer; and configuring an interface system of the access layer with access to the encoded data set represented in the digital wallet system, where the interface system is accessible by a third party. Some embodiments further include assigning a monetary value to the encoded data set that is viewable via the interface system. In embodiments, assigning the monetary value to the encoded data set includes generating an estimated monetary value from valuation data compiled from a set of target consumers. In embodiments, assigning the monetary value to the encoded data set includes: generating an invite to a set of target consumers for the data set; requesting the set of target consumers assign a proposed value to a set of secondary data sets that share one or more characteristics with the data set; and determining the monetary value for the encoded data set by statistical inference from the proposed values returned from the set of target consumers. Some embodiments further include adjusting the monetary value based on feedback from the enterprise. In embodiments, adjusting the monetary value includes: generating a feedback request to the enterprise to authorize the monetary value assigned to the encoded data set; and in response to the feedback request, receiving a message from the enterprise to modify the monetary value of the encoded data set. In some embodiments generating the encoded data set includes partially encoding a portion of the data set that includes information failing to satisfy the set of

governing rules. In embodiments, publishing the representation of the encoded data set to the digital wallet system includes publishing the representation of the encoded data set to a hot wallet of the wallet system. In embodiments, publishing the representation of the encoded data set to the digital wallet system includes publishing the representation of the encoded data set to a cold wallet of the wallet system. In embodiments, publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a custodial wallet of the wallet system. In embodiments, the group of resources is enterprise-owned devices. In embodiments, the group of resources is production equipment of the enterprise. In embodiments, the data set includes logistics information. In embodiments, the data set includes inventory information. In embodiments, the data set includes procurement information. In embodiments, the data set includes enterprise marketing information. In embodiments, the data set includes client-purchasing information. In embodiments, the access layer is a network access layer. In embodiments, the enterprise assets are digital assets. In embodiments, the governing rules are privacy rules. In embodiments, re the governing rules are prioritization rules.

[0009] In embodiments, a system includes: an access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: receiving, at the access layer controlled by an enterprise, a data set characterizing one or more attributes associated with a group of assets or resources controlled by the enterprise, where the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets; determining, by a permissions system of the access layer, whether the data set satisfies a set of permission criteria indicating a set of governing rules for resources controlled by the enterprise; in response to the data set satisfying the permission criteria, generating, by a data services system associated with the access layer, an encoded data set that satisfies the set of governing rules; and converting the encoded data set to an exchangeable digital asset by: publishing a representation of the encoded data set to a digital wallet system of the access layer; and configuring an interface system of the access layer with access to the encoded data set represented in the digital wallet system, where the interface system is accessible by a third party. In embodiments, the operations further comprise assigning a monetary value to the encoded data set that is viewable via the interface system. In embodiments, assigning the monetary value to the encoded data set includes generating an estimated monetary value from valuation data compiled from a set of target consumers. In embodiments, assigning the monetary value to the encoded data set includes: generating an invite to a set of target consumers for the data set; requesting the set of target consumers assign a proposed value to a set of secondary data sets that share one or more characteristics with the data set; and determining the monetary value for the encoded data set by

statistical inference from the proposed values returned from the set of target consumers. In embodiments, the operations further comprise adjusting the monetary value based on feedback from the enterprise. In embodiments, adjusting the monetary value includes: generating a feedback request to the enterprise to authorize the monetary value assigned to the encoded data set; and in response to the feedback request, receiving a message from the enterprise to modify the monetary value of the encoded data set. In embodiments, generating the encoded data set includes partially encoding a portion of the data set that includes information failing to satisfy the set of governing rules. In embodiments, publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a hot wallet of the wallet system. In embodiments, publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a cold wallet of the wallet system. In embodiments, publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a custodial wallet of the wallet system. In embodiments, the group of resources is enterprise-owned devices. In embodiments, the group of resources is production equipment of the enterprise. In embodiments, the data set includes logistics information. In embodiments, the data set includes inventory information. In embodiments, the data set includes procurement information. In embodiments, the data set includes enterprise marketing information. In embodiments, the data set includes client-purchasing information. In embodiments, the access layer is a network access layer. In embodiments, the enterprise assets are digital assets. In embodiments, the governing rules are privacy rules. In embodiments, the governing rules are prioritization rules.

Control Plane and Data Plane Coverage

[0010] In embodiments, a computer-implemented method includes: receiving, at a network access layer, an asset request from a requesting entity, where the asset request indicates an asset available in a digital wallet system associated with the network access layer, and where the network access layer includes a data plane configured to exchange assets privately-generated by an enterprise entity operating a control plane associated with the network access layer; identifying an asset control associated with the asset indicated by the asset request, where the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer, and where the control parameter is configured using data derived from the enterprise entity that privately generated the asset; determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and in response to the asset control being satisfied, facilitating fulfillment of the asset request. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, facilitating

fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes: signing a transaction involving the asset on the cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity. In embodiments, the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the asset control indicates a security clearance level. In embodiments, the asset control includes transactional detail requirements for the asset.

[0011] In embodiments, a system includes: a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: receiving, at the network access layer, an asset request from a requesting entity, where the asset request indicates an asset available in a digital wallet system associated with the network access layer, and where the network access layer includes a data plane configured to exchange assets privately-generated by an enterprise entity operating a control plane associated with the network access layer; identifying an asset control associated with the asset indicated by the asset request, where the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer, and where the control parameter is configured using data derived from the enterprise entity that privately generated the asset; determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and in response to the asset control being satisfied, facilitating fulfillment of the asset request. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes: signing a transaction involving the asset on the cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity. In embodiments, the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the asset control indicates a security clearance level. In embodiments, the asset control includes transactional detail requirements for the asset.

Private to Public Block Chain Via an Enterprise Access Layer

[0012] In embodiments, a computer-implemented method includes: receiving, at a network access layer, an asset request from a requesting entity, where the asset request indicates an asset available in a digital wallet system associated with the network access layer, where the network access layer corresponds to a client-facing intelligence system that hosts exchangeable digital assets, and where the exchangeable digital assets correspond to one or more assets stored in a private append-only data structure associated with an owner of the exchangeable digital assets; identifying an asset control associated with the asset indicated by the asset request, where the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer; determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and in response to the asset control being satisfied by the at least one of the asset request or the requesting entity, facilitating fulfillment of the asset request, where fulfillment includes storing the asset in a public append-only data structure to represent an exchange of the asset with the requesting entity. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes: signing a transaction involving the asset on the cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity. In embodiments, the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the asset control indicates a security clearance level. In embodiments, the asset control includes transactional detail requirements for the asset.

[0013] In embodiments, a system includes: a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: receiving, at a network access layer, an asset request from a requesting entity, where the asset request indicates an asset available in a digital wallet system associated with the network access layer, where the network access layer corresponds to a client-facing intelligence system that hosts exchangeable digital assets, and where the exchangeable digital assets correspond to one or more assets stored in a private append-only data structure associated with an owner of the exchangeable digital assets; identifying an asset control associated with the asset indicated by the asset request, where the asset control is configured by a permissions system of the network access

layer and indicates a control parameter determined by an intelligence system of the network access layer; determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and in response to the asset control being satisfied by the at least one of the asset request or the requesting entity, facilitating fulfillment of the asset request, where fulfillment includes storing the asset in a public append-only data structure to represent an exchange of the asset with the requesting entity. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system. In embodiments, facilitating fulfillment of the asset request includes: signing a transaction involving the asset on the cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity. In embodiments, the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the asset control indicates a security clearance level. In embodiments, the asset control includes transactional detail requirements for the asset.

Assigning Access Controls to an Enterprise-Generated Asset

[0014] In embodiments, a computer-implemented method includes: receiving, at a network access layer controlled by an enterprise, a set of assets privately generated by the enterprise, where the network access layer corresponds to a client-facing intelligence system that hosts exchangeable enterprise digital assets; for each asset of the set of assets: classifying, by an artificial-intelligence system of the network access layer, the respective asset into an access control category, where each asset control category is associated with a set of asset controls that dictate one or more transaction parameters for the exchange of the respective asset with a third party; and assigning, by a permissions system of the network access layer, the set of asset controls for the access control category classified by the AI system for the respective asset; and

[0015] converting the set of assets to exchangeable digital assets by: publishing the set of assets to a digital wallet system of the network access layer; and configuring an interface system of the network access layer with access to the set in the digital wallet system, where the interface system is accessible by a third party. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a hot wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a cold wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least

a portion of assets in the set to a custodial wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing a first portion of assets in the set to a hot wallet of the digital wallet system and a second portion of the assets in the set to a cold wallet of the digital wallet system. In embodiments, the first portion has a first access control category that indicates that a first set of asset controls of the first access control category is less restrictive than a second set of asset controls for a second access control category classified for the second portion. In embodiments, the first portion has a first access control category that indicates a greater frequency of access than a second access control category classified for the second portion. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that communicated at least one of the assets from the set of assets to the network asset layer. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level. In embodiments, the one or more transaction parameters include a minimum pricing requirement. In embodiments, a system including: a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: receiving, at a network access layer controlled by an enterprise, a set of assets privately generated by the enterprise, where the network access layer corresponds to a client-facing intelligence system that hosts exchangeable enterprise digital assets; for each asset of the set of assets: classifying, by an artificial-intelligence system of the network access layer, the respective asset into an access control category, where each asset control category is associated with a set of asset controls that dictate one or more transaction parameters for the exchange of the respective asset with a third party; and assigning, by a permissions system of the network access layer, the set of asset controls for the access control category classified by the AI system for the respective asset; and converting the set of assets to exchangeable digital assets by: publishing the set of assets to a digital wallet system of the network access layer; and configuring an interface system of the network access layer with access to the set in the digital wallet system, where the interface system is accessible by a third party. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a hot wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a cold wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a custodial wallet of the digital wallet system. In embodiments, publishing the set of assets to the digital wallet system includes publishing a first portion of assets in the set to a hot wallet of the digital wallet system and a second portion of the assets in the set to a cold wallet of the digital wallet system. In embodiments, the first portion has a first access control

category that indicates that a first set of asset controls of the first access control category is less restrictive than a second set of asset controls for a second access control category classified for the second portion. In embodiments, the first portion has a first access control category that indicates a greater frequency of access than a second access control category classified for the second portion. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that communicated at least one of the assets from the set of assets to the network asset layer. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level. In embodiments, the one or more transaction parameters include a minimum pricing requirement.

Monitoring Public Data Exchanges for Viable Enterprise Data Transactions

[0016] In embodiments, a computer-implemented method includes: monitoring a plurality of public market participants via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network asset layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, where the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. Some embodiments include: receiving a response message from the monitored public market participant; and determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a

public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls transactional detail requirements for the asset.

[0017] In embodiments, a system includes: a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: monitoring a plurality of public market participants via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network asset layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, where the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system. In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, the operations further comprise: receiving a response

message from the monitored public market participant; and determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls transactional detail requirements for the asset.

Managing Tenancy in a Multi-party Enterprise Access Layer

[0018] In embodiments, a computer-implemented method includes: monitoring, using an access layer accessible to a plurality of tenant enterprises, a set of assets associated with a set of digital wallets of a digital wallet system for the access layer, where the access layer corresponds to a tenant-facing intelligence system that hosts exchangeable enterprise assets; receiving, at the access layer, an indication that a requesting tenant enterprise of the plurality of tenant enterprises requests a transaction involving an asset of the set of assets; determining, by the access layer, whether the requesting tenant enterprise has a set of access rights that satisfy an access criteria for the asset of the requested transaction; in response to the requesting tenant having the set of access rights that satisfy the access criteria, deploying, for the requesting tenant enterprise, a set of resources associated with the access layer and shared among the plurality of tenant enterprises to facilitate the transaction involving the asset on behalf of the tenant enterprise.

[0019] In embodiments, the requesting tenant enterprise includes a first tenant enterprise and a second tenant enterprise; the method further includes determining a transaction priority for each of the first tenant enterprise and the second tenant enterprise; and deploying the set of resources occurs for the first tenant enterprise having a first transaction priority greater than a second transaction priority of the second tenant enterprise. In embodiments, each tenant enterprise is associated with (i) a set of private resources inaccessible to each other tenant and (ii) a set of shared resources associated with the access layer and shared among the plurality of tenant enterprises. In embodiments, the digital wallet system includes: a first subset of digital wallets accessible to one

of the tenant enterprises and inaccessible to other tenant enterprises; and a second subset of digital wallets accessible to and shared among a set of the plurality of tenant enterprises. In embodiments, the access layer is a network access layer. In embodiments, the exchangeable enterprise assets are digital assets. In embodiments, the set of digital wallets includes a cold wallet. In embodiments, the set of digital wallets includes a hot wallet and a cold wallet. In embodiments, the set of digital wallets includes a custodial wallet. In embodiments, the set of digital wallets includes a custodial wallet and a cold wallet. In embodiments, the set of digital wallets includes at least two of a hot wallet, a cold wallet, or a custodial wallet.

Peer-to-peer Enterprise Access Layer

[0020] In embodiments, a computer-implemented method includes: receiving, at an access layer, an asset request from a requesting entity, where the asset request indicates a transaction involving an asset available in a digital wallet system associated with the access layer, and where the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets; identifying an asset control associated with the asset indicated by the asset request, where the asset control is configured by a permissions system of the access layer and indicates a control parameter determined by an intelligence system of the access layer; determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and in response to the asset control being satisfied, establishing a peer-to-peer access layer between the requesting entity and another transacting entity associated with the transaction indicated by the asset request, where the peer-to-peer access layer provides the other transacting entity with access to a limited set of digital assets and resources of the requesting entity. In embodiments, the transacting entity includes a plurality of entities forming a multilateral connection between the requesting entity and the plurality of entities. In embodiments, the peer-to-peer connection is a secure connection. Some embodiments further include generating, using a data processing system of the access layer, an encrypted message packet for communication using the peer-to-peer connection. In embodiments, the access layer is a network access layer. In embodiments, the exchangeable enterprise assets are digital assets. In embodiments, the asset is available in a digital wallet of the digital wallet system. In embodiments, the digital wallet is a cold wallet. In embodiments, the digital wallet is a hot wallet. In embodiments, the digital wallet is a custodial wallet. In embodiments, the peer-to-peer access layer provides an interface that is accessible by a wallet system of the other transacting party, whereby the wallet system of the other transacting party accesses the limited set of digital assets and resources of the requesting enterprise via the interface. Some embodiments further include: receiving a set of access rules from a user device associated with the requesting entity, where the set of access rules define the set of digital assets and resources that are accessible to the

other transacting enterprise; and configuring the peer-to-peer access layer based on the set of access rules.

Market Orchestration Architecture

[0021] In embodiments, a system for normalizing an item value for a plurality of exchanges includes: a plurality of electronic exchanges configured for conducting transactions for at least one item in a set of items; an item value normalization system configured to identify a reference item in the set of items, and state a value for at least one other item in the set of items as a normalized value relative to a value of the reference item; and a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item value normalization through automated operation of the item value normalization system. In embodiments, the item value normalization system is configured to identify the reference item based on a transaction history for one or more candidate reference items in the set of items. In embodiments, the item value normalization system is configured to identify the reference item based on a transaction history for one or more items that are similar to a candidate reference item. In embodiments, the item value normalization system is configured to identify the reference item based on a degree of commonality of a candidate reference item to other items in the set of items. In embodiments, an item identified as a reference item from the set of items for a first exchange is distinct from an item identified as a reference item from the set of items for a second exchange. In embodiments, to automate item value normalization includes stating the normalized item value based on a native currency of a target electronic exchange of the plurality exchanges. In embodiments, to state a value for at least one other item in the set of items as a normalized value includes at least one exchange-specific fee associated with conducting a transaction for the item. In embodiments, the item value normalization system is further configured to identify a reference set of items, and state a value for at least one other item in a different set of items as a normalized value relative to a value of at least one item in the set of reference items. Some embodiments further include a set of robotic process automation services that are configured to generate a token that represents an item in the second exchange based on characteristics of the item determined from data from the first exchange. Some embodiments further include a set of robotic process automation services that are configured to generate a digital representation of a set of rights relating to an item that is consistent with governing rules of the second exchange based on processing at least one of a set of smart contracts and a set of terms and conditions relating to the item. Some embodiments further include a set of robotic process automation services that are configured to orchestrate a set of transaction workflows in each of a plurality of exchanges, such that initiation of a set of actions in one exchange of the plurality of exchanges automatically results in the triggering of a set of actions in at least one other exchange.

Some embodiments further include a digital twin that represents a set of entities, workflows, and transaction parameters of a plurality of exchanges, such that interaction with an interface of the digital twin can orchestrate an interaction in each of the plurality of exchanges. Some embodiments further include a data and network infrastructure pipeline that is configured to deliver data from a set of assets to set of smart contracts that include terms, conditions and parameters for a set of transaction workflows involving the assets, where the pipeline is automatically configured to adjust a network path based on the characteristics of the data and at least one performance parameter of the network path. Some embodiments further include a data and network infrastructure pipeline that is configured to deliver data from a set of assets to an interface by which an operator orchestrates a set of parameters for a set of transaction workflows involving the assets, where the pipeline is automatically configured to adjust timing of data delivery based on at least one of a transaction parameter and a network performance parameter.

[0022] Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into an electronic wallet system, such that interactions with a set of interfaces of the wallet system automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a digital twin platform, such that interactions with a set of interfaces of the digital twin platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into an enterprise database platform, such that interactions with a set of interfaces of the enterprise database platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a platform-as-a-service platform, such that interactions with a set of interfaces of the platform-as-a-service platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a computer-aided design platform, such that interactions with a set of interfaces of the computer-aided design platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a video game, such that interactions with a set of interfaces of the video game automatically trigger a set of transaction workflows within the marketplace.

[0023] In embodiments, a system for normalizing an item value for a plurality of exchanges includes: a plurality of electronic exchanges configured for conducting transactions for at least one item in a set of items in an exchange-native currency for each of the plurality of electronic

exchanges; an item value normalization system configured to identify a reference currency of a plurality of exchange-native currencies for the plurality of electronic exchanges, and to state a value for the at least one item in the set of items as a normalized value relative to a reference currency value of the at least one item; and a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item value normalization through automated operation of the item value normalization system. In embodiments, the item value normalization system is further configure to identify a reference currency based on a candidate currency exchange rate history, a futures value of a candidate currency, a volatility score of a candidate currency, or a relative valuation of a candidate currency. In embodiments, the item value normalization system is configured to identify the reference currency based on an exchange rate for a portion of the plurality of exchange-native currencies. In embodiments, to state a value for the at least one item in the set of items as a normalized value includes at least one exchange-specific fee associated with conducting a transaction for the item. Some embodiments further include a set of robotic process automation services that are configured to generate a token that represents an item in the second exchange based on characteristics of the item determined from data from the first exchange. Some embodiments further include a set of robotic process automation services that are configured to generate a digital representation of a set of rights relating to an item that is consistent with governing rules of the second exchange based on processing at least one of a set of smart contracts and a set of terms and conditions relating to the item.

[0024] Some embodiments further include a set of robotic process automation services that are configured to orchestrate a set of transaction workflows in each of a plurality of exchanges, such that initiation of a set of actions in one exchange of the plurality of exchanges automatically results in the triggering of a set of actions in at least one other exchange. Some embodiments further include a digital twin that represents a set of entities, workflows, and transaction parameters of a plurality of exchanges, such that interaction with an interface of the digital twin can orchestrate an interaction in each of the plurality of exchanges. Some embodiments further include a data and network infrastructure pipeline that is configured to deliver data from a set of assets to set of smart contracts that include terms, conditions and parameters for a set of transaction workflows involving the assets, where the pipeline is automatically configured to adjust a network path based on the characteristics of the data and at least one performance parameter of the network path. Some embodiments further include a data and network infrastructure pipeline that is configured to deliver data from a set of assets to an interface by which an operator orchestrates a set of parameters for a set of transaction workflows involving the assets, where the pipeline is automatically configured to adjust timing of data delivery based on at least one of a transaction parameter and a network

performance parameter. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into an electronic wallet system, such that interactions with a set of interfaces of the wallet system automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a digital twin platform, such that interactions with a set of interfaces of the digital twin platform automatically trigger a set of transaction workflows within the marketplace.

[0025] Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into an enterprise database platform, such that interactions with a set of interfaces of the enterprise database platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a platform-as-a-service platform, such that interactions with a set of interfaces of the platform-as-a-service platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a computer-aided design platform, such that interactions with a set of interfaces of the computer-aided design platform automatically trigger a set of transaction workflows within the marketplace. Some embodiments further include a set of application programming interfaces to a marketplace that are configured to be integrated into a video game, such that interactions with a set of interfaces of the video game automatically trigger a set of transaction workflows within the marketplace. In embodiments, a system for item token generation including: a smart contact for an item, the smart contract for control of at least a portion of aspects of conducting a transaction for the item in a first exchange; a set of item characteristics that facilitate tokenization of the item; a set of target exchange characteristics rules; a smart contract parsing system configured to parse the smart contract for the item into a set of contract terms for the item; a token generation system configured to receive the set of contract terms for the item, to receive the set of item characteristics, to receive the set of target exchange characteristics rules and to generate through cooperative operation of a smart contract engine, a token for the item for use in the target exchange; and a smart contract engine interfacing with the token generation system and configured to perform validation of at least one of the contract terms through emulation of a smart contract generated for the item.

[0026] In embodiments, the smart contract engine is further configured to perform validation of at least one of a set of contract terms for a smart contract configured for the target exchange. Some embodiments further include a set of characteristics harvesting functions configured to facilitate harvesting the set of item characteristics from a digital representation of the item in the first

exchange. Some embodiments further include a set of robotic process automation services executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item token generation through automated operation of the token generation system. In embodiments, a system for item token generation including: a first token representing characteristics of an item in a first electronic exchange; a set of target exchange characteristics rules; a set of item characteristics harvesting services configured to extract one or more item characteristics from the first token; a token generation system configured to receive the first token, to receive the set of target exchange characteristics rules and to generate a token for the item for use in the target exchange by applying at least one of the set item characteristic harvesting services to harvest a set of characteristics of an item represented by the first token; and a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item token generation through automated operation of the token generation system.

Intelligent data layer summary

Intelligent data layer system

[0027] In embodiments, an intelligent data layer system includes: a computer-readable storage system that stores a layer configuration data store that maintains: ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost; parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and one or more analysis algorithms; and a set of one or more processors that execute a set of computer-readable instructions, where the set of one or more processors collectively: receive an intelligence request from an intelligence consumer portal; determine at least one data source for deriving intelligence for the consumer portal based on the received request; configure an ingestion system based on the ingestion parameters and parsing rules in the layer configuration data store for the at least one data source; configure an analysis system based on the analysis algorithms in the layer configuration data store for the at least one data source; configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system; and operate the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, derive a set of intelligence data from at least one of the ingested data form the at least one data source and an outcome of using the analysis system, and communicating the set of intelligence data to at least one of the consumer portal or an intelligent data layer store. In embodiments, the

computer-readable storage system stores an intelligent data layer store that maintains results of operations of one or more systems of the intelligent data layer system. In embodiments, the one or more systems includes the ingestion system, the analysis system, and the intelligence deriving system. In embodiments, the result of operations includes intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results. In embodiments, to configure the analysis system is further based on consumer intelligence objectives of the request. In embodiments, to configure the analysis system is further based on aspects of the request.

[0028] In embodiments, the set of one or more processors is configured in an intelligent data layer control tower that configures and operates the intelligent data layer system by communicating control sequences with the ingestion system, the analysis system, and the intelligence deriving system. Some embodiments further include an algorithm portal of an intelligent data layer control tower of the system through which at least one of the analysis algorithms is received. In embodiments, the ingestion system parses content of data sources to determine structure of the content and relationships among elements in the data. In embodiments, the ingestion system parsing a content of data sources results in generating characterization data that includes an intended meaning of elements of the data and relationships among the data, structures of the data, and meaning of the data parsed from the content. In embodiments, the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of the data source. In embodiments, the ingestion system is configured to maintain a schedule of collection activity for one or more data sources.

[0029] In embodiments, the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data. In embodiments, the ingestion system communicates ingested data, results of ingestion, and results of parsing, to an intelligent data layer control tower of the system. In embodiments, the location of the data source is a source address selected from a list of source addresses consisting of a universal record locator, port number, stream identifier, publication and/or broad channel, sensor output address. In embodiments, the analysis system compares data from the data source against a target use of intelligence derived from a data source to determine a degree of fitness for use of the data source by the intelligence deriving system. In embodiments, the analysis system analyzes ingestion system results for meeting at least one consumption target requirement of the consumer portal request. In embodiments, the consumption target requirement includes one or more of a validity time constraint, an accuracy constraint, a frequency of update constraint, or relevance to a consumption subject matter focus. In embodiments, the analysis system configures data regarding the ingested data for one or more system uses from a list of uses

including advertisements that characterize the ingested data in terms of potential intelligence value, indexing schemes for offering intelligence derived data in a marketplace, searching intelligence derived data by identifying keywords, terms, and values associated with the ingested data. In embodiments, the analysis system estimates a value of intelligence data derived from the ingested data for a range of consumer portals to enable setting costs for consuming the intelligence data derived from the ingested data.

[0030] In embodiments, one or more systems of the intelligent data layer is configured as a micro-service architecture for isolated and independent operation of instances of the one or more systems for a plurality of distinct consumer portals. In embodiments, the one or more systems of the intelligent data layer system is initiated as a virtualized container to perform system-specific intelligent data layer system functions. In embodiments, the virtualized container is executed on a cloud-processing architecture. In embodiments, the virtualized container is configured with a consumer portal-specific instance of at least one of the ingestion system, the analysis system, or the intelligence deriving system. In embodiments, the intelligent data layer system ingests data from a plurality of types of data sources including data channels, on-demand data sources, and published data sources. In embodiments, the intelligent data layer system derives intelligence with the intelligence deriving system for a plurality of intelligence consumer portals. In embodiments, an intelligent data layer control tower adapts a configuration of the ingestion system based on a type of data source for a data source selected by the intelligent data layer control tower for each of a plurality of instances of ingestion. In embodiments, an intelligent data layer control tower adapts a configuration of the ingestion system, the analysis system, and the intelligence deriving system. In embodiments, the intelligent data layer ingests data differently from a single data source based on ingestion requirements accessible through the request. In embodiments, the intelligent data layer system further includes a plurality of system-focused probes that provide near real-time context of a range of aspects of system services. In embodiments, the system-focused probes include probes that monitor source data for source data impacting activity and that signal to an intelligent data layer control tower for taking action within the system based on a projected impact of the source data impacting activity. In embodiments, the system-focused probes monitor for time-related triggers for data sources, including early release of an update of source data, delayed release of an update of source data, and an announcement of new sources of data. In embodiments, the ingestion system monitors a port on a data network for an indication of data availability at a data source. In embodiments, the system develops a multi-dimensional understanding of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

[0031] In embodiments, a method of operating an intelligent data layer includes: receiving an intelligence request from an intelligence consumer portal; determining at least one data source for deriving intelligence for the consumer portal based on the received request; configuring an ingestion system based on ingestion parameters and parsing rules in a layer configuration data store for the at least one data source; configuring an analysis system based on one or more analysis algorithms in the layer configuration data store for the at least one data source; configuring an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system; and operating the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, derive a set of intelligence data from at least one of the ingested data form the at least one data source and an outcome of using the analysis system, and communicating the set of intelligence data to at least one of the consumer portal or an intelligent data layer store. Some embodiments further include storing in a computer-readable storage system results of operations of one or more systems of the intelligent data layer. In embodiments, the one or more systems includes the ingestion system, the analysis system, and the intelligence deriving system. In embodiments, the results of operations include intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results. In embodiments, configuring the analysis system is further based on consumer intelligence objectives of the request. In embodiments, configuring the analysis system is further based on aspects of the request. Some embodiments further include operating an intelligent data layer control tower that configures and operates the intelligent data layer by communicating control sequences with the ingestion system, the analysis system, and the intelligence deriving system. Some embodiments further include receiving, through an algorithm portal of an intelligent data layer control tower, at least one analysis algorithm used by the analysis system. In embodiments, the ingestion system applies the parsing rules to content of data sources to determine structure of the content and relationships among elements in the data. In embodiments, the ingestion system applies the parsing rules to content of data sources thereby generating characterization data that includes an intended meaning of elements of the data and relationships among the data, structures of the data, and meaning of the data parsed from the content. In embodiments, the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of the data source. In embodiments, the ingestion system is configured to maintain a schedule of collection activity for one or more data sources. In embodiments, the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data. In embodiments, the ingestion system

communicates ingested data, results of ingestion, and results of parsing, to an intelligent data layer control tower of the system.

[0032] In embodiments, a location of the data source is a source address selected from a list of source address consisting of a universal record locator, port number, stream identifier, publication and/or broad channel, sensor output address. In embodiments, the analysis system compares data from the data source against a target use of intelligence derived from a data source to determine a degree of fitness for use of the data source by the intelligence deriving system. In embodiments, the analysis system analyzes ingestion system results for meeting at least one consumption target requirement of the consumer portal request. In embodiments, the consumption target requirement includes one or more of a validity time constraint, an accuracy constraint, a frequency of update constraint, or relevance to a consumption subject matter focus.

[0033] In embodiments, the analysis system configures data regarding the ingested data for one or more system uses from a list of uses including advertisements that characterize the ingested data in terms of potential intelligence value, indexing schemes for offering intelligence derived data in a marketplace, searching intelligence derived data by identifying keywords, terms, and values associated with the ingested data. In embodiments, the analysis system estimates a value of intelligence data derived from the ingested data for a range of consumer portals to enable setting costs for consuming the intelligence data derived from the ingested data. In embodiments, one or more systems of the intelligent data layer is configured as a micro-service architecture for isolated and independent operation of instances of the one or more systems for a plurality of distinct consumer portals. In embodiments, the one or more systems of the intelligent data layer system is initiated as a virtualized container to perform system-specific intelligent data layer system functions. In embodiments, the virtualized container is executed on a cloud-processing architecture. In embodiments, the virtualized container is configured with a consumer portal-specific instance of at least one of the ingestion system, the analysis system, or the intelligence deriving system. In embodiments, the intelligent data layer system ingests data from a plurality of types of data sources including data channels, on-demand data sources, and published data sources. In embodiments, the intelligent data layer derives intelligence with the intelligence deriving system for a plurality of intelligence consumer portals.

[0034] In embodiments, an intelligent data layer control tower adapts a configuration of the ingestion system based on a type of data source for a data source selected by the intelligent data layer control tower for each of a plurality of instances of ingestion. In embodiments, an intelligent data layer control tower adapts a configuration of the ingestion system, the analysis system, and the intelligence deriving system. In embodiments, the intelligent data layer ingests data differently from a single data source based on ingestion requirements accessible through the request. In

embodiments, the intelligent data layer further includes a plurality of system-focused probes that provide near real-time context of a range of aspects of system services. In embodiments, the system-focused probes include probes that monitor source data for source data impacting activity and that signal to an intelligent data layer control tower for taking action within the system based on a projected impact of the source data impacting activity. In embodiments, the system-focused probes monitor for time-related triggers for data sources, including early release of an update of source data, delayed release of an update of source data, and an announcement of new sources of data. In embodiments, the ingestion system monitors a port on a data network for an indication of data availability at a data source. In embodiments, the intelligent data layer develops a multi-dimensional understanding of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

Network of intelligent data layers

[0035] In embodiments, a system of intelligent data layer network elements includes: a first intelligent data layer element deriving a first degree of source data intelligence from a first source of data; a second intelligent data layer element deriving a second degree of source data intelligence from a second source of data, the second source of data representing a context of the first source of data; a third intelligent data layer element forming an intelligent data layer network through interconnections with the first intelligent data layer element and the second intelligent data layer element and deriving composite intelligence by processing data from a local source of data with the first degree of source data intelligence received through the interconnections and the second degree of source data intelligence received through the interconnections; and a fourth intelligent data layer element extending the intelligent data layer network through interconnection with the third intelligent data layer element and deriving a set of intelligence data structures by processing data from a second local source with one or more of the first degree of source data intelligence, the second degree of source data intelligence, or the composite intelligence, where deriving a set of intelligence data structures is based on intelligent data structures requirements of an intelligent data layer consumer element of the set of intelligence data structures. In embodiments, the first intelligent data layer derives marketplace bidding activity intelligence, the second intelligent data layer derives marketplace settlement activity intelligence, and the third intelligent data layer derives the composite intelligence including relative impacts of changes in bidding activity on settlement terms. In embodiments, the data from the second local source is monitored marketplace regulatory compliance and the set of intelligence data structures includes analysis of regulatory compliance of at least one of the bidding activity intelligence, the settlement activity intelligence, and the composite intelligence. In embodiments, the data from the second local source includes

one or more of, raw transaction data, analyzed transaction data, marketplace data, or financial data for a plurality of transactions in the monitored marketplace.

[0036] In embodiments, at least one intelligent data layer element includes an intelligent data layer control tower that configures and operates the at least one intelligent data layer element by communicating control sequences with an ingestion system that receives source data, an analysis system that evaluates a data output of the ingestion system, and an intelligence deriving system that produces a corresponding one of source data intelligence, composite intelligence, and the set of intelligence data structures. In embodiments, the ingestion system parses content of source data to determine structure of source data content and relationships among elements in the source data. In embodiments, the ingestion system parses a content of data sources resulting in generating characterization data that includes an intended meaning of data elements and relationships among the data elements, structures of the data, and the intended meaning of the data parsed from the content. In embodiments, the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of a corresponding source of data. In embodiments, the ingestion system is configured to maintain a schedule of collection activity for one or more sources of data. In embodiments, the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data. In embodiments, the analysis system compares data from the source data against a target use of corresponding sourced data intelligence to determine a degree of fitness for use of the source of data by the intelligence deriving system. In embodiments, one or more intelligent data layer network elements in the system of intelligent data layer network elements is initiated as a virtualized container of system-specific intelligent data layer element functions.

[0037] In embodiments, the virtualized container is executed on a cloud-processing architecture. In embodiments, at least one of the intelligent data layer elements ingests data from a plurality of types of sources of data including data channels, on-demand data sources, and published data sources. In embodiments, the ingestion system monitors a port on a data network for an indication of data availability at a source of data. In embodiments, the set of intelligence data structures includes a multi-dimensional representation of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data. In embodiments, a method of networking intelligent data layer elements including: deriving a first degree of source data intelligence from a first source of data with a first intelligent data layer element; deriving a second degree of source data intelligence with a second intelligent data layer element from a second source of data, the second source of data representing a context of the first source of data; forming an intelligent data layer network through

interconnections of a third intelligent data layer element with the first intelligent data layer element and the second intelligent data layer element and deriving composite intelligence by processing data from a local source of data with the first degree of source data intelligence received through the interconnections and the second degree of source data intelligence received through the interconnections; and extending the intelligent data layer network through interconnection of a fourth intelligent data layer element with the third intelligent data layer element and deriving a set of intelligence data structures by processing data from a second local source with one or more of the first degree of source data intelligence, the second degree of source data intelligence, or the composite intelligence, where deriving a set of intelligence data structures is based on intelligent data structures requirements of an intelligent data layer consumer element of the set of intelligence data structures.

[0038] In embodiments, the first intelligent data layer derives marketplace bidding activity intelligence, the second intelligent data layer derives marketplace settlement activity intelligence, and the third intelligent data layer derives the composite intelligence including relative impacts of changes in bidding activity on settlement terms. In embodiments, the data from the second local source is monitored marketplace regulatory compliance data and the set of intelligence data structures includes analysis of regulatory compliance of at least one of the bidding activity intelligence, the settlement activity intelligence, and the composite intelligence. In embodiments, the data from the second local source includes one or more of, raw transaction data, analyzed transaction data, marketplace data, or financial data for a plurality of transactions in the monitored marketplace. In embodiments, at least one intelligent data layer element includes an intelligent data layer control tower that configures and operates the at least one intelligent data layer element by communicating control sequences with an ingestion system that receives source data, an analysis system that evaluates a data output of the ingestion system, and an intelligence deriving system that produces a corresponding one of source data intelligence, composite intelligence, and the set of intelligence data structures. In embodiments, the ingestion system parses content of source data to determine structure of source data content and relationships among elements in the source data. In embodiments, the ingestion system parses a content of data sources resulting in generating characterization data that includes an intended meaning of data elements and relationships among the data elements, structures of the data, and the intended meaning of the data parsed from the content. In embodiments, the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of a corresponding source of data. In embodiments, the ingestion system is configured to maintain a schedule of collection activity for one or more sources of data. In embodiments, the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an

ingestion instance of the source data. In embodiments, the analysis system compares data from the source data against a target use of corresponding sourced data intelligence to determine a degree of fitness for use of the source of data by the intelligence deriving system.

[0039] In embodiments, one or more intelligent data layer network elements is initiated as a virtualized container of system-specific intelligent data layer element functions. In embodiments, the virtualized container is executed on a cloud-processing architecture. In embodiments, at least one of the intelligent data layer elements ingests data from a plurality of types of sources of data including data channels, on-demand data sources, and published data sources. In embodiments, the ingestion system monitors a port on a data network for an indication of data availability at a source of data. In embodiments, the set of intelligence data structures includes a multi-dimensional representation of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

Source discovery using an intelligent data layer

[0040] In embodiments, a system for discovering data sources for an intelligent data layer includes: a computer-readable storage system that stores a source discovery data store that maintains a data store storing information about existing data sources; an ingestion system for capturing data from candidate data sources; an analysis system for evaluating content ingested from the candidate data sources for meeting one or more aspects of a target source discovery criteria; a similarity engine that produces a degree of similarity signal indicative of a degree of similarity of the candidate data source to at least one of the existing data sources; a relevance engine that produces a degree of usefulness signal indicative of a utility of the candidate source for producing at least one intelligence outcome; and an intelligent data layer control tower that applies artificial intelligence techniques for determining at least one of ingestion actions for the ingestion system and analysis actions for the analysis engine, and for making a determination of use of the candidate data source. In embodiments, the intelligent data layer control tower applies machine learning to train the artificial intelligence techniques. In embodiments, the intelligent data layer is integrated into a marketplace system of systems. In embodiments, the marketplace system of systems is an automated market orchestration system of systems. In embodiments, the intelligent data layer control tower determines that at least one integration action includes capturing information from and about candidate sources. In embodiments, the intelligent data layer control tower determines that at least one integration action includes advertising for candidate sources. In embodiments, the intelligent data layer control tower determines that at least one integration action includes contacting a plurality of known content sources with sets of criteria that are descriptive of a type of content. In embodiments, the ingestion system adapts at least a portion of a set of criteria

for seeking a source of data by performing at least one of adjusting a range of a value that is descriptive of target source data, or broadening the set of criteria by abstracting at least one data requirement.

[0041] In embodiments, the intelligent data layer control tower suggests source content discovery criteria based on analysis of existing sources, based on requests for variation of intelligence from consumers of the intelligent data layer, and feedback relating to usefulness of existing sources. In embodiments, the ingestion system adapts an original ingestion profile for one or more existing data sources thereby causing ingestion of content from the one or more existing data sources that is excluded from ingestion under the original ingestion profile. In embodiments, the ingestion system filters data from the candidate data sources based on compliance with at least a portion of a target content ingestion criteria and forwards data from the candidate data source that is accepted through the filter to the analysis engine. In embodiments, the target content ingestion criteria includes requirements of a data format, a language, and a minimum precision. In embodiments, the ingestion system provides source discovery status information to the intelligent data layer control tower for candidate sources of data. In embodiments, the analysis system processes data forwarded by the ingestion system to determine compliance with source discovery criteria. In embodiments, the source discovery criteria includes consistency of source terminology. In embodiments, the source discovery criteria includes consistency of terminology in the candidate data source to terminology of at least one of the existing data sources.

[0042] In embodiments, the analysis system applies a data stabilization algorithm to a portion of the data from the candidate source, a result of which is compared to a data stability criteria of the source discovery criteria. In embodiments, the similarity engine determines a degree of similarity of a portion of the candidate source data and at least one existing source of data by comparing data values of the portion to data values of a portion of an existing source of data. In embodiments, a degree of usefulness signal includes a predicted impact on intelligence derivable from the candidate source used by one or more intelligence derivation algorithms.

[0043] In embodiments, the degree of usefulness signal includes an indication that a corresponding candidate source is to be added to a list of approved sources.

[0044] In embodiments, a method of discovering data sources for an intelligent data layer includes: storing a source discovery data store that maintains a data store storing information about existing data sources in a computer-readable storage system; capturing data from candidate data sources with an ingestion system; evaluating content ingested from the candidate data sources for meeting one or more aspects of a target source discovery criteria with an analysis system; producing a degree of similarity signal indicative of a degree of similarity of the candidate data source to at least one of the existing data sources with a similarity engine; producing a degree of

usefulness signal indicative of a utility of the candidate source for producing at least one intelligence outcome with a relevance engine; and applying artificial intelligence techniques with an intelligent data layer control tower for determining at least one of ingestion actions for the ingestion system and analysis actions for the analysis engine, and for making a determination of use of the candidate data source. In embodiments, the intelligent data layer control tower applies machine learning to train the artificial intelligence techniques. In embodiments, the intelligent data layer is integrated into a marketplace system of systems. In embodiments, the marketplace system of systems is an automated market orchestration system of systems. In embodiments, the intelligent data layer control tower determines that at least one integration action includes capturing information from and about candidate sources. In embodiments, the intelligent data layer control tower determines that at least one integration action includes advertising for candidate sources. In embodiments, the intelligent data layer control tower determines that at least one integration action includes contacting a plurality of known content sources with sets of criteria that are descriptive of a type of content. In embodiments, the ingestion system adapts at least a portion of a set of criteria for seeking a source of data by performing at least one of adjusting a range of a value that is descriptive of target source data, or broadening the set of criteria by abstracting at least one data requirement.

[0045] In embodiments, the intelligent data layer control tower suggests source content discovery criteria based on analysis of existing sources, based on requests for variation of intelligence from consumers of the intelligent data layer, and feedback relating to usefulness of existing sources. In embodiments, the ingestion system adapts an original ingestion profile for one or more existing data sources thereby causing ingestion of content from the one or more existing data sources that is excluded from ingestion under the original ingestion profile. In embodiments, the ingestion system filters data from the candidate data sources based on compliance with at least a portion of a target content ingestion criteria and forwards data from the candidate data source that is accepted through the filter to the analysis engine. In embodiments, the target content ingestion criteria includes requirements of a data format, a language, and a minimum precision. In embodiments, the ingestion system provides source discovery status information to the intelligent data layer control tower for candidate sources of data. In embodiments, the analysis system processes data forwarded by the ingestion system to determine compliance with source discovery criteria. In embodiments, the source discovery criteria includes consistency of source terminology. In embodiments, the source discovery criteria includes consistency of terminology in the candidate data source to terminology of at least one of the existing data sources. In embodiments, the analysis system applies a data stabilization algorithm to a portion of the data from the candidate source, a result of which is compared to a data stability criteria of the source discovery criteria. In

embodiments, the similarity engine determines a degree of similarity of a portion of the candidate source data and at least one existing source of data by comparing data values of the portion to data values of a portion of an existing source of data. In embodiments, a degree of usefulness signal includes a predicted impact on intelligence derivable from the candidate source used by one or more intelligence derivation algorithms. In embodiments, the degree of usefulness signal includes an indication that a corresponding candidate source is to be added to a list of approved sources.

Data and networking pipeline for market orchestration

[0046] In embodiments, a method of adapting a route for delivery of asset data to a marketplace orchestration interface through a network pipeline is embodied as a set of computer-readable instructions that is executed by a set of one or more processors and including: identifying a set of asset-centric network resources in the network pipeline, a portion of the set of asset-centric network resources providing an interface to an asset in a set of assets for which transactions are conducted in a marketplace, the interface to the asset further configured to facilitate delivery of the asset data from the asset through the network pipeline; identifying a set of marketplace-centric network resources in the network pipeline, a portion of the set of marketplace-centric network resources providing access to a transaction orchestration system interface, the transaction orchestration system interface configured for an operator to orchestrate a set of parameters for a set of transaction workflows of the marketplace involving the set of assets; adapting a network path within the network pipeline that enables delivery of the asset data from the asset in the set of assets through the portion of the set of asset-centric network resources and through the portion of the set of marketplace-centric network resources to the transaction orchestration system interface, where adapting the network path is based on one or more characteristics of the asset data and at least one performance parameter of the network path; and delivering the asset data from the asset through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

[0047] In embodiments, the interface to an asset in a set of assets communicates with a native network interface of the asset. In embodiments, the interface to the asset in the set of assets communicates with an asset management resource. In embodiments, the asset data is provided by the asset management resource. In embodiments, the interface to an asset in a set of assets communicates with a digital twin of the asset. In embodiments, the asset data is provided by the digital twin. In embodiments, the set of assets include one or more assets selected from a list of assets consisting of electronic devices, non-electronic devices, digital rights, services, humans, robots, and on-demand built items. In embodiments, the set of assets includes at least one interface for a plurality of assets in the set of assets, where the asset data for the plurality of assets is provided to the network pipeline through the at least one interface. In embodiments, the set of asset-centric

network resources in the network pipeline includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store. In embodiments, the set of asset-centric network resources perform asset-centric data handling. In embodiments, a portion of the set of asset-centric network resources is configured by an asset resource controller to work cooperatively with an asset-centric data handling service for processing and storing the asset data in an asset-localized network data store. In embodiments, the asset resource controller configures the portion of the set of asset-centric network resources based on a result of analysis of the asset data by the asset-centric handling service. In embodiments, the asset resource controller retrieves the result of analysis from the asset-localized network data store. In embodiments, the set of marketplace-centric network resources includes at least one resource providing a service selected from a list of services consisting of electronic wallet services, digital twin services, enterprise database services, platform as a service platform services, computer aided design services, and video game services. In embodiments, adapting the network path is based on one or more security characteristics of the asset data. In embodiments, adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, adapting the network path is based on one or more jurisdiction characteristics of the asset data. In embodiments, adapting the network path based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

[0048] In embodiments, the set of marketplace-centric network resources includes smart contract-centric network resources that provide an interface to a set of smart contracts. In embodiments, the set of marketplace-centric network resources includes workflow centric resources that provide an interface to a set workflow resources.

[0049] In embodiments, a system includes: a set of asset-centric network resources in a network pipeline, a portion of the set of asset-centric network resources providing an interface to an asset in a set of assets for which transactions are conducted in a marketplace, the interface to the asset further configured to facilitate delivery of asset data from the asset through the network pipeline; a set of marketplace-centric network resources in the network pipeline, a portion of the set of marketplace-centric network resources providing access to a transaction orchestration system interface, the transaction orchestration system interface configured for an operator to orchestrate a set of parameters for a set of transaction workflows of the marketplace involving the set of assets; and a set of computer-readable instructions that is executed by a set of one or more processors to adapt a network path within the network pipeline based on one or more characteristics of the asset data and at least one performance parameter of the network path thereby enabling delivery of the

asset data from the asset in the set of assets through the portion of the set of asset-centric network resources and through the portion of the set of marketplace-centric network resources to the transaction orchestration system interface and to deliver the asset data from the asset through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface. In embodiments, the interface to an asset in a set of assets communicates with a native network interface of the asset. In embodiments, the interface to the asset in the set of assets communicates with an asset management resource. In embodiments, the asset data is provided by the asset management resource. In embodiments, the interface to an asset in a set of assets communicates with a digital twin of the asset. In embodiments, the asset data is provided by the digital twin. In embodiments, the set of assets includes one or more assets selected from a list of assets consisting of electronic devices, non-electronic devices, digital rights, services, humans, robots, and on-demand built items. In embodiments, the set of assets includes at least one interface for a plurality of assets in the set of assets, where the asset data for the plurality of assets is provided to the network pipeline through the at least one interface. In embodiments, the set of asset-centric network resources in the network pipeline includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store. In embodiments, the set of asset-centric network resources perform asset-centric data handling. In embodiments, a portion of the set of asset-centric network resources is configured by an asset resource controller to work cooperatively with an asset-centric data handling service for processing and storing the asset data in an asset-localized network data store. In embodiments, the asset resource controller configures the portion of the set of asset-centric network resources based on a result of analysis of the asset data by the asset-centric handling service. In embodiments, the asset resource controller retrieves the result of analysis from the asset-localized network data store. In embodiments, the set of marketplace-centric network resources includes at least one resource providing a service selected from a list of services consisting of electronic wallet services, digital twin services, enterprise database services, platform as a service platform services, computer aided design services, and video game services. In embodiments, to adapt the network path is based on one or more security characteristics of the asset data. In embodiments, to adapt the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, to adapt the network path is based on one or more jurisdiction characteristics of the asset data. In embodiments, to adapt the network path based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources. In embodiments, the set of marketplace-centric network resources includes smart contract-centric network resources that provide an interface to a set of smart contracts. In

embodiments, the set of marketplace-centric network resources includes workflow centric resources that provide an interface to a set workflow resources.

[0050] In embodiments, a system includes: a network adaptation system that automatically constructs a network infrastructure path in a network pipeline to deliver data from an asset to a market orchestration recipient, the constructed network infrastructure path is automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path; a network timing adaptation system that automatically adapts network infrastructure resources in a network pipeline that delivers data from the asset to the market orchestration recipient for orchestration of a transaction of the asset, where the network infrastructure resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline; a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline; and a set of marketplace-centric network resources that facilitate delivery of the asset data from the adapted network pipeline to the market orchestration recipient. In embodiments, the network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset. In embodiments, the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset. In embodiments, the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

[0051] In embodiments, adapting the network infrastructure path is based on one or more security characteristics of the asset data. In embodiments, adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data. In embodiments, adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path.

[0052] In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure nodes used previously to deliver the data from the asset. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to

deliver the data from the asset that are recorded in a historical record of network paths for the asset data. In embodiments, adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one or more portions of the data from the asset, where the plurality of recipients is determined from a transaction workflow for the asset.

[0053] In embodiments, a method embodied as a set of computer-readable instructions that is executed by a set of one or more processors and includes: constructing a network infrastructure path in a network pipeline with a network adaptation system to deliver data from an asset to a market orchestration recipient, the network infrastructure path automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path; adapting network infrastructure resources in the network pipeline, with a network timing adaptation system, that delivers data from the asset to the market orchestration recipient, where the network infrastructure resources are adapted based on at least one of a parameter of a transaction of the asset and a performance parameter of the network pipeline; ingesting the data from the asset into the network pipeline with a set of asset-centric network resources; and delivering the asset data from the adapted network pipeline to the market orchestration recipient with a set of marketplace-centric network resources. In embodiments, the adapted network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset. In embodiments, the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset. In embodiments, the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

[0054] In embodiments, adapting the network path is based on one or more security characteristics of the asset data. In embodiments, adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data. In embodiments, adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure

nodes used previously to deliver the data from the asset. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the asset data. In embodiments, adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one or more portions of the data from the asset, where the plurality of recipients is determined from a transaction workflow for the asset.

Asset-centric network pipeline infrastructure resources (operator interface))

[0055] In embodiments, a system of network infrastructure resources includes: a first network interface connecting a set of the network infrastructure resources to an asset network resource; a second network interface connecting the set of network infrastructure resources to a second set of network infrastructure resources forming a portion of a network path for delivering data from the asset to a marketplace orchestration system interface, the network path automatically adapted to deliver the data from the asset to the marketplace orchestration system interface based on one or more characteristics of the data from the asset and at least one performance parameter for the network path; an asset-centric controller communicating with the asset through the first network interface and controlling delivery of the data from the asset over the adapted network path; an asset-centric data handling system communicating with the asset through the first network interface and processing the data from the asset in support of delivery of the data from the asset over the adapted network path; and an asset-centric data storage facility controlled by the asset-centric controller to receive data processed by the asset-centric data handling system, where data stored in the asset-centric data storage facility is accessible through the second interface by a portion of the second set of network infrastructure resources for delivering data from the asset to the marketplace orchestration system interface. In embodiments, the network path is further automatically adapted to adjust timing of delivery of data from the asset to the marketplace orchestration system interface based on at least one of a transaction parameter and a network performance parameter. In embodiments, the first network interface communicates with a native network interface of the asset. In embodiments, the first network interface communicates with an asset management resource. In embodiments, the asset data is provided by the asset management resource. In embodiments, the first network interface communicates with a digital twin of the asset. In embodiments, the data from the asset is provided by the digital twin. In embodiments, the asset-centric controller configures the first network interface based on a result of analysis of the data from the asset by the asset-centric data handling system. In embodiments, the asset-centric controller retrieves the result of analysis from the asset-centric data storage facility. In embodiments, the network path is further automatically adapted based on one or more security

characteristics of the data from the asset. In embodiments, further automatically adapting the network path based on the one or more security characteristics of the data includes configuring the network path to avoid poor reputation network resources. In embodiments, the automatically adapted network path includes an adapted communication protocol that avoids exposing data from the asset in a context that gives meaning to the data. In embodiments, adjusting the adapted communication protocol delivers a first portion of the data from the asset through a first network path and a second portion of the data from the asset through a second network path. In embodiments, the automatically adapted network path for delivering the data from the asset changes over time. In embodiments, the automatically adapted network path is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the data from the asset. In embodiments, the asset-centric controller configures the first network interface and the asset-centric data handling system so delivery of the data from the asset over the adapted network path is independent of how data from the asset is received from the asset by the first network communication interface.

[0056] In embodiments, the marketplace orchestration system interface is a set of smart contracts that includes terms, conditions, and parameters for a set of transaction workflows involving the asset. In embodiments, the marketplace orchestration system interface is an interface through which an operator orchestrates parameters of a set of transaction workflows associated with transactions for the assets. In embodiments, the operator orchestrates parameters of a set of transaction workflows based on the data from the asset. In embodiments, the marketplace orchestration system interface is adapted to facilitate orchestrating parameters of a set of transaction workflows involving the assets.

[0057] In embodiments, a method includes: connecting via a first network interface a set of network infrastructure resources to an asset; connecting via a second network interface the set of network infrastructure resources to a second set of network infrastructure resources forming a portion of a network path for delivering data from the asset to a marketplace orchestration system interface, the network path automatically adapted to deliver the data from the asset to the marketplace orchestration system interface based on one or more characteristics of the data from the asset and at least one performance parameter for the network path; controlling delivery of the data from the asset over the adapted network path with an asset-centric controller disposed to communicate with the asset through the first network interface; processing the data from the asset in support of delivery of the data from the asset over the adapted network path with an asset-centric data handling system disposed to communicate with the asset through the first network interface; and storing data processed by the asset-centric data handling system in an asset-centric data storage facility controlled by the asset-centric controller, where data stored in the asset-centric data storage

facility is accessible through the second interface by a portion of the second set of network infrastructure resources for delivering data from the asset to the marketplace orchestration system interface.

[0058] In embodiments, the network path is further automatically adapted to adjust timing of delivery of data from the asset to the marketplace orchestration system interface based on at least one of a transaction parameter and a network performance parameter. In embodiments, the first network interface communicates with a native network interface of the asset. In embodiments, the first network interface communicates with an asset management resource. In embodiments, the asset data is provided by the asset management resource. In embodiments, the first network interface communicates with a digital twin of the asset. In embodiments, the data from the asset is provided by the digital twin. In embodiments, the asset-centric controller configures the first network interface based on a result of analysis of the data from the asset by the asset-centric data handling system. In embodiments, the asset-centric controller retrieves the result of analysis from the asset-centric data storage facility. In embodiments, the network path is further automatically adapted based on one or more security characteristics of the data from the asset. In embodiments, further automatically adapting the network path based on the one or more security characteristics of the data includes configuring the network path to avoid poor reputation network resources. In embodiments, the automatically adapted network path includes an adapted communication protocol that avoids exposing data from the asset in a context that gives meaning to the data. In embodiments, adjusting the adapted communication protocol delivers a first portion of the data from the asset through a first network path and a second portion of the data from the asset through a second network path. In embodiments, the automatically adapted network path for delivering the data from the asset changes over time. In embodiments, the automatically adapted network path is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the data from the asset. In embodiments, the asset-centric controller configures the first network interface and the asset-centric data handling system so delivery of the data from the asset over the adapted network path is independent of how data from the asset is received from the asset by the first network communication interface.

[0059] In embodiments, the marketplace orchestration system interface is a set of smart contracts that includes terms, conditions, and parameters for a set of transaction workflows involving the asset. In embodiments, the marketplace orchestration system interface is an interface through which an operator orchestrates parameters of a set of transaction workflows associated with transactions for the assets. In embodiments, the operator orchestrates parameters of a set of transaction workflows based on the data from the asset. In embodiments, the marketplace

orchestration system interface is adapted to facilitate orchestrating parameters of a set of transaction workflows involving the assets.

Adapted path in a network pipeline with integrated marketplace APIs for orchestration by an operator

[0060] In embodiments, a system includes: a network adaptation system that automatically adapts a network infrastructure path from an asset to a market orchestration recipient in a network pipeline that delivers asset data from the asset to the recipient, the network infrastructure path automatically adapted based on one or more characteristics of the asset data and at least one performance parameter for the network path; a set of asset-centric network resources that facilitate ingestion of the data from the asset into the adapted network pipeline; a set of marketplace-centric network resources that facilitate delivery of the asset data of the adapted network pipeline to the market orchestration recipient; and a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the market orchestration recipient, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the set of integrated application programming interfaces, where a portion of the transaction workflows is activated.

[0061] In embodiments, the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function that monitors a status of a service signals to the marketplace to activate the portion of the

transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the automated design function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Adapted path in a network pipeline with integrated marketplace APIs for orchestration by for a smart contract)

[0062] In embodiments, a method includes: adapting a network infrastructure path from an asset to a smart contract in a network pipeline with a network adaptation system, the adapted network pipeline delivering asset data from the asset to the smart contract, the network infrastructure path automatically adapted based on one or more characteristics of the asset data and at least one performance parameter for the network path; ingesting the data from the asset into the adapted network pipeline with a set of asset-centric network resources; delivering the ingested asset data of the adapted network pipeline to the smart contract with a set of marketplace-centric network resources; and activating a portion of a set of transaction workflows with a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the smart contract, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the set of integrated application programming interfaces, where the portion of the transaction workflows is activated.

[0063] In embodiments, the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the digital twin of the function of the asset signals to the marketplace to activate the portion of the

transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the automated design function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Adapted timing of a path in a network pipeline with integrated marketplace APIs

[0064] In embodiments, a system includes: a network timing adaptation system that automatically adapts timing of data transfer through a network pipeline that delivers data from an asset to a market orchestration recipient by adapting one or more network resources of the network pipeline to control data transfer within the network pipeline, the timing of data transfer associated with a time requirement for a transaction of the asset, where the one or more network resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline; a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline; a set of marketplace-centric network resources that facilitate delivery of the ingested asset data of the adapted network pipeline to the market orchestration recipient; a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the market orchestration recipient according to data from the asset that is delivered through the adapted one or more network infrastructure resources, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for

activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the integrated application programming interfaces whereby a portion of the transaction workflows is activated.

[0065] In embodiments, the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the automated design function signals to the marketplace to activate the portion of the transaction workflows through the set of application programming interfaces. In embodiments, the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the set of application programming interfaces.

Adapted timing of a path in a network pipeline with integrated marketplace APIs for a smart contact)

[0066] In embodiments, a method includes: adapting timing of data transfer through a network pipeline that delivers data from an asset to a smart contract with a network timing adaptation system by adapting one or more network resources of the network pipeline to control data transfer within

the network pipeline, the timing of data transfer associated with a time requirement for a transaction of the asset determined by the smart contract, where the one or more network resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline; ingesting the data from the asset into the network pipeline with a set of asset-centric network resources; delivering the ingested asset data of the adapted network pipeline to the smart contract with a set of marketplace-centric network resources; activating a portion of a set of transaction workflows of the transaction of the asset determined by the smart contract with a set of application programming interfaces for a marketplace that executes the set of transaction workflows based on workflow parameters determined by the smart contract according to data from the asset that is delivered through the adapted one or more network infrastructure resources, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the integrated application programming interfaces whereby the portion of the set of transaction workflows is activated.

[0067] In embodiments, the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the automated design function signals to the

marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces. In embodiments, the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace. In embodiments, the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Market prediction

[0068] In embodiments, a market prediction system includes: a machine learning system that trains a set of machine-learned models to generate a market prediction using training data including demand features and outcomes; an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request. In embodiments, the market prediction is a prediction for a parameter of demand in a forward market for an asset. In embodiments, the market prediction is a prediction for a parameter of supply in a forward market for an asset. In embodiments, the market prediction is a prediction of a set of terms and/or conditions for a smart contract. In embodiments, the market prediction is based at least in part on crowdsourced data. In embodiments, the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments. In embodiments, the artificial intelligence system includes a recurrent neural network. In embodiments, the artificial intelligence system includes a convolutional neural network. In embodiments, the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network. In embodiments, the set of Internet of Things systems includes a set of smart home Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of workplace Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores. In embodiments, the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border

control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

[0069] In embodiments, the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

[0070] In embodiments, a market prediction system includes: A quantum computing system that receives a request to generate a market prediction and outputs a market prediction based on the request. In embodiments, the market prediction is a prediction for a parameter of demand in a forward market for an asset. In embodiments, the market prediction is a prediction for a parameter of supply in a forward market for an asset. In embodiments, the market prediction is a prediction of a set of terms and/or conditions for a smart contract. In embodiments, the market prediction is based at least in part on crowdsourced data. In embodiments, the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments. In embodiments, the set of Internet of Things systems includes a set of smart home Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of workplace Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores. In embodiments, the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities. In embodiments, the set of environments comprises one or more of: home

of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

Market orchestration and alternative lending platform

[0071] A market orchestration platform includes: a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data including smart contract features and outcomes; an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request; and a lending platform including: an Internet of Things data collection platform for monitoring at least one of a set of assets and a set of collateral for a loan, a bond, or a debt transaction.

[0072] Some embodiments further include a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform. In embodiments, the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform. In embodiments, the data collected by the Internet of Things data collection platform is image data, sensor data, or location data. Some embodiments further include a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system. In embodiments, the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing. In embodiments, the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Market prediction system and a lending platform

[0073] In embodiments, a market prediction system includes: a machine learning system that trains a set of machine-learned models to generate a market prediction using training data including market features and outcomes; an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the

request; and a lending platform including: an Internet of Things data collection platform for monitoring at least one of a set of assets and a set of collateral for a loan, a bond, or a debt transaction.

[0074] In embodiments, the market prediction is a prediction for a parameter of demand in a forward market for an asset. In embodiments, the market prediction is a prediction for a parameter of supply in a forward market for an asset. In embodiments, the market prediction is a prediction of a set of terms and/or conditions for a smart contract. In embodiments, the market prediction is based at least in part on crowdsourced data. In embodiments, the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments. In embodiments, the artificial intelligence system includes a recurrent neural network. In embodiments, the artificial intelligence system includes a convolutional neural network. In embodiments, the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network. In embodiments, the set of Internet of Things systems includes a set of smart home Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of workplace Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores. In embodiments, the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities. In embodiments, the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge,

tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

[0075] Some embodiments further include a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform. In embodiments, the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform. In embodiments, the data collected by the Internet of Things data collection platform is image data, sensor data, or location data. Some embodiments further include a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system. In embodiments, the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Enterprise access layer and market prediction system

[0076] In embodiments, a system includes: a machine learning system that trains a set of machine-learned models to generate a market prediction using training data including market features and outcomes; an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request; a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: monitoring a plurality of public market participants via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network asset layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, where the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that

involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system.

[0077] In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, the operations further comprise: receiving a response message from the monitored public market participant; and determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

[0078] facilitating fulfillment of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system. In embodiments, the market prediction is a prediction for a parameter of demand in a forward market for an asset. In embodiments, the market prediction is a prediction for a parameter of supply in a forward market for an asset. In embodiments, the market prediction is a prediction of a set of terms and/or conditions for a smart contract. In embodiments, the market prediction is based at least in part on crowdsourced data. In embodiments, the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments. In embodiments, the artificial intelligence system includes a recurrent neural network. In embodiments, the artificial intelligence system includes a convolutional neural network. In embodiments, the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network. In embodiments, the set of Internet of Things systems includes a set of smart home Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of workplace Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

[0079] In embodiments, the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers,

consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities. In embodiments, the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

Market orchestration and enterprise access layer

[0080] In embodiments, a system includes: a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data including smart contract features and outcomes; an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request; a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: monitoring a plurality of public market participants via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network asset

layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, where the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system.

[0081] In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, the operations further comprise: receiving a response message from the monitored public market participant; and determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

[0082] facilitating fulfillment of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system. Some embodiments further include a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform. In embodiments, the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform. In embodiments, the data collected by the Internet of Things data collection platform is image data, sensor data, or location data.

[0083] Some embodiments further include a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system. In embodiments, the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term

memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Market orchestration and market prediction

[0084] In embodiments, a system includes: a machine learning system that trains a set of machine-learned models to generate a market prediction using training data including market features and outcomes; an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request; a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data including smart contract features and outcomes; and an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request.

[0085] In embodiments, the market prediction is a prediction for a parameter of demand in a forward market for an asset. In embodiments, the market prediction is a prediction for a parameter of supply in a forward market for an asset. In embodiments, the market prediction is a prediction of a set of terms and/or conditions for a smart contract. In embodiments, the market prediction is based at least in part on crowdsourced data. In embodiments, the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments. In embodiments, the artificial intelligence system includes a recurrent neural network. In embodiments, the artificial intelligence system includes a convolutional neural network. In embodiments, the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network. In embodiments, the set of Internet of Things systems includes a set of smart home Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of workplace Internet of Things devices. In embodiments, the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

[0086] In embodiments, the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers,

fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

[0087] In embodiments, the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

[0088] Some embodiments further include a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform.

[0089] In embodiments, the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform. In embodiments, the data collected by the Internet of Things data collection platform is image data, sensor data, or location data. Some embodiments further include a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system. In embodiments, the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Data and network infrastructure pipeline with market orchestration

[0090] In embodiments, a system includes: a network adaptation system that automatically constructs a network infrastructure path in a network pipeline to deliver data from an asset to a market orchestration recipient, the constructed network infrastructure path is automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path; a network timing adaptation system that automatically adapts network infrastructure resources in a network pipeline that delivers data from the asset to the market orchestration recipient for orchestration of a transaction of the asset, where the network infrastructure resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline; a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline; a set of marketplace-centric network resources that facilitate delivery of the asset data from the

adapted network pipeline to the market orchestration recipient; a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data including smart contract features and outcomes; and

[0091] an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request.

[0092] In embodiments, the network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset. In embodiments, the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset. In embodiments, the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

[0093] In embodiments, adapting the network infrastructure path is based on one or more security characteristics of the asset data. In embodiments, adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data. In embodiments, adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure nodes used previously to deliver the data from the asset. In embodiments, constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the asset data. In embodiments, adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one or more portions of the data from the asset, where the plurality of recipients is determined from a transaction workflow for the asset.

Trust networks and enterprise access layers

[0094] In embodiments, a system includes: a computer-readable medium that stores a set of executable instructions; a processing system that executes an enterprise access layer that executes transactions on behalf of an enterprise having a plurality of different users, where the enterprise

access layer includes a wallet system, a workflow system, and a permissions system, where: the wallet system manages a plurality of digital wallets associated with the enterprise and is configured to: receive a transaction request initiated by a user device associated with a user of the plurality of users, the transaction request requesting a transaction to be executed by the wallet system and having a set of attributes corresponding to the transaction; select a wallet of the plurality of wallets to execute the transaction based on the set of attributes; and initiating a transaction workflow from a set of workflows based on the selected wallet; when the transaction is a trustless transaction performed on a distributed ledger, the workflow system is configured to: obtain a distributed ledger address of a counterparty to the trustless transaction; obtain a trust score based on the distributed ledger address of the counterparty; determine whether to execute the transaction based on the trust score corresponding to the counterparty and a role of the user within the enterprise; and in response to determining to allow the trustless transaction, instructing the wallet system to perform the trustless transaction from the selected wallet.

[0095] In embodiments, the workflow system provides a request to the permissions system to verify that the user is authorized to perform the transaction based on the role of the user and one or more transaction attributes. In embodiments, the workflow system provides a trust score request to a trust system, where the request indicates the distributed ledger address of the counterparty and the trust system returns the trust score. In embodiments, the trust system comprises a decentralized network of node computing devices, where each respective node computing device independently determines a local trust score for the distributed ledger address based on distributed ledger data available to the respective node computing device. In embodiments, the trust score is a consensus trust score that is based on the local trust scores determined by the respective node computing devices. In embodiments, the trust system comprises a centralized system that monitors a distributed network. In embodiments, the transaction workflow determines to execute the transaction in response to verifying that the user is authorized to perform the transaction and the trust score exceeding a trust threshold. In embodiments, in response to performing the trustless transaction, the wallet system generates a transaction record and stores the transaction record on a second distributed ledger. In embodiments, the second distributed ledger is a private distributed ledger maintained by the enterprise. In embodiments, the wallet system manages a set of private and public keys on behalf of the entity.

[0096] In embodiments, a method for executing user-initiated transactions on behalf of an enterprise having a plurality of different users includes: receiving, by a wallet system, a transaction request initiated by a user device associated with a user of the plurality of users, the transaction request requesting a transaction to be executed by the wallet system and having a set of attributes corresponding to the transaction; selecting, by the wallet system, a wallet of a plurality of digital

wallets associated with the enterprise to execute the transaction based on the set of attributes; and initiating a transaction workflow from a set of workflows based on the selected wallet, where when the transaction is a trustless transaction performed on a distributed ledger, the selected workflow executes: obtaining a distributed ledger address of a counterparty to the trustless transaction; obtaining a trust score based on the distributed ledger address of the counterparty; determining whether to execute the transaction based on the trust score corresponding to the counterparty and a role of the user within the enterprise; and in response to determining to allow the trustless transaction, instructing the wallet system to perform the trustless transaction from the selected wallet.

[0097] In embodiments, the workflow system provides a request to the permissions system to verify that the user is authorized to perform the transaction based on the role of the user and one or more transaction attributes. In embodiments, the workflow system provides a trust score request to a trust system, where the request indicates the distributed ledger address of the counterparty and the trust system returns the trust score. In embodiments, the trust system comprises a decentralized network of node computing devices, where each respective node computing device independently determines a local trust score for the distributed ledger address based on distributed ledger data available to the respective node computing device. In embodiments, the trust score is a consensus trust score that is based on the local trust scores determined by the respective node computing devices. In embodiments, the trust system comprises a centralized system that monitors a distributed network. In embodiments, the transaction workflow determines to execute the transaction in response to verifying that the user is authorized to perform the transaction and the trust score exceeds a trust threshold. In embodiments, in response to performing the trustless transaction, the wallet system generates a transaction record and stores the transaction record on a second distributed ledger. In embodiments, the second distributed ledger is a private distributed ledger maintained by the enterprise. In embodiments, the wallet system manages a set of private and public keys on behalf of the entity.

Data and network infrastructure Pipeline and Intelligent Data Layers

[0098] An intelligent data layer system includes: a computer-readable storage system that stores a layer configuration data store that maintains: ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost; parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and one or more analysis algorithms; and a set of one or more processors that execute a set of computer-readable instructions, where the set of one or more processors collectively: receive an

intelligence request pertaining to an asset in a set of assets from an intelligence consumer portal a set of marketplace-centric network resources that provide access to a transaction orchestration system interface; determine at least one data source for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of data source-centric network resources; configure an ingestion system based on the ingestion parameters and parsing rules in the layer configuration data store for ingesting data pertaining to the asset from the at least one data source via the set of data source-centric network resources; configure an analysis system based on the analysis algorithms in the layer configuration data store for the at least one data source; configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system; operate the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, and derive a set of intelligence data from at least one of the ingested data from the at least one data source or from an outcome of using the analysis system; adapt a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction orchestration system interface based on one or more characteristics of the asset ingested from the at least one source and at least one performance parameter of the network path; and communicating the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

[0099] An intelligent data layer system includes: a set of one or more processors that execute a set of computer-readable instructions, where the set of one or more processors collectively: receive an intelligence request pertaining to an asset in a set of assets from an intelligence consumer portal a set of marketplace-centric network resources that provide access to a transaction orchestration system interface; determine at least one data source pertaining to the asset and for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of asset-data source-centric network resources; configure an ingestion system based on a set of ingestion parameters and parsing rules from an ingestion system configuration data store, the ingestion system for ingesting data pertaining to the asset from the at least one data source via the set of asset-data source-centric network resources; configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system to derive a set of intelligence data from at least one of the ingested data from the at least one data source; adapt a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction orchestration system interface, where to

adapt the network path is based on one or more characteristics of the asset captured from the at least one source and at least one performance parameter of the network path; and communicate the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

[0100] In embodiments, the set of asset-data source-centric network resources is an asset management resource. In embodiments, the data pertaining to the asset is ingested from the asset management resource. In embodiments, the at least one data source pertaining to the asset is a digital twin of the asset. In embodiments, the data pertaining to the asset is provided by the digital twin. In embodiments, the set of asset-data source-centric network resources includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store. In embodiments, the asset resource controller configures a portion of the set of asset-data source-centric network resources based on a result of analysis of the data pertaining to the asset data by the asset resource controller. In embodiments, the at least one data source pertaining to the asset is the asset. In embodiments, the network path is adapted based on one or more security characteristics of the data pertaining to the asset ingested from the at least one data source. In embodiments, the network path is adapted based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, the network path is adapted based on one or more jurisdiction characteristics of the asset data. In embodiments, the network path is adapted based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

[0101] In embodiments, a method of providing intelligence for a transaction orchestration system through an intelligent data layer system includes: receiving an intelligence request pertaining to an asset in a set of assets from a set of marketplace-centric network resources that provide access to a transaction orchestration system interface; determining at least one data source pertaining to the asset and for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of asset-data source-centric network resources; configuring an ingestion system based on a set of ingestion parameters and parsing rules from an ingestion system configuration data store, the ingestion system for ingesting data pertaining to the asset from the at least one data source via the set of asset-data source-centric network resources; configuring an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system to derive a set of intelligence data from at least one of the ingested data from the at least one data source; adapting a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction

orchestration system interface, where adapting the network path is based on one or more characteristics of the asset captured from the at least one source and at least one performance parameter of the network path; and communicating the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

[0102] In embodiments, the set of asset-data source-centric network resources is an asset management resource. In embodiments, the data pertaining to the asset is ingested from the asset management resource. In embodiments, the at least one data source pertaining to the asset is a digital twin of the asset. In embodiments, the data pertaining to the asset is provided by the digital twin. In embodiments, the set of asset-data source-centric network resources includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store. In embodiments, the asset resource controller configures a portion of the set of asset-data source-centric network resources based on a result of analysis of the data pertaining to the asset data by the asset resource controller. In embodiments, the at least one data source pertaining to the asset is the asset. In embodiments, the network path is adapted based on one or more security characteristics of the data pertaining to the asset ingested from the at least one data source.

Enterprise access layers and data pipeline

[0103] A computer-implemented method includes: monitoring a plurality of public market participants via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate; identifying a digital wallet system associated with the network access layer, the digital wallet system making available a digital asset of a set of assets for which transactions are conducted in a marketplace, the digital wallet further configured to facilitate delivery of the digital asset through a network pipeline associated with the network access layer to an interface of the marketplace; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches the digital asset available in the digital wallet system; and

[0104] in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network asset layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a transaction targeted for the marketplace based on a set of parameters for a set of digital asset transaction workflows of the marketplace that are orchestrated by an operator through a transaction orchestration interface the transaction with the monitored public market participant and involving the asset available in the

digital wallet system satisfies an asset control criteria corresponding to the asset available, where the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria: adapting a network path within the network pipeline that enables delivery of the digital asset to the transaction orchestration system interface, where adapting the network path is based on one or more characteristics of the digital asset and at least one performance parameter of the network path; and delivering the digital asset and a message requesting an actual transaction with the monitored public market participant involving the asset available from the interface system to the transaction orchestration system interface via the adapted network path.

[0105] Some embodiments further include: receiving a message from the monitored public market participant that indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction in the marketplace. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the digital asset in a public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes: signing the actual transaction involving the asset on a cold wallet; and

[0106] relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls transactional detail requirements for the asset. In embodiments, the digital wallet communicates with a digital twin of the digital asset. In embodiments, determining whether a transaction targeted for the marketplace with the monitored public market participant and involving the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available is based on data of the digital asset provided by the digital twin. In embodiments, adapting the network path is based on one or more security characteristics of the digital asset. In embodiments, adapting the network path based on the one or more security characteristics of the digital asset includes configuring a path through the network pipeline that avoids poor reputation network resources. In embodiments, adapting the network path is based on one or more jurisdiction characteristics of the digital asset. In embodiments, adapting the network

path based on the one or more jurisdiction characteristics of the digital asset includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

Enterprise Access Layer and Intelligent Data Layers

[0107] An intelligent data enterprise network access layer system includes: a computer-readable storage system that stores a network access layer configuration data store that maintains: ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost; parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and one or more analysis algorithms; and a set of one or more processors of the network access layer that is controlled by an enterprise, the set of one or more processors that execute a set of computer-readable instructions, where the set of one or more processors collectively: monitor a plurality of public market participants via an interface system of the network access layer; receive an indication that a monitored public market participant requests a digital asset candidate; determine at least one digital wallet system associated with the network access layer with available assets based on the received request; configure an ingestion system based on the ingestion parameters and parsing rules in the network access layer configuration data store for the at least one digital wallet; configure an analysis system based on the analysis algorithms in the network access layer configuration data store for the at least one digital wallet; configure an intelligence deriving system based on information in the digital asset candidate request and available intelligence services in an intelligence service system associated with the network access layer; ingest data from the at least one digital wallet pertaining to available assets using the ingestion system; analyze the ingested data from the at least one digital wallet using the analysis system; derive a set of intelligence data from at least one of the ingested data from the at least one data source or an outcome of using the analysis system; determine based on the derived set of intelligence data and the request whether the digital asset candidate matches an available asset; identify a set of asset controls managed by a permission system of the network access layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determine whether a transaction with the monitored public market participant that involves a matching available asset satisfies a criteria of the set of asset controls assigned to the matching available asset, where the criteria indicates that a threshold number of the set of asset controls have been violated; and in response to determining that the transaction with the monitored public market participant that involves the matching available asset satisfies the assigned asset control criteria, generate a message data packet

requesting an actual transaction with the monitored public market participant involving the asset available, the message including a portion of the set of intelligence data, where the message data packet is configured for communication via the interface system.

[0108] In embodiments, the computer-readable storage system stores an intelligent data layer store that maintains results of operations of one or more systems of the intelligent data enterprise network access layer system. In embodiments, the one or more systems includes the ingestion system, the analysis system, the permissions system, the interface system, and the intelligence deriving system. In embodiments, the result of operations includes intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results. In embodiments, to configure the analysis system is further based on public market participants objectives of the request. In embodiments, re to configure the analysis system is further based on aspects of the request for a digital asset candidate. In embodiments, the set of one or more processors is configured in an intelligent data enterprise network access layer control tower that configures and operates the intelligent data enterprise network access layer system by communicating control sequences with the ingestion system, the analysis system, the permission system, the interface system, and the intelligence deriving system. Some embodiments include an algorithm portal of an intelligent data enterprise network access layer control tower of the system through which at least one of the analysis algorithms is received. In embodiments, the ingestion system parses content of digital wallets to determine structure of the content and relationships among elements in the data. In embodiments, the matching asset is available in a hot wallet of the digital wallet system. In embodiments, the matching asset is available in a cold wallet of the digital wallet system. In embodiments, matching asset is available in a custodial wallet of the digital wallet system.

[0109] Some embodiments include: receiving a response message from the monitored public market participant; and determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitates use of at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitates use of at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an

access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls transactional detail requirements for the asset.

Cross-market transactions with Enterprise access layers

[0110] A computer-implemented method includes: monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, market data from a plurality of data source feeds, each of the data source feeds corresponding to one or more of the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate; processing the market data by performing one or more of filtering, normalizing, deduplicating, organizing, summarizing, and compressing, the market data; creating a distributed ledger, the distributed ledger being based on a blockchain; storing the processed data via the distributed ledger, the processed data being stored via one or more blocks of the distributed ledger; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet

[0111] system: identifying a set of asset controls managed by a permission system of the network access layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, where the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via the distributed ledger, the smart contract being stored via one or more blocks of the distributed ledger; and in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system.

[0112] A computer-implemented method includes: monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, market data from the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate; determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network access layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, where the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via a distributed ledger being based on a blockchain, the smart contract being stored via one or more blocks of the distributed ledger; and in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction that includes the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system.

[0113] In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. Some embodiments include: receiving a response message from the monitored public market participant; determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction according to the set of asset control criteria of the prospective transaction configured into the smart contract. In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction, where the public append-only data structure is the distributed ledger, and storing a digital form of the asset includes being stored via one or more blocks of the distributed ledger. In embodiments, facilitating fulfillment of the

asset transaction request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls define transactional detail requirements for the asset that are configured into the smart contract.

[0114] In embodiments, a system includes: a network access layer including a processor and storage hardware in communication with the processor, where the storage hardware includes instructions that when executed by the processor perform operations, and where the operations include: monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, where the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets; receiving, at the network access layer via the interface system, market data from the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate; and determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and in response to the digital asset candidate matching the asset available in the digital wallet system: identifying a set of asset controls managed by a permission system of the network access layer, where the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system; determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, where the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via a distributed ledger being based on a blockchain, the smart contract being stored via one or more blocks of the distributed ledger; and in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting

an actual transaction that includes the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, where the message data packet is configured for communication via the interface system.

[0115] In embodiments, the asset is available in a hot wallet of the digital wallet system. In embodiments, the asset is available in a cold wallet of the digital wallet system. In embodiments, the asset is available in a custodial wallet of the digital wallet system. In embodiments, the operations further comprise: receiving a response message from the monitored public market participant; determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and facilitating fulfillment of the actual transaction according to the set of asset control criteria of the prospective transaction configured into the smart contract.

[0116] In embodiments, facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction, where the public append-only data structure is the distributed ledger, and storing a digital form of the asset includes being stored via one or more blocks of the distributed ledger. In embodiments, facilitating fulfillment of the asset request includes: signing the actual transaction involving the asset on a cold wallet; and relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet. In embodiments, storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a hot wallet of the digital wallet system. In embodiments, storing the digital form of the asset to a public append-only data structure facilitating using at least one key from a cold wallet of the digital wallet system. In embodiments, the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system. In embodiments, the set of asset controls includes an asset control that indicates a security clearance level for the asset. In embodiments, the set of asset controls defines transactional detail requirements for the asset that are configured into the smart contract.

Trust and Transactions summary

[0117] In embodiments, a method includes identifying, by a device, an opportunity to engage in a transaction associated with a blockchain address of a blockchain ledger; receiving, by the device and from another device that is a member of a consensus trust network, a consensus trust score that is associated with the blockchain address; determining, by the device, whether to engage in the transaction with the blockchain address, wherein the determining is based on the consensus trust score received from the consensus trust network; and performing, by the device, an action to initiate an engagement in the transaction in response to determining to engage in the transaction with the blockchain address based on the consensus trust score.

[0118] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score further includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score further includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

[0119] In embodiments, a method includes receiving, by a device, a request to generate a trust score for a blockchain address associated with a blockchain ledger; determining, by the device, information that associates the blockchain address with fraudulent activity; generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information; transmitting, by the device, the first trust score associated with the blockchain address to another device; receiving, by the device and from another device, a consensus trust score for the blockchain address, wherein the consensus trust score is based on the first trust score and at least two additional trust scores associated with the blockchain address; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the other device are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and an additional reputation score associated with the other device. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

[0120] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; processing, by the device, the information with a machine learning model, wherein the machine learning model is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity; receiving, by the device, an output of the machine learning model, wherein the output includes a first trust score for the blockchain address; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an

average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

[0121] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; processing, by the device, the information with a quantum computing system, wherein the quantum computing system is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity; receiving, by the device, an output of the quantum computing system, wherein the output includes a first trust score for the blockchain address; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is

statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance. In some embodiments, the quantum computing system is configured to generate trust scores based on a graph clustering analysis of activities associated with the blockchain ledger, wherein the graph clustering analysis includes the blockchain address. In some embodiments, the quantum computing system is further configured to detect a market trend associated with an asset, and the quantum prediction algorithm is configured to generate trust scores for respective blockchain addresses based on an activity of the respective blockchain address that is associated with the asset. In some embodiments, the quantum computing system is further configured to generate trust scores based on a quantum principal component analysis of the information associated with the blockchain addresses.

[0122] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; generating, by the device, a digital twin of an entity associated with the blockchain address, wherein a response of the digital twin to a stimulus corresponds to a predicted response of the entity to the stimulus; generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on an analysis of the digital twin; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the request is associated with a transaction that includes the blockchain address, and the device is configured to determine the first trust score based on a simulation of the transaction including the digital twin and a behavior of the digital twin during the simulation. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the

blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

[0123] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; processing, by the device, the information with a dual purpose artificial neural network, wherein the dual purpose artificial neural network is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity; receiving, by the device, an output of the dual purpose artificial neural network, wherein the output includes a first trust score for the blockchain address; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger. In some embodiments, the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the

blockchain address. In some embodiments, the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance. Some embodiments further include updating, by the device, a data set that is associated with a training of the dual purpose artificial neural network; and retraining, by the device, the dual purpose artificial neural network based on the updated data set. In some embodiments, updating the data set includes adding, to the data set, one or more data samples based on a subsequent activity associated with the blockchain address.

[0124] In embodiments, a method includes receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger; generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information; receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address; determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and processing, by the device, one or more transactions associated with the blockchain address by a robotic process automation module, wherein the robotic process automation module is configured to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on respective consensus trust scores associated with the respective blockchain addresses. In some embodiments, the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger. In some embodiments, the device is further configured to

monitor the blockchain ledger to detect transaction with the blockchain address. In some embodiments, the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating. Some embodiments further include generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address. In some embodiments, the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices. In some embodiments, determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device. In some embodiments, the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger. In some embodiments, determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score. In some embodiments, determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance. In some embodiments, the robotic process automation module is further configured to determine whether or not to engage in transactions with respective blockchain addresses, and the determining is based on the respective consensus trust scores associated with the respective blockchain addresses. In some embodiments, the robotic process automation module is configured to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on a training of the robotic process automation module, and the training is based on a training data set including data samples that correspond to actions taken by one or more users while engaging in transactions with blockchain addresses associated with the blockchain ledger. In some embodiments, the robotic process automation module is configured to determine whether or not to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on a training of the robotic process automation module, and the training is based on a training data set including data samples that correspond to actions taken by one or more users while determining whether or not to engage in transactions with blockchain addresses associated with the blockchain ledger.

BRIEF DESCRIPTION OF THE FIGURES

[0125] The disclosure and the following detailed description of certain embodiments thereof may be understood by reference to the following figures:

[0126] Fig. 1 is a schematic diagram of components of a platform for enabling intelligent transactions in accordance with embodiments of the present disclosure.

[0127] Figs. 2A and 2B are schematic diagrams of additional components of a platform for enabling intelligent transactions in accordance with embodiments of the present disclosure.

[0128] Fig. 3 is a schematic diagram of additional components of a platform for enabling intelligent transactions in accordance with embodiments of the present disclosure.

[0129] Figs. 4 to Fig. 31 are schematic diagrams of embodiments of neural net systems that may connect to, be integrated in, and be accessible by the platform for enabling intelligent transactions including ones involving expert systems, self-organization, machine learning, artificial intelligence and including neural net systems trained for pattern recognition, for classification of one or more parameters, characteristics, or phenomena, for support of autonomous control, and other purposes in accordance with embodiments of the present disclosure.

[0130] Fig. 32 is a schematic diagram of components of an environment including an intelligent energy and compute facility, a host intelligent energy and compute facility resource management platform, a set of data sources, a set of expert systems, interfaces to a set of market platforms and external resources, and a set of user or client systems and devices in accordance with embodiments of the present disclosure.

[0131] Fig. 33 depicts components and interactions of a transactional, financial and marketplace enablement system.

[0132] Fig. 34 depicts components and interactions of a set of data handling layers of a transactional, financial and marketplace enablement system.

[0133] Fig. 35 depicts adaptive intelligence and robotic process automation capabilities of a transactional, financial and marketplace enablement system.

[0134] Fig. 36 depicts opportunity mining capabilities of a transactional, financial and marketplace enablement system.

[0135] Fig. 37 depicts adaptive edge computation management and edge intelligence capabilities of a transactional, financial and marketplace enablement system.

[0136] Fig. 38 depicts protocol adaptation and adaptive data storage capabilities of a transactional, financial and marketplace enablement system.

[0137] Fig. 39 depicts robotic operational analytic capabilities of a transactional, financial and marketplace enablement system.

[0138] Fig. 40 depicts a blockchain and smart contract platform for a forward market for access rights to events.

[0139] Fig. 41 depicts an algorithm and a dashboard of a blockchain and smart contract platform for a forward market for access rights to events.

[0140] Fig. 42 depicts a blockchain and smart contract platform for forward market demand aggregation.

[0141] Fig. 43 depicts an algorithm and a dashboard of a blockchain and smart contract platform for forward market demand aggregation.

[0142] Fig. 44 depicts a blockchain and smart contract platform for crowdsourcing for innovation.

[0143] Fig. 45 depicts an algorithm and a dashboard of a blockchain and smart contract platform for crowdsourcing for innovation.

[0144] Fig. 46 depicts a blockchain and smart contract platform for crowdsourcing for evidence.

[0145] Fig. 47 depicts an algorithm and a dashboard of a blockchain and smart contract platform for crowdsourcing for evidence.

[0146] Fig. 48 depicts components and interactions of an embodiment of a lending platform having a set of data-integrated microservices including data collection and monitoring services for handling lending entities and transactions.

[0147] Fig. 49 depicts components and interactions of an embodiment of a lending platform in which a set of lending solutions are supported by a data-integrated set of data collection and monitoring services, adaptive intelligent systems, and data storage systems.

[0148] Fig. 50 depicts components and interactions of an embodiment of a lending platform having a set of data integrated blockchain services, smart contract services, social network analytic services, crowdsourcing services and Internet of Things data collection and monitoring services for collecting, monitoring, and processing information about entities involved in or related to a lending transaction.

[0149] Fig. 51 depicts components and interactions of a lending platform having an Internet of Things and sensor platform for monitoring at least one of a set of assets, a set of collateral, and a guarantee for a loan, a bond, or a debt transaction.

[0150] Fig. 52 depicts components and interactions of a lending platform having a crowdsourcing system for collecting information related to entities involved in a lending transaction.

[0151] Fig. 53 depicts an embodiment of a crowdsourcing workflow enabled by a lending platform.

[0152] Fig. 54 depicts components and interactions of an embodiment of a lending platform having a smart contract system that automatically adjusts an interest rate for a loan based on information collected via at least one of an Internet of Things system, a crowdsourcing system, a set of social network analytic services and a set of data collection and monitoring services.

[0153] Fig. 55 depicts components and interactions of an embodiment of a lending platform having a smart contract that automatically restructures debt based on a monitored condition.

[0154] Fig. 56 depicts components and interactions of a lending platform having a set of data collection and monitoring systems for validating the reliability of a guarantee for a loan, including an Internet of Things system and a social network analytics system.

[0155] Fig. 57 depicts components and interactions of a lending platform having a robotic process automation system for negotiation of a set of terms and conditions for a loan.

[0156] Fig. 58 depicts components and interactions of a lending platform having a robotic process automation system for loan collection.

[0157] Fig. 59 depicts components and interactions of a lending platform having a robotic process automation system for consolidating a set of loans.

[0158] Fig. 60 depicts components and interactions of a lending platform having a robotic process automation system for managing a factoring loan.

[0159] Fig. 61 depicts components and interactions of a lending platform having a robotic process automation system for brokering a mortgage loan.

[0160] Fig. 62 depicts components and interactions of a lending platform having a crowdsourcing and automated classification system for validating condition of an issuer for a bond, a social network monitoring system with artificial intelligence for classifying a condition about a bond, and an Internet of Things data collection and monitoring system with artificial intelligence for classifying a condition about a bond.

[0161] Fig. 63 depicts components and interactions of a lending platform having a system that manages the terms and conditions of a loan based on a parameter monitored by the IoT, by a parameter determined by a social network analytic system, or a parameter determined by a crowdsourcing system.

[0162] Fig. 64 depicts components and interactions of a lending platform having an automated blockchain custody service for managing a set of custodial assets.

[0163] Fig. 65 depicts components and interactions of a lending platform having an underwriting system for a loan with a set of data-integrated microservices including data collection and monitoring services, blockchain services, artificial intelligence services, and smart contract services for underwriting lending entities and transactions.

[0164] Fig. 66 depicts components and interactions of a lending platform having a loan marketing system with a set of data-integrated microservices including data collection and monitoring services, blockchain services, artificial intelligence services and smart contract services for marketing a loan to a set of prospective parties.

[0165] Fig. 67 depicts components and interactions of a lending platform having a rating system with a set of data-integrated microservices including data collection and monitoring services,

blockchain services, artificial intelligence services, and smart contract services for rating a set of loan-related entities.

[0166] Fig. 68 depicts components and interactions of a lending platform having a regulatory and/or compliance system with a set of data-integrated microservices including data collection and monitoring services, blockchain services, artificial intelligence services, and smart contract services for automatically facilitating compliance with at least one of a law, a regulation and a policy that applies to a lending transaction.

[0167] Fig. 69, depicts a system for automated loan management.

[0168] Fig. 70 depicts a system with a blockchain service circuit.

[0169] Fig. 71 depicts a method for handling a loan.

[0170] Fig. 72 depicts a system for adaptive intelligence and robotic process automation capabilities of a transactional, financial and marketplace enablement.

[0171] Fig. 73 depicts a method for automated smart contract creation and collateral assignment.

[0172] Fig. 74 depicts a system for handling a loan.

[0173] Fig. 75 depicts a method for handling a loan.

[0174] Fig. 76 depicts a system for adaptive intelligence and robotic process automation.

[0175] Fig. 77 depicts a method for loan creation and management.

[0176] Fig. 78 depicts a system for adaptive intelligence and robotic process automation capabilities of a transactional, financial and marketplace enablement.

[0177] Fig. 79 depicts a method for robotic process automation of transactional, financial and marketplace activities.

[0178] Fig. 80 depicts a system for adaptive intelligence and robotic process automation.

[0179] Fig. 81 depicts a method for automated transactional, financial and marketplace activities.

[0180] Fig. 82 depicts a system for adaptive intelligence and robotic process.

[0181] Fig. 83 depicts a method for performing loan related actions.

[0182] Fig. 84 depicts a system for adaptive intelligence and robotic process.

[0183] Fig. 85 depicts a method for performing loan related actions.

[0184] Fig. 86 depicts a system for adaptive intelligence and robotic process.

[0185] Fig. 87 depicts a method for performing loan related actions.

[0186] Fig. 88 depicts a smart contract system for managing collateral for a loan.

[0187] Fig. 89 depicts a smart contract method for managing collateral for a loan.

[0188] Fig. 90 depicts a system for validating conditions of collateral or a guarantor for a loan.

[0189] Fig. 91 depicts a crowdsourcing method for validating conditions of collateral or a guarantor for a loan.

[0190] Fig. 92 depicts a smart contract system for modifying a loan.

[0191] Fig. 93 depicts a smart contract method for modifying a loan.

[0192] Fig. 94 depicts a smart contract system for modifying a loan.

[0193] Fig. 95 depicts a smart contract method for modifying a loan.

[0194] Fig. 96 depicts a smart contract system for modifying a loan.

[0195] Fig. 97 depicts a smart contract method for modifying a loan.

[0196] Fig. 98 depicts a monitoring system for validating conditions of a guarantee for a loan.

[0197] Fig. 99 depicts a monitoring method for validating conditions of a guarantee for a loan.

[0198] Fig. 100 depicts a robotic process automation system for negotiating a loan.

[0199] Fig. 101 depicts a robotic process automation method for negotiating a loan.

[0200] Fig. 102 depicts a system for adaptive intelligence and robotic process automation.

[0201] Fig. 103 depicts a loan collection method.

[0202] Fig. 104 depicts a system for adaptive intelligence and robotic process automation.

[0203] Fig. 105 depicts a loan refinancing method.

[0204] Fig. 106 depicts a system for adaptive intelligence and robotic process automation.

[0205] Fig. 107 depicts a for loan consolidation method.

[0206] Fig. 108 depicts a system for adaptive intelligence and robotic process automation.

[0207] Fig. 109 depicts a loan factoring method.

[0208] Fig. 110 depicts a system for adaptive intelligence and robotic process automation.

[0209] Fig. 111 depicts a mortgage brokering method.

[0210] Fig. 112 depicts a system for adaptive intelligence and robotic process automation.

[0211] Fig. 113 depicts a method for debt management.

[0212] Fig. 114 depicts a system for adaptive intelligence and robotic process automation.

[0213] Fig. 115 depicts a method for bond management.

[0214] Fig. 116 depicts a system for monitoring a condition of an issuer for a bond.

[0215] Fig. 117 depicts a method for monitoring a condition of an issuer for a bond

[0216] Fig. 118 depicts a system for monitoring a condition of an issuer for a bond.

[0217] Fig. 119 depicts a method for monitoring a condition of an issuer for a bond.

[0218] Fig. 120 depicts a system for automatic subsidized loan management.

[0219] Fig. 121 depicts a method for automatically modifying subsidized loan terms and conditions.

[0220] Fig. 122 depicts a system to automatically modify terms and conditions of a loan.

[0221] Fig. 123 depicts a method for collecting social network information about an entity involved in a subsidized loan transaction.

[0222] Fig. 124 depicts a system for automating handling of a subsidized loan using crowdsourcing.

[0223] Fig. 125 depicts a method for automating handling of a subsidized loan.

[0224] Fig. 126 depicts a system for asset access control.

[0225] Fig. 127 depicts a method for asset access control.

[0226] Fig. 128 depicts a system automated handling of loan foreclosure.

[0227] Fig. 129 depicts a method for facilitating foreclosure on collateral.

[0228] Fig. 130 depicts an example energy and computing resource platform.

[0229] Fig. 131 depicts an example facility data record.

[0230] Fig. 132 depicts an example schema of a person data record.

[0231] Fig. 133 depicts a cognitive processing system.

[0232] Fig. 134 depicts a process for a lead generation system to generate a lead list.

[0233] Fig. 135 depicts a process for a lead generation system to determine facility outputs for identified leads.

[0234] Fig. 136 depicts a process to generate and output personalized content.

[0235] Fig. 137 depicts a schematic illustrating an example of a portion of an information technology system for transaction artificial intelligence leveraging digital twins according to some embodiments of the present disclosure.

[0236] Fig. 138 depicts a schematic illustrating a compliance system that facilitates the licensing of personality rights according to some embodiments of the present disclosure.

[0237] Fig. 139 depicts a schematic illustrating an example set of components of a compliance system according to some embodiments of the present disclosure.

[0238] Fig. 140 depicts a set of operations of a method for vetting a potential licensee for purposes of licensing personality rights of a licensor according to some embodiments of the present disclosure.

[0239] Fig. 141 depicts a set of operations of a method for facilitating the licensing of personality rights of a licensor by a licensee according to some embodiments of the present disclosure.

[0240] Fig. 142 depicts a set of operations of a method for detecting potential circumvention of rules or regulations by a licensor and/or licensee according to some embodiments of the present disclosure.

[0241] Fig. 143 depicts a method for selecting an AI solution.

[0242] Fig. 144 depicts a method for selecting an AI solution.

[0243] Fig. 145 depicts an example of an assembled AI solution.

[0244] Fig. 146 depicts a method for selecting an AI solution.

[0245] Fig. 147 depicts a method for selecting an AI solution.

[0246] Fig. 148 depicts an AI solution selection and configuration system.

[0247] Fig. 149 depicts an AI solution selection and configuration system.

[0248] Fig. 150 depicts an AI solution selection and configuration system.

[0249] Fig. 151 depicts a component configuration circuit.

[0250] Fig. 152 depicts an AI solution selection and configuration system.

[0251] Fig. 153 depicts a system for selecting and configuring an artificial intelligence model.

[0252] Fig. 154 depicts a method of selecting and configuring an artificial intelligence model.

[0253] Fig. 155 is a schematic illustrating examples of architecture of a digital twin system according to embodiments of the present disclosure.

[0254] Fig. 156 is a schematic illustrating exemplary components of a digital twin management system according to embodiments of the present disclosure.

[0255] Fig. 157 is a schematic illustrating examples of a digital twin I/O system that interfaces with an environment, the digital twin system, and/or components thereof to provide bi-directional transfer of data between coupled components according to embodiments of the present disclosure.

[0256] Fig. 158 is a schematic illustrating an example set of identified states related to industrial environments that the digital twin system may identify and/or store for access by intelligent systems (e.g., a cognitive intelligence system) or users of the digital twin system according to embodiments of the present disclosure.

[0257] Fig. 159 is a schematic illustrating example embodiments of methods for updating a set of properties of a digital twin of the present disclosure on behalf of a client application and/or one or more embedded digital twins.

[0258] Fig. 160 illustrates example embodiments of a display interface of the present disclosure that renders a digital twin of a dryer centrifuge with information relating to the dryer centrifuge.

[0259] Fig. 161 is a schematic illustrating an example embodiment of a method for updating a set of vibration fault level states of machine components such as bearings in the digital twin of an industrial machine, on behalf of a client application.

[0260] Fig. 162 is a schematic illustrating an example embodiment of a method for updating a set of vibration severity unit values of machine components such as bearings in the digital twin of a machine on behalf of a client application.

[0261] Fig. 163 is a schematic illustrating an example embodiment of a method for updating a set of probability of failure values in the digital twins of machine components on behalf of a client application.

[0262] Fig. 164 is a schematic illustrating an example embodiment of a method for updating a set of probability of downtime values of machines in the digital twin of a manufacturing facility on behalf of a client application.

[0263] Fig. 165 is a schematic illustrating an example embodiment of a method for updating a set of probability of shutdown values of manufacturing facilities in the digital twin of an enterprise on behalf of a client application.

[0264] Fig. 166 is a schematic illustrating an example embodiment of a method for updating a set of cost of downtime values of machines in the digital twin of a manufacturing facility.

[0265] Fig. 167 is a schematic illustrating an example embodiment of a method for updating one or more manufacturing KPI values in a digital twin of a manufacturing facility, on behalf of a client application.

[0266] Fig. 168 is a schematic diagram of components of a knowledge distribution system and a communication network for facilitating management of digital knowledge in accordance with embodiments of the present disclosure.

[0267] Fig. 169 is a schematic diagram of a ledger network of the knowledge distribution system in accordance with embodiments of the present disclosure.

[0268] Fig. 170 is a schematic diagram of the knowledge distribution system of Fig. 168 including details of a smart contract and a smart contract system of the knowledge distribution system in accordance with embodiments of the present disclosure.

[0269] Fig. 171 is a schematic diagram of a plurality of datastores of the knowledge distribution system in accordance with embodiments of the present disclosure.

[0270] Fig. 172 illustrates a method of deploying a knowledge token and related smart contract via the knowledge distribution system in accordance with embodiments of the present disclosure.

[0271] Fig. 173 illustrates a method of performing high level process flow of a smart contract that distributes digital knowledge via the knowledge distribution system in accordance with embodiments of the present disclosure.

[0272] Fig. 174 is a schematic diagram of another embodiment of components of the knowledge distribution system and a communication network for facilitating management of digital knowledge in accordance with embodiments of the present disclosure.

[0273] Fig. 175 depicts a knowledge distribution system for controlling rights related to digital knowledge.

[0274] Fig. 176 depicts a computer-implemented method for controlling rights related to digital knowledge.

[0275] Fig. 177 depicts a computer-implemented method for controlling rights related to digital knowledge.

[0276] Fig. 178 depicts a knowledge distribution system for controlling rights related to digital knowledge.

[0277] Fig. 179 depicts possible components of a 3D printer instruction set.

[0278] Fig. 180 depicts possible content of tokenized digital knowledge.

[0279] Fig. 181 depicts possible smart contract actions.

[0280] Fig. 182 depicts possible conditions relating to triggering events.

[0281] Fig. 183 depicts possible control and access rights.

[0282] Fig. 184 depicts possible triggering events.

[0283] Fig. 185 depicts a computer-implemented method for controlling rights related to digital knowledge.

[0284] Fig. 186 depicts a computer-implemented method for controlling rights related to digital knowledge.

[0285] Fig. 187 depicts possible crowdsourced information.

[0286] Fig. 188 depicts possible contents of a distributed ledger.

[0287] Fig. 189 depicts possible parameters.

[0288] Fig. 190 depicts an embodiment of a knowledge distribution system for controlling rights related to digital knowledge.

[0289] Figs. 191-196 depict embodiments of operations for controlling rights related to digital knowledge.

[0290] Fig. 197 is a diagrammatic view illustrating an example implementation of the knowledge distribution system including a trust network for identifying the likelihood of fraudulent transactions using a consensus trust score and preventing such fraudulent transactions according to some embodiments of the present disclosure.

[0291] Fig. 198 illustrates an example method that describes operation of an example trust network illustrated in Fig. 197 according to some embodiments of the present disclosure.

[0292] Fig. 199 is a diagrammatic view illustrating a transaction being processed by the ledger network including a plurality of node computing devices according to some embodiments of the present disclosure.

[0293] Fig. 200 is a diagrammatic view illustrating an example implementation of the knowledge distribution system including a digital marketplace configured to provide an environment allowing knowledge providers and knowledge recipients to engage in commerce relating to the transfer of digital knowledge according to some embodiments of the present disclosure.

[0294] Fig. 201 is a diagrammatic view illustrating an example user interface of a digital marketplace configured to enable transactions and commerce between various users of the knowledge distribution system according to some embodiments of the present disclosure.

[0295] Fig. 202 is a schematic view of an exemplary embodiment of the market orchestration system according to some embodiments of the present disclosure.

[0296] Fig. 203 is a schematic view of an exemplary embodiment of the market orchestration system including a marketplace configuration system for configuring and launching a marketplace.

[0297] Fig. 204 is a schematic illustrating an example embodiment of a method of configuring and launching a marketplace according to some embodiments of the present disclosure.

[0298] Fig. 205 is a schematic view of an exemplary embodiment of the market orchestration system including a robotic process automation system configured to automate internal marketplace workflows based on robotic process automation.

[0299] Fig. 206 is a schematic view of an exemplary embodiment of the market orchestration system including an edge device configured to perform edge computation and intelligence.

[0300] Fig. 207 is a schematic view of an exemplary embodiment of the market orchestration system including a digital twin system configured to integrate a set of adaptive edge computing systems with a market orchestration digital twin.

[0301] Fig. 208 is a schematic view of a digital twin system according to some embodiments.

Gaming engine and smart contract platform FIGS.

[0302] Fig. 209A, Fig. 209B, and Fig. 209C are a block diagrams depicting systems of a gaming engine smart contract executing platform in an exemplary deployment environment.

[0303] Fig. 210 is a block diagram depicting a gaming engine system of a gaming engine smart contract executing platform in an exemplary deployment environment.

[0304] Fig. 211 is a block diagram depicting an intelligence layer of a gaming engine smart contract executing platform in an exemplary deployment environment.

[0305] Fig. 212 is a block diagram depicting a cloud-based deployment of the gaming engine smart contract platform of Figs. 209A-C.

[0306] Fig. 213 is a block diagram depicting an exemplary embodiment of a gaming engine system of the gaming engine smart contract platform.

[0307] Fig. 214 is a flowchart depicting an exemplary execution flow of the gaming engine smart contract platform.

[0308] Fig. 215 is a flowchart depicting another exemplary execution flow of the gaming engine smart contract platform.

[0309] Fig. 216A and Fig. 216B are flowcharts depicting yet another exemplary execution flow of the gaming engine smart contract platform.

[0310] Fig. 217 is a block diagram depicting an exemplary embodiment of an intelligence layer of the gaming engine smart contract platform.

[0311] Fig. 218 is a block diagram depicting an exemplary embodiment of a distributed ledger system of the gaming engine smart contract platform.

[0312] Fig. 219 is a block diagram depicting an exemplary embodiment of a distributed ledger network of the gaming engine smart contract platform.

[0313] Fig. 220 is a block diagram depicting another exemplary embodiment of a distributed ledger network of the gaming engine smart contract platform.

[0314] Fig. 221 is a flowchart depicting an exemplary method of executing a smart contract via the gaming engine smart contract platform.

Additive manufacturing FIGS.

[0315] Fig. 222 is a diagrammatic view illustrating an example environment of an autonomous additive manufacturing platform according to some embodiments of the present disclosure.

[0316] Fig. 223 is a schematic illustrating an example implementation of an autonomous additive manufacturing platform for automating and optimizing the digital production workflow for metal additive manufacturing according to some embodiments of the present disclosure.

[0317] Fig. 224 is a flow diagram illustrating the optimization of different parameters of an additive manufacture process according to some embodiments of the present disclosure.

[0318] Fig. 225A is a schematic illustrating an example artificial neural network used to provide real-time, adaptive control of an additive manufacturing process according to some embodiments of the present disclosure.

[0319] Fig. 225B is a diagrammatic view illustrating an example implementation of a data processing system using a convolutional neural network (CNN) to provide automatic classification and clustering of parts and defects in an additive manufacturing process according to some embodiments of the present disclosure.

[0320] Fig. 226 is a schematic view illustrating a system for learning on data from an autonomous additive manufacturing platform to train an artificial learning system to use digital twins for classification, predictions and decision making according to some embodiments of the present disclosure.

[0321] Fig. 227A, Fig. 227B, and Fig. 227C are schematics illustrating an example implementation of an autonomous additive manufacturing platform including various components along with other entities of a distributed manufacturing network according to some embodiments of the present disclosure.

[0322] Fig. 228 is a schematic illustrating an example implementation of an autonomous additive manufacturing platform for automating and managing manufacturing functions and sub-processes including process and material selection, hybrid part workflows, feedstock formulation, part design optimization, risk prediction and management, marketing and customer service according to some embodiments of the present disclosure.

[0323] Fig. 229 is a diagrammatic view of a distributed manufacturing network enabled by an autonomous additive manufacturing platform and built on a distributed ledger system according to some embodiments of the present disclosure.

[0324] Fig. 230 is a schematic illustrating an example implementation of a distributed manufacturing network where the digital thread data is tokenized and stored in a distributed ledger so as to ensure traceability of parts printed at one or more manufacturing nodes in the distributed manufacturing network according to some embodiments of the present disclosure.

Enterprise Access Layer FIGS.

[0325] FIG. 231 is a schematic view of an example of an enterprise ecosystem having an enterprise access layer.

[0326] FIG. 232 is a schematic view of another example of an enterprise ecosystem having an enterprise access layer.

[0327] FIG. 233 is a schematic view of examples as to how the enterprise access layer of FIG. 232 may be integrated with portions of an enterprise ecosystem.

[0328] FIG. 234 is a schematic view of an example market orchestration system that includes an enterprise access layer.

Intelligence Services System FIGS.

[0329] FIG. 235 is a schematic view of an example of an intelligence services system according to some embodiments.

[0330] FIG. 236 is a schematic view of an example of a neural network according to some embodiments.

[0331] FIG. 237 is a schematic view of an example of a convolutional neural network according to some embodiments.

[0332] FIG. 238 is a schematic view of an example of a neural network according to some embodiments.

[0333] FIG. 239 is a diagram of an approach based on reinforcement learning according to some embodiments.

Market Orchestration Architecture FIGS.

[0334] FIG. 240 depicts a block diagram of a market orchestration architecture that integrates cross market exchange methods and systems described herein.

[0335] FIG. 241 depicts an example of normalizing item values within a set of items for exchange-specific currencies.

[0336] FIG. 242 depicts an example of normalizing item values across sets of items for exchange-specific currencies.

[0337] FIG. 243 depicts an example of normalizing a value of an item across a plurality of exchange-specific currencies.

[0338] FIG. 244 depicts an example of item value translation among exchanges.

[0339] FIG. 245 depicts an example of conditional item value translation among exchanges.

[0340] FIG. 246 depicts an example of item-representative token generation for use in a target exchange based on characteristics of the item from a source exchange.

[0341] FIG. 247 depicts an example of the item-representative token generation of FIG. 246 through application of item characteristics harvesting algorithms.

[0342] FIG. 248 depicts an example of the item-representative token generation of FIG. 246 through processing of smart contracts associated with the item in a source exchange.

[0343] FIG. 249 depicts an example of generating a rights token for an item based on at least one of a smart contract and terms and conditions for the item.

[0344] FIG. 250 depicts an example of generating a rights token for an item based on at least one of a smart contract and terms and conditions for the item for a range of exchange governing rules.

[0345] FIG. 251 depicts an example of generating a rights token for an item based on at least one of a smart contract and terms and conditions for the item and further based on conformance of detected rights with exchange governing rules.

[0346] FIG. 252 depicts an example of generating an adaptable rights token for an item based on at least one of a smart contract and terms and conditions for the item and target exchange adaptation rules.

[0347] FIG. 253 depicts an example of automatically cascading actions across exchanges in which workflows are automated through robotic process automation.

[0348] FIG. 254 depicts an example of automatically cascading workflow initiation actions across exchanges in which the workflows are automated through robotic process automation.

[0349] FIG. 255 depicts an example of automatically cascading actions of workflows across exchanges in which the workflows are automated through robotic process automation.

[0350] FIG. 256 depicts an example of applying robotic process automation to generate a cross-exchange smart contract from discrete exchange-specific smart contracts.

[0351] FIG. 257 depicts an example of a self-adapting asset data delivery network infrastructure pipeline that includes one or more of the normalization, value translation, item tokenization, or rights tokenization methods or systems described herein.

Intelligent data layer FIGS.

[0352] FIG. 258 depicts a block diagram of exemplary features, capabilities, and interfaces of an intelligent data layer platform.

[0353] FIG. 259 depicts a block diagram of an exemplary intelligent data layer architecture.

[0354] FIG. 260 depicts a block diagram of an independently operated intelligent data layer for producing data for a plurality of data consumers.

[0355] FIG. 261 depicts a block diagram of an intelligent data layer platform deployment for data-strategic approach of an enterprise.

[0356] FIG. 262 depicts a block diagram of a remote intelligent data layer with actively deployed elements for dynamic on-demand IDL operation.

[0357] FIG. 263 depicts a diagram of mapping parameters of a data producer (e.g., source) with a data consumer.

[0358] FIG. 264 depicts a block diagram of an enterprise deployment of intelligent data layers.

[0359] FIG. 265 depicts a block diagram of a network constructed of intelligent data layers.

[0360] FIG. 266 depicts a block diagram of an exemplary cloud-based deployment for an intelligent data layer architecture.

[0361] FIG. 267 depicts a block diagram of a multi-use (configurable) intelligent data layer architecture to produce different layer content and intelligence for different purposes / uses / consumers.

[0362] FIG. 268 depicts a block diagram of a marketplace / transaction environment deployment of intelligent data layers.

[0363] FIG. 269 depicts a block diagram of use of intelligent data layers for source discovery.

Data and networking pipeline for market orchestration FIGS.

[0364] FIGS. 270-287 illustrate various features associated with data network and infrastructure pipelines.

Cross-market transaction engine FIGS.

[0365] FIG. 288 illustrates an exemplary environment of a cross-market transaction engine according to some embodiments of the present disclosure.

[0366] FIG. 289 illustrates another exemplary environment of a cross-market transaction engine according to some embodiments of the present disclosure.

Marketplace prediction system FIG.

[0367] FIG. 290 is a diagrammatic view that illustrates embodiments of the market prediction system platform in accordance with the present disclosure.

Quantum FIGS.

[0368] FIG. 291 is a schematic view of an exemplary embodiment of the quantum computing service according to some embodiments of the present disclosure.

[0369] FIG. 292 illustrates quantum computing service request handling according to some embodiments of the present disclosure.

Trust Network FIGS.

[0370] FIGS. 293-297 illustrate an example trust network in communication with cryptocurrency transactor computing devices, intermediate transaction systems, and automated transaction systems.

[0371] FIG. 298 is a method that describes operation of an example trust network.

[0372] FIG. 299 is a functional block diagram of an example node that calculates local trust scores and consensus trust scores.

[0373] FIG. 300 is a functional block diagram of an example node that calculates consensus trust scores.

[0374] FIG. 301 is a flow diagram that illustrates an example method for calculating a consensus trust score.

[0375] FIG. 302 is a functional block diagram of an example node that calculates reputation values.

[0376] FIG. 303 is a functional block diagram of an example node that implements a token economy for a trust network.

[0377] FIG. 304 illustrates an example method that describes operation of a reward protocol.

[0378] FIGS. 305-306 illustrate graphical user interfaces (GUIs) for requesting and reviewing trust reports.

[0379] FIG. 307 is a functional block diagram of a trust network being used in a payment insurance implementation.

[0380] FIG. 308 illustrates an example relationship of staked token and consensus trust score cost.

[0381] FIG. 309 illustrates example services associated with different levels of nodes.

[0382] FIG. 310 illustrates an example relationship between the number of nodes, the number of cliques, the address overlap, and the probability that a node will get a single address in their control.

[0383] FIG. 311 illustrates sample token staking amounts and number of nodes.

[0384] FIG. 312 is a functional block diagram of an example trust score determination module and local trust data store.

[0385] FIG. 313 is a method that describes operation of an example trust score determination module.

[0386] FIG. 314 is a functional block diagram of a data acquisition and processing module.

[0387] FIG. 315 is a functional block diagram of a blockchain data acquisition and processing module.

[0388] FIGS. 316-317 illustrate generation and processing of a blockchain graph data structure.

[0389] FIG. 318 is a functional block diagram of a scoring feature generation module and a scoring model generation module.

[0390] FIG. 319 is a functional block diagram that illustrates operation of a score generation module.

[0391] FIG. 320 illustrates an environment that includes a cryptocurrency blockchain network that executes smart contracts.

[0392] FIG. 321 illustrates a method that describes operation of the environment of FIG. 320.

[0393] FIG. 322 is a functional block diagram that illustrates interactions between a sender user device, an intermediate transaction system, a blockchain network, and a trust network/system.

[0394] FIGS. 323-324 illustrate an example trust system and an example trust node that can determine trust scores for blockchain addresses.

[0395] FIGS. 325-326 illustrate an example sender interface on a user device.

[0396] FIG. 327 illustrates an example method describing operation of an intermediate transaction system.

[0397] FIG. 328 illustrates an example method describing operation of a trust network/system.

Dual process artificial neural network figures

[0398] FIG. 329 is a diagrammatic view of a dual process artificial neural network system in accordance with some embodiments.

[0399] FIG. 330 is a diagrammatic view that illustrates embodiments of the biology-based system in accordance with the present disclosure.

[0400] FIG. 331 is a diagrammatic view of a thalamus service in accordance with the present disclosure.

DETAILED DESCRIPTION

[0401] The term services/microservices (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a service/microservice includes any system (or platform) configured to functionally perform the operations of the service, where the system may be data-integrated, including data collection circuits, blockchain circuits, artificial intelligence circuits, and/or smart contract circuits for handling lending entities and transactions. Services/microservices may facilitate data handling and may include facilities for data extraction, transformation and loading; data cleansing and deduplication facilities; data normalization facilities; data synchronization facilities; data security facilities; computational facilities (e.g., for performing pre-defined calculation operations on data streams and providing an output stream); compression and de-compression facilities; analytic facilities (such as providing automated production of data visualizations), data processing facilities,

and/or data storage facilities (including storage retention, formatting, compression, migration, etc.), and others.

[0402] Services/microservices may include controllers, processors, network infrastructure, input/output devices, servers, client devices (e.g., laptops, desktops, terminals, mobile devices, and/or dedicated devices), sensors (e.g., IoT sensors associated with one or more entities, equipment, and/or collateral), actuators (e.g., automated locks, notification devices, lights, camera controls, etc.), virtualized versions of any one or more of the foregoing (e.g., outsourced computing resources such as a cloud storage, computing operations; virtual sensors; subscribed data to be gathered such as stock or commodity prices, recordal logs, etc.), and/or include components configured as computer readable instructions that, when performed by a processor, cause the processor to perform one or more functions of the service, etc. Services may be distributed across a number of devices, and/or functions of a service may be performed by one or more devices cooperating to perform the given function of the service.

[0403] Services/ microservices may include application programming interfaces that facilitate connection among the components of the system performing the service (e.g., microservices) and between the system to entities (e.g., programs, websites, user devices, etc.) that are external to the system. Without limitation to any other aspect of the present disclosure, example microservices that may be present in certain embodiments include (a) a multi-modal set of data collection circuits that collect information about and monitor entities related to a lending transaction; (b) blockchain circuits for maintaining a secure historical ledger of events related to a loan, the blockchain circuits having access control features that govern access by a set of parties involved in a loan; (c) a set of application programming interfaces, data integration services, data processing workflows and user interfaces for handling loan-related events and loan-related activities; and (d) smart contract circuits for specifying terms and conditions of smart contracts that govern at least one of loan terms and conditions, loan-related events, and loan-related activities. Any of the services/microservices may be controlled by or have control over a controller. Certain systems may not be considered to be a service/microservice. For example, a point of sale device that simply charges a set cost for a good or service may not be a service. In another example, a service that tracks the cost of a good or service and triggers notifications when the value changes may not be a valuation service itself, but may rely on valuation services, and/or may form a portion of a valuation service in certain embodiments. It can be seen that a given circuit, controller, or device may be a service or a part of a service in certain embodiments, such as when the functions or capabilities of the circuit, controller, or device are configured to support a service or microservice as described herein, but may not be a service or part of a service for other embodiments (e.g., where the functions or capabilities of the circuit, controller, or device are not relevant to a service or microservice as

described herein). In another example, a mobile device being operated by a user may form a portion of a service as described herein at a first point in time (e.g., when the user accesses a feature of the service through an application or other communication from the mobile device, and/or when a monitoring function is being performed via the mobile device), but may not form a portion of the service at a second point in time (e.g., after a transaction is completed, after the user un-installs an application, and/or when a monitoring function is stopped and/or passed to another device). Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes or systems, and any such processes or systems may be considered a service (or a part of a service) herein.

[0404] One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system, how to combine processes and systems from the present disclosure to construct, provide performance characteristics (e.g., bandwidth, computing power, time response, etc.), and/or provide operational capabilities (e.g., time between checks, up-time requirements including longitudinal (e.g., continuous operating time) and/or sequential (e.g., time-of-day, calendar time, etc.), resolution and/or accuracy of sensing, data determinations (e.g., accuracy, timing, amount of data), and/or actuator confirmation capability) of components of the service that are sufficient to provide a given embodiment of a service, platform, and/or microservice as described herein. Certain considerations for the person of skill in the art, in determining the configuration of components, circuits, controllers, and/or devices to implement a service, platform, and/or microservice ("service" in the listing following) as described herein include, without limitation: the balance of capital costs versus operating costs in implementing and operating the service; the availability, speed, and/or bandwidth of network services available for system components, service users, and/or other entities that interact with the service; the response time of considerations for the service (e.g., how quickly decisions within the service must be implemented to support the commercial function of the service, the operating time for various artificial intelligence or other high computation operations) and/or the capital or operating cost to support a given response time; the location of interacting components of the service, and the effects of such locations on operations of the service (e.g., data storage locations and relevant regulatory schemes, network communication limitations and/or costs, power costs as a function of the location, support availability for time zones relevant to the service, etc.); the availability of certain sensor types, the related support for those sensors, and the availability of sufficient substitutes (e.g., a camera may require supportive lighting, and/or high network bandwidth or local storage) for the sensing purpose; an aspect of the underlying value of an aspect of the service (e.g., a principal amount of a loan, a value of collateral, a volatility of the collateral

value, a net worth or relative net worth of a lender, guarantor, and/or borrower, etc.) including the time sensitivity of the underlying value (e.g., if it changes quickly or slowly relative to the operations of the service or the term of the loan); a trust indicator between parties of a transaction (e.g., history of performance between the parties, a credit rating, social rating, or other external indicator, conformance of activity related to the transaction to an industry standard or other normalized transaction type, etc.); and/or the availability of cost recovery options (e.g., subscriptions, fees, payment for services, etc.) for given configurations and/or capabilities of the service, platform, and/or microservice. Without limitation to any other aspect of the present disclosure, certain operations performed by services herein include: performing real-time alterations to a loan based on tracked data; utilizing data to execute a collateral-backed smart contract; re-evaluating debt transactions in response to a tracked condition or data, and the like. While specific examples of services/microservices and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0405] Without limitation, services include a financial service (e.g., a loan transaction service), a data collection service (e.g., a data collection service for collecting and monitoring data), a blockchain service (e.g., a blockchain service to maintain secure data), data integration services (e.g., a data integration service to aggregate data), smart contract services (e.g., a smart contract service to determine aspects of smart contracts), software services (e.g., a software service to extract data related to the entities from publicly available information sites), crowdsourcing services (e.g., a crowdsourcing service to solicit and report information), Internet of Things services (e.g., an Internet of Things service to monitor an environment), publishing services (e.g., a publishing services to publish data), microservices (e.g., having a set of application programming interfaces that facilitate connection among the microservices), valuation services (e.g., that use a valuation model to set a value for collateral based on information), artificial intelligence services, market value data collection services (e.g., that monitor and report on marketplace information), clustering services (e.g., for grouping the collateral items based on similarity of attributes), social networking services (e.g., that enables configuration with respect to parameters of a social network), asset identification services (e.g., for identifying a set of assets for which a financial institution is responsible for taking custody), identity management services (e.g., by which a financial institution verifies identities and credentials), and the like, and/or similar functional terminology. Example services to perform one or more functions herein include computing devices; servers; networked devices; user interfaces; inter-device interfaces such as communication protocols, shared information and/or information storage, and/or application

programming interfaces (APIs); sensors (e.g., IoT sensors operationally coupled to monitored components, equipment, locations, or the like); distributed ledgers; circuits; and/or computer readable code configured to cause a processor to execute one or more functions of the service. One or more aspects or components of services herein may be distributed across a number of devices, and/or may consolidated, in whole or part, on a given device. In embodiments, aspects or components of services herein may be implemented at least in part through circuits, such as, in non-limiting examples, a data collection service implemented at least in part as a data collection circuit structured to collect and monitor data, a blockchain service implemented at least in part as a blockchain circuit structured to maintain secure data, data integration services implemented at least in part as a data integration circuit structured to aggregate data, smart contract services implemented at least in part as a smart contract circuit structured to determine aspects of smart contracts, software services implemented at least in part as a software service circuit structured to extract data related to the entities from publicly available information sites, crowdsourcing services implemented at least in part as a crowdsourcing circuit structured to solicit and report information, Internet of Things services implemented at least in part as an Internet of Things circuit structured to monitor an environment, publishing services implemented at least in part as a publishing services circuit structured to publish data, microservice service implemented at least in part as a microservice circuit structured to interconnect a plurality of service circuits, valuation service implemented at least in part as valuation services circuit structured to access a valuation model to set a value for collateral based on data, artificial intelligence service implemented at least in part as an artificial intelligence services circuit, market value data collection service implemented at least in part as market value data collection service circuit structured to monitor and report on marketplace information, clustering service implemented at least in part as a clustering services circuit structured to group collateral items based on similarity of attributes, a social networking service implemented at least in part as a social networking analytic services circuit structured to configure parameters with respect to a social network, asset identification services implemented at least in part as an asset identification service circuit for identifying a set of assets for which a financial institution is responsible for taking custody, identity management services implemented at least in part as an identity management service circuit enabling a financial institution to verify identities and credentials, and the like. Accordingly, the benefits of the present disclosure may be applied in a wide variety of systems, and any such systems may be considered with respect to items and services herein, while in certain embodiments a given system may not be considered with respect to items and services herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system, and/or how to

combine processes and systems from the present disclosure to enhance operations of the contemplated system. Among the considerations that one of skill in the art may contemplate to determine a configuration for a particular service include: the distribution and access devices available to one or more parties to a particular transaction; jurisdictional limitations on the storage, type, and communication of certain types of information; requirements or desired aspects of security and verification of information communication for the service; the response time of information gathering, inter-party communications, and determinations to be made by algorithms, machine learning components, and/or artificial intelligence components of the service; cost considerations of the service, including capital expenses and operating costs, as well as which party or entity will bear the costs and availability to recover costs such as through subscriptions, service fees, or the like; the amount of information to be stored and/or communicated to support the service; and/or the processing or computing power to be utilized to support the service.

[0406] The terms items and services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, items and service include any items and service, including, without limitation, items and services used as a reward, used as collateral, become the subject of a negotiation, and the like, such as, without limitation, an application for a warranty or guarantee with respect to an item that is the subject of a loan, collateral for a loan, or the like, such as a product, a service, an offering, a solution, a physical product, software, a level of service, quality of service, a financial instrument, a debt, an item of collateral, performance of a service, or other items. Without limitation to any other aspect or description of the present disclosure, items and service include any items and service, including, without limitation, items and services as applied to physical items (e.g., a vehicle, a ship, a plane, a building, a home, real estate property, undeveloped land, a farm, a crop, a municipal facility, a warehouse, a set of inventory, an antique, a fixture, an item of furniture, an item of equipment, a tool, an item of machinery, and an item of personal property), a financial item (e.g., a commodity, a security, a currency, a token of value, a ticket, a cryptocurrency), a consumable item (e.g., an edible item, a beverage), a highly valued item (e.g., a precious metal, an item of jewelry, a gemstone), an intellectual item (e.g., an item of intellectual property, an intellectual property right, a contractual right), and the like. Accordingly, the benefits of the present disclosure may be applied in a wide variety of systems, and any such systems may be considered with respect to items and services herein, while in certain embodiments a given system may not be considered with respect to items and services herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system, and/or how to combine

processes and systems from the present disclosure to enhance operations of the contemplated system.

[0407] The terms agent, automated agent, and similar terms as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, an agent or automated agent may process events relevant to at least one of the value, the condition, and the ownership of items of collateral or assets. The agent or automated agent may also undertake an action related to a loan, debt transaction, bond transaction, subsidized loan, or the like to which the collateral or asset is subject, such as in response to the processed events. The agent or automated agent may interact with a marketplace for purposes of collecting data, testing spot market transactions, executing transactions, and the like, where dynamic system behavior involves complex interactions that a user may desire to understand, predict, control, and/or optimize. Certain systems may not be considered an agent or an automated agent. For example, if events are merely collected but not processed, the system may not be an agent or automated agent. In some embodiments, if a loan-related action is undertaken not in response to a processed event, it may not have been undertaken by an agent or automated agent. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure include and/or benefit from agents or automated agent. Certain considerations for the person of skill in the art, or embodiments of the present disclosure with respect to an agent or automated agent include, without limitation: rules that determine when there is a change in a value, condition or ownership of an asset or collateral, and/or rules to determine if a change warrants a further action on a loan or other transaction, and other considerations. While specific examples of market values and marketplace information are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0408] The term marketplace information, market value and similar terms as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, marketplace information and market value describe a status or value of an asset, collateral, food, or service at a defined point or period in time. Market value may refer to the expected value placed on an item in a marketplace or auction setting, or pricing or financial data for items that are similar to the item, asset, or collateral in at least one public marketplace. For a company, market value may be the number of its outstanding shares multiplied by the current share price. Valuation services may include market value data collection services that monitor and report on marketplace information relevant to the value (e.g., market value) of collateral, the issuer, a set of bonds, and a set of assets. a set of subsidized loans, a party, and the like. Market values may be

dynamic in nature because they depend on an assortment of factors, from physical operating conditions to economic climate to the dynamics of demand and supply. Market value may be affected by, and marketplace information may include, proximity to other assets, inventory or supply of assets, demand for assets, origin of items, history of items, underlying current value of item components, a bankruptcy condition of an entity, a foreclosure status of an entity, a contractual default status of an entity, a regulatory violation status of an entity, a criminal status of an entity, an export controls status of an entity, an embargo status of an entity, a tariff status of an entity, a tax status of an entity, a credit report of an entity, a credit rating of an entity, a website rating of an entity, a set of customer reviews for a product of an entity, a social network rating of an entity, a set of credentials of an entity, a set of referrals of an entity, a set of testimonials for an entity, a set of behavior of an entity, a location of an entity, and a geolocation of an entity. In certain embodiments, a market value may include information such as a volatility of a value, a sensitivity of a value (e.g., relative to other parameters having an uncertainty associated therewith), and/or a specific value of the valuated object to a particular party (e.g., an object may have more value as possessed by a first party than as possessed by a second party).

[0409] Certain information may not be marketplace information or a market value. For example, where variables related to a value are not market-derived, they may be a value-in-use or an investment value. In certain embodiments, an investment value may be considered a market value (e.g., when the valuating party intends to utilize the asset as an investment if acquired), and not a market value in other embodiments (e.g., when the valuating party intends to immediately liquidate the investment if acquired). One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit from marketplace information or a market value. Certain considerations for the person of skill in the art, in determining whether the term market value is referring to an asset, item, collateral, good, or service include: the presence of other similar assets in a marketplace, the change in value depending on location, an opening bid of an item exceeding a list price, and other considerations. While specific examples of market values and marketplace information are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0410] The term apportion value or apportioned value and similar terms as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, apportion value describes a proportional distribution or allocation of value proportionally, or a process to divide and assign value according to a rule of proportional

distribution. Apportionment of the value may be to several parties (e.g., each of the several parties is a beneficiary of a portion of the value), to several transactions (e.g., each of the transactions utilizes a portion of the value), and/or in a many-to-many relationship (e.g., a group of objects has an aggregate value that is apportioned between a number of parties and/or transactions). In some embodiments, the value may be a net loss and the apportioned value is the allocation of a liability to each entity. In other embodiments, apportioned value may refer to the distribution or allocation of an economic benefit, real estate, collateral, or the like. In certain embodiments, apportionment may include a consideration of the value relative to the parties, for example, a $10 million asset apportioned 50/50 between two parties, where the parties have distinct value considerations for the asset, may result in one party crediting the apportionment differing resulting values from the apportionment. In certain embodiments, apportionment may include a consideration of the value relative to given transactions, for example, a first type of transaction (e.g., a long-term loan) may have a different valuation of a given asset than a second type of transaction (e.g., a short-term line of credit).

[0411] Certain conditions or processes may not relate to apportioned value. For example, the total value of an item may provide its inherent worth, but not how much of the value is held by each identified entity. One of skill in the art, having the benefit of the disclosure herein and knowledge about apportioned value, can readily determine which aspects of the present disclosure will benefit a particular application for apportioned value. Certain considerations for the person of skill in the art, or embodiments of the present disclosure with respect to an apportioned value include, without limitation: the currency of the principal sum, the anticipated transaction type (loan, bond or debt), the specific type of collateral, the ratio of the loan to value, the ratio of the collateral to the loan, the gross transaction/loan amount, the amount of the principal sum, the number of entities owed, the value of the collateral, and the like. While specific examples of apportioned values are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0412] The term financial condition and similar terms as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, financial condition describes a current status of an entity's assets, liabilities, and equity positions at a defined point or period in time. The financial condition may be memorialized in financial statement. The financial condition may further include an assessment of the ability of the entity to survive future risk scenarios or meet future or maturing obligations. Financial condition may be based on a set of attributes of the entity selected from among a publicly stated valuation of the entity, a set of

property owned by the entity as indicated by public records, a valuation of a set of property owned by the entity, a bankruptcy condition of an entity, a foreclosure status of an entity, a contractual default status of an entity, a regulatory violation status of an entity, a criminal status of an entity, an export controls status of an entity, an embargo status of an entity, a tariff status of an entity, a tax status of an entity, a credit report of an entity, a credit rating of an entity, a website rating of an entity, a set of customer reviews for a product of an entity, a social network rating of an entity, a set of credentials of an entity, a set of referrals of an entity, a set of testimonials for an entity, a set of behavior of an entity, a location of an entity, and a geolocation of an entity. A financial condition may also describe a requirement or threshold for an agreement or loan. For example, conditions for allowing a developer to proceed may be various certifications and their agreement to a financial payout. That is, the developer's ability to proceed is conditioned upon a financial element, among others. Certain conditions may not be a financial condition. For example, a credit card balance alone may be a clue as to the financial condition, but may not be the financial condition on its own. In another example, a payment schedule may determine how long a debt may be on an entity's balance sheet, but in a silo may not accurately provide a financial condition. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure include and/or will benefit from a financial condition. Certain considerations for the person of skill in the art, in determining whether the term financial condition is referring to a current status of an entity's assets, liabilities, and equity positions at a defined point or period in time and/or for a given purpose include: the reporting of more than one financial data point, the ratio of a loan to value of collateral, the ratio of the collateral to the loan, the gross transaction/loan amount, the credit scores of the borrower and the lender, and other considerations. While specific examples of financial conditions are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0413] The term interest rate and similar terms, as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, interest rate includes an amount of interest due per period, as a proportion of an amount lent, deposited, or borrowed. The total interest on an amount lent or borrowed may depend on the principal sum, the interest rate, the compounding frequency, and the length of time over which it is lent, deposited, or borrowed. Typically, interest rate is expressed as an annual percentage but can be defined for any time period. The interest rate relates to the amount a bank or other lender charges to borrow its money, or the rate a bank or other entity pays its savers for keeping money in an account. Interest rate may be variable or fixed. For example, an interest rate may vary in accordance with a

government or other stakeholder directive, the currency of the principal sum lent or borrowed, the term to maturity of the investment, the perceived default probability of the borrower, supply and demand in the market, the amount of collateral, the status of an economy, or special features like call provisions. In certain embodiments, an interest rate may be a relative rate (e.g., relative to a prime rate, an inflation index, etc.). In certain embodiments, an interest rate may further consider costs or fees applied (e.g., "points") to adjust the interest rate. A nominal interest rate may not be adjusted for inflation while a real interest rate takes inflation into account. Certain examples may not be an interest rate for purposes of particular embodiments. For example, a bank account growing by a fixed dollar amount each year, and/or a fixed fee amount, may not be an example of an interest rate for certain embodiments. One of skill in the art, having the benefit of the disclosure herein and knowledge about interest rates, can readily determine the characteristics of an interest rate for a particular embodiment. Certain considerations for the person of skill in the art, or embodiments of the present disclosure with respect to an interest rate include, without limitation: the currency of the principal sum, variables for setting an interest rate, criteria for modifying an interest rate, the anticipated transaction type (loan, bond or debt), the specific type of collateral, the ratio of the loan to value, the ratio of the collateral to the loan, the gross transaction/loan amount, the amount of the principal sum, the appropriate lifespans of transactions and/or collateral for a particular industry, the likelihood that a lender will sell and/or consolidate a loan before the term, and the like. While specific examples of interest rates are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0414] The term valuation services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a valuation service includes any service that sets a value for a good or service. Valuation services may use a valuation model to set a value for collateral based on information from data collection and monitoring services. Smart contract services may process output from the set of valuation services and assign items of collateral sufficient to provide security for a loan and/or apportion value for an item of collateral among a set of lenders and/or transactions. Valuation services may include artificial intelligence services that may iteratively improve the valuation model based on outcome data relating to transactions in collateral. Valuation services may include market value data collection services that may monitor and report on marketplace information relevant to the value of collateral. Certain processes may not be considered to be a valuation service. For example, a point of sale device that simply charges a set cost for a good or service may not be a valuation service. In another example, a service that tracks the cost of a good or service and triggers

notifications when the value changes may not be a valuation service itself, but may rely on valuation services and/or form a part of a valuation service. Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes systems, and any such processes or systems may be considered a valuation service herein, while in certain embodiments a given service may not be considered a valuation service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system and how to combine processes and systems from the present disclosure to enhance operations of the contemplated system and/or to provide a valuation service. Certain considerations for the person of skill in the art, in determining whether a contemplated system is a valuation service and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: perform real-time alterations to a loan based on a value of a collateral; utilize marketplace data to execute a collateral-backed smart contract; re-evaluate collateral based on a storage condition or geolocation; the tendency of the collateral to have a volatile value, be utilized, and/or be moved; and the like. While specific examples of valuation services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0415] The term collateral attributes (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, collateral attributes include any identification of the durability (ability of the collateral to withstand wear or the useful life of the collateral), value, identification (does the collateral have definite characteristics that make it easy to identify or market), stability of value (does the collateral maintain value over time), standardization, grade, quality, marketability, liquidity, transferability, desirability, trackability, deliverability (ability of the collateral be delivered or transfer without a deterioration in value), market transparency (is the collateral value easily verifiable or widely agreed upon), physical or virtual. Collateral attributes may be measured in absolute or relative terms, and/or may include qualitative (e.g., categorical descriptions) or quantitative descriptions. Collateral attributes may be different for different industries, products, elements, uses, and the like. Collateral attributes may be assigned quantitative or qualitative values. Values associated with collateral attributes may be based on a scale (such as 1-10) or a relative designation (high, low, better, etc.). Collateral may include various components; each component may have collateral attributes. Collateral may, therefore, have multiple values for the same collateral attribute. In some embodiments, multiple values of collateral attributes may be combined to generate one value for

each attribute. Some collateral attributes may apply only to specific portions of collateral. Some collateral attributes, even for a given component of the collateral, may have distinct values depending upon the party of interest (e.g., a party that values an aspect of the collateral more highly than another party) and/or depending upon the type of transaction (e.g., the collateral may be more valuable or appropriate for a first type of loan than for a second type of loan). Certain attributes associated with collateral may not be collateral attributes as described herein depending upon the purpose of the collateral attributes herein. For example, a product may be rated as durable relative to similar products; however, if the life of the product is much lower than the term of a particular loan in consideration, the durability of the product may be rated differently (e.g., not durable) or irrelevant (e.g., where the current inventory of the product is attached as the collateral, and is expected to change out during the term of the loan). Accordingly, the benefits of the present disclosure may be applied to a variety of attributes, and any such attributes may be considered collateral attributes herein, while in certain embodiments a given attribute may not be considered a collateral attribute herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about contemplated collateral attributes ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular collateral attribute. Certain considerations for the person of skill in the art, in determining whether a contemplated attribute is a collateral attribute and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: the source of the attribute and the source of the value of the attribute (e.g. does the attribute and attribute value comes from a reputable source), the volatility of the attribute (e.g. does the attribute values for the collateral fluctuate, is the attribute a new attribute for the collateral), relative differences in attribute values for similar collateral, exceptional values for attributes (e.g., some attribute values may be high, such as, in the 98th percentile or very low, such as in the 2nd percentile, compared to similar class of collateral), the fungibility of the collateral, the type of transaction related to the collateral, and/or the purpose of the utilization of collateral for a particular party or transaction. While specific examples of collateral attributes and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0416] The term blockchain services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, blockchain services include any service related to the processing, recordation, and/or updating of a blockchain, and may include services for processing blocks, computing hash values, generating new blocks in a blockchain, appending a block to the blockchain, creating a fork in the blockchain, merging of

forks in the blockchain, verifying previous computations, updating a shared ledger, updating a distributed ledger, generating cryptographic keys, verifying transactions, maintaining a blockchain, updating a blockchain, verifying a blockchain, generating random numbers. The services may be performed by execution of computer readable instructions on local computers and/or by remote servers and computers. Certain services may not be considered blockchain services individually but may be considered blockchain services based on the final use of the service and/or in a particular embodiment, for example, a computing a hash value may be performed in a context outside of a blockchain such in the context of secure communication. Some initial services may be invoked without first being applied to blockchains, but further actions or services in conjunction with the initial services may associate the initial service with aspects of blockchains. For example, a random number may be periodically generated and stored in memory; the random numbers may initially not be generated for blockchain purposes but may be utilized for blockchains. Accordingly, the benefits of the present disclosure may be applied in a wide variety of services, and any such services may be considered blockchain services herein, while in certain embodiments a given service may not be considered a blockchain service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated blockchain service ordinarily available to that person, can readily determine which aspects of the present disclosure can be configured to implement, and/or will benefit, a particular blockchain service. Certain considerations for the person of skill in the art, in determining whether a contemplated service is a blockchain service and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: the application of the service, the source of the service (e.g., if the service is associated with a known or verifiable blockchain service provider), responsiveness of the service (e.g., some blockchain services may have an expected completion time, and/or may be determined through utilization), cost of the service, the amount of data requested for the service, and/or the amount of data generated by the service (blocks of blockchain or keys associated with blockchains may be a specific size or a specific range of sizes). While specific examples of blockchain services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0417] The term blockchain (and variations such as cryptocurrency ledger, and the like) as utilized herein may be understood broadly to describe a cryptocurrency ledger that records, administrates, or otherwise processes online transactions. A blockchain may be public, private, or a combination thereof, without limitation. A blockchain may also be used to represent a set of digital transactions, agreement, terms, or other digital value. Without limitation to any other aspect

or description of the present disclosure, in the former case, a blockchain may also be used in conjunction with investment applications, token-trading applications, and/or digital/cryptocurrency based marketplaces. A blockchain can also be associated with rendering consideration, such as providing goods, services, items, fees, access to a restricted area or event, data, or other valuable benefit. Blockchains in various forms may be included where discussing a unit of consideration, collateral, currency, cryptocurrency, or any other form of value. One of skill in the art, having the benefit of the disclosure herein and knowledge ordinarily available about a contemplated system, can readily determine the value symbolized or represented by a blockchain. While specific examples of blockchains are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0418] The terms ledger and distributed ledger (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a ledger may be a document, file, computer file, database, book, and the like which maintains a record of transactions. Ledgers may be physical or digital. Ledgers may include records related to sales, accounts, purchases, transactions, assets, liabilities, incomes, expenses, capital, and the like. Ledgers may provide a history of transactions that may be associated with time. Ledgers may be centralized or decentralized/distributed. A centralized ledger may be a document that is controlled, updated, or viewable by one or more selected entities or a clearinghouse and wherein changes or updates to the ledger are governed or controlled by the entity or clearinghouse. A distributed ledger may be a ledger that is distributed across a plurality of entities, participants or regions which may independently, concurrently, or consensually, update, or modify their copies of the ledger. Ledgers and distributed ledgers may include security measures and cryptographic functions for signing, concealing, or verifying content. In the case of distributed ledgers, blockchain technology may be used. In the case of distributed ledgers implemented using blockchain, the ledger may be Merkle trees comprising a linked list of nodes in which each node contains hashed or encrypted transactional data of the previous nodes. Certain records of transactions may not be considered ledgers. A file, computer file, database, or book may or may not be a ledger depending on what data it stores, how the data is organized, maintained, or secured. For example, a list of transactions may not be considered a ledger if it cannot be trusted or verified, and/or if it is based on inconsistent, fraudulent, or incomplete data. Data in ledgers may be organized in any format such as tables, lists, binary streams of data, or the like which may depend on convenience, source of data, type of data, environment, applications, and the like. A ledger that is shared among various entities may not be a distributed ledger, but the distinction of distributed may be based on which

entities are authorized to make changes to the ledger and/or how the changes are shared and processed among the different entities. Accordingly, the benefits of the present disclosure may be applied in a wide variety of data, and any such data may be considered ledgers herein, while in certain embodiments a given data may not be considered a ledger herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about contemplated ledgers and distributed ledger ordinarily available to that person, can readily determine which aspects of the present disclosure can be utilized to implement, and/or will benefit a particular ledger. Certain considerations for the person of skill in the art, in determining whether a contemplated data is a ledger and/or whether aspects of the present disclosure can benefit or enhance the contemplated ledger include, without limitation: the security of the data in the ledger (can the data be tampered or modified), the time associated with making changes to the data in the ledger, cost of making changes (computationally and monetarily), detail of data, organization of data (does the data need to be processed for use in an application), who controls the ledger (can the party be trusted or relied to manage the ledger), confidentiality of the data (who can see or track the data in the ledger), size of the infrastructure, communication requirements (distributed ledgers may require a communication interface or specific infrastructure), resiliency. While specific examples of blockchain services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0419] The term loan (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a loan may be an agreement related to an asset that is borrowed, and that is expected to be returned in kind (e.g., money borrowed, and money returned) or as an agreed transaction (e.g., a first good or service is borrowed, and money, a second good or service, or a combination, is returned). Assets may be money, property, time, physical objects, virtual objects, services, a right (e.g., a ticket, a license, or other rights), a depreciation amount, a credit (e.g., a tax credit, an emissions credit, etc.), an agreed assumption of a risk or liability, and/or any combination thereof. A loan may be based on a formal or informal agreement between a borrower and a lender wherein a lender may provide an asset to the borrower for a predefined amount of time, a variable period of time, or indefinitely. Lenders and borrowers may be individuals, entities, corporations, governments, groups of people, organizations, and the like. Loan types may include mortgage loans, personal loans, secured loans, unsecured loans, concessional loans, commercial loans, microloans, and the like. The agreement between the borrower and the lender may specify terms of the loan. The borrower may be required to return an asset or repay with a different asset than was borrowed. In some cases, a loan may

require interest to be repaid on the borrowed asset. Borrowers and lenders may be intermediaries between other entities and may never possess or use the asset. In some embodiments, a loan may not be associated with direct transfer of goods but may be associated with usage rights or shared usage rights. In certain embodiments, the agreement between the borrower and the lender may be executed between the borrower and the lender, and/or executed between an intermediary (e.g., a beneficiary of a loan right such as through a sale of the loan). In certain embodiment, the agreement between the borrower and the lender may be executed through services herein, such as through a smart contract service that determines at least a portion of the terms and conditions of the loans, and in certain embodiments may commit the borrower and/or the lender to the terms of the agreement, which may be a smart contract. In certain embodiments, the smart contract service may populate the terms of the agreement, and present them to the borrower and/or lender for execution. In certain embodiments, the smart contract service may automatically commit one of the borrower or the lender to the terms (at least as an offer) and may present the offer to the other one of the borrower or the lender for execution. In certain embodiments, a loan agreement may include multiple borrowers and/or multiple lenders, for example where a set of loans includes a number of beneficiaries of payment on the set of loans, and/or a number of borrowers on the set of loans. In certain embodiments, the risks and/or obligations of the set of loans may be individualized (e.g., each borrower and/or lender is related to specific loans of the set of loans), apportioned (e.g., a default on a particular loan has an associated loss apportioned between the lenders), and/or combinations of these (e.g., one or more subsets of the set of loans is treated individually and/or apportioned).

[0420] Certain agreements may not be considered a loan. An agreement to transfer or borrow assets may not be a loan depending on what assets are transferred, how the assets were transferred, or the parties involved. For example, in some cases, the transfer of assets may be for an indefinite time and may be considered a sale of the asset or a permanent transfer. Likewise, if an asset is borrowed or transferred without clear or definite terms or lack of consensus between the lender and the borrower it may, in some cases, not be considered a loan. An agreement may be considered a loan even if a formal agreement is not directly codified in a written agreement as long as the parties willingly and knowingly agreed to the arrangement, and/or ordinary practices (e.g., in a particular industry) may treat the transaction as a loan. Accordingly, the benefits of the present disclosure may be applied in a wide variety of agreements, and any such agreement may be considered a loan herein, while in certain embodiments a given agreement may not be considered a loan herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about contemplated loans ordinarily available to that person, can readily determine which aspects of the present disclosure implement a loan, utilize a loan, or benefit a particular loan transaction.

Certain considerations for the person of skill in the art, in determining whether a contemplated data is a loan and/or whether aspects of the present disclosure can benefit or enhance the contemplated loan include, without limitation: the value of the assets involved, the ability of the borrower to return or repay the loan, the types of assets involved (e.g., whether the asset is consumed through utilization), the repayment time frame associated with the loan, the interest on the loan, how the agreement of the loan was arranged, formality of the agreement, detail of the agreement, the detail of the agreements of the loan, the collateral attributes associated with the loan, and/or the ordinary business expectations of any of the foregoing in a particular context. While specific examples of loans and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0421] The term loan related event(s) (and similar terms, including loan-related events) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a loan related events may include any event related to terms of the loan or events triggered by the agreement associated with the loan. Loan-related events may include default on loan, breach of contract, fulfillment, repayment, payment, change in interest, late fee assessment, refund assessment, distribution, and the like. Loan-related events may be triggered by explicit agreement terms; for example, an agreement may specify a rise in interest rate after a time period has elapsed from the beginning of the loan; the rise in interest rate triggered by the agreement may be a loan related event. Loan-related events may be triggered implicitly by related loan agreement terms. In certain embodiments, any occurrence that may be considered relevant to assumptions of the loan agreement, and/or expectations of the parties to the loan agreement, may be considered an occurrence of an event. For example, if collateral for a loan is expected to be replaceable (e.g., an inventory as collateral), then a change in inventory levels may be considered an occurrence of a loan related event. In another example, if review and/or confirmation of the collateral is expected, then a lack of access to the collateral, the disablement or failure of a monitoring sensor, etc. may be considered an occurrence of a loan related event. In certain embodiments, circuits, controllers, or other devices described herein may automatically trigger the determination of a loan-related events. In some embodiments, loan-related events may be triggered by entities that manage loans or loan-related contracts. Loan-related events may be conditionally triggered based on one or more conditions in the loan agreement. Loan related events may be related to tasks or requirements that need to be completed by the lender, borrower, or a third party. Certain events may be considered loan-related events in certain embodiments and/or in certain contexts, but may not be considered a loan-related event in another embodiment or context. Many

events may be associated with loans but may be caused by external triggers not associated with a loan. However, in certain embodiments, an externally triggered event (e.g., a commodity price change related to a collateral item) may be loan-related events. For example, renegotiation of loan terms initiated by a lender may not be considered a loan related event if the terms and/or performance of the existing loan agreement did not trigger the renegotiation. Accordingly, the benefits of the present disclosure may be applied in a wide variety of events, and any such event may be considered a loan related event herein, while in certain embodiments given events may not be considered a loan related event herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure may be considered a loan-related event for the contemplated system and/or for particular transactions supported by the system. Certain considerations for the person of skill in the art, in determining whether a contemplated data is a loan related event and/or whether aspects of the present disclosure can benefit or enhance the contemplated transaction system include, without limitation: the impact of the related event on the loan (events that cause default or termination of the loan may have higher impact), the cost (capital and/or operating) associated with the event, the cost (capital and/or operating) associated with monitoring for an occurrence of the event, the entities responsible for responding to the event, a time period and/or response time associated with the event (e.g., time required to complete the event and time that is allotted from the time the event is triggered to when processing or detection of the event is desired to occur), the entity responsible for the event, the data required for processing the event (e.g., confidential information may have different safeguards or restrictions), the availability of mitigating actions if an undetected event occurs, and/or the remedies available to an at-risk party if the event occurs without detection. While specific examples of loan-related events and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0422] The term loan-related activities (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a loan related activity may include activities related to the generation, maintenance, termination, collection, enforcement, servicing, billing, marketing, ability to perform, or negotiation of a loan. Loan-related activity may include activities related to the signing of a loan agreement or a promissory note, review of loan documents, processing of payments, evaluation of collateral, evaluation of compliance of the borrower or lender to the loan terms, renegotiation of terms, perfection of security or collateral for the loan, and/or a negation of terms. Loan-related activities may relate to events associated with a loan before formal agreement on the terms, such as activities

associated with initial negotiations. Loan-related activities may relate to events during the life of the loan and after the termination of a loan. Loan-related activities may be performed by a lender, borrower, or a third party. Certain activities may not be considered loan related activities services individually but may be considered loan related activities based on the specificity of the activity to the loan lifecycle- for example, billing or invoicing related to outstanding loans may be considered a loan related activity, however when the invoicing or billing of loans is combined with billing or invoicing for non loan-related elements the invoicing may not be considered a loan related activity. Some activities may be performed in relation to an asset regardless of whether a loan is associated with the asset; in these cases, the activity may not be considered a loan related activity. For example, regular audits related to an asset may occur regardless of whether the asset is associated with a loan and may not be considered a loan related activity. In another example, a regular audit related to an asset may be required by a loan agreement and would not typically occur but for the association with a loan, in this case, the activity may be considered a loan related activity. In some embodiments, activities may be considered loan-related activities if the activity would otherwise not occur if the loan is not active or present, but may still be considered a loan-related activity in some instances (e.g., if auditing occurs normally, but the lender does not have the ability to enforce or review the audit, then the audit may be considered a loan-related activity even though it already occurs otherwise). Accordingly, the benefits of the present disclosure may be applied in a wide variety of events, and any such event may be considered a loan related event herein, while in certain embodiments given events may not be considered a loan related events herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine a loan related activity for the purposes of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated data is a loan related activity and/or whether aspects of the present disclosure can benefit or enhance the contemplated loan include, without limitation: the necessity of the activity for the loan (can the loan agreement or terms be satisfied without the activity), the cost of the activity, the specificity of the activity to the loan (is the activity similar or identical to other industries), time involved in the activity, the impact of the activity on a loan life cycle, entity performing the activity, amount of data required for the activity (does the activity require confidential information related to the loan, or personal information related to the entities), and/or the ability of parties to enforce and/or review the activity. While specific examples of loan-related events and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0423] The terms loan-terms, loan terms, terms for a loan, terms and conditions, and the like as utilized herein should be understood broadly ("loan terms"). Without limitation to any other aspect or description of the present disclosure, loan terms may relate to conditions, rules, limitations, contract obligations, and the like related to the timing, repayment, origination, and other enforceable conditions agreed to by the borrower and the lender of the loan. Loan terms may be specified in a formal contract between a borrower and the lender. Loan terms may specify aspects of an interest rate, collateral, foreclose conditions, consequence of debt, payment options, payment schedule, a covenant, and the like. Loan terms may be negotiable or may change during the life of a loan. Loan terms may be change or be affected by outside parameters such as market prices, bond prices, conditions associated with a lender or borrower, and the like. Certain aspects of a loan may not be considered loan terms. In certain embodiments, aspects of loan that have not been formally agreed upon between a lender and a borrower, and/or that are not ordinarily understood in the course of business (and/or the particular industry) may not be considered loan terms. Certain aspects of a loan may be preliminary or informal until they have been formally agreed or confirmed in a contract or a formal agreement. Certain aspects of a loan may not be considered loan terms individually but may not be considered loan terms based on the specificity of the aspect to a specific loan. Certain aspects of a loan may not be considered loan terms at a particular time during the loan, but may be considered loan terms at another time during the loan (e.g., obligations and/or waivers that may occur through the performance of the parties, and/or expiration of a loan term). For example, an interest rate may generally not be considered a loan term until it is defined in relation of a loan and defined as to how the interest compounded (annual, monthly), calculated, and the like. An aspect of a loan may not be considered a term if it is indefinite or unenforceable. Some aspects may be manifestations or related to terms of a loan but may themselves not be the terms. For example, a loan term may be the repayment period of a loan, such as one year. The term may not specify how the loan is to be repaid in the year. The loan may be repaid with 12 monthly payments or one annual payment. A monthly payment plan in this case may not be considered a loan term as it can be just one or many options for repayment not directly specified by a loan. Accordingly, the benefits of the present disclosure may be applied in a wide variety of loan aspects, and any such aspect may be considered a loan term herein, while in certain embodiments given aspects may not be considered loan terms herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure are loan terms for the contemplated system.

[0424] Certain considerations for the person of skill in the art, in determining whether a contemplated data is a loan term and/or whether aspects of the present disclosure can benefit or

enhance the contemplated loan include, without limitation: the enforceability of the terms (can the conditions be enforced by the lender or the lender or the borrower), the cost of enforcing the terms (amount of time, or effort required ensure the conditions are being followed), the complexity of the terms (how easily can they be followed or understood by the parties involved, are the terms error prone or easily misunderstood), entities responsible for the terms, fairness of the terms, stability of the terms (how often do they change), observability of the terms (can the terms be verified by a another party), favorability of the terms to one party (do the terms favor the borrower or the lender), risk associated with the loan (terms may depend on the probability that the loan may not be repaid), characteristics of the borrower or lender (their ability to meet the terms), and/or ordinary expectations for the loan and/or related industry.

[0425] While specific examples of loan terms are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0426] The term loan conditions, loan-conditions, conditions for a loan, terms and conditions, and the like as utilized herein should be understood broadly ("loan conditions"). Without limitation to any other aspect or description of the present disclosure, loan conditions may relate to rules, limits, and/or obligations related to a loan. Loan conditions may relate to rules or necessary obligations for obtaining a loan, for maintaining a loan, for applying for a loan, for transferring a loan, and the like. Loan conditions may include principal amount of debt, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, treatment of collateral, access to collateral, a party, a guarantee, a guarantor, a security, a personal guarantee, a lien, a duration, a covenant, a foreclose condition, a default condition, conditions related to other debts of the borrower, and a consequence of default.

[0427] Certain aspects of a loan may not be considered loan conditions. Aspects of loan that have not been formally agreed upon between a lender and a borrower, and/or that are not ordinarily understood in the course of business (and/or the particular industry), may not be considered loan conditions. Certain aspects of a loan may be preliminary or informal until they have been formally agreed or confirmed in a contract or a formal agreement. Certain aspects of a loan may not be considered loan conditions individually but may be considered loan conditions based on the specificity of the aspect to a specific loan. Certain aspects of a loan may not be considered loan conditions at a particular time during the loan, but may be considered loan conditions at another time during the loan (e.g., obligations and/or waivers that may occur through the performance of the parties, and/or expiration of a loan condition). Accordingly, the benefits of the present

disclosure may be applied in a wide variety of loan aspects, and any such aspect may be considered loan conditions herein, while in certain embodiments given aspects may not be considered loan conditions herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure are loan conditions for the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated data is a loan condition and/or whether aspects of the present disclosure can benefit or enhance the contemplated loan include, without limitation: the enforceability of the condition (can the conditions be enforced by the lender or the lender or the borrower), the cost of enforcing the condition (amount of time, or effort required ensure the conditions are being followed), the complexity of the condition (how easily can they be followed or understood by the parties involved, are the conditions error prone or easily misunderstood), entities responsible for the conditions, fairness of the conditions, observability of the conditions (can the conditions be verified by a another party), favorability of the conditions to one party (do the conditions favor the borrower or the lender), risk associated with the loan (conditions may depend on the probability that the loan may not be repaid), and/or ordinary expectations for the loan and/or related industry.

[0428] While specific examples of loan conditions are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0429] The term loan collateral, collateral, item of collateral, collateral item, and the like as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a loan collateral may relate to any asset or property that a borrower promises to a lender as backup in exchange for a loan, and/or as security for the loan. Collateral may be any item of value that is accepted as an alternate form of repayment in case of default on a loan. Collateral may include any number of physical or virtual items such as a vehicle, a ship, a plane, a building, a home, real estate property, undeveloped land, a farm, a crop, a municipal facility, a warehouse, a set of inventory, a commodity, a security, a currency, a token of value, a ticket, a cryptocurrency, a consumable item, an edible item, a beverage, a precious metal, an item of jewelry, a gemstone, an item of intellectual property, an intellectual property right, a contractual right, an antique, a fixture, an item of furniture, an item of equipment, a tool, an item of machinery, and an item of personal property. Collateral may include more than one item or types of items.

[0430] A collateral item may describe an asset, a property, a value, or other item defined as a security for a loan or a transaction. A set of collateral items may be defined, and within that set substitution, removal or addition of collateral items may be affected. For example, a collateral item

may be, without limitation: a vehicle, a ship, a plane, a building, a home, real estate property, undeveloped land, a farm, a crop, a municipal facility, a warehouse, a set of inventory, a commodity, a security, a currency, a token of value, a ticket, a cryptocurrency, a consumable item, an edible item, a beverage, a precious metal, an item of jewelry, a gemstone, an item of intellectual property, an intellectual property right, a contractual right, an antique, a fixture, an item of furniture, an item of equipment, a tool, an item of machinery, or an item of personal property, or the like. If a set or plurality of collateral items is defined, substitution, removal or addition of collateral items may be affected, such as substituting, removing, or adding a collateral item to or from a set of collateral items. Without limitation to any other aspect or description of the present disclosure, a collateral item or set of collateral items may also be used in conjunction with other terms to an agreement or loan, such as a representation, a warranty, an indemnity, a covenant, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, a security, a personal guarantee, a lien, a duration, a foreclose condition, a default condition, and a consequence of default. In certain embodiments, a smart contract may calculate whether a borrower has satisfied conditions or covenants and in cases where the borrower has not satisfied such conditions or covenants, may enable automated action, or trigger another conditions or terms that may affect the status, ownership, or transfer of a collateral item, or initiate the substitution, removal, or addition of collateral items to a set of collateral for a loan. One of skill in the art, having the benefit of the disclosure herein and knowledge about collateral items, can readily determine the purposes and use of collateral items in various embodiments and contexts disclosed herein, including the substitution, removal, and addition thereof.

[0431] While specific examples of loan collateral are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0432] The term smart contract services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a smart contract service includes any service or application that manages a smart contract or a smart lending contract. For example, the smart contract service may specify terms and conditions of a smart contract, such as in a rules database, or process output from a set of valuation services and assign items of collateral sufficient to provide security for a loan. Smart contract services may automatically execute a set of rules or conditions that embody the smart contract, wherein the execution may be based on or take advantage of collected data. Smart contract services may

automatically initiate a demand for payment of a loan, automatically initiate a foreclosure process, automatically initiate an action to claim substitute or backup collateral or transfer ownership of collateral, automatically initiate an inspection process, automatically change a payment, or interest rate term that is based on the collateral, and may also configure smart contracts to automatically undertake a loan-related action. Smart contracts may govern at least one of loan terms and conditions, loan-related events, and loan-related activities. Smart contracts may be agreements that are encoded as computer protocols and may facilitate, verify, or enforce the negotiation or performance of a smart contract. Smart contracts may or may not be one or more of partially or fully self-executing, or partially or fully self-enforcing.

[0433] Certain processes may not be considered to be smart-contract related individually, but may be considered smart-contract related in an aggregated system - for example automatically undertaking a loan-related action may not be smart contract-related in one instance, but in another instance, may be governed by terms of a smart contract. Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes systems, and any such processes or systems may be considered a smart contract or smart contract service herein, while in certain embodiments a given service may not be considered a smart contract service herein.

[0434] One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system and how to combine processes and systems from the present disclosure to implement a smart contract service and/or enhance operations of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system includes a smart contract service or smart contract and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: ability to transfer ownership of collateral automatically in response to an event; automated actions available upon a finding of covenant compliance (or lack of compliance); the amenity of the collateral to clustering, re-balancing, distribution, addition, substitution, and removal of items from collateral; the modification parameters of an aspect of a loan in response to an event (e.g., timing, complexity, suitability for the loan type, etc.); the complexity of terms and conditions of loans for the system, including benefits from rapid determination and/or predictions of changes to entities (e.g., in the collateral, a financial condition of a party, offset collateral, and/or in an industry related to a party) related to the loan; the suitability of automated generation of terms and conditions and/or execution of terms and conditions for the types of loans, parties, and/or industries contemplated for the system; and the like. While specific examples of smart contract services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the

benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0435] The term IoT system (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, an IoT system includes any system of uniquely identified and interrelated computing devices, mechanical and digital machines, sensors, and objects that are able to transfer data over a network without intervention. Certain components may not be considered an IoT system individually, but may be considered an IoT system in an aggregated system, for example, a single networked.

[0436] The sensor, smart speaker, and/or medical device may be not an IoT system, but may be a part of a larger system and/or be accumulated with a number of other similar components to be considered an IoT system and/or a part of an IoT system. In certain embodiments, a system may be considered an IoT system for some purposes but not for other purposes - for example, a smart speaker may be considered part of an IoT system for certain operations, such as for providing surround sound, or the like, but not part of an IoT system for other operations such as directly streaming content from a single, locally networked source. Additionally, in certain embodiments, otherwise similar looking systems may be differentiated in determining whether such systems are IoT systems, and/or which type of IoT system. For example, one group of medical devices may not, at a given time, be sharing to an aggregated HER database, while another group of medical devices may be sharing data to an aggregate HER for the purposes of a clinical study, and accordingly one group of medical devices may be an IoT system, while the other is not. Accordingly, the benefits of the present disclosure may be applied in a wide variety of systems, and any such systems may be considered an IoT system herein, while in certain embodiments a given system may not be considered an IoT system herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system, how to combine processes and systems from the present disclosure to enhance operations of the contemplated system, and which circuits, controllers, and/or devices include an IoT system for the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system is an IoT system and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: the transmission environment of the system (e.g., availability of low power, inter-device networking); the shared data storage of a group of devices; establishment of a geofence by a group of devices; service as blockchain nodes; the performance of asset, collateral, or entity monitoring; the relay of data between devices; ability to aggregate data from a plurality of sensors or monitoring devices, and the like. While specific examples of IoT systems and considerations are described herein for

purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0437] The term data collection services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a data collection service includes any service that collects data or information, including any circuit, controller, device, or application that may store, transmit, transfer, share, process, organize, compare, report on and/or aggregate data. The data collection service may include data collection devices (e.g., sensors) and/or may be in communication with data collection devices. The data collection service may monitor entities, such as to identify data or information for collection. The data collection service may be event-driven, run on a periodic basis, or retrieve data from an application at particular points in the application's execution. Certain processes may not be considered to be a data collection service individually, but may be considered a data collection service in an aggregated system - for example, a networked storage device may be a component of a data collection service in one instance, but in another instance, may have stand-alone functionality. Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes systems, and any such processes or systems may be considered a data collection service herein, while in certain embodiments a given service may not be considered a data collection service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system and how to combine processes and systems from the present disclosure implement a data collection service and/or to enhance operations of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system is a data collection service and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: ability to modify a business rule on the fly and alter a data collection protocol; perform real-time monitoring of events; connection of a device for data collection to a monitoring infrastructure, execution of computer readable instructions that cause a processor to log or track events; use of an automated inspection system; occurrence of sales at a networked point-of-sale; need for data from one or more distributed sensors or cameras; and the like. While specific examples of data collection services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0438] The term data integration services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a data integration service includes any service that integrates data or information, including any device or application that may extract, transform, load, normalize, compress, decompress, encode, decode, and otherwise process data packets, signals, and other information. The data integration service may monitor entities, such as to identify data or information for integration. The data integration service may integrate data regardless of required frequency, communication protocol, or business rules needed for intricate integration patterns. Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes systems, and any such processes or systems may be considered a data integration service herein, while in certain embodiments a given service may not be considered a data integration service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system and how to combine processes and systems from the present disclosure to implement a data integration service and/or enhance operations of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system is a data integration service and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: ability to modify a business rule on the fly and alter a data integration protocol; communication with third party databases to pull in data to integrate with; synchronization of data across disparate platforms; connection to a central data warehouse; data storage capacity, processing capacity, and/or communication capacity distributed throughout the system; the connection of separate, automated workflows; and the like. While specific examples of data integration services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0439] The term computational services (and similar terms) as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, computational services may be included as a part of one or more services, platforms, or microservices, such as blockchain services, data collection services, data integration services, valuation services, smart contract services, data monitoring services, data mining, and/or any service that facilitates collection, access, processing, transformation, analysis, storage, visualization, or sharing of data. Certain processes may not be considered to be a computational service. For example, a process may not be considered a computational service depending on the sorts of rules governing the service, an end product of the service, or the intent of the service.

Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes systems, and any such processes or systems may be considered a computational service herein, while in certain embodiments a given service may not be considered a computational service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system and how to combine processes and systems from the present disclosure to implement one or more computational service, and/or to enhance operations of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system is a computational service and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: agreement-based access to the service; mediate an exchange between different services; provides on demand computational power to a web service; accomplishes one or more of monitoring, collection, access, processing, transformation, analysis, storage, integration, visualization, mining, or sharing of data. While specific examples of computational services and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0440] The term sensor as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, a sensor may be a device, module, machine, or subsystem that detects or measures a physical quality, event, or change. In embodiments, may record, indicate, transmit, or otherwise respond to the detection or measurement. Examples of sensors may be sensors for sensing movement of entities, for sensing temperatures, pressures or other attributes about entities or their environments, cameras that capture still or video images of entities, sensors that collect data about collateral or assets, such as, for example, regarding the location, condition (health, physical, or otherwise), quality, security, possession, or the like. In embodiments, sensors may be sensitive to, but not influential on, the property to be measured but insensitive to other properties. Sensors may be analog or digital. Sensors may include processors, transmitters, transceivers, memory, power, sensing circuit, electrochemical fluid reservoirs, light sources, and the like. Further examples of sensors contemplated for use in the system include biosensors, chemical sensors, black silicon sensor, IR sensor, acoustic sensor, induction sensor, motion sensor, optical sensor, opacity sensor, proximity sensor, inductive sensor, Eddy-current sensor, passive infrared proximity sensor, radar, capacitance sensor, capacitive displacement sensor, hall-effect sensor, magnetic sensor, GPS sensor, thermal imaging sensor, thermocouple, thermistor, photoelectric sensor, ultrasonic sensor, infrared laser sensor, inertial motion sensor, MEMS internal motion sensor, ultrasonic 3D motion

sensor, accelerometer, inclinometer, force sensor, piezoelectric sensor, rotary encoders, linear encoders, ozone sensor, smoke sensor, heat sensor, magnetometer, carbon dioxide detector, carbon monoxide detector, oxygen sensor, glucose sensor, smoke detector, metal detector, rain sensor, altimeter, GPS, detection of being outside, detection of context, detection of activity, object detector (e.g. collateral), marker detector (e.g. geo-location marker), laser rangefinder, sonar, capacitance, optical response, heart rate sensor, or an RF/micropower impulse radio (MIR) sensor. In certain embodiments, a sensor may be a virtual sensor - for example determining a parameter of interest as a calculation based on other sensed parameters in the system. In certain embodiments, a sensor may be a smart sensor - for example reporting a sensed value as an abstracted communication (e.g., as a network communication) of the sensed value. In certain embodiments, a sensor may provide a sensed value directly (e.g., as a voltage level, frequency parameter, etc.) to a circuit, controller, or other device in the system. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit from a sensor. Certain considerations for the person of skill in the art, in determining whether a contemplated device is a sensor and/or whether aspects of the present disclosure can benefit from or be enhanced by the contemplated sensor include, without limitation: the conditioning of an activation/deactivation of a system to an environmental quality; the conversion of electrical output into measured quantities; the ability to enforce a geofence; the automatic modification of a loan in response to change in collateral; and the like. While specific examples of sensors and considerations are described herein for purposes of illustration, any system benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0441] The term storage condition and similar terms, as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, storage condition includes an environment, physical location, environmental quality, level of exposure, security measures, maintenance description, accessibility description, and the like related to the storage of an asset, collateral, or an entity specified and monitored in a contract, loan, or agreement or backing the contract, loan or other agreement, and the like. Based on a storage condition of a collateral, an asset, or entity, actions may be taken to, maintain, improve, and/or confirm a condition of the asset or the use of that asset as collateral. Based on a storage condition, actions may be taken to alter the terms or conditions of a loan or bond. Storage condition may be classified in accordance with various rules, thresholds, conditional procedures, workflows, model parameters, and the like and may be based on self-reporting or on data from Internet of Things devices, data from a set of environmental condition sensors, data from a set of social network

analytic services and a set of algorithms for querying network domains, social media data, crowdsourced data, and the like. The storage condition may be tied to a geographic location relating to the collateral, the issuer, the borrower, the distribution of the funds or other geographic locations. Examples of IoT data may include images, sensor data, location data, and the like. Examples of social media data or crowdsourced data may include behavior of parties to the loan, financial condition of parties, adherence to a party's a term or condition of the loan, or bond, or the like. Parties to the loan may include issuers of a bond, related entities, lender, borrower, 3rd parties with an interest in the debt. Storage condition may relate to an asset or type of collateral such as a municipal asset, a vehicle, a ship, a plane, a building, a home, real estate property, undeveloped land, a farm, a crop, a municipal facility, a warehouse, a set of inventory, a commodity, a security, a currency, a token of value, a ticket, a cryptocurrency, a consumable item, an edible item, a beverage, a precious metal, an item of jewelry, a gemstone, an item of intellectual property, an intellectual property right, a contractual right, an antique, a fixture, an item of furniture, an item of equipment, a tool, an item of machinery, and an item of personal property. The storage condition may include an environment where environment may include an environment selected from among a municipal environment, a corporate environment, a securities trading environment, a real property environment, a commercial facility, a warehousing facility, a transportation environment, a manufacturing environment, a storage environment, a home, and a vehicle. Actions based on the storage condition of a collateral, an asset or an entity may include managing, reporting on, altering, syndicating, consolidating, terminating, maintaining, modifying terms and/or conditions, foreclosing an asset, or otherwise handling a loan, contract, or agreement. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated storage condition, can readily determine which aspects of the present disclosure will benefit a particular application for a storage condition. Certain considerations for the person of skill in the art, or embodiments of the present disclosure in choosing an appropriate storage condition to manage and/or monitor, include, without limitation: the legality of the condition given the jurisdiction of the transaction, the data available for a given collateral, the anticipated transaction type (loan, bond or debt), the specific type of collateral, the ratio of the loan to value, the ratio of the collateral to the loan, the gross transaction/loan amount, the credit scores of the borrower and the lender, ordinary practices in the industry, and other considerations. While specific examples of storage conditions are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0442] The term geolocation and similar terms, as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, geolocation includes

the identification or estimation of the real-world geographic location of an object, including the generation of a set of geographic coordinates (e.g. latitude and longitude) and/or street address. Based on a geolocation of a collateral, an asset, or entity, actions may be taken to maintain or improve a condition of the asset or the use of that asset as collateral. Based on a geolocation, actions may be taken to alter the terms or conditions of a loan or bond. Based on a geolocation, determinations or predictions related to a transaction may be performed - for example based upon the weather, civil unrest in a particular area, and/or local disasters (e.g., an earthquake, flood, tornado, hurricane, industrial accident, etc.). Geolocations may be determined in accordance with various rules, thresholds, conditional procedures, workflows, model parameters, and the like and may be based on self-reporting or on data from Internet of Things devices, data from a set of environmental condition sensors, data from a set of social network analytic services and a set of algorithms for querying network domains, social media data, crowdsourced data, and the like. Examples of geolocation data may include GPS coordinates, images, sensor data, street address, and the like. Geolocation data may be quantitative (e.g., longitude/latitude, relative to a plat map, etc.) and/or qualitative (e.g., categorical such as "coastal", "rural", etc.; "within New York City", etc.). Geolocation data may be absolute (e.g., GPS location) or relative (e.g., within 100 yards of an expected location). Examples of social media data or crowdsourced data may include behavior of parties to the loan as inferred by their geolocation, financial condition of parties inferred by geolocation, adherence of parties to a term or condition of the loan, or bond, or the like. Geolocation may be determined for an asset or type of collateral such as a municipal asset, a vehicle, a ship, a plane, a building, a home, real estate property, undeveloped land, a farm, a crop, a municipal facility, a warehouse, a set of inventory, a commodity, a security, a currency, a token of value, a ticket, a consumable item, an edible item, a beverage, a precious metal, an item of jewelry, a gemstone, an antique, a fixture, an item of furniture, an item of equipment, a tool, an item of machinery, and an item of personal property. Geolocation may be determined for an entity such as one of the parties, a third-party (e.g., an inspection service, maintenance service, cleaning service, etc. relevant to a transaction), or any other entity related to a transaction. The geolocation may include an environment selected from among a municipal environment, a corporate environment, a securities trading environment, a real property environment, a commercial facility, a warehousing facility, a transportation environment, a manufacturing environment, a storage environment, a home, and a vehicle. Actions based on the geolocation of a collateral, an asset or an entity may include managing, reporting on, altering, syndicating, consolidating, terminating, maintaining, modifying terms and/or conditions, foreclosing an asset, or otherwise handling a loan, contract, or agreement. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system, can readily determine which aspects of the present

disclosure will benefit a particular application for a geolocation, and which location aspect of an item is a geolocation for the contemplated system. Certain considerations for the person of skill in the art, or embodiments of the present disclosure in choosing an appropriate geolocation to manage, include, without limitation: the legality of the geolocation given the jurisdiction of the transaction, the data available for a given collateral, the anticipated transaction type (loan, bond or debt), the specific type of collateral, the ratio of the loan to value, the ratio of the collateral to the loan, the gross transaction/loan amount, the frequency of travel of the borrower to certain jurisdictions and other considerations, the mobility of the collateral, and/or a likelihood of location-specific event occurrence relevant to the transaction (e.g., weather, location of a relevant industrial facility, availability of relevant services, etc.). While specific examples of geolocation are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0443] The term jurisdictional location and similar terms, as utilized herein should be understood broadly. Without limitation to any other aspect or description of the present disclosure, jurisdictional location refers to the laws and legal authority governing a loan entity. The jurisdictional location may be based on a geolocation of an entity, a registration location of an entity (e.g. a ship's flag state, a state of incorporation for a business, and the like), a granting state for certain rights such as intellectual priority, and the like. In certain embodiments, a jurisdictional location may be one or more of the geolocations for an entity in the system. In certain embodiments, a jurisdictional location may not be the same as the geolocation of any entity in the system (e.g., where an agreement specifies some other jurisdiction). In certain embodiments, a jurisdictional location may vary for entities in the system (e.g., borrower at A, lender at B, collateral positioned at C, agreement enforced at D, etc.). In certain embodiments, a jurisdictional location for a given entity may vary during the operations of the system (e.g., due to movement of collateral, related data, changes in terms and conditions, etc.). In certain embodiments, a given entity of the system may have more than one jurisdictional location (e.g., due to operations of the relevant law, and/or options available to one or more parties), and/or may have distinct jurisdictional locations for different purposes. A jurisdictional location of an item of collateral, an asset, or entity, actions may dictate certain terms or conditions of a loan or bond, and/or may indicate different obligations for notices to parties, foreclosure and/or default execution, treatment of collateral and/or debt security, and/or treatment of various data within the system. While specific examples of jurisdictional location are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the

benefit of the disclosures herein are specifically contemplated within the scope of the present disclosure.

[0444] The terms token of value, token, and variations such as cryptocurrency token, and the like, as utilized herein, in the context of increments of value, may be understood broadly to describe either: (a) a unit of currency or cryptocurrency (e.g. a cryptocurrency token), and (b) may also be used to represent a credential that can be exchanged for a good, service, data or other valuable consideration (e.g. a token of value). Without limitation to any other aspect or description of the present disclosure, in the former case, a token may also be used in conjunction with investment applications, token-trading applications, and token-based marketplaces. In the latter case, a token can also be associated with rendering consideration, such as providing goods, services, fees, access to a restricted area or event, data, or other valuable benefit. Tokens can be contingent (e.g. contingent access token) or not contingent. For example, a token of value may be exchanged for accommodations, (e.g. hotel rooms), dining/food goods and services, space (e.g. shared space, workspace, convention space, etc.), fitness/wellness goods or services, event tickets or event admissions, travel, flights or other transportation, digital content, virtual goods, license keys, or other valuable goods, services, data, or consideration. Tokens in various forms may be included where discussing a unit of consideration, collateral, or value, whether currency, cryptocurrency, or any other form of value such as goods, services, data, or other benefits. One of skill in the art, having the benefit of the disclosure herein and knowledge about a token, can readily determine the value symbolized or represented by a token, whether currency, cryptocurrency, good, service, data, or other value. While specific examples of tokens are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0445] The term pricing data as utilized herein may be understood broadly to describe a quantity of information such as a price or cost, of one or more items in a marketplace. Without limitation to any other aspect or description of the present disclosure, pricing data may also be used in conjunction with spot market pricing, forward market pricing, pricing discount information, promotional pricing, and other information relating to the cost or price of items. Pricing data may satisfy one or more conditions, or may trigger application of one or more rules of a smart contract. Pricing data may be used in conjunction with other forms of data such as market value data, accounting data, access data, asset and facility data, worker data, event data, underwriting data, claims data or other forms of data. Pricing data may be adjusted for the context of the valued item (e.g., condition, liquidity, location, etc.) and/or for the context of a particular party. One of skill in the art, having the benefit of the disclosure herein and knowledge about pricing data, can readily

determine the purposes and use of pricing data in various embodiments and contexts disclosed herein.

[0446] Without limitation to any other aspect or description of the present disclosure, a token includes any token including, without limitation, a token of value, such as collateral, an asset, a reward, such as in a token serving as representation of value, such as a value holding voucher that can be exchanged for goods or services. Certain components may not be considered tokens individually, but may be considered tokens in an aggregated system, for example, a value placed on an asset may not be in itself be a token, but the value of an asset may be placed in a token of value, such as to be stored, exchanged, traded, and the like. For instance, in a non-limiting example, a blockchain circuit may be structured to provide lenders a mechanism to store the value of assets, where the value attributed to the token is stored in a distributed ledger of the blockchain circuit, but the token itself, assigned the value, may be exchanged, or traded such as through a token marketplace. In certain embodiments, a token may be considered a token for some purposes but not for other purposes - for example, a token may be used as an indication of ownership of an asset, but this use of a token would not be traded as a value where a token including the value of the asset might. Accordingly, the benefits of the present disclosure may be applied in a wide variety of systems, and any such systems may be considered a token herein, while in certain embodiments a given system may not be considered a token herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system ordinarily available to that person, can readily determine which aspects of the present disclosure will benefit a particular system, and/or how to combine processes and systems from the present disclosure to enhance operations of the contemplated system. Certain considerations for the person of skill in the art, in determining whether a contemplated system is a token and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation, access data such as relating to rights of access, tickets, and tokens; use in an investment application such as for investment in shares, interests, and tokens; a token-trading application; a token-based marketplace; forms of consideration such as monetary rewards and tokens; translating the value of a resources in tokens; a cryptocurrency token; indications of ownership such as identity information, event information, and token information; a blockchain-based access token traded in a marketplace application; pricing application such as for setting and monitoring pricing for contingent access rights, underlying access rights, tokens, and fees; trading applications such as for trading or exchanging contingent access rights or underlying access rights or tokens; tokens created and stored on a blockchain for contingent access rights resulting in an ownership (e.g., a ticket); and the like.

[0447] The term financial data as utilized herein may be understood broadly to describe a collection of financial information about an asset, collateral or other item or items. Financial data may include revenues, expenses, assets, liabilities, equity, bond ratings, default, return on assets (ROA), return on investment (ROI), past performance, expected future performance, earnings per share (EPS), internal rate of return (IRR), earnings announcements, ratios, statistical analysis of any of the foregoing (e.g. moving averages), and the like. Without limitation to any other aspect or description of the present disclosure, financial data may also be used in conjunction with pricing data and market value data. Financial data may satisfy one or more conditions, or may trigger application of one or more rules of a smart contract. Financial data may be used in conjunction with other forms of data such as market value data, pricing data, accounting data, access data, asset and facility data, worker data, event data, underwriting data, claims data or other forms of data. One of skill in the art, having the benefit of the disclosure herein and knowledge about financial data, can readily determine the purposes and use of pricing data in various embodiments and contexts disclosed herein.

[0448] The term covenant as utilized herein may be understood broadly to describe a term, agreement, or promise, such as performance of some action or inaction. For example, a covenant may relate to behavior of a party or legal status of a party. Without limitation to any other aspect or description of the present disclosure, a covenant may also be used in conjunction with other related terms to an agreement or loan, such as a representation, a warranty, an indemnity, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, a party, a guarantee, a guarantor, a security, a personal guarantee, a lien, a duration, a foreclose condition, a default condition, and a consequence of default. A covenant or lack of performance of a covenant may satisfy one or more conditions, or may trigger collection, breach or other terms and conditions. In certain embodiments, a smart contract may calculate whether a covenant is satisfied and in cases where the covenant is not satisfied, may enable automated action, or trigger other conditions or terms. One of skill in the art, having the benefit of the disclosure herein and knowledge about covenants, can readily determine the purposes and use of covenants in various embodiments and contexts disclosed herein.

[0449] The term entity as utilized herein may be understood broadly to describe a party, a third-party (e.g., an auditor, regulator, service provider, etc.), and/or an identifiable related object such as an item of collateral related to a transaction. Example entities include an individual, partnership, corporation, limited liability company or other legal organization. Other example entities include an identifiable item of collateral, offset collateral, potential collateral, or the like. For example, an entity may be a given party, such as an individual, to an agreement or loan. Data or other terms

herein may be characterized as having a context relating to an entity, such as entity-oriented data. An entity may be characterized with a specific context or application, such as a human entity, physical entity, transactional entity, or a financial entity, without limitation. An entity may have representatives that represent or act on its behalf. Without limitation to any other aspect or description of the present disclosure, an entity may also be used in conjunction with other related entities or terms to an agreement or loan, such as a representation, a warranty, an indemnity, a covenant, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, a party, a guarantee, a guarantor, a security, a personal guarantee, a lien, a duration, a foreclose condition, a default condition, and a consequence of default. An entity may have a set of attributes such as: a publicly stated valuation, a set of property owned by the entity as indicated by public records, a valuation of a set of property owned by the entity, a bankruptcy condition, a foreclosure status, a contractual default status, a regulatory violation status, a criminal status, an export controls status, an embargo status, a tariff status, a tax status, a credit report, a credit rating, a website rating, a set of customer reviews for a product of an entity, a social network rating, a set of credentials, a set of referrals, a set of testimonials, a set of behavior, a location, and a geolocation, without limitation. In certain embodiments, a smart contract may calculate whether an entity has satisfied conditions or covenants and in cases where the entity has not satisfied such conditions or covenants, may enable automated action, or trigger other conditions or terms. One of skill in the art, having the benefit of the disclosure herein and knowledge about entities, can readily determine the purposes and use of entities in various embodiments and contexts disclosed herein.

[0450] The term party as utilized herein may be understood broadly to describe a member of an agreement, such as an individual, partnership, corporation, limited liability company or other legal organization. For example, a party may be a primary lender, a secondary lender, a lending syndicate, a corporate lender, a government lender, a bank lender, a secured lender, a bond issuer, a bond purchaser, an unsecured lender, a guarantor, a provider of security, a borrower, a debtor, an underwriter, an inspector, an assessor, an auditor, a valuation professional, a government official, an accountant or other entities having rights or obligations to an agreement, transaction or loan. A party may characterize a different term, such as transaction as in the term multi-party transaction, where multiple parties are involved in a transaction, or the like, without limitation. A party may have representatives that represent or act on its behalf. In certain embodiments, the term party may reference a potential party or a prospective party - for example, an intended lender or borrower interacting with a system, that may not yet be committed to an actual agreement during the interactions with the system. Without limitation to any other aspect or description of the present

disclosure, an party may also be used in conjunction with other related parties or terms to an agreement or loan, such as a representation, a warranty, an indemnity, a covenant, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, an entity, a guarantee, a guarantor, a security, a personal guarantee, a lien, a duration, a foreclose condition, a default condition, and a consequence of default. A party may have a set of attributes such as: an identity, a creditworthiness, an activity, a behavior, a business practice, a status of performance of a contract, information about accounts receivable, information about accounts payable, information about the value of collateral, and other types of information, without limitation. In certain embodiments, a smart contract may calculate whether a party has satisfied conditions or covenants and in cases where the party has not satisfied such conditions or covenants, may enable automated action, or trigger other conditions or terms. One of skill in the art, having the benefit of the disclosure herein and knowledge about parties, can readily determine the purposes and use of parties in various embodiments and contexts disclosed herein.

[0451] The term party attribute, entity attribute, or party/entity attribute as utilized herein may be understood broadly to describe a value, characteristic, or status of a party or entity. For example, attributes of a party or entity may be, without limitation: value, quality, location, net worth, price, physical condition, health condition, security, safety, ownership, identity, creditworthiness, activity, behavior, business practice, status of performance of a contract, information about accounts receivable, information about accounts payable, information about the value of collateral, and other types of information, and the like. In certain embodiments, a smart contract may calculate values, status or conditions associated with attributes of a party or entity, and in cases where the party or entity has not satisfied such conditions or covenants, may enable automated action, or trigger other conditions or terms. One of skill in the art, having the benefit of the disclosure herein and knowledge about attributes of a party or entity, can readily determine the purposes and use of these attributes in various embodiments and contexts disclosed herein.

[0452] The term lender as utilized herein may be understood broadly to describe a party to an agreement offering an asset for lending, proceeds of a loan, and may include an individual, partnership, corporation, limited liability company, or other legal organization. For example, a lender may be a primary lender, a secondary lender, a lending syndicate, a corporate lender, a government lender, a bank lender, a secured lender, an unsecured lender, or other party having rights or obligations to an agreement, transaction or loan offering a loan to a borrower, without limitation. A lender may have representatives that represent or act on its behalf. Without limitation to any other aspect or description of the present disclosure, an party may also be used in conjunction with other related parties or terms to an agreement or loan, such as a borrower, a guarantor, a

representation, a warranty, an indemnity, a covenant, a balance of debt, a fixed interest rate, a variable interest rate, a payment amount, a payment schedule, a balloon payment schedule, a specification of collateral, a specification of substitutability of collateral, a security, a personal guarantee, a lien, a duration, a foreclose condition, a default condition, and a consequence of default. In certain embodiments, a smart contract may calculate whether a lender has satisfied conditions or covenants and in cases where the lender has not satisfied such conditions or covenants, may enable automated action, a notification or alert, or trigger other conditions or terms. One of skill in the art, having the benefit of the disclosure herein and knowledge about a lender, can readily determine the purposes and use of a lender in various embodiments and contexts disclosed herein.

[0453] The term crowdsourcing services as utilized herein may be understood broadly to describe services offered or rendered in conjunction with a crowdsourcing model or transaction, wherein a large group of people or entities supply contributions to fulfill a need, such as a loan, for the transaction. Crowdsourcing services may be provided by a platform or system, without limitation. A crowdsourcing request may be communicated to a group of information suppliers and by which responses to the request may be collected and processed to provide a reward to at least one successful information supplier. The request and parameters may be configured to obtain information related to the condition of a set of collateral for a loan. The crowdsourcing request may be published. In certain embodiments, without limitation, crowdsourcing services may be performed by a smart contract, wherein the reward is managed by a smart contract that processes responses to the crowdsourcing request and automatically allocates a reward to information that satisfies a set of parameter configured for the crowdsourcing request. One of skill in the art, having the benefit of the disclosure herein and knowledge about crowdsourcing services, can readily determine the purposes and use of crowdsourcing services in various embodiments and contexts disclosed herein.

[0454] The term publishing services as utilized herein may be understood to describe a set of services to publish a crowdsourcing request. Publishing services may be provided by a platform or system, without limitation. In certain embodiments, without limitation, publishing services may be performed by a smart contract, wherein the crowdsourcing request is published, or publication is initiated by the smart contract. One of skill in the art, having the benefit of the disclosure herein and knowledge about publishing services, can readily determine the purposes and use of publishing services in various embodiments and contexts disclosed herein.

[0455] The term interface as utilized herein may be understood broadly to describe a component by which interaction or communication is achieved, such as a component of a computer, which may be embodied in software, hardware, or a combination thereof. For example, an interface may

serve a number of different purposes or be configured for different applications or contexts, such as, without limitation: an application programming interface, a graphic user interface, user interface, software interface, marketplace interface, demand aggregation interface, crowdsourcing interface, secure access control interface, network interface, data integration interface or a cloud computing interface, or combinations thereof. An interface may serve to act as a way to enter, receive or display data, within the scope of lending, refinancing, collection, consolidation, factoring, brokering or foreclosure, without limitation. An interface may serve as an interface for another interface. Without limitation to any other aspect or description of the present disclosure, an interface may be used in conjunction with applications, processes, modules, services, layers, devices, components, machines, products, sub-systems, interfaces, connections, or as part of a system. In certain embodiments, an interface may be embodied in software, hardware, or a combination thereof, as well as stored on a medium or in memory. One of skill in the art, having the benefit of the disclosure herein and knowledge about an interface, can readily determine the purposes and use of an interface in various embodiments and contexts disclosed herein.

[0456] The term graphical user interface as utilized herein may be understood as a type of interface to allow a user to interact with a system, computer, or other interfaces, in which interaction or communication is achieved through graphical devices or representations. A graphical user interface may be a component of a computer, which may be embodied in computer readable instructions, hardware, or a combination thereof. A graphical user interface may serve a number of different purposes or be configured for different applications or contexts. Such an interface may serve to act as a way to receive or display data using visual representation, stimulus or interactive data, without limitation. A graphical user interface may serve as an interface for another graphical user interface or other interfaces. Without limitation to any other aspect or description of the present disclosure, a graphical user interface may be used in conjunction with applications, processes, modules, services, layers, devices, components, machines, products, sub-systems, interfaces, connections, or as part of a system. In certain embodiments, a graphical user interface may be embodied in computer readable instructions, hardware, or a combination thereof, as well as stored on a medium or in memory. Graphical user interfaces may be configured for any input types, including keyboards, a mouse, a touch screen, and the like. Graphical user interfaces may be configured for any desired user interaction environments, including for example a dedicated application, a web page interface, or combinations of these. One of skill in the art, having the benefit of the disclosure herein and knowledge about a graphical user interface, can readily determine the purposes and use of a graphical user interface in various embodiments and contexts disclosed herein.

[0457] The term user interface as utilized herein may be understood as a type of interface to allow a user to interact with a system, computer, or other apparatus, in which interaction or communication is achieved through graphical devices or representations. A user interface may be a component of a computer, which may be embodied in software, hardware, or a combination thereof. The user interface may be stored on a medium or in memory. User interfaces may include drop-down menus, tables, forms, or the like with default, templated, recommended, or pre-configured conditions. In certain embodiments, a user interface may include voice interaction. Without limitation to any other aspect or description of the present disclosure, a user interface may be used in conjunction with applications, circuits, controllers, processes, modules, services, layers, devices, components, machines, products, sub-systems, interfaces, connections, or as part of a system. User interfaces may serve a number of different purposes or be configured for different applications or contexts. For example, a lender-side user interface may include features to view a plurality of customer profiles, but may be restricted from making certain changes. A debtor-side user interface may include features to view details and make changes to a user account. A 3rd party neutral-side interface (e.g. a 3rd party not having an interest in an underlying transaction, such as a regulator, auditor, etc.) may have features that enable a view of company oversight and anonymized user data without the ability to manipulate any data, and may have scheduled access depending upon the 3rd party and the purpose for the access. A 3rd party interested-side interface (e.g. a 3rd party that may have an interest in an underlying transaction, such as a collector, debtor advocate, investigator, partial owner, etc.) may include features enabling a view of particular user data with restrictions on making changes. Many more features of these user interfaces may be available to implements embodiments of the systems and/or procedures described throughout the present disclosure. Accordingly, the benefits of the present disclosure may be applied in a wide variety of processes and systems, and any such processes or systems may be considered a service herein. One of skill in the art, having the benefit of the disclosure herein and knowledge about a user interface, can readily determine the purposes and use of a user interface in various embodiments and contexts disclosed herein. Certain considerations for the person of skill in the art, in determining whether a contemplated interface is a user interface and/or whether aspects of the present disclosure can benefit or enhance the contemplated system include, without limitation: configurable views, ability to restrict manipulation or views, report functions, ability to manipulate user profile and data, implement regulatory requirements, provide the desired user features for borrowers, lenders, and 3rd parties, and the like.

[0458] Interfaces and dashboards as utilized herein may further be understood broadly to describe a component by which interaction or communication is achieved, such as a component of a computer, which may be embodied in software, hardware, or a combination thereof. Interfaces and

dashboards may acquire, receive, present, or otherwise administrate an item, service, offering or other aspects of a transaction or loan. For example, interfaces and dashboards may serve a number of different purposes or be configured for different applications or contexts, such as, without limitation: an application programming interface, a graphic user interface, user interface, software interface, marketplace interface, demand aggregation interface, crowdsourcing interface, secure access control interface, network interface, data integration interface or a cloud computing interface, or combinations thereof. An interface or dashboard may serve to act as a way to receive or display data, within the context of lending, refinancing, collection, consolidation, factoring, brokering or foreclosure, without limitation. An interface or dashboard may serve as an interface or dashboard for another interface or dashboard. Without limitation to any other aspect or description of the present disclosure, an interface may be used in conjunction with applications, circuits, controllers, processes, modules, services, layers, devices, components, machines, products, sub-systems, interfaces, connections, or as part of a system. In certain embodiments, an interface or dashboard may be embodied in computer readable instructions, hardware, or a combination thereof, as well as stored on a medium or in memory. One of skill in the art, having the benefit of the disclosure herein and knowledge ordinarily available about a contemplated system, can readily determine the purposes and use of interfaces and/or dashboards in various embodiments and contexts disclosed herein.

[0459] The term domain as utilized herein may be understood broadly to describe a scope or context of a transaction and/or communications related to a transaction. For example, a domain may serve a number of different purposes or be configured for different applications or contexts, such as, without limitation: a domain for execution, a domain for a digital asset, domains to which a request will be published, domains to which social network data collection and monitoring services will be applied, domains to which Internet of Things data collection and monitoring services will be applied, network domains, geolocation domains, jurisdictional location domains, and time domains. Without limitation to any other aspect or description of the present disclosure, one or more domains may be utilized relative to any applications, circuits, controllers, processes, modules, services, layers, devices, components, machines, products, sub-systems, interfaces, connections, or as part of a system. In certain embodiments, a domain may be embodied in computer readable instructions, hardware, or a combination thereof, as well as stored on a medium or in memory. One of skill in the art, having the benefit of the disclosure herein and knowledge about a domain, can readily determine the purposes and use of a domain in various embodiments and contexts disclosed herein.

[0460] The term request (and variations) as utilized herein may be understood broadly to describe the action or instance of initiating or asking for a thing (e.g. information, a response, an

object, and the like) to be provided. A specific type of request may also serve a number of different purposes or be configured for different applications or contexts, such as, without limitation: a formal legal request (e.g. a subpoena), a request to refinance (e.g. a loan), or a crowdsourcing request. Systems may be utilized to perform requests as well as fulfill requests. Requests in various forms may be included where discussing a legal action, a refinancing of a loan, or a crowdsourcing service, without limitation. One of skill in the art, having the benefit of the disclosure herein and knowledge about a contemplated system, can readily determine the value of a request implemented in an embodiment. While specific examples of requests are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0461] The term reward (and variations) as utilized herein may be understood broadly to describe a thing or consideration received or provided in response to an action or stimulus. Rewards can be of a financial type, or non-financial type, without limitation. A specific type of reward may also serve a number of different purposes or be configured for different applications or contexts, such as, without limitation: a reward event, claims for rewards, monetary rewards, rewards captured as a data set, rewards points, and other forms of rewards. Rewards may be triggered, allocated, generated for innovation, provided for the submission of evidence, requested, offered, selected, administrated, managed, configured, allocated, conveyed, identified, without limitation, as well as other actions. Systems may be utilized to perform the aforementioned actions. Rewards in various forms may be included where discussing a particular behavior, or encouragement of a particular behavior, without limitation. In certain embodiments herein, a reward may be utilized as a specific incentive (e.g., rewarding a particular person that responds to a crowdsourcing request) or as a general incentive (e.g., providing a reward responsive to a successful crowdsourcing request, in addition to or alternatively to a reward to the particular person that responded). One of skill in the art, having the benefit of the disclosure herein and knowledge about a reward, can readily determine the value of a reward implemented in an embodiment. While specific examples of rewards are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood to one of skill in the art having the benefit of the disclosures herein, are specifically contemplated within the scope of the present disclosure.

[0462] The term robotic process automation system as utilized herein may be understood broadly to describe a system capable of performing tasks or providing needs for a system of the present disclosure. For example, a robotic process automation system, without limitation, can be configured for: negotiation of a set of terms and conditions for a loan, negotiation of refinancing of a loan, loan collection, consolidating a set of loans, managing a factoring loan, brokering a

mortgage loan, training for foreclosure negotiations, configuring a crowdsourcing request based on a set of attributes for a loan, setting a reward, determining a set of domains to which a request will be published, configuring the content of a request, configuring a data collection and monitoring action based on a set of attributes of a loan, determining a set of domains to which the Internet of Things data collection and monitoring services will be applied, and iteratively training and improving based on a set of outcomes. A robotic process automation system may include: a set of data collection and monitoring services, an artificial intelligence system, and another robotic process automation system which is a component of the higher level robotic process automation system. The robotic process automation system may include: at least one of the set of mortgage loan activities and the set of mortgage loan interactions includes activities among marketing activity, identification of a set of prospective borrowers, identification of property, identification of collateral, qualification of borrower, title search, title verification, property assessment, property inspection, property valuation, income verification, borrower demographic analysis, identification of capital providers, determination of available interest rates, determination of available payment terms and conditions, analysis of existing mortgage, comparative analysis of existing and new mortgage terms, completion of application workflow, population of fields of application, preparation of mortgage agreement, completion of schedule to mortgage agreement, negotiation of mortgage terms and conditions with capital provider, negotiation of mortgage terms and conditions with borrower, transfer of title, placement of lien and closing of mortgage agreement. Example and non-limiting robotic process automation systems may include one or more user interfaces, interfaces with circuits and/or controllers throughout the system to provide, request, and/or share data, and/or one or more artificial intelligence circuits configured to iteratively improve one or more operations of the robotic process automation system. One of skill in the art, having the benefit of the disclosure herein and knowledge ordinarily available about a contemplated robotic process automation system, can readily determine the circuits, controllers, and/or devices to include to implement a robotic process automation system performing the selected functions for the contemplated system. While specific examples of robotic process automation systems are described herein for purposes of illustration, any embodiment benefitting from the disclosures herein, and any considerations understood.

[0463] The term loan-related action (and other related terms such as loan-related event and loan-related activity) are utilized herein and may be understood broadly to describe one or multiple actions, events or activities relating to a transaction that includes a loan within the transaction. The action, event or activity may occur in many different contexts of loans, such as lending, refinancing, consolidation, factoring, brokering, foreclosure, administration, negotiating, collecting, procuring, enforcing and data processing (e.g. data collection), or combinations thereof,

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JUMBO APPLICATIONS/PATENTS

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CLAIMS

What is claimed is:

Market orchestration claims

Configuring and launching a marketplace

1. A method for configuring and launching a marketplace, the method comprising:

identifying, by a processing system having one or more processors, an opportunity to facilitate configuration of a new marketplace;

receiving, by a processing system, marketplace opportunity data, wherein the marketplace opportunity data includes information related to a set of assets of one or more types;

determining, by the processing system, configuration parameters to be implemented in the new marketplace;

determining, by the processing system, the feasibility of implementing the configuration parameters in the new marketplace;

determining, by the processing system, data resources to support the new marketplace;

determining, by the processing system, an architecture of the new marketplace;

determining, by the processing system, the configuration of the data resources in a data model for the marketplace;

configuring, by the processing system, a marketplace object;

connecting, by the processing system, selected data resources to populate the marketplace object; and

launching, by the processing system, the new marketplace.

RPA for configuring and launching a New Marketplace

2. A method for configuring and launching a marketplace, the method comprising:

taking an identified type of asset and defining an exchangeable marketplace object that represents a set of rights to control the type of asset, wherein defining the marketplace object includes specifying a data model for the marketplace object and a set of data resources for populating instances of the marketplace object;

configuring the mechanism for exchange of instances of the marketplace object, wherein the mechanism for exchange includes a set of interfaces whereby instances of the objects may be exchanged in defined quantities for defined units of value; and

configuring a set of computational and connectivity resources to support a marketplace by which the defined marketplace objects are exchanged;

wherein at least one defining the marketplace object, configuring the mechanism of exchange and configuring the set of computational and connectivity resources is performed by robotic process automation that is trained on a training set of interactions by a set of human users.

Updating properties of market orchestration digital twins

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3. A method for updating one or more properties of one or more market orchestration digital twins, the method comprising:

receiving a request to update one or more properties of one or more digital twins;

retrieving the one or more digital twins required to fulfill the request;

selecting data sources from a set of available data sources;

retrieving data from selected data sources; and

updating one or more properties of the one or more digital twins based on the retrieved data.

4. The method of claim 3, wherein the digital twins are selected from the set of marketplace digital twins, asset digital twins, trader digital twins, broker digital twins, environment digital twins, and marketplace host digital twins.

5. The method of claim 3, wherein the one or more properties of the one or more digital twins relates to asset ownership.

6. The method of claim 3, wherein the data source is selected from the set of an Internet of Things connected device, a machine vision system, an analog vibration sensor, a digital vibration sensor, a fixed digital vibration sensor, a tri-axial vibration sensor, a single axis vibration sensor, an optical vibration sensor, and a crosspoint switch.

Method of generating a fairness score

7. A method for generating a fairness score for a transaction, the method comprising:

receiving, by a fairness engine, transaction data from a set of transactions from an execution engine; and

calculating, by the fairness engine, a fairness score representing the fairness of a transaction

8. The method of claim 7, wherein the fairness engine includes an execution timing fairness engine that determines or receives a set of measures of latency for a set of users.

9. The method of claim 8, wherein the execution timing fairness engine automatically orchestrates a set of configuration parameters or other features that mitigate unfairness that may be caused by disparate latency.

10. The method of claim 8, wherein the set of measures of latency are determined by testing network return times.

11. The method of claim 10, wherein testing network return times includes determining the ping, the upload speed, or the download speed.

12. The method of claim 7, wherein the set of transactions are executed based upon the fairness score exceeding a predetermined threshold.

EAL Claims

Enterprise Data Set Exchange

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13. A computer-implemented method comprising:

receiving, at an access layer controlled by an enterprise, a data set characterizing one or more attributes associated with a group of assets or resources controlled by the enterprise, wherein the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets;

determining, by a permissions system of the access layer, whether the data set satisfies a set of permission criteria indicating a set of governing rules for assets or resources controlled by the enterprise;

in response to the data set satisfying the permission criteria, generating, by a data services system associated with the access layer, an encoded data set that satisfies the set of governing rules; and

converting the encoded data set to an exchangeable digital asset by:

publishing a representation of the encoded data set to a digital wallet system of the access layer; and

configuring an interface system of the access layer with access to the encoded data set represented in the digital wallet system, wherein the interface system is accessible by a third party.

14. The method of claim 13, further comprising assigning a monetary value to the encoded data set that is viewable via the interface system.

15. The method of claim 14, wherein assigning the monetary value to the encoded data set includes generating an estimated monetary value from valuation data compiled from a set of target consumers.

16. The method of claim 14, wherein assigning the monetary value to the encoded data set includes:

generating an invite to a set of target consumers for the data set;

requesting the set of target consumers assign a proposed value to a set of secondary data sets that share one or more characteristics with the data set; and

determining the monetary value for the encoded data set by statistical inference from the proposed values returned from the set of target consumers.

17. The method of any of claims 14–16, further comprising adjusting the monetary value based on feedback from the enterprise.

18. The method of claim 17, wherein adjusting the monetary value includes:

generating a feedback request to the enterprise to authorize the monetary value assigned to the encoded data set; and

in response to the feedback request, receiving a message from the enterprise to modify the monetary value of the encoded data set.

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19. The method of any of claims 13–18, wherein generating the encoded data set includes partially encoding a portion of the data set that includes information failing to satisfy the set of governing rules.

20. The method of any of claims 13–19, wherein publishing the representation of the encoded data set to the digital wallet system includes publishing the representation of the encoded data set to a hot wallet of the wallet system.

21. The method of any of claims 13–19, wherein publishing the representation of the encoded data set to the digital wallet system includes publishing the representation of the encoded data set to a cold wallet of the wallet system.

22. The method of any of claims 13–19, wherein publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a custodial wallet of the wallet system.

23. The method of any of claims 13–22, wherein the group of resources is enterprise-owned devices.

24. The method of any of claims 13–22, wherein the group of resources is production equipment of the enterprise.

25. The method of any of claims 13–22, wherein the data set includes logistics information.

26. The method of any of claims 13–22 wherein the data set includes inventory information.

27. The method of any of claims 13–22 wherein the data set includes procurement information.

28. The method of any of claims 13–22 wherein the data set includes enterprise marketing information.

29. The method of any of claims 13–22 wherein the data set includes client-purchasing information.

30. The method of any of claims 13–29, wherein the access layer is a network access layer.

31. The method of any of claims 13–30, wherein the enterprise assets are digital assets.

32. The method of any of claims 13–31, wherein the governing rules are privacy rules.

33. The method of any of claims 13–32, wherein the governing rules are prioritization rules.

34. A system comprising:

an access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

receiving, at the access layer controlled by an enterprise, a data set characterizing one or more attributes associated with a group of assets or resources controlled by the enterprise, wherein the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets;

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determining, by a permissions system of the access layer, whether the data set satisfies a set of permission criteria indicating a set of governing rules for resources controlled by the enterprise;

in response to the data set satisfying the permission criteria, generating, by a data services system associated with the access layer, an encoded data set that satisfies the set of governing rules; and

converting the encoded data set to an exchangeable digital asset by:

publishing a representation of the encoded data set to a digital wallet system of the access layer; and

configuring an interface system of the access layer with access to the encoded data set represented in the digital wallet system, wherein the interface system is accessible by a third party.

35. The system of claim 34, wherein the operations further comprise assigning a monetary value to the encoded data set that is viewable via the interface system.

36. The system of claim 35, wherein assigning the monetary value to the encoded data set includes generating an estimated monetary value from valuation data compiled from a set of target consumers.

37. The system of claim 35, wherein assigning the monetary value to the encoded data set includes:

generating an invite to a set of target consumers for the data set;

requesting the set of target consumers assign a proposed value to a set of secondary data sets that share one or more characteristics with the data set; and

determining the monetary value for the encoded data set by statistical inference from the proposed values returned from the set of target consumers.

38. The system of any of claims 35–37, wherein the operations further comprise adjusting the monetary value based on feedback from the enterprise.

39. The system of claim 38, wherein adjusting the monetary value includes:

generating a feedback request to the enterprise to authorize the monetary value assigned to the encoded data set; and

in response to the feedback request, receiving a message from the enterprise to modify the monetary value of the encoded data set.

40. The system of any of claims 34–39, wherein generating the encoded data set includes partially encoding a portion of the data set that includes information failing to satisfy the set of governing rules.

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41. The system of any of claims 34–40, wherein publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a hot wallet of the wallet system.

42. The system of any of claims 34–40, wherein publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a cold wallet of the wallet system.

43. The system of any of claims 34–40, wherein publishing the encoded data set to the digital wallet system includes publishing the encoded data set to a custodial wallet of the wallet system.

44. The system of any of claims 34–43, wherein the group of resources is enterprise-owned devices.

45. The system of any of claims 34–43, wherein the group of resources is production equipment of the enterprise.

46. The system of any of claims 34–43, wherein the data set includes logistics information.

47. The system of any of claims 34–43 wherein the data set includes inventory information.

48. The system of any of claims 34–43 wherein the data set includes procurement information.

49. The system of any of claims 34–43 wherein the data set includes enterprise marketing information.

50. The system of any of claims 34–43 wherein the data set includes client-purchasing information.

51. The system of any of claims 34–50, wherein the access layer is a network access layer.

52. The system of any of claims 34–51, wherein the enterprise assets are digital assets.

53. The system of any of claims 34–52, wherein the governing rules are privacy rules.

54. The system of any of claim 34–53, wherein the governing rules are prioritization rules.

Control Plane and Data Plane Coverage

55. A computer-implemented method comprising:

receiving, at a network access layer, an asset request from a requesting entity, wherein the asset request indicates an asset available in a digital wallet system associated with the network access layer, and wherein the network access layer includes a data plane configured to exchange assets privately-generated by an enterprise entity operating a control plane associated with the network access layer;

identifying an asset control associated with the asset indicated by the asset request, wherein the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer, and wherein the control parameter is configured using data derived from the enterprise entity that privately generated the asset;

determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and

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in response to the asset control being satisfied, facilitating fulfillment of the asset request.

56. The method of claim 55, wherein the asset is available in a hot wallet of the digital wallet system.

57. The method of claim 55, wherein the asset is available in a cold wallet of the digital wallet system.

58. The method of claim 55, wherein the asset is available in a custodial wallet of the digital wallet system.

59. The method of claim 57, wherein facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system.

60. The method of claim 57, wherein facilitating fulfillment of the asset request includes:

signing a transaction involving the asset on the cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

61. The method of claim 57, wherein facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity.

62. The method of any of claims 55–61, wherein the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

63. The method of any of claims 55–61, wherein the asset control indicates a security clearance level.

64. The method of any of claims 55–61, wherein the asset control includes transactional detail requirements for the asset.

65. A system comprising:

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

receiving, at the network access layer, an asset request from a requesting entity, wherein the asset request indicates an asset available in a digital wallet system associated with the network access layer, and wherein the network access layer includes a data plane configured to exchange assets privately-generated by an enterprise entity operating a control plane associated with the network access layer;

identifying an asset control associated with the asset indicated by the asset request, wherein the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer, and wherein the control parameter is configured using data derived from the enterprise entity that privately generated the asset;

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determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and

in response to the asset control being satisfied, facilitating fulfillment of the asset request.

66. The system of claim 65, wherein the asset is available in a hot wallet of the digital wallet system.

67. The system of claim 65, wherein the asset is available in a cold wallet of the digital wallet system.

68. The system of claim 65, wherein the asset is available in a custodial wallet of the digital wallet system.

69. The system of claim 67, wherein facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system.

70. The system of claim 67, wherein facilitating fulfillment of the asset request includes:

signing a transaction involving the asset on the cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

71. The system of claim 67, wherein facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity.

72. The system of any of claims 65–71, wherein the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

73. The system of any of claims 65–71, wherein the asset control indicates a security clearance level.

74. The system of any of claims 65–71, wherein the asset control includes transactional detail requirements for the asset.

Private to Public Block Chain Via an Enterprise Access Layer

75. A computer-implemented method comprising:

receiving, at a network access layer, an asset request from a requesting entity, wherein the asset request indicates an asset available in a digital wallet system associated with the network access layer, wherein the network access layer corresponds to a client-facing intelligence system that hosts exchangeable digital assets, and wherein the exchangeable digital assets correspond to one or more assets stored in a private append-only data structure associated with an owner of the exchangeable digital assets;

identifying an asset control associated with the asset indicated by the asset request, wherein the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer;

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determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and

in response to the asset control being satisfied by the at least one of the asset request or the requesting entity, facilitating fulfillment of the asset request, wherein fulfillment includes storing the asset in a public append-only data structure to represent an exchange of the asset with the requesting entity.

76. The method of claim 75, wherein the asset is available in a hot wallet of the digital wallet system.

77. The method of claim 75, wherein the asset is available in a cold wallet of the digital wallet system.

78. The method of claim 75, wherein the asset is available in a custodial wallet of the digital wallet system.

79. The method of claim 77, wherein facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system.

80. The method of claim 77, wherein facilitating fulfillment of the asset request includes:

signing a transaction involving the asset on the cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

81. The method of claim 77, wherein facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity.

82. The method of any of claims 75–81, wherein the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

83. The method of any of claims 75–81, wherein the asset control indicates a security clearance level.

84. The method of any of claims 75–81, wherein the asset control includes transactional detail requirements for the asset.

85. A system comprising:

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

receiving, at a network access layer, an asset request from a requesting entity, wherein the asset request indicates an asset available in a digital wallet system associated with the network access layer, wherein the network access layer corresponds to a client-facing intelligence system that hosts exchangeable digital assets, and wherein the exchangeable digital assets

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correspond to one or more assets stored in a private append-only data structure associated with an owner of the exchangeable digital assets;

identifying an asset control associated with the asset indicated by the asset request, wherein the asset control is configured by a permissions system of the network access layer and indicates a control parameter determined by an intelligence system of the network access layer;

determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and

in response to the asset control being satisfied by the at least one of the asset request or the requesting entity, facilitating fulfillment of the asset request, wherein fulfillment includes storing the asset in a public append-only data structure to represent an exchange of the asset with the requesting entity.

86. The system of claim 85, wherein the asset is available in a hot wallet of the digital wallet system.

87. The system of claim 85, wherein the asset is available in a cold wallet of the digital wallet system.

88. The system of claim 85, wherein the asset is available in a custodial wallet of the digital wallet system.

89. The system of claim 87, wherein facilitating fulfillment of the asset request includes transferring a set of keys for the cold wallet to a hot wallet of the digital wallet system.

90. The system of claim 87, wherein facilitating fulfillment of the asset request includes:

signing a transaction involving the asset on the cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

91. The system of claim 87, wherein facilitating fulfillment of the asset request includes connecting the cold wallet to the requesting entity.

92. The system of any of claims 85–91, wherein the asset control matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

93. The system of any of claims 85–91, wherein the asset control indicates a security clearance level.

94. The system of any of claims 85–91, wherein the asset control includes transactional detail requirements for the asset.

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Assigning Access Controls to an Enterprise-Generated Asset

95. A computer-implemented method comprising:

receiving, at a network access layer controlled by an enterprise, a set of assets privately generated by the enterprise, wherein the network access layer corresponds to a client-facing intelligence system that hosts exchangeable enterprise digital assets;

for each asset of the set of assets:

classifying, by an artificial-intelligence system of the network access layer, the respective asset into an access control category, wherein each asset control category is associated with a set of asset controls that dictate one or more transaction parameters for the exchange of the respective asset with a third party; and

assigning, by a permissions system of the network access layer, the set of asset controls for the access control category classified by the AI system for the respective asset; and converting the set of assets to exchangeable digital assets by:

publishing the set of assets to a digital wallet system of the network access layer; and

configuring an interface system of the network access layer with access to the set in the digital wallet system, wherein the interface system is accessible by a third party.

96. The method of claim 95, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a hot wallet of the digital wallet system.

97. The method of claim 95, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a cold wallet of the digital wallet system.

98. The method of claim 95, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a custodial wallet of the digital wallet system.

99. The method of claim 95, wherein publishing the set of assets to the digital wallet system includes publishing a first portion of assets in the set to a hot wallet of the digital wallet system and a second portion of the assets in the set to a cold wallet of the digital wallet system.

100. The method of claim 99, wherein the first portion has a first access control category that indicates that a first set of asset controls of the first access control category is less restrictive than a second set of asset controls for a second access control category classified for the second portion.

101. The method of claim 99, wherein the first portion has a first access control category that indicates a greater frequency of access than a second access control category classified for the second portion.

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102. The method of any of claims 95–101, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that communicated at least one of the assets from the set of assets to the network asset layer.

103. The method of any of claims 95–102, wherein the set of asset controls includes an asset control that indicates a security clearance level.

104. The method of any of claims 95–103, wherein the one or more transaction parameters include a minimum pricing requirement.

105. A system comprising:

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

receiving, at a network access layer controlled by an enterprise, a set of assets privately generated by the enterprise, wherein the network access layer corresponds to a client-facing intelligence system that hosts exchangeable enterprise digital assets;

for each asset of the set of assets:

classifying, by an artificial-intelligence system of the network access layer, the respective asset into an access control category, wherein each asset control category is associated with a set of asset controls that dictate one or more transaction parameters for the exchange of the respective asset with a third party; and

assigning, by a permissions system of the network access layer, the set of asset controls for the access control category classified by the AI system for the respective asset; and

converting the set of assets to exchangeable digital assets by:

publishing the set of assets to a digital wallet system of the network access layer; and

configuring an interface system of the network access layer with access to the set in the digital wallet system, wherein the interface system is accessible by a third party.

106. The system of claim 105, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a hot wallet of the digital wallet system.

107. The system of claim 105, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a cold wallet of the digital wallet system.

108. The system of claim 105, wherein publishing the set of assets to the digital wallet system includes publishing at least a portion of assets in the set to a custodial wallet of the digital wallet system.

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109. The system of claim 105, wherein publishing the set of assets to the digital wallet system includes publishing a first portion of assets in the set to a hot wallet of the digital wallet system and a second portion of the assets in the set to a cold wallet of the digital wallet system.

110. The system of claim 109, wherein the first portion has a first access control category that indicates that a first set of asset controls of the first access control category is less restrictive than a second set of asset controls for a second access control category classified for the second portion.

111. The system of claim 109, wherein the first portion has a first access control category that indicates a greater frequency of access than a second access control category classified for the second portion.

112. The system of any of claims 105–111, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that communicated at least one of the assets from the set of assets to the network asset layer.

113. The system of any of claims 105–112, wherein the set of asset controls includes an asset control that indicates a security clearance level.

114. The system of any of claims 95–103, wherein the one or more transaction parameters include a minimum pricing requirement.

Monitoring Public Data Exchanges for Viable Enterprise Data Transactions

115. A computer-implemented method comprising:

monitoring a plurality of public market participants via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

identifying a set of asset controls managed by a permission system of the network asset layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, wherein the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and

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in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

116. The method of claim 115, wherein the asset is available in a hot wallet of the digital wallet system.

117. The method of claim 115, wherein the asset is available in a cold wallet of the digital wallet system.

118. The method of claim 115, wherein the asset is available in a custodial wallet of the digital wallet system.

119. The method of any of claims 115–118, further comprising:

receiving a response message from the monitored public market participant; and

determining that the response message indicates an acknowledgment to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction.

120. The method of claim 119, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction.

121. The method of any of claims 119 or 120, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

122. The method of claim 119, wherein storing the digital form of the asset to a public append-only data structure facilitates use of at least one key from a hot wallet of the digital wallet system.

123. The method of any of claims 119 or 121, wherein storing the digital form of the asset to a public append-only data structure facilitates use of at least one key from a cold wallet of the digital wallet system.

124. The method of any of claims 115–123, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

125. The method of any of claims 115–124, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

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126. The method of any of claims 115–125, wherein the set of asset controls transactional detail requirements for the asset.

127. A system comprising:

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

monitoring a plurality of public market participants via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

identifying a set of asset controls managed by a permission system of the network asset layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, wherein the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and

in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

128. The system of claim 127, wherein the asset is available in a hot wallet of the digital wallet system.

129. The system of claim 127, wherein the asset is available in a cold wallet of the digital wallet system.

130. The system of claim 127, wherein the asset is available in a custodial wallet of the digital wallet system.

131. The system of any of claims 127–130, wherein the operations further comprise:

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receiving a response message from the monitored public market participant; and

determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction.

132. The system of claim 131, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction.

133. The system of any of claims 131 or 132, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

134. The system of claim 131, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system.

135. The system of any of claims 131 or 133, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system.

136. The system of any of claims 127–135, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

137. The system of any of claims 127–136, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

138. The system of any of claims 127–137, wherein the set of asset controls transactional detail requirements for the asset.

Managing Tenancy in a Multi-party Enterprise Access Layer

139. A computer-implemented method comprising:

monitoring, using an access layer accessible to a plurality of tenant enterprises, a set of assets associated with a set of digital wallets of a digital wallet system for the access layer, wherein the access layer corresponds to a tenant-facing intelligence system that hosts exchangeable enterprise assets;

receiving, at the access layer, an indication that a requesting tenant enterprise of the plurality of tenant enterprises requests a transaction involving an asset of the set of assets;

determining, by the access layer, whether the requesting tenant enterprise has a set of access rights that satisfy an access criteria for the asset of the requested transaction;

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in response to the requesting tenant having the set of access rights that satisfy the access criteria, deploying, for the requesting tenant enterprise, a set of resources associated with the access layer and shared among the plurality of tenant enterprises to facilitate the transaction involving the asset on behalf of the tenant enterprise.

140. The method of claim 139, wherein:

the requesting tenant enterprise includes a first tenant enterprise and a second tenant enterprise;

the method further includes determining a transaction priority for each of the first tenant enterprise and the second tenant enterprise; and

deploying the set of resources occurs for the first tenant enterprise having a first transaction priority greater than a second transaction priority of the second tenant enterprise.

141. The method of any of claims 139 or 140, wherein each tenant enterprise is associated with (i) a set of private resources inaccessible to each other tenant and (ii) a set of shared resources associated with the access layer and shared among the plurality of tenant enterprises.

142. The method of any of claims 139–141, wherein the digital wallet system includes:

a first subset of digital wallets accessible to one of the tenant enterprises and inaccessible to other tenant enterprises; and

a second subset of digital wallets accessible to and shared among a set of the plurality of tenant enterprises.

143. The method of any of claims 139–142, wherein the access layer is a network access layer.

144. The method of any of claims 139–143, wherein the exchangeable enterprise assets are digital assets.

145. The method of any of claims 139–144, wherein the set of digital wallets includes a cold wallet.

146. The method of any of claims 139–144, wherein the set of digital wallets includes a hot wallet and a cold wallet.

147. The method of any of claims 139–144, wherein the set of digital wallets includes a custodial wallet.

148. The method of any of claims 139–144, wherein the set of digital wallets includes a custodial wallet and a cold wallet.

149. The method of any of claims 139–144, wherein the set of digital wallets includes at least two of a hot wallet, a cold wallet, or a custodial wallet.

Peer-to-peer Enterprise Access Layer

150. A computer-implemented method comprising:

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receiving, at an access layer, an asset request from a requesting entity, wherein the asset request indicates a transaction involving an asset available in a digital wallet system associated with the access layer, and wherein the access layer corresponds to an intelligence system that hosts exchangeable enterprise assets;

identifying an asset control associated with the asset indicated by the asset request, wherein the asset control is configured by a permissions system of the access layer and indicates a control parameter determined by an intelligence system of the access layer;

determining whether the asset control is satisfied by at least one of the asset request or the requesting entity; and

in response to the asset control being satisfied, establishing a peer-to-peer access layer between the requesting entity and another transacting entity associated with the transaction indicated by the asset request, wherein the peer-to-peer access layer provides the other transacting entity with access to a limited set of digital assets and resources of the requesting entity.

151. The method of claim 150, wherein the transacting entity includes a plurality of entities forming a multilateral connection between the requesting entity and the plurality of entities.

152. The method of any of claims 150 or 151, wherein the peer-to-peer connection is a secure connection.

153. The method of claim 152, further comprising generating, using a data processing system of the access layer, an encrypted message packet for communication using the peer-to-peer connection.

154. The method of any of claims 150–153, wherein the access layer is a network access layer.

155. The method of any of claims 150–154, wherein the exchangeable enterprise assets are digital assets.

156. The method of any of claims 150–155, wherein the asset is available in a digital wallet of the digital wallet system.

157. The method of claim 156, wherein the digital wallet is a cold wallet.

158. The method of claim 156, wherein the digital wallet is a hot wallet.

159. The method of claim 156, wherein the digital wallet is a custodial wallet.

160. The method of claim 150, wherein the peer-to-peer access layer provides an interface that is accessible by a wallet system of the other transacting party, whereby the wallet system of the other transacting party accesses the limited set of digital assets and resources of the requesting enterprise via the interface.

161. The method of claim 150, further comprising:

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receiving a set of access rules from a user device associated with the requesting entity, wherein the set of access rules define the set of digital assets and resources that are accessible to the other transacting enterprise; and

configuring the peer-to-peer access layer based on the set of access rules.

Market Orchestration Architecture Claims

162. A system for normalizing an item value for a plurality of exchanges, the system comprising:

a plurality of electronic exchanges configured for conducting transactions for at least one item in a set of items;

an item value normalization system configured to identify a reference item in the set of items, and state a value for at least one other item in the set of items as a normalized value relative to a value of the reference item; and

a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item value normalization through automated operation of the item value normalization system.

163. The system of claim 162, wherein the item value normalization system is configured to identify the reference item based on a transaction history for one or more candidate reference items in the set of items.

164. The system of claim 162, wherein the item value normalization system is configured to identify the reference item based on a transaction history for one or more items that are similar to a candidate reference item.

165. The system of claim 162, wherein the item value normalization system is configured to identify the reference item based on a degree of commonality of a candidate reference item to other items in the set of items.

166. The system of claim 162, wherein an item identified as a reference item from the set of items for a first exchange is distinct from an item identified as a reference item from the set of items for a second exchange.

167. The system of claim 162, wherein to automate item value normalization includes stating the normalized item value based on a native currency of a target electronic exchange of the plurality exchanges.

168. The system of claim 162, wherein to state a value for at least one other item in the set of items as a normalized value includes at least one exchange-specific fee associated with conducting a transaction for the item.

169. The system of claim 162, wherein the item value normalization system is further configured to identify a reference set of items, and state a value for at least one other item in a different set of items as a normalized value relative to a value of at least one item in the set of reference items.

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170. The system of claim 162, further comprising a set of robotic process automation services that are configured to generate a token that represents an item in the second exchange based on characteristics of the item determined from data from the first exchange.

171. The system of claim 162, further comprising a set of robotic process automation services that are configured to generate a digital representation of a set of rights relating to an item that is consistent with governing rules of the second exchange based on processing at least one of a set of smart contracts and a set of terms and conditions relating to the item.

172. The system of claim 162, further comprising a set of robotic process automation services that are configured to orchestrate a set of transaction workflows in each of a plurality of exchanges, such that initiation of a set of actions in one exchange of the plurality of exchanges automatically results in the triggering of a set of actions in at least one other exchange.

173. The system of claim 162, further comprising a digital twin that represents a set of entities, workflows, and transaction parameters of a plurality of exchanges, such that interaction with an interface of the digital twin can orchestrate an interaction in each of the plurality of exchanges.

174. The system of claim 162, further comprising a data and network infrastructure pipeline that is configured to deliver data from a set of assets to set of smart contracts that include terms, conditions and parameters for a set of transaction workflows involving the assets, wherein the pipeline is automatically configured to adjust a network path based on the characteristics of the data and at least one performance parameter of the network path.

175. The system of claim 162, further comprising a data and network infrastructure pipeline that is configured to deliver data from a set of assets to an interface by which an operator orchestrates a set of parameters for a set of transaction workflows involving the assets, wherein the pipeline is automatically configured to adjust timing of data delivery based on at least one of a transaction parameter and a network performance parameter.

176. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into an electronic wallet system, such that interactions with a set of interfaces of the wallet system automatically trigger a set of transaction workflows within the marketplace.

177. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a digital twin platform, such that interactions with a set of interfaces of the digital twin platform automatically trigger a set of transaction workflows within the marketplace.

178. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into an enterprise database platform, such that

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interactions with a set of interfaces of the enterprise database platform automatically trigger a set of transaction workflows within the marketplace.

179. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a platform-as-a-service platform, such that interactions with a set of interfaces of the platform-as-a-service platform automatically trigger a set of transaction workflows within the marketplace.

180. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a computer-aided design platform, such that interactions with a set of interfaces of the computer-aided design platform automatically trigger a set of transaction workflows within the marketplace.

181. The system of claim 162, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a video game, such that interactions with a set of interfaces of the video game automatically trigger a set of transaction workflows within the marketplace.

182. A system for normalizing an item value for a plurality of exchanges, the system comprising:

a plurality of electronic exchanges configured for conducting transactions for at least one item in a set of items in an exchange-native currency for each of the plurality of electronic exchanges;

an item value normalization system configured to identify a reference currency of a plurality of exchange-native currencies for the plurality of electronic exchanges, and to state a value for the at least one item in the set of items as a normalized value relative to a reference currency value of the at least one item; and

a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item value normalization through automated operation of the item value normalization system.

183. The system of claim 182, wherein the item value normalization system is further configure to identify a reference currency based on a candidate currency exchange rate history, a futures value of a candidate currency, a volatility score of a candidate currency, or a relative valuation of a candidate currency.

184. The system of claim 182, wherein the item value normalization system is configured to identify the reference currency based on an exchange rate for a portion of the plurality of exchange-native currencies.

185. The system of claim 182, wherein to state a value for the at least one item in the set of items as a normalized value includes at least one exchange-specific fee associated with conducting a transaction for the item.

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186. The system of claim 182, further comprising a set of robotic process automation services that are configured to generate a token that represents an item in the second exchange based on characteristics of the item determined from data from the first exchange.

187. The system of claim 182, further comprising a set of robotic process automation services that are configured to generate a digital representation of a set of rights relating to an item that is consistent with governing rules of the second exchange based on processing at least one of a set of smart contracts and a set of terms and conditions relating to the item.

188. The system of claim 182, further comprising a set of robotic process automation services that are configured to orchestrate a set of transaction workflows in each of a plurality of exchanges, such that initiation of a set of actions in one exchange of the plurality of exchanges automatically results in the triggering of a set of actions in at least one other exchange.

189. The system of claim 182, further comprising a digital twin that represents a set of entities, workflows, and transaction parameters of a plurality of exchanges, such that interaction with an interface of the digital twin can orchestrate an interaction in each of the plurality of exchanges.

190. The system of claim 182, further comprising a data and network infrastructure pipeline that is configured to deliver data from a set of assets to set of smart contracts that include terms, conditions and parameters for a set of transaction workflows involving the assets, wherein the pipeline is automatically configured to adjust a network path based on the characteristics of the data and at least one performance parameter of the network path.

191. The system of claim 182, further comprising a data and network infrastructure pipeline that is configured to deliver data from a set of assets to an interface by which an operator orchestrates a set of parameters for a set of transaction workflows involving the assets, wherein the pipeline is automatically configured to adjust timing of data delivery based on at least one of a transaction parameter and a network performance parameter.

192. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into an electronic wallet system, such that interactions with a set of interfaces of the wallet system automatically trigger a set of transaction workflows within the marketplace.

193. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a digital twin platform, such that interactions with a set of interfaces of the digital twin platform automatically trigger a set of transaction workflows within the marketplace.

194. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into an enterprise database platform, such that

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interactions with a set of interfaces of the enterprise database platform automatically trigger a set of transaction workflows within the marketplace.

195. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a platform-as-a-service platform, such that interactions with a set of interfaces of the platform-as-a-service platform automatically trigger a set of transaction workflows within the marketplace.

196. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a computer-aided design platform, such that interactions with a set of interfaces of the computer-aided design platform automatically trigger a set of transaction workflows within the marketplace.

197. The system of claim 182, further comprising a set of application programming interfaces to a marketplace that are configured to be integrated into a video game, such that interactions with a set of interfaces of the video game automatically trigger a set of transaction workflows within the marketplace.

198. A system for item token generation comprising:

a smart contact for an item, the smart contract for control of at least a portion of aspects of conducting a transaction for the item in a first exchange;

a set of item characteristics that facilitate tokenization of the item;

a set of target exchange characteristics rules;

a smart contract parsing system configured to parse the smart contract for the item into a set of contract terms for the item;

a token generation system configured to receive the set of contract terms for the item, to receive the set of item characteristics, to receive the set of target exchange characteristics rules and to generate through cooperative operation of a smart contract engine, a token for the item for use in the target exchange; and

a smart contract engine interfacing with the token generation system and configured to perform validation of at least one of the contract terms through emulation of a smart contract generated for the item.

199. The system of claim 198, wherein the smart contract engine is further configured to perform validation of at least one of a set of contract terms for a smart contract configured for the target exchange.

200. The system of claim 198, further comprising a set of characteristics harvesting functions configured to facilitate harvesting the set of item characteristics from a digital representation of the item in the first exchange.

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201. The system of claim 198, further comprising a set of robotic process automation services executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item token generation through automated operation of the token generation system.

202. A system for item token generation comprising:

a first token representing characteristics of an item in a first electronic exchange;

a set of target exchange characteristics rules;

a set of item characteristics harvesting services configured to extract one or more item characteristics from the first token;

a token generation system configured to receive the first token, to receive the set of target exchange characteristics rules and to generate a token for the item for use in the target exchange by applying at least one of the set item characteristic harvesting services to harvest a set of characteristics of an item represented by the first token; and

a robotic process automation system executing a set of computer-readable instructions on at least one processor, the instructions causing the robotic process automation system to automate item token generation through automated operation of the token generation system.

Intelligent data layer claims

Intelligent data layer system

203. An intelligent data layer system, comprising:

a computer-readable storage system that stores a layer configuration data store that maintains:

ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost;

parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and

one or more analysis algorithms; and

a set of one or more processors that execute a set of computer-readable instructions, wherein the set of one or more processors collectively:

receive an intelligence request from an intelligence consumer portal;

determine at least one data source for deriving intelligence for the consumer portal based on the received request;

configure an ingestion system based on the ingestion parameters and parsing rules in the layer configuration data store for the at least one data source;

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configure an analysis system based on the analysis algorithms in the layer configuration data store for the at least one data source;

configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system; and

operate the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, derive a set of intelligence data from at least one of the ingested data form the at least one data source and an outcome of using the analysis system, and communicating the set of intelligence data to at least one of the consumer portal or an intelligent data layer store.

204. The intelligent data layer system of claim 203, wherein the computer-readable storage system stores an intelligent data layer store that maintains results of operations of one or more systems of the intelligent data layer system.

205. The intelligent data layer system of claim 204, wherein the one or more systems includes the ingestion system, the analysis system, and the intelligence deriving system.

206. The intelligent data layer system of claim 205, wherein the result of operations includes intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results.

207. The intelligent data layer system of claim 203, wherein to configure the analysis system is further based on consumer intelligence objectives of the request.

208. The intelligent data layer system of claim 203, wherein to configure the analysis system is further based on aspects of the request.

209. The intelligent data layer system of claim 203, wherein the set of one or more processors is configured in an intelligent data layer control tower that configures and operates the intelligent data layer system by communicating control sequences with the ingestion system, the analysis system, and the intelligence deriving system.

210. The intelligent data layer system of claim 203, further including an algorithm portal of an intelligent data layer control tower of the system through which at least one of the analysis algorithms is received.

211. The intelligent data layer system of claim 203, wherein the ingestion system parses content of data sources to determine structure of the content and relationships among elements in the data.

212. The intelligent data layer system of claim 203, wherein the ingestion system parsing a content of data sources results in generating characterization data that includes an intended meaning of elements of the data and relationships among the data, structures of the data, and meaning of the data parsed from the content.

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213. The intelligent data layer system of claim 203, wherein the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of the data source.

214. The intelligent data layer system of claim 203, wherein the ingestion system is configured to maintain a schedule of collection activity for one or more data sources.

215. The intelligent data layer system of claim 203, wherein the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data.

216. The intelligent data layer system of claim 203, wherein the ingestion system communicates ingested data, results of ingestion, and results of parsing, to an intelligent data layer control tower of the system.

217. The intelligent data layer system of claim 203, wherein the location of the data source is a source address selected from a list of source addresses consisting of a universal record locator, port number, stream identifier, publication and/or broad channel, sensor output address.

218. The intelligent data layer system of claim 203, wherein the analysis system compares data from the data source against a target use of intelligence derived from a data source to determine a degree of fitness for use of the data source by the intelligence deriving system.

219. The intelligent data layer system of claim 203, wherein the analysis system analyzes ingestion system results for meeting at least one consumption target requirement of the consumer portal request.

220. The intelligent data layer system of claim 219, wherein the consumption target requirement includes one or more of a validity time constraint, an accuracy constraint, a frequency of update constraint, or relevance to a consumption subject matter focus.

221. The intelligent data layer system of claim 203, wherein the analysis system configures data regarding the ingested data for one or more system uses from a list of uses including advertisements that characterize the ingested data in terms of potential intelligence value, indexing schemes for offering intelligence derived data in a marketplace, searching intelligence derived data by identifying keywords, terms, and values associated with the ingested data.

222. The intelligent data layer system of claim 203, wherein the analysis system estimates a value of intelligence data derived from the ingested data for a range of consumer portals to enable setting costs for consuming the intelligence data derived from the ingested data.

223. The intelligent data layer system of claim 203, wherein one or more systems of the intelligent data layer is configured as a micro-service architecture for isolated and independent operation of instances of the one or more systems for a plurality of distinct consumer portals.

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224. The intelligent data layer system of claim 223, wherein the one or more systems of the intelligent data layer system is initiated as a virtualized container to perform system-specific intelligent data layer system functions.

225. The intelligent data layer system of claim 224, wherein the virtualized container is executed on a cloud-processing architecture.

226. The intelligent data layer system of claim 224, wherein the virtualized container is configured with a consumer portal-specific instance of at least one of the ingestion system, the analysis system, or the intelligence deriving system.

227. The intelligent data layer system of claim 203, wherein the intelligent data layer system ingests data from a plurality of types of data sources including data channels, on-demand data sources, and published data sources.

228. The intelligent data layer system of claim 227, wherein the intelligent data layer system derives intelligence with the intelligence deriving system for a plurality of intelligence consumer portals.

229. The intelligent data layer system of claim 227, wherein an intelligent data layer control tower adapts a configuration of the ingestion system based on a type of data source for a data source selected by the intelligent data layer control tower for each of a plurality of instances of ingestion.

230. The intelligent data layer system of claim 203, wherein an intelligent data layer control tower adapts a configuration of the ingestion system, the analysis system, and the intelligence deriving system.

231. The intelligent data layer system of claim 203, wherein the intelligent data layer ingests data differently from a single data source based on ingestion requirements accessible through the request.

232. The intelligent data layer system of claim 203, wherein the intelligent data layer system further includes a plurality of system-focused probes that provide near real-time context of a range of aspects of system services.

233. The intelligent data layer system of claim 232, wherein the system-focused probes include probes that monitor source data for source data impacting activity and that signal to an intelligent data layer control tower for taking action within the system based on a projected impact of the source data impacting activity.

234. The intelligent data layer system of claim 232, wherein the system-focused probes monitor for time-related triggers for data sources, including early release of an update of source data, delayed release of an update of source data, and an announcement of new sources of data.

235. The intelligent data layer system of claim 203, wherein the ingestion system monitors a port on a data network for an indication of data availability at a data source.

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236. The intelligent data layer system of claim 203, wherein the system develops a multi-dimensional understanding of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

237. A method of operating an intelligent data layer, the method comprising:

receiving an intelligence request from an intelligence consumer portal;

determining at least one data source for deriving intelligence for the consumer portal based on the received request;

configuring an ingestion system based on ingestion parameters and parsing rules in a layer configuration data store for the at least one data source;

configuring an analysis system based on one or more analysis algorithms in the layer configuration data store for the at least one data source;

configuring an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system; and

operating the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, derive a set of intelligence data from at least one of the ingested data form the at least one data source and an outcome of using the analysis system, and communicating the set of intelligence data to at least one of the consumer portal or an intelligent data layer store.

238. The method of claim 237, further including storing in a computer-readable storage system results of operations of one or more systems of the intelligent data layer.

239. The method of claim 238, wherein the one or more systems includes the ingestion system, the analysis system, and the intelligence deriving system.

240. The method of claim 239, wherein the results of operations include intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results.

241. The method of claim 237, wherein configuring the analysis system is further based on consumer intelligence objectives of the request.

242. The method of claim 237, wherein configuring the analysis system is further based on aspects of the request.

243. The method of claim 237, further including operating an intelligent data layer control tower that configures and operates the intelligent data layer by communicating control sequences with the ingestion system, the analysis system, and the intelligence deriving system.

244. The method of claim 237, further including receiving, through an algorithm portal of an intelligent data layer control tower, at least one analysis algorithm used by the analysis system.

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245. The method of claim 237, wherein the ingestion system applies the parsing rules to content of data sources to determine structure of the content and relationships among elements in the data.

246. The method of claim 237, wherein the ingestion system applies the parsing rules to content of data sources thereby generating characterization data that includes an intended meaning of elements of the data and relationships among the data, structures of the data, and meaning of the data parsed from the content.

247. The method of claim 237, wherein the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of the data source.

248. The method of claim 237, wherein the ingestion system is configured to maintain a schedule of collection activity for one or more data sources.

249. The method of claim 237, wherein the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data.

250. The method of claim 237, wherein the ingestion system communicates ingested data, results of ingestion, and results of parsing, to an intelligent data layer control tower of the system.

251. The method of claim 237, wherein a location of the data source is a source address selected from a list of source address consisting of a universal record locator, port number, stream identifier, publication and/or broad channel, sensor output address.

252. The method of claim 237, wherein the analysis system compares data from the data source against a target use of intelligence derived from a data source to determine a degree of fitness for use of the data source by the intelligence deriving system.

253. The method of claim 237, wherein the analysis system analyzes ingestion system results for meeting at least one consumption target requirement of the consumer portal request.

254. The method of claim 253, wherein the consumption target requirement includes one or more of a validity time constraint, an accuracy constraint, a frequency of update constraint, or relevance to a consumption subject matter focus.

255. The method of claim 237, wherein the analysis system configures data regarding the ingested data for one or more system uses from a list of uses including advertisements that characterize the ingested data in terms of potential intelligence value, indexing schemes for offering intelligence derived data in a marketplace, searching intelligence derived data by identifying keywords, terms, and values associated with the ingested data.

256. The method of claim 237, wherein the analysis system estimates a value of intelligence data derived from the ingested data for a range of consumer portals to enable setting costs for consuming the intelligence data derived from the ingested data.

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257. The method of claim 237, wherein one or more systems of the intelligent data layer is configured as a micro-service architecture for isolated and independent operation of instances of the one or more systems for a plurality of distinct consumer portals.

258. The method of claim 257, wherein the one or more systems of the intelligent data layer system is initiated as a virtualized container to perform system-specific intelligent data layer system functions.

259. The method of claim 258, wherein the virtualized container is executed on a cloud-processing architecture.

260. The method of claim 258, wherein the virtualized container is configured with a consumer portal-specific instance of at least one of the ingestion system, the analysis system, or the intelligence deriving system.

261. The method of claim 237, wherein the intelligent data layer system ingests data from a plurality of types of data sources including data channels, on-demand data sources, and published data sources.

262. The method of claim 261, wherein the intelligent data layer derives intelligence with the intelligence deriving system for a plurality of intelligence consumer portals.

263. The method of claim 261, wherein an intelligent data layer control tower adapts a configuration of the ingestion system based on a type of data source for a data source selected by the intelligent data layer control tower for each of a plurality of instances of ingestion.

264. The method of claim 237, wherein an intelligent data layer control tower adapts a configuration of the ingestion system, the analysis system, and the intelligence deriving system.

265. The method of claim 237, wherein the intelligent data layer ingests data differently from a single data source based on ingestion requirements accessible through the request.

266. The method of claim 237, wherein the intelligent data layer further includes a plurality of system-focused probes that provide near real-time context of a range of aspects of system services.

267. The method of claim 266, wherein the system-focused probes include probes that monitor source data for source data impacting activity and that signal to an intelligent data layer control tower for taking action within the system based on a projected impact of the source data impacting activity.

268. The method of claim 266, wherein the system-focused probes monitor for time-related triggers for data sources, including early release of an update of source data, delayed release of an update of source data, and an announcement of new sources of data.

269. The method of claim 237, wherein the ingestion system monitors a port on a data network for an indication of data availability at a data source.

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270. The method of claim 237, wherein the intelligent data layer develops a multi-dimensional understanding of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

Network of intelligent data layers

271. A system of intelligent data layer network elements comprising:

a first intelligent data layer element deriving a first degree of source data intelligence from a first source of data;

a second intelligent data layer element deriving a second degree of source data intelligence from a second source of data, the second source of data representing a context of the first source of data;

a third intelligent data layer element forming an intelligent data layer network through interconnections with the first intelligent data layer element and the second intelligent data layer element and deriving composite intelligence by processing data from a local source of data with the first degree of source data intelligence received through the interconnections and the second degree of source data intelligence received through the interconnections; and

a fourth intelligent data layer element extending the intelligent data layer network through interconnection with the third intelligent data layer element and deriving a set of intelligence data structures by processing data from a second local source with one or more of the first degree of source data intelligence, the second degree of source data intelligence, or the composite intelligence, wherein deriving a set of intelligence data structures is based on intelligent data structures requirements of an intelligent data layer consumer element of the set of intelligence data structures.

272. The system of claim 271, wherein the first intelligent data layer derives marketplace bidding activity intelligence, the second intelligent data layer derives marketplace settlement activity intelligence, and the third intelligent data layer derives the composite intelligence including relative impacts of changes in bidding activity on settlement terms.

273. The system of claim 272, wherein the data from the second local source is monitored marketplace regulatory compliance and the set of intelligence data structures includes analysis of regulatory compliance of at least one of the bidding activity intelligence, the settlement activity intelligence, and the composite intelligence.

274. The system of claim 273, wherein the data from the second local source includes one or more of, raw transaction data, analyzed transaction data, marketplace data, or financial data for a plurality of transactions in the monitored marketplace.

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275. The system of claim 271, wherein at least one intelligent data layer element includes an intelligent data layer control tower that configures and operates the at least one intelligent data layer element by communicating control sequences with an ingestion system that receives source data, an analysis system that evaluates a data output of the ingestion system, and an intelligence deriving system that produces a corresponding one of source data intelligence, composite intelligence, and the set of intelligence data structures.

276. The system of claim 275, wherein the ingestion system parses content of source data to determine structure of source data content and relationships among elements in the source data.

277. The system of claim 276, wherein the ingestion system parses a content of data sources resulting in generating characterization data that includes an intended meaning of data elements and relationships among the data elements, structures of the data, and the intended meaning of the data parsed from the content.

278. The system of claim 275, wherein the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of a corresponding source of data.

279. The system of claim 275, wherein the ingestion system is configured to maintain a schedule of collection activity for one or more sources of data.

280. The system of claim 275, wherein the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data.

281. The system of claim 280, wherein the analysis system compares data from the source data against a target use of corresponding sourced data intelligence to determine a degree of fitness for use of the source of data by the intelligence deriving system.

282. The system of claim 271, herein one or more intelligent data layer network elements in the system of intelligent data layer network elements is initiated as a virtualized container of system-specific intelligent data layer element functions.

283. The system of claim 282, wherein the virtualized container is executed on a cloud-processing architecture.

284. The system of claim 271, wherein at least one of the intelligent data layer elements ingests data from a plurality of types of sources of data including data channels, on-demand data sources, and published data sources.

285. The system of claim 275, wherein the ingestion system monitors a port on a data network for an indication of data availability at a source of data.

286. The system of claim 271, wherein the set of intelligence data structures includes a multi-dimensional representation of source data value by applying a value determination cross matrix

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that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

287. A method of networking intelligent data layer elements comprising:

deriving a first degree of source data intelligence from a first source of data with a first intelligent data layer element;

deriving a second degree of source data intelligence with a second intelligent data layer element from a second source of data, the second source of data representing a context of the first source of data;

forming an intelligent data layer network through interconnections of a third intelligent data layer element with the first intelligent data layer element and the second intelligent data layer element and deriving composite intelligence by processing data from a local source of data with the first degree of source data intelligence received through the interconnections and the second degree of source data intelligence received through the interconnections; and

extending the intelligent data layer network through interconnection of a fourth intelligent data layer element with the third intelligent data layer element and deriving a set of intelligence data structures by processing data from a second local source with one or more of the first degree of source data intelligence, the second degree of source data intelligence, or the composite intelligence, wherein deriving a set of intelligence data structures is based on intelligent data structures requirements of an intelligent data layer consumer element of the set of intelligence data structures.

288. The method of claim 287, wherein the first intelligent data layer derives marketplace bidding activity intelligence, the second intelligent data layer derives marketplace settlement activity intelligence, and the third intelligent data layer derives the composite intelligence including relative impacts of changes in bidding activity on settlement terms.

289. The method of claim 288, wherein the data from the second local source is monitored marketplace regulatory compliance data and the set of intelligence data structures includes analysis of regulatory compliance of at least one of the bidding activity intelligence, the settlement activity intelligence, and the composite intelligence.

290. The method of claim 289, wherein the data from the second local source includes one or more of, raw transaction data, analyzed transaction data, marketplace data, or financial data for a plurality of transactions in the monitored marketplace.

291. The method of claim 287, wherein at least one intelligent data layer element includes an intelligent data layer control tower that configures and operates the at least one intelligent data layer element by communicating control sequences with an ingestion system that receives source data, an analysis system that evaluates a data output of the ingestion system, and an intelligence

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deriving system that produces a corresponding one of source data intelligence, composite intelligence, and the set of intelligence data structures.

292. The method of claim 291, wherein the ingestion system parses content of source data to determine structure of source data content and relationships among elements in the source data.

293. The method of claim 292, wherein the ingestion system parses a content of data sources resulting in generating characterization data that includes an intended meaning of data elements and relationships among the data elements, structures of the data, and the intended meaning of the data parsed from the content.

294. The method of claim 291, wherein the ingestion system assigns a relationship attribute to a pair of data values that are configured as parent/child in a hierarchy of a corresponding source of data.

295. The method of claim 291, wherein the ingestion system is configured to maintain a schedule of collection activity for one or more sources of data.

296. The method of claim 291, wherein the ingestion system is configured to parse source data according to at least one of a specification of the source or a context of a supply chain for an ingestion instance of the source data.

297. The method of claim 296, wherein the analysis system compares data from the source data against a target use of corresponding sourced data intelligence to determine a degree of fitness for use of the source of data by the intelligence deriving system.

298. The method of claim 287, wherein one or more intelligent data layer network elements is initiated as a virtualized container of system-specific intelligent data layer element functions.

299. The method of claim 298, wherein the virtualized container is executed on a cloud-processing architecture.

300. The method of claim 287, wherein at least one of the intelligent data layer elements ingests data from a plurality of types of sources of data including data channels, on-demand data sources, and published data sources.

301. The method of claim 291, wherein the ingestion system monitors a port on a data network for an indication of data availability at a source of data.

302. The method of claim 287, wherein the set of intelligence data structures includes a multi-dimensional representation of source data value by applying a value determination cross matrix that facilitates mapping a data source-relevant value of the source data to a consumer portal-relevant value of the source data.

Source discovery using an intelligent data layer

303. A system for discovering data sources for an intelligent data layer, the system comprising:

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a computer-readable storage system that stores a source discovery data store that maintains a data store storing information about existing data sources;

an ingestion system for capturing data from candidate data sources;

an analysis system for evaluating content ingested from the candidate data sources for meeting one or more aspects of a target source discovery criteria;

a similarity engine that produces a degree of similarity signal indicative of a degree of similarity of the candidate data source to at least one of the existing data sources;

a relevance engine that produces a degree of usefulness signal indicative of a utility of the candidate source for producing at least one intelligence outcome; and

an intelligent data layer control tower that applies artificial intelligence techniques for determining at least one of ingestion actions for the ingestion system and analysis actions for the analysis engine, and for making a determination of use of the candidate data source.

304. The system of claim 303, wherein the intelligent data layer control tower applies machine learning to train the artificial intelligence techniques.

305. The system of claim 303, wherein the intelligent data layer is integrated into a marketplace system of systems.

306. The system of claim 305, wherein the marketplace system of systems is an automated market orchestration system of systems.

307. The system of claim 303, wherein the intelligent data layer control tower determines that at least one integration action includes capturing information from and about candidate sources.

308. The system of claim 303, wherein the intelligent data layer control tower determines that at least one integration action includes advertising for candidate sources.

309. The system of claim 303, wherein the intelligent data layer control tower determines that at least one integration action includes contacting a plurality of known content sources with sets of criteria that are descriptive of a type of content.

310. The system of claim 303, wherein the ingestion system adapts at least a portion of a set of criteria for seeking a source of data by performing at least one of adjusting a range of a value that is descriptive of target source data, or broadening the set of criteria by abstracting at least one data requirement.

311. The system of claim 303, wherein the intelligent data layer control tower suggests source content discovery criteria based on analysis of existing sources, based on requests for variation of intelligence from consumers of the intelligent data layer, and feedback relating to usefulness of existing sources.

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312. The system of claim 303, wherein the ingestion system adapts an original ingestion profile for one or more existing data sources thereby causing ingestion of content from the one or more existing data sources that is excluded from ingestion under the original ingestion profile.

313. The system of claim 303, wherein the ingestion system filters data from the candidate data sources based on compliance with at least a portion of a target content ingestion criteria and forwards data from the candidate data source that is accepted through the filter to the analysis engine.

314. The system of claim 313, wherein the target content ingestion criteria includes requirements of a data format, a language, and a minimum precision.

315. The system of claim 303, wherein the ingestion system provides source discovery status information to the intelligent data layer control tower for candidate sources of data.

316. The system of claim 303, wherein the analysis system processes data forwarded by the ingestion system to determine compliance with source discovery criteria.

317. The system of claim 316, wherein the source discovery criteria includes consistency of source terminology.

318. The system of claim 316, wherein the source discovery criteria includes consistency of terminology in the candidate data source to terminology of at least one of the existing data sources.

319. The system of claim 316, wherein the analysis system applies a data stabilization algorithm to a portion of the data from the candidate source, a result of which is compared to a data stability criteria of the source discovery criteria.

320. The system of claim 303, wherein the similarity engine determines a degree of similarity of a portion of the candidate source data and at least one existing source of data by comparing data values of the portion to data values of a portion of an existing source of data.

321. The system of claim 303, wherein a degree of usefulness signal includes a predicted impact on intelligence derivable from the candidate source used by one or more intelligence derivation algorithms.

322. The system of claim 303, wherein the degree of usefulness signal includes an indication that a corresponding candidate source is to be added to a list of approved sources.

323. A method of discovering data sources for an intelligent data layer, comprising:

storing a source discovery data store that maintains a data store storing information about existing data sources in a computer-readable storage system;

capturing data from candidate data sources with an ingestion system;

evaluating content ingested from the candidate data sources for meeting one or more aspects of a target source discovery criteria with an analysis system;

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producing a degree of similarity signal indicative of a degree of similarity of the candidate data source to at least one of the existing data sources with a similarity engine;

producing a degree of usefulness signal indicative of a utility of the candidate source for producing at least one intelligence outcome with a relevance engine; and

applying artificial intelligence techniques with an intelligent data layer control tower for determining at least one of ingestion actions for the ingestion system and analysis actions for the analysis engine, and for making a determination of use of the candidate data source.

324. The method of claim 323, wherein the intelligent data layer control tower applies machine learning to train the artificial intelligence techniques.

325. The method of claim 323, wherein the intelligent data layer is integrated into a marketplace system of systems.

326. The method of claim 325, wherein the marketplace system of systems is an automated market orchestration system of systems.

327. The method of claim 323, wherein the intelligent data layer control tower determines that at least one integration action includes capturing information from and about candidate sources.

328. The method of claim 323, wherein the intelligent data layer control tower determines that at least one integration action includes advertising for candidate sources.

329. The method of claim 323, wherein the intelligent data layer control tower determines that at least one integration action includes contacting a plurality of known content sources with sets of criteria that are descriptive of a type of content.

330. The method of claim 323, wherein the ingestion system adapts at least a portion of a set of criteria for seeking a source of data by performing at least one of adjusting a range of a value that is descriptive of target source data, or broadening the set of criteria by abstracting at least one data requirement.

331. The method of claim 323, wherein the intelligent data layer control tower suggests source content discovery criteria based on analysis of existing sources, based on requests for variation of intelligence from consumers of the intelligent data layer, and feedback relating to usefulness of existing sources.

332. The method of claim 323, wherein the ingestion system adapts an original ingestion profile for one or more existing data sources thereby causing ingestion of content from the one or more existing data sources that is excluded from ingestion under the original ingestion profile.

333. The method of claim 323, wherein the ingestion system filters data from the candidate data sources based on compliance with at least a portion of a target content ingestion criteria and forwards data from the candidate data source that is accepted through the filter to the analysis engine.

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334. The method of claim 333, wherein the target content ingestion criteria include requirements of a data format, a language, and a minimum precision.

335. The method of claim 323, wherein the ingestion system provides source discovery status information to the intelligent data layer control tower for candidate sources of data.

336. The method of claim 323, wherein the analysis system processes data forwarded by the ingestion system to determine compliance with source discovery criteria.

337. The method of claim 336, wherein the source discovery criteria includes consistency of source terminology.

338. The method of claim 336, wherein the source discovery criteria includes consistency of terminology in the candidate data source to terminology of at least one of the existing data sources.

339. The method of claim 336, wherein the analysis system applies a data stabilization algorithm to a portion of the data from the candidate source, a result of which is compared to a data stability criteria of the source discovery criteria.

340. The method of claim 323, wherein the similarity engine determines a degree of similarity of a portion of the candidate source data and at least one existing source of data by comparing data values of the portion to data values of a portion of an existing source of data.

341. The method of claim 323, wherein a degree of usefulness signal includes a predicted impact on intelligence derivable from the candidate source used by one or more intelligence derivation algorithms.

342. The method of claim 323, wherein the degree of usefulness signal includes an indication that a corresponding candidate source is to be added to a list of approved sources.

Data and networking pipeline for market orchestration claims

First claim set for data and networking pipeline for market orchestration

343. A method of adapting a route for delivery of asset data to a marketplace orchestration interface through a network pipeline, the method embodied as a set of computer-readable instructions that is executed by a set of one or more processors and comprising:

identifying a set of asset-centric network resources in the network pipeline, a portion of the set of asset-centric network resources providing an interface to an asset in a set of assets for which transactions are conducted in a marketplace, the interface to the asset further configured to facilitate delivery of the asset data from the asset through the network pipeline;

identifying a set of marketplace-centric network resources in the network pipeline, a portion of the set of marketplace-centric network resources providing access to a transaction orchestration system interface, the transaction orchestration system interface configured for an operator to orchestrate a set of parameters for a set of transaction workflows of the marketplace involving the set of assets;

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adapting a network path within the network pipeline that enables delivery of the asset data from the asset in the set of assets through the portion of the set of asset-centric network resources and through the portion of the set of marketplace-centric network resources to the transaction orchestration system interface, wherein adapting the network path is based on one or more characteristics of the asset data and at least one performance parameter of the network path; and

delivering the asset data from the asset through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

344. The method of claim 343, wherein the interface to an asset in a set of assets communicates with a native network interface of the asset.

345. The method of claim 343, wherein the interface to the asset in the set of assets communicates with an asset management resource.

346. The method of claim 345, wherein the asset data is provided by the asset management resource.

347. The method of claim 343, wherein the interface to an asset in a set of assets communicates with a digital twin of the asset.

348. The method of claim 347, wherein the asset data is provided by the digital twin.

349. The method of claim 343, wherein the set of assets include one or more assets selected from a list of assets consisting of electronic devices, non-electronic devices, digital rights, services, humans, robots, and on-demand built items.

350. The method of claim 343, wherein the set of assets includes at least one interface for a plurality of assets in the set of assets, wherein the asset data for the plurality of assets is provided to the network pipeline through the at least one interface.

351. The method of claim 343, wherein the set of asset-centric network resources in the network pipeline includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store.

352. The method of claim 343, wherein the set of asset-centric network resources perform asset-centric data handling.

353. The method of claim 343, wherein a portion of the set of asset-centric network resources is configured by an asset resource controller to work cooperatively with an asset-centric data handling service for processing and storing the asset data in an asset-localized network data store.

354. The method of claim 353, wherein the asset resource controller configures the portion of the set of asset-centric network resources based on a result of analysis of the asset data by the asset-centric handling service.

355. The method of claim 354, wherein the asset resource controller retrieves the result of analysis from the asset-localized network data store.

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356. The method of claim 343, wherein the set of marketplace-centric network resources includes at least one resource providing a service selected from a list of services consisting of electronic wallet services, digital twin services, enterprise database services, platform as a service platform services, computer aided design services, and video game services.

357. The method of claim 343, wherein adapting the network path is based on one or more security characteristics of the asset data.

358. The method of claim 357, wherein adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

359. The method of claim 343,wherein adapting the network path is based on one or more jurisdiction characteristics of the asset data.

360. The method of claim 359, wherein adapting the network path based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

361. The method of claim 343, wherein the set of marketplace-centric network resources includes smart contract-centric network resources that provide an interface to a set of smart contracts.

362. The method of claim 343, wherein the set of marketplace-centric network resources includes workflow centric resources that provide an interface to a set workflow resources.

363. A system comprising:

a set of asset-centric network resources in a network pipeline, a portion of the set of asset-centric network resources providing an interface to an asset in a set of assets for which transactions are conducted in a marketplace, the interface to the asset further configured to facilitate delivery of asset data from the asset through the network pipeline;

a set of marketplace-centric network resources in the network pipeline, a portion of the set of marketplace-centric network resources providing access to a transaction orchestration system interface, the transaction orchestration system interface configured for an operator to orchestrate a set of parameters for a set of transaction workflows of the marketplace involving the set of assets; and

a set of computer-readable instructions that is executed by a set of one or more processors to adapt a network path within the network pipeline based on one or more characteristics of the asset data and at least one performance parameter of the network path thereby enabling delivery of the asset data from the asset in the set of assets through the portion of the set of asset-centric network resources and through the portion of the set of marketplace-centric network resources to the transaction orchestration system interface and to deliver the asset data from the asset through a

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set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

364. The system of claim 363, wherein the interface to an asset in a set of assets communicates with a native network interface of the asset.

365. The system of claim 363, wherein the interface to the asset in the set of assets communicates with an asset management resource.

366. The system of claim 365, wherein the asset data is provided by the asset management resource.

367. The system of claim 363, wherein the interface to an asset in a set of assets communicates with a digital twin of the asset.

368. The system of claim 367, wherein the asset data is provided by the digital twin.

369. The system of claim 363, wherein the set of assets includes one or more assets selected from a list of assets consisting of electronic devices, non-electronic devices, digital rights, services, humans, robots, and on-demand built items.

370. The system of claim 363, wherein the set of assets includes at least one interface for a plurality of assets in the set of assets, wherein the asset data for the plurality of assets is provided to the network pipeline through the at least one interface.

371. The system of claim 363, wherein the set of asset-centric network resources in the network pipeline includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store.

372. The system of claim 363, wherein the set of asset-centric network resources perform asset-centric data handling.

373. The system of claim 363, wherein a portion of the set of asset-centric network resources is configured by an asset resource controller to work cooperatively with an asset-centric data handling service for processing and storing the asset data in an asset-localized network data store.

374. The system of claim 373, wherein the asset resource controller configures the portion of the set of asset-centric network resources based on a result of analysis of the asset data by the asset-centric handling service.

375. The system of claim 374, wherein the asset resource controller retrieves the result of analysis from the asset-localized network data store.

376. The system of claim 363, wherein the set of marketplace-centric network resources includes at least one resource providing a service selected from a list of services consisting of electronic wallet services, digital twin services, enterprise database services, platform as a service platform services, computer aided design services, and video game services.

377. The system of claim 363, wherein to adapt the network path is based on one or more security characteristics of the asset data.

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378. The system of claim 377, wherein to adapt the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

379. The system of claim 363, wherein to adapt the network path is based on one or more jurisdiction characteristics of the asset data.

380. The system of claim 379, wherein to adapt the network path based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

381. The system of claim 363, wherein the set of marketplace-centric network resources includes smart contract-centric network resources that provide an interface to a set of smart contracts.

382. The system of claim 363, wherein the set of marketplace-centric network resources includes workflow centric resources that provide an interface to a set workflow resources.

Second claim set for data and networking pipeline for market orchestration

383. A system comprising:

a network adaptation system that automatically constructs a network infrastructure path in a network pipeline to deliver data from an asset to a market orchestration recipient, the constructed network infrastructure path is automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path;

a network timing adaptation system that automatically adapts network infrastructure resources in a network pipeline that delivers data from the asset to the market orchestration recipient for orchestration of a transaction of the asset, wherein the network infrastructure resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline;

a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline; and

a set of marketplace-centric network resources that facilitate delivery of the asset data from the adapted network pipeline to the market orchestration recipient.

384. The system of claim 383, wherein the network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset.

385. The system of claim 383, wherein the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset.

386. The system of claim 383, wherein the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

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387. The system of claim 383, wherein adapting the network infrastructure path is based on one or more security characteristics of the asset data.

388. The system of claim 387, wherein adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

389. The system of claim 383, wherein constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data.

390. The system of claim 389, wherein adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path.

391. The system of claim 383, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time.

392. The system of claim 383, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure nodes used previously to deliver the data from the asset.

393. The system of claim 383, wherein constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the asset data.

394. The system of claim 383, wherein adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one or more portions of the data from the asset, wherein the plurality of recipients is determined from a transaction workflow for the asset.

395. A method embodied as a set of computer-readable instructions that is executed by a set of one or more processors and comprising:

constructing a network infrastructure path in a network pipeline with a network adaptation system to deliver data from an asset to a market orchestration recipient, the network infrastructure path automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path;

adapting network infrastructure resources in the network pipeline, with a network timing adaptation system, that delivers data from the asset to the market orchestration recipient, wherein the network infrastructure resources are adapted based on at least one of a parameter of a transaction of the asset and a performance parameter of the network pipeline;

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ingesting the data from the asset into the network pipeline with a set of asset-centric network resources; and

delivering the asset data from the adapted network pipeline to the market orchestration recipient with a set of marketplace-centric network resources.

396. The method of claim 395, wherein the adapted network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset.

397. The method of claim 395, wherein the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset.

398. The method of claim 395, wherein the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

399. The method of claim 395, wherein adapting the network path is based on one or more security characteristics of the asset data.

400. The method of claim 399, wherein adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

401. The method of claim 395, wherein constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data.

402. The method of claim 401, wherein adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path.

403. The method of claim 395, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time.

404. The method of claim 395, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure nodes used previously to deliver the data from the asset.

405. The method of claim 395, wherein constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the asset data.

406. The method of claim 395, wherein adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one

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or more portions of the data from the asset, wherein the plurality of recipients is determined from a transaction workflow for the asset.

Asset-centric network pipeline infrastructure resources (operator interface))

407. A system of network infrastructure resources comprising:

a first network interface connecting a set of the network infrastructure resources to an asset network resource;

a second network interface connecting the set of network infrastructure resources to a second set of network infrastructure resources forming a portion of a network path for delivering data from the asset to a marketplace orchestration system interface, the network path automatically adapted to deliver the data from the asset to the marketplace orchestration system interface based on one or more characteristics of the data from the asset and at least one performance parameter for the network path;

an asset-centric controller communicating with the asset through the first network interface and controlling delivery of the data from the asset over the adapted network path;

an asset-centric data handling system communicating with the asset through the first network interface and processing the data from the asset in support of delivery of the data from the asset over the adapted network path; and

an asset-centric data storage facility controlled by the asset-centric controller to receive data processed by the asset-centric data handling system, wherein data stored in the asset-centric data storage facility is accessible through the second interface by a portion of the second set of network infrastructure resources for delivering data from the asset to the marketplace orchestration system interface.

408. The system of claim 407, wherein the network path is further automatically adapted to adjust timing of delivery of data from the asset to the marketplace orchestration system interface based on at least one of a transaction parameter and a network performance parameter.

409. The system of claim 407, wherein the first network interface communicates with a native network interface of the asset.

410. The system of claim 407, wherein the first network interface communicates with an asset management resource.

411. The system of claim 410, wherein the asset data is provided by the asset management resource.

412. The system of claim 407, wherein the first network interface communicates with a digital twin of the asset.

413. The system of claim 412, wherein the data from the asset is provided by the digital twin.

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414. The system of claim 407, wherein the asset-centric controller configures the first network interface based on a result of analysis of the data from the asset by the asset-centric data handling system.

415. The system of claim 414, wherein the asset-centric controller retrieves the result of analysis from the asset-centric data storage facility.

416. The system of claim 407, wherein the network path is further automatically adapted based on one or more security characteristics of the data from the asset.

417. The system of claim 416, wherein further automatically adapting the network path based on the one or more security characteristics of the data includes configuring the network path to avoid poor reputation network resources.

418. The system of claim 407, wherein the automatically adapted network path includes an adapted communication protocol that avoids exposing data from the asset in a context that gives meaning to the data.

419. The system of claim 418, wherein adjusting the adapted communication protocol delivers a first portion of the data from the asset through a first network path and a second portion of the data from the asset through a second network path.

420. The system of claim 407, wherein the automatically adapted network path for delivering the data from the asset changes over time.

421. The system of claim 407, wherein the automatically adapted network path is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the data from the asset.

422. The system of claim 407, wherein the asset-centric controller configures the first network interface and the asset-centric data handling system so delivery of the data from the asset over the adapted network path is independent of how data from the asset is received from the asset by the first network communication interface.

423. The system of claim 407, wherein the marketplace orchestration system interface is a set of smart contracts that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

424. The system of claim 407, wherein the marketplace orchestration system interface is an interface through which an operator orchestrates parameters of a set of transaction workflows associated with transactions for the assets.

425. The system of claim 424, wherein the operator orchestrates parameters of a set of transaction workflows based on the data from the asset.

426. The system of claim 407, wherein the marketplace orchestration system interface is adapted to facilitate orchestrating parameters of a set of transaction workflows involving the assets.

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427. A method comprising:

connecting via a first network interface a set of network infrastructure resources to an asset;

connecting via a second network interface the set of network infrastructure resources to a second set of network infrastructure resources forming a portion of a network path for delivering data from the asset to a marketplace orchestration system interface, the network path automatically adapted to deliver the data from the asset to the marketplace orchestration system interface based on one or more characteristics of the data from the asset and at least one performance parameter for the network path;

controlling delivery of the data from the asset over the adapted network path with an asset-centric controller disposed to communicate with the asset through the first network interface;

processing the data from the asset in support of delivery of the data from the asset over the adapted network path with an asset-centric data handling system disposed to communicate with the asset through the first network interface; and

storing data processed by the asset-centric data handling system in an asset-centric data storage facility controlled by the asset-centric controller, wherein data stored in the asset-centric data storage facility is accessible through the second interface by a portion of the second set of network infrastructure resources for delivering data from the asset to the marketplace orchestration system interface.

428. The method of claim 427, wherein the network path is further automatically adapted to adjust timing of delivery of data from the asset to the marketplace orchestration system interface based on at least one of a transaction parameter and a network performance parameter.

429. The method of claim 427, wherein the first network interface communicates with a native network interface of the asset.

430. The method of claim 427, wherein the first network interface communicates with an asset management resource.

431. The method of claim 430, wherein the asset data is provided by the asset management resource.

432. The method of claim 427, wherein the first network interface communicates with a digital twin of the asset.

433. The method of claim 432, wherein the data from the asset is provided by the digital twin.

434. The method of claim 427, wherein the asset-centric controller configures the first network interface based on a result of analysis of the data from the asset by the asset-centric data handling system.

435. The method of claim 434, wherein the asset-centric controller retrieves the result of analysis from the asset-centric data storage facility.

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436. The method of claim 427, wherein the network path is further automatically adapted based on one or more security characteristics of the data from the asset.

437. The method of claim 436, wherein further automatically adapting the network path based on the one or more security characteristics of the data includes configuring the network path to avoid poor reputation network resources.

438. The method of claim 427, wherein the automatically adapted network path includes an adapted communication protocol that avoids exposing data from the asset in a context that gives meaning to the data.

439. The method of claim 438, wherein adjusting the adapted communication protocol delivers a first portion of the data from the asset through a first network path and a second portion of the data from the asset through a second network path.

440. The method of claim 427, wherein the automatically adapted network path for delivering the data from the asset changes over time.

441. The method of claim 427, wherein the automatically adapted network path is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the data from the asset.

442. The method of claim 427, wherein the asset-centric controller configures the first network interface and the asset-centric data handling system so delivery of the data from the asset over the adapted network path is independent of how data from the asset is received from the asset by the first network communication interface.

443. The method of claim 427, wherein the marketplace orchestration system interface is a set of smart contracts that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

444. The method of claim 427, wherein the marketplace orchestration system interface is an interface through which an operator orchestrates parameters of a set of transaction workflows associated with transactions for the assets.

445. The method of claim 444, wherein the operator orchestrates parameters of a set of transaction workflows based on the data from the asset.

446. The method of claim 427, wherein the marketplace orchestration system interface is adapted to facilitate orchestrating parameters of a set of transaction workflows involving the assets.

Adapted path in a network pipeline with integrated marketplace APIs for orchestration by an operator

447. A system comprising:

a network adaptation system that automatically adapts a network infrastructure path from an asset to a market orchestration recipient in a network pipeline that delivers asset data from the

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asset to the recipient, the network infrastructure path automatically adapted based on one or more characteristics of the asset data and at least one performance parameter for the network path;

a set of asset-centric network resources that facilitate ingestion of the data from the asset into the adapted network pipeline;

a set of marketplace-centric network resources that facilitate delivery of the asset data of the adapted network pipeline to the market orchestration recipient; and

a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the market orchestration recipient, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the set of integrated application programming interfaces, wherein a portion of the transaction workflows is activated.

448. The system of claim 447, wherein the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

449. The system of claim 448, wherein the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

450. The system of claim 447, wherein the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace.

451. The system of claim 450, wherein the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

452. The system of claim 447, wherein the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

453. The system of claim 452, wherein the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

454. The system of claim 447, wherein the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace.

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455. The system of claim 454, wherein the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

456. The system of claim 447, wherein the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

457. The system of claim 456, wherein the automated design function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

458. The system of claim 447, wherein the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace.

459. The system of claim 458, wherein the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Adapted path in a network pipeline with integrated marketplace APIs for orchestration by for a smart contract)

460. A method comprising:

adapting a network infrastructure path from an asset to a smart contract in a network pipeline with a network adaptation system, the adapted network pipeline delivering asset data from the asset to the smart contract, the network infrastructure path automatically adapted based on one or more characteristics of the asset data and at least one performance parameter for the network path;

ingesting the data from the asset into the adapted network pipeline with a set of asset-centric network resources;

delivering the ingested asset data of the adapted network pipeline to the smart contract with a set of marketplace-centric network resources; and

activating a portion of a set of transaction workflows with a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the smart contract, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the set of integrated application programming interfaces, wherein the portion of the transaction workflows is activated.

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461. The method of claim 460, wherein the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

462. The method of claim 461, wherein the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

463. The method of claim 460, wherein the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace.

464. The method of claim 463, wherein the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

465. The method of claim 460, wherein the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

466. The method of claim 465, wherein the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

467. The method of claim 460, wherein the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace.

468. The method of claim 467, wherein the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

469. The method of claim 460, wherein the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

470. The method of claim 469, wherein the automated design function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

471. The method of claim 460, wherein the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace.

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472. The method of claim 471, wherein the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Adapted timing of a path in a network pipeline with integrated marketplace APIs

473. A system comprising:

a network timing adaptation system that automatically adapts timing of data transfer through a network pipeline that delivers data from an asset to a market orchestration recipient by adapting one or more network resources of the network pipeline to control data transfer within the network pipeline, the timing of data transfer associated with a time requirement for a transaction of the asset, wherein the one or more network resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline;

a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline;

a set of marketplace-centric network resources that facilitate delivery of the ingested asset data of the adapted network pipeline to the market orchestration recipient;

a set of application programming interfaces for a marketplace that executes transaction workflows for conducting a transaction for the asset based on workflow parameters determined by the market orchestration recipient according to data from the asset that is delivered through the adapted one or more network infrastructure resources, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the integrated application programming interfaces whereby a portion of the transaction workflows is activated.

474. The system of claim 473, wherein the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

475. The system of claim 474, wherein the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

476. The system of claim 473, wherein the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace.

477. The system of claim 476, wherein the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

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478. The system of claim 473, wherein the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

479. The system of claim 478, wherein the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

480. The system of claim 473, wherein the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace.

481. The system of claim 480, wherein the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

482. The system of claim 473, wherein the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

483. The system of claim 482, wherein the automated design function signals to the marketplace to activate the portion of the transaction workflows through the set of application programming interfaces.

484. The system of claim 473, wherein the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace.

485. The system of claim 484, wherein the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the set of application programming interfaces.

Adapted timing of a path in a network pipeline with integrated marketplace APIs for a smart contact)

486. A method comprising:

adapting timing of data transfer through a network pipeline that delivers data from an asset to a smart contract with a network timing adaptation system by adapting one or more network resources of the network pipeline to control data transfer within the network pipeline, the timing of data transfer associated with a time requirement for a transaction of the asset determined by the smart contract, wherein the one or more network resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline;

ingesting the data from the asset into the network pipeline with a set of asset-centric network resources;

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delivering the ingested asset data of the adapted network pipeline to the smart contract with a set of marketplace-centric network resources;

activating a portion of a set of transaction workflows of the transaction of the asset determined by the smart contract with a set of application programming interfaces for a marketplace that executes the set of transaction workflows based on workflow parameters determined by the smart contract according to data from the asset that is delivered through the adapted one or more network infrastructure resources, the set of application programming interfaces integrated into an auxiliary system that includes a set of interfaces for activating a function of the auxiliary system that when activated sends a transaction workflow activation signal to the marketplace through the integrated application programming interfaces whereby the portion of the set of transaction workflows is activated.

487. The method of claim 486, wherein the auxiliary system is an electronic wallet platform and the function is a transaction settlement function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

488. The method of claim 487, wherein the transaction settlement function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

489. The method of claim 486, wherein the auxiliary system is a digital twin platform and the function is a digital twin of a function of the asset that, when activated causes activation of the portion of the transaction workflows in the marketplace.

490. The method of claim 489, wherein the digital twin of the function of the asset signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

491. The method of claim 486, wherein the auxiliary system is an enterprise database platform and the function is a database update detection function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

492. The method of claim 491, wherein the database update detection function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

493. The method of claim 486, wherein the auxiliary system is a platform as-a-service platform and the function monitors a status of a service that, when activated causes activation of the portion of the transaction workflows in the marketplace.

494. The method of claim 493, wherein the function that monitors a status of a service signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

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495. The method of claim 486, wherein the auxiliary system is a computer aided design platform and the function is an automated design function that, when activated causes activation of the portion of the transaction workflows in the marketplace.

496. The method of claim 495, wherein the automated design function signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

497. The method of claim 486, wherein the auxiliary system is a video game platform and the function reflects an action by a user of the video game that, when activated causes activation of the portion of the transaction workflows in the marketplace.

498. The method of claim 497, wherein the function reflects an action by a user of the video game signals to the marketplace to activate the portion of the transaction workflows through the integrated set of application programming interfaces.

Market prediction claims

First claim set for market prediction system

499. A market prediction system, comprising:

a machine learning system that trains a set of machine-learned models to generate a market prediction using training data comprising demand features and outcomes;

an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request.

500. The system of claim 499, wherein the market prediction is a prediction for a parameter of demand in a forward market for an asset.

501. The system of claim 499, wherein the market prediction is a prediction for a parameter of supply in a forward market for an asset.

502. The system of claim 499, wherein the market prediction is a prediction of a set of terms and/or conditions for a smart contract.

503. The system of claim 499, wherein the market prediction is based at least in part on crowdsourced data.

504. The system of claim 499, wherein the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments.

505. The system of claim 499, wherein the artificial intelligence system includes a recurrent neural network.

506. The system of claim 499, wherein the artificial intelligence system includes a convolutional neural network.

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507. The system of claim 499, wherein the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network.

508. The system of claim 504, wherein the set of Internet of Things systems includes a set of smart home Internet of Things devices.

509. The system of claim 504, wherein the set of Internet of Things systems includes a set of workplace Internet of Things devices.

510. The system of claim 504, wherein the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

511. The system of claim 504, wherein the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

512. The system of claim 504, wherein the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

Second claim set for market prediction system

513. A market prediction system, comprising:

A quantum computing system that receives a request to generate a market prediction and outputs a market prediction based on the request.

514. The system of claim 513, wherein the market prediction is a prediction for a parameter of demand in a forward market for an asset.

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515. The system of claim 513, wherein the market prediction is a prediction for a parameter of supply in a forward market for an asset.

516. The system of claim 513, wherein the market prediction is a prediction of a set of terms and/or conditions for a smart contract.

517. The system of claim 513, wherein the market prediction is based at least in part on crowdsourced data.

518. The system of claim 513, wherein the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments.

519. The system of claim 518, wherein the set of Internet of Things systems includes a set of smart home Internet of Things devices.

520. The system of claim 519, wherein the set of Internet of Things systems includes a set of workplace Internet of Things devices.

521. The system of claim 518, wherein the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

522. The system of claim 518, wherein the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

523. The system of claim 518, wherein the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot,

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vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

Market orchestration and alternative lending platform

524. A market orchestration platform, comprising:

a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data comprising smart contract features and outcomes;

an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request; and

a lending platform comprising:

an Internet of Things data collection platform for monitoring at least one of a set of assets and a set of collateral for a loan, a bond, or a debt transaction.

525. The system of claim 524, further comprising a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform.

526. The system of claim 525, wherein the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform.

527. The system of claim 526, wherein the data collected by the Internet of Things data collection platform is image data, sensor data, or location data.

528. The system of claim 525, further comprising a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system.

529. The system of claim 524, wherein the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

530. The system of claim 526, wherein the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Market prediction system and a lending platform

531. A market prediction system, comprising:

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a machine learning system that trains a set of machine-learned models to generate a market prediction using training data comprising market features and outcomes;

an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request; and

a lending platform comprising:

an Internet of Things data collection platform for monitoring at least one of a set of assets and a set of collateral for a loan, a bond, or a debt transaction.

532. The system of claim 531, wherein the market prediction is a prediction for a parameter of demand in a forward market for an asset.

533. The system of claim 531, wherein the market prediction is a prediction for a parameter of supply in a forward market for an asset.

534. The system of claim 531, wherein the market prediction is a prediction of a set of terms and/or conditions for a smart contract.

535. The system of claim 531, wherein the market prediction is based at least in part on crowdsourced data.

536. The system of claim 531, wherein the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments.

537. The system of claim 531, wherein the artificial intelligence system includes a recurrent neural network.

538. The system of claim 531, wherein the artificial intelligence system includes a convolutional neural network.

539. The system of claim 531, wherein the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network.

540. The system of claim 536, wherein the set of Internet of Things systems includes a set of smart home Internet of Things devices.

541. The system of claim 536, wherein the set of Internet of Things systems includes a set of workplace Internet of Things devices.

542. The system of claim 536, wherein the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

543. The system of claim 536, wherein the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation

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processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

544. The system of claim 536, wherein the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

545. The system of claim 531, further comprising a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform.

546. The system of claim 545, wherein the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform.

547. The system of claim 546, wherein the data collected by the Internet of Things data collection platform is image data, sensor data, or location data.

548. The system of claim 545, further comprising a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system.

549. The system of claim 531, wherein the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Enterprise access layer and market prediction system

550. A system comprising:

a machine learning system that trains a set of machine-learned models to generate a market prediction using training data comprising market features and outcomes;

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an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request;

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

monitoring a plurality of public market participants via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

identifying a set of asset controls managed by a permission system of the network asset layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, wherein the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and

in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

551. The system of claim 550, wherein the asset is available in a hot wallet of the digital wallet system.

552. The system of claim 550, wherein the asset is available in a cold wallet of the digital wallet system.

553. The system of claim 550, wherein the asset is available in a custodial wallet of the digital wallet system.

554. The system of any of claims 550–553, wherein the operations further comprise:

receiving a response message from the monitored public market participant; and

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determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction.

555. The system of claim 554, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction.

556. The system of any of claims 554 or 555, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

557. The system of claim 554, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system.

558. The system of any of claims 554 or 556, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system.

559. The system of claim 550, wherein the market prediction is a prediction for a parameter of demand in a forward market for an asset.

560. The system of claim 550, wherein the market prediction is a prediction for a parameter of supply in a forward market for an asset.

561. The system of claim 550, wherein the market prediction is a prediction of a set of terms and/or conditions for a smart contract.

562. The system of claim 550, wherein the market prediction is based at least in part on crowdsourced data.

563. The system of claim 550, wherein the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments.

564. The system of claim 550, wherein the artificial intelligence system includes a recurrent neural network.

565. The system of claim 550, wherein the artificial intelligence system includes a convolutional neural network.

566. The system of claim 550, wherein the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network.

567. The system of claim 563, wherein the set of Internet of Things systems includes a set of smart home Internet of Things devices.

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568. The system of claim 563, wherein the set of Internet of Things systems includes a set of workplace Internet of Things devices.

569. The system of claim 563, wherein the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

570. The system of claim 563, wherein the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways, roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

571. The system of claim 563, wherein the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

Market orchestration and enterprise access layer

572. A system, comprising:

a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data comprising smart contract features and outcomes;

an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request;

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a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

monitoring a plurality of public market participants via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

identifying a set of asset controls managed by a permission system of the network asset layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, wherein the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and

in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

573. The system of claim 572, wherein the asset is available in a hot wallet of the digital wallet system.

574. The system of claim 572, wherein the asset is available in a cold wallet of the digital wallet system.

575. The system of claim 572, wherein the asset is available in a custodial wallet of the digital wallet system.

576. The system of any of claims 572--575, wherein the operations further comprise:

receiving a response message from the monitored public market participant; and

determining that the response message indicates an acknowledgment to fulfill the request for the actual transaction; and

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facilitating fulfillment of the actual transaction.

577. The system of claim 576, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction.

578. The system of any of claims 576 or 577, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

579. The system of claim 576, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system.

580. The system of any of claims 576 or 578, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system.

581. The system of claim 572, further comprising a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform.

582. The system of claim 581, wherein the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform.

583. The system of claim 582, wherein the data collected by the Internet of Things data collection platform is image data, sensor data, or location data.

584. The system of claim 581, further comprising a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system.

585. The system of claim 572, wherein the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Market orchestration and market prediction

586. A system, comprising:

a machine learning system that trains a set of machine-learned models to generate a market prediction using training data comprising market features and outcomes;

an artificial intelligence system that receives a request to generate a market prediction and outputs a market prediction based on the machine-learned models and the request;

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a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data comprising smart contract features and outcomes; and

an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request.

587. The system of claim 586, wherein the market prediction is a prediction for a parameter of demand in a forward market for an asset.

588. The system of claim 586, wherein the market prediction is a prediction for a parameter of supply in a forward market for an asset.

589. The system of claim 586, wherein the market prediction is a prediction of a set of terms and/or conditions for a smart contract.

590. The system of claim 586, wherein the market prediction is based at least in part on crowdsourced data.

591. The system of claim 586, wherein the market prediction is based at least in part on behavioral data collected from a set of IoT systems monitoring a set of entities in a set of environments.

592. The system of claim 586, wherein the artificial intelligence system includes a recurrent neural network.

593. The system of claim 586, wherein the artificial intelligence system includes a convolutional neural network.

594. The system of claim 586, wherein the artificial intelligence system includes a combination of a recurrent neural network and a convolutional neural network.

595. The system of claim 591, wherein the set of Internet of Things systems includes a set of smart home Internet of Things devices.

596. The system of claim 591, wherein the set of Internet of Things systems includes a set of workplace Internet of Things devices.

597. The system of claim 591, wherein the set of Internet of Things systems includes a set of Internet of Things device to monitor a set of consumer goods stores.

598. The system of claim 591, wherein the set of entities comprises one or more of: products, suppliers, producers, manufacturers, retailers, businesses, owners, operators, operating facilities, customers, consumers, workers, mobile devices, wearable devices, distributors, resellers, supply chain infrastructure facilities, supply chain processes, logistics processes, reverse logistics processes, demand prediction processes, demand management processes, demand aggregation processes, machines, ships, barges, warehouses, maritime ports, airports, airways, waterways,

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roadways, railways, bridges, tunnels, online retailers, ecommerce sites, demand factors, supply factors, delivery systems, floating assets, points of origin, points of destination, points of storage, points of use, networks, information technology systems, software platforms, distribution centers, fulfillment centers, containers, container handling facilities, customs, export control, border control, drones, robots, autonomous vehicles, hauling facilities, drones/robots/AVs, waterways, and port infrastructure facilities.

599. The system of claim 591, wherein the set of environments comprises one or more of: home of a consumer, retail facilities, manufacturing facilities, supply chain facilities, ship containers, ship, boat, barge, maritime port, crane, container, container handling facilities, shipyard, maritime dock, warehouse, distribution facilities, fulfillment facilities, fueling facilities, refueling facilities, nuclear refueling facilities, waste removal facilities, food supply facilities, beverage supply facilities, drone facilities, robot facilities, autonomous vehicle, aircraft, automotive, truck, train, lift, forklift, hauling facilities, conveyor, loading dock, waterway, bridge, tunnel, airport, depot, vehicle station, train station, weigh station, inspection station or point, roadway, railway, highway, customs house, and border control facilities.

600. The system of claim 586, further comprising a security monitoring system for monitoring assets and/or collateral based on the data collected by the Internet of Things data collection platform.

601. The system of claim 600, wherein the security monitoring system uses machine-learned models to determine the condition or value of items based on data collected by the Internet of Things data collection platform.

602. The system of claim 601, wherein the data collected by the Internet of Things data collection platform is image data, sensor data, or location data.

603. The system of claim 600, further comprising a loan management system that enables a loan manager to access information from the Internet of Things data collection platform and the security monitoring system.

604. The system of claim 586, wherein the set of machine-learned models employ a convolutional neural network, a recurrent neural network, a feed forward neural network, a long-term/short-term memory (LTSM) neural network, a self-organizing neural network, and hybrids and combinations of the foregoing.

Data and network infrastructure pipeline with market orchestration

605. A system comprising:

a network adaptation system that automatically constructs a network infrastructure path in a network pipeline to deliver data from an asset to a market orchestration recipient, the constructed

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network infrastructure path is automatically adapted based on one or more characteristics of the data from the asset and at least one performance parameter for the network infrastructure path;

a network timing adaptation system that automatically adapts network infrastructure resources in a network pipeline that delivers data from the asset to the market orchestration recipient for orchestration of a transaction of the asset, wherein the network infrastructure resources are adapted based on at least one of a parameter of the transaction of the asset and a performance parameter of the network pipeline;

a set of asset-centric network resources that facilitate ingestion of the data from the asset into the network pipeline;

a set of marketplace-centric network resources that facilitate delivery of the asset data from the adapted network pipeline to the market orchestration recipient;

a machine learning system that trains a set of machine-learned models to cluster a set of smart contracts by attribute similarity using training data comprising smart contract features and outcomes; and

an artificial intelligence system that receives a request to cluster a set of smart contracts by attribute similarity and outputs a clustering of a set of smart contracts by attribute similarity based on the machine-learned models and the request.

606. The system of claim 605, wherein the network pipeline delivers the data from the asset to the market orchestration recipient for orchestration of a transaction of the asset.

607. The system of claim 605, wherein the network timing adaptation system adapts the network infrastructure resources in the network pipeline to satisfy a data delivery timing requirement associated with a transaction workflow for the asset.

608. The system of claim 605, wherein the market orchestration recipient is a smart contract that includes terms, conditions, and parameters for a set of transaction workflows involving the asset.

609. The system of claim 605, wherein adapting the network infrastructure path is based on one or more security characteristics of the asset data.

610. The system of claim 609, wherein adapting the network path based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

611. The system of claim 605, wherein constructing a network infrastructure path in a network pipeline includes adjusting a communication protocol that avoids exposing data from the asset in a context that gives meaning to the data.

612. The system of claim 611, wherein adjusting the communication protocol includes delivering a first portion of the asset data through a first network path and a second portion of the asset data through a second network path.

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613. The system of claim 605, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path for delivering the data from the asset so that the network path changes over time.

614. The system of claim 605, wherein constructing a network infrastructure path in a network pipeline includes adapting the network path to include at least one infrastructure node that is different than infrastructure nodes used previously to deliver the data from the asset.

615. The system of claim 605, wherein constructing a network infrastructure path in a network pipeline includes adapting the network infrastructure path so that it is different than prior network infrastructure paths used to deliver the data from the asset that are recorded in a historical record of network paths for the asset data.

616. The system of claim 605, wherein adapting the network infrastructure path based on one or more characteristics of the data from the asset includes configuring a plurality of recipients for one or more portions of the data from the asset, wherein the plurality of recipients is determined from a transaction workflow for the asset.

Trust networks and enterprise access layers

617. A system comprising:

a computer-readable medium that stores a set of executable instructions;

a processing system that executes

an enterprise access layer that executes transactions on behalf of an enterprise having a plurality of different users, wherein the enterprise access layer includes a wallet system, a workflow system, and a permissions system, wherein:

the wallet system manages a plurality of digital wallets associated with the enterprise and is configured to:

receive a transaction request initiated by a user device associated with a user of the plurality of users, the transaction request requesting a transaction to be executed by the wallet system and having a set of attributes corresponding to the transaction;

select a wallet of the plurality of wallets to execute the transaction based on the set of attributes; and

initiating a transaction workflow from a set of workflows based on the selected wallet;

when the transaction is a trustless transaction performed on a distributed ledger, the workflow system is configured to:

obtain a distributed ledger address of a counterparty to the trustless transaction;

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obtain a trust score based on the distributed ledger address of the counterparty;

determine whether to execute the transaction based on the trust score corresponding to the counterparty and a role of the user within the enterprise; and

in response to determining to allow the trustless transaction, instructing the wallet system to perform the trustless transaction from the selected wallet.

618. The system of claim 617, wherein the workflow system provides a request to the permissions system to verify that the user is authorized to perform the transaction based on the role of the user and one or more transaction attributes.

619. The system of claim 618, wherein the workflow system provides a trust score request to a trust system, wherein the request indicates the distributed ledger address of the counterparty and the trust system returns the trust score.

620. The system of claim 619, wherein the trust system comprises a decentralized network of node computing devices, wherein each respective node computing device independently determines a local trust score for the distributed ledger address based on distributed ledger data available to the respective node computing device.

621. The system of claim 620, wherein the trust score is a consensus trust score that is based on the local trust scores determined by the respective node computing devices.

622. The system of claim 619, wherein the trust system comprises a centralized system that monitors a distributed network.

623. The system of claim 619, wherein the transaction workflow determines to execute the transaction in response to verifying that the user is authorized to perform the transaction and the trust score exceeding a trust threshold.

624. The system of claim 617, wherein in response to performing the trustless transaction, the wallet system generates a transaction record and stores the transaction record on a second distributed ledger.

625. The system of claim 624, wherein the second distributed ledger is a private distributed ledger maintained by the enterprise.

626. The system of claim 617, wherein the wallet system manages a set of private and public keys on behalf of the entity.

627. A method for executing user-initiated transactions on behalf of an enterprise having a plurality of different users, the comprising:

receiving, by a wallet system, a transaction request initiated by a user device associated with a user of the plurality of users, the transaction request requesting a transaction to be executed by the wallet system and having a set of attributes corresponding to the transaction;

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selecting, by the wallet system, a wallet of a plurality of digital wallets associated with the enterprise to execute the transaction based on the set of attributes; and

initiating a transaction workflow from a set of workflows based on the selected wallet, wherein when the transaction is a trustless transaction performed on a distributed ledger, the selected workflow executes:

obtaining a distributed ledger address of a counterparty to the trustless transaction;

obtaining a trust score based on the distributed ledger address of the counterparty;

determining whether to execute the transaction based on the trust score corresponding to the counterparty and a role of the user within the enterprise; and

in response to determining to allow the trustless transaction, instructing the wallet system to perform the trustless transaction from the selected wallet.

628. The method of claim 627, wherein the workflow system provides a request to the permissions system to verify that the user is authorized to perform the transaction based on the role of the user and one or more transaction attributes.

629. The method of claim 628, wherein the workflow system provides a trust score request to a trust system, wherein the request indicates the distributed ledger address of the counterparty and the trust system returns the trust score.

630. The method of claim 629, wherein the trust system comprises a decentralized network of node computing devices, wherein each respective node computing device independently determines a local trust score for the distributed ledger address based on distributed ledger data available to the respective node computing device.

631. The method of claim 630, wherein the trust score is a consensus trust score that is based on the local trust scores determined by the respective node computing devices.

632. The method of claim 629, wherein the trust system comprises a centralized system that monitors a distributed network.

633. The method of claim 629, wherein the transaction workflow determines to execute the transaction in response to verifying that the user is authorized to perform the transaction and the trust score exceeding a trust threshold.

634. The method of claim 627, wherein in response to performing the trustless transaction, the wallet system generates a transaction record and stores the transaction record on a second distributed ledger.

635. The method of claim 634, wherein the second distributed ledger is a private distributed ledger maintained by the enterprise.

636. The method of claim 627, wherein the wallet system manages a set of private and public keys on behalf of the entity.

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Data and network infrastructure Pipeline and Intelligent Data Layers

637. An intelligent data layer system, comprising:

a computer-readable storage system that stores a layer configuration data store that maintains:

ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost;

parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and

one or more analysis algorithms; and

a set of one or more processors that execute a set of computer-readable instructions, wherein the set of one or more processors collectively:

receive an intelligence request pertaining to an asset in a set of assets from an intelligence consumer portal a set of marketplace-centric network resources that provide access to a transaction orchestration system interface;

determine at least one data source for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of data source-centric network resources;

configure an ingestion system based on the ingestion parameters and parsing rules in the layer configuration data store for ingesting data pertaining to the asset from the at least one data source via the set of data source-centric network resources;

configure an analysis system based on the analysis algorithms in the layer configuration data store for the at least one data source;

configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system;

operate the system to ingest data from the at least one data source using the ingestion system, analyze the ingested data from the at least one data source using the analysis system, and derive a set of intelligence data from at least one of the ingested data from the at least one data source or from an outcome of using the analysis system;

adapt a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction orchestration system interface based on one or more characteristics of the asset ingested from the at least one source and at least one performance parameter of the network path;

and communicating the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

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638. An intelligent data layer system, comprising:

a set of one or more processors that execute a set of computer-readable instructions, wherein the set of one or more processors collectively:

receive an intelligence request pertaining to an asset in a set of assets from an intelligence consumer portal a set of marketplace-centric network resources that provide access to a transaction orchestration system interface;

determine at least one data source pertaining to the asset and for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of asset-data source-centric network resources;

configure an ingestion system based on a set of ingestion parameters and parsing rules from an ingestion system configuration data store, the ingestion system for ingesting data pertaining to the asset from the at least one data source via the set of asset-data source-centric network resources;

configure an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system to derive a set of intelligence data from at least one of the ingested data from the at least one data source;

adapt a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction orchestration system interface, wherein to adapt the network path is based on one or more characteristics of the asset captured from the at least one source and at least one performance parameter of the network path; and

communicate the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

639. The system of claim 638, wherein the set of asset-data source-centric network resources is an asset management resource.

640. The system of claim 639, wherein the data pertaining to the asset is ingested from the asset management resource.

641. The system of claim 638, wherein the at least one data source pertaining to the asset is a digital twin of the asset.

642. The system of claim 641, wherein the data pertaining to the asset is provided by the digital twin.

643. The system of claim 638, wherein the set of asset-data source-centric network resources includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store.

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644. The system of claim 643, wherein the asset resource controller configures a portion of the set of asset-data source-centric network resources based on a result of analysis of the data pertaining to the asset data by the asset resource controller.

645. The system of claim 638, wherein the at least one data source pertaining to the asset is the asset.

646. The system of claim 638, wherein the network path is adapted based on one or more security characteristics of the data pertaining to the asset ingested from the at least one data source.

647. The system of claim 646, wherein the network path is adapted based on the one or more security characteristics of the data includes configuring a path through the network pipeline that avoids poor reputation network resources.

648. The method of claim 638, wherein the network path is adapted based on one or more jurisdiction characteristics of the asset data.

649. The method of claim 648, wherein the network path is adapted based on the one or more jurisdiction characteristics of the data includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

650. A method of providing intelligence for a transaction orchestration system through an intelligent data layer system, comprising:

receiving an intelligence request pertaining to an asset in a set of assets from a set of marketplace-centric network resources that provide access to a transaction orchestration system interface;

determining at least one data source pertaining to the asset and for deriving intelligence for use by the transaction orchestration system interface based on the received request, the at least one data source being accessible on a computing network via a set of asset-data source-centric network resources;

configuring an ingestion system based on a set of ingestion parameters and parsing rules from an ingestion system configuration data store, the ingestion system for ingesting data pertaining to the asset from the at least one data source via the set of asset-data source-centric network resources;

configuring an intelligence deriving system based on information in the request and available intelligence services in an intelligence service system to derive a set of intelligence data from at least one of the ingested data from the at least one data source;

adapting a network path from the intelligence deriving system through a network pipeline that enables delivery of the set of intelligence data to the transaction orchestration system interface, wherein adapting the network path is based on one or more characteristics of the asset captured from the at least one source and at least one performance parameter of the network path; and

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communicating the set of intelligence data through a set of infrastructure resources in the adapted network path to the transaction orchestration system interface.

651. The method of claim 650, wherein the set of asset-data source-centric network resources is an asset management resource.

652. The method of claim 651, wherein the data pertaining to the asset is ingested from the asset management resource.

653. The method of claim 650, wherein the at least one data source pertaining to the asset is a digital twin of the asset.

654. The method of claim 653, wherein the data pertaining to the asset is provided by the digital twin.

655. The method of claim 650, wherein the set of asset-data source-centric network resources includes asset interfacing resources, an asset-centric network resource controller and an asset-localized network data store.

656. The method of claim 655, wherein the asset resource controller configures a portion of the set of asset-data source-centric network resources based on a result of analysis of the data pertaining to the asset data by the asset resource controller.

657. The method of claim 650, wherein the at least one data source pertaining to the asset is the asset.

658. The method of claim 650, wherein the network path is adapted based on one or more security characteristics of the data pertaining to the asset ingested from the at least one data source.

Enterprise access layers and data pipeline

659. A computer-implemented method comprising:

monitoring a plurality of public market participants via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, an indication that a monitored public market participant requests a digital asset candidate;

identifying a digital wallet system associated with the network access layer, the digital wallet system making available a digital asset of a set of assets for which transactions are conducted in a marketplace, the digital wallet further configured to facilitate delivery of the digital asset through a network pipeline associated with the network access layer to an interface of the marketplace;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches the digital asset available in the digital wallet system; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

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identifying a set of asset controls managed by a permission system of the network asset layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a transaction targeted for the marketplace based on a set of parameters for a set of digital asset transaction workflows of the marketplace that are orchestrated by an operator through a transaction orchestration interface the transaction with the monitored public market participant and involving the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, wherein the asset control criteria indicates that a threshold number of the set of asset controls have been violated; and

in response to determining that the transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria:

adapting a network path within the network pipeline that enables delivery of the digital asset to the transaction orchestration system interface, wherein adapting the network path is based on one or more characteristics of the digital asset and at least one performance parameter of the network path; and

delivering the digital asset and a message requesting an actual transaction with the monitored public market participant involving the asset available from the interface system to the transaction orchestration system interface via the adapted network path.

660. The method claim 659, further comprising:

receiving a message from the monitored public market participant that indicates an acknowledgement to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction in the marketplace.

661. The method of claim 660, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the digital asset in a public append-only data structure to represent execution of the actual transaction.

662. The method of claim 660, wherein facilitating fulfillment of the actual transaction includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

663. The method of claim 661, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system.

664. The method of claim 661, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system.

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665. The method of claim 659, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

666. The method of claim 659, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

667. The method of claim 659, wherein the set of asset controls transactional detail requirements for the asset.

668. The method of claim 659, wherein the digital wallet communicates with a digital twin of the digital asset.

669. The method of claim 668, wherein determining whether a transaction targeted for the marketplace with the monitored public market participant and involving the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available is based on data of the digital asset provided by the digital twin.

670. The method of claim 659, wherein adapting the network path is based on one or more security characteristics of the digital asset.

671. The method of claim 670, wherein adapting the network path based on the one or more security characteristics of the digital asset includes configuring a path through the network pipeline that avoids poor reputation network resources.

672. The method of claim 660, wherein adapting the network path is based on one or more jurisdiction characteristics of the digital asset.

673. The method of claim 672, wherein adapting the network path based on the one or more jurisdiction characteristics of the digital asset includes configuring a path through the network pipeline that avoids network resources based on a jurisdiction of the network resources.

Enterprise Access Layer and Intelligent Data Layers

674. An intelligent data enterprise network access layer system, comprising:

a computer-readable storage system that stores a network access layer configuration data store that maintains:

ingestion parameters including one or more data structures that represent aspects of one or more of a plurality of data sources including a source location, an interface protocol, a source data ontology, and an ingestion cost;

parsing rules that facilitate determining one or more of structure, content, relationships among data elements, intended meaning of the data elements, or relationships of data, structure, and intended meaning; and

one or more analysis algorithms; and

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a set of one or more processors of the network access layer that is controlled by an enterprise, the set of one or more processors that execute a set of computer-readable instructions, wherein the set of one or more processors collectively:

monitor a plurality of public market participants via an interface system of the network access layer;

receive an indication that a monitored public market participant requests a digital asset candidate;

determine at least one digital wallet system associated with the network access layer with available assets based on the received request;

configure an ingestion system based on the ingestion parameters and parsing rules in the network access layer configuration data store for the at least one digital wallet;

configure an analysis system based on the analysis algorithms in the network access layer configuration data store for the at least one digital wallet;

configure an intelligence deriving system based on information in the digital asset candidate request and available intelligence services in an intelligence service system associated with the network access layer;

ingest data from the at least one digital wallet pertaining to available assets using the ingestion system;

analyze the ingested data from the at least one digital wallet using the analysis system;

derive a set of intelligence data from at least one of the ingested data from the at least one data source or an outcome of using the analysis system;

determine based on the derived set of intelligence data and the request whether the digital asset candidate matches an available asset;

identify a set of asset controls managed by a permission system of the network access layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determine whether a transaction with the monitored public market participant that involves a matching available asset satisfies a criteria of the set of asset controls assigned to the matching available asset, wherein the criteria indicates that a threshold number of the set of asset controls have been violated; and

in response to determining that the transaction with the monitored public market participant that involves the matching available asset satisfies the assigned asset control criteria, generate a message data packet requesting an actual transaction with the monitored public market participant involving the asset available, the message including a portion of the set of intelligence data, wherein the message data packet is configured for communication via the interface system.

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675. The intelligent data enterprise network access layer system of claim 674, wherein the computer-readable storage system stores an intelligent data layer store that maintains results of operations of one or more systems of the intelligent data enterprise network access layer system.

676. The intelligent data enterprise network access layer system of claim 675, wherein the one or more systems includes the ingestion system, the analysis system, the permissions system, the interface system, and the intelligence deriving system.

677. The intelligent data enterprise network access layer system of claim 676, wherein the result of operations includes intermediate results of at least one of the one or more systems and at least one role-adapted final result variant of the intermediate results.

678. The intelligent data enterprise network access layer system of claim 674, wherein to configure the analysis system is further based on public market participants objectives of the request.

679. The intelligent data enterprise network access layer system of claim 674, wherein to configure the analysis system is further based on aspects of the request for a digital asset candidate.

680. The intelligent data enterprise network access layer system of claim 674, wherein the set of one or more processors is configured in an intelligent data enterprise network access layer control tower that configures and operates the intelligent data enterprise network access layer system by communicating control sequences with the ingestion system, the analysis system, the permission system, the interface system, and the intelligence deriving system.

681. The intelligent data enterprise network access layer system of claim 674, further including an algorithm portal of an intelligent data enterprise network access layer control tower of the system through which at least one of the analysis algorithms is received.

682. The intelligent data enterprise network access layer system of claim 674, wherein the ingestion system parses content of digital wallets to determine structure of the content and relationships among elements in the data.

683. The intelligent data enterprise network access layer system of claim 674, wherein the matching asset is available in a hot wallet of the digital wallet system.

684. The intelligent data enterprise network access layer system of claim 674, wherein the matching asset is available in a cold wallet of the digital wallet system.

685. The intelligent data enterprise network access layer system of claim 674, wherein the matching asset is available in a custodial wallet of the digital wallet system.

686. The intelligent data enterprise network access layer system of claim 674, further comprising:

receiving a response message from the monitored public market participant; and

determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

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facilitating fulfillment of the actual transaction.

687. The intelligent data enterprise network access layer system of claim 686, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction.

688. The intelligent data enterprise network access layer system of claim 686, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

689. The intelligent data enterprise network access layer system of claim 687, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a hot wallet of the digital wallet system.

690. The intelligent data enterprise network access layer system of claim 687, wherein storing the digital form of the asset to a public append-only data structure facilitating uses at least one key from a cold wallet of the digital wallet system.

691. The intelligent data enterprise network access layer system of claim 674, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

692. The intelligent data enterprise network access layer system of claim 674, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

693. The intelligent data enterprise network access layer system of claim 674, wherein the set of asset controls transactional detail requirements for the asset.

Cross-market transactions with Enterprise access layers

694. A computer-implemented method, comprising:

monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, market data from a plurality of data source feeds, each of the data source feeds corresponding to one or more of the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate;

processing the market data by performing one or more of filtering, normalizing, deduplicating, organizing, summarizing, and compressing, the market data;

creating a distributed ledger, the distributed ledger being based on a blockchain;

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storing the processed data via the distributed ledger, the processed data being stored via one or more blocks of the distributed ledger;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

identifying a set of asset controls managed by a permission system of the network access layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, wherein the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via the distributed ledger, the smart contract being stored via one or more blocks of the distributed ledger; and

in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction with the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

695. A computer-implemented method comprising:

monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, market data from the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate;

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

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identifying a set of asset controls managed by a permission system of the network access layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, wherein the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via a distributed ledger being based on a blockchain, the smart contract being stored via one or more blocks of the distributed ledger; and

in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction that includes the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

696. The method of claim 695, wherein the asset is available in a hot wallet of the digital wallet system.

697. The method of claim 695, wherein the asset is available in a cold wallet of the digital wallet system.

698. The method of claim 695, wherein the asset is available in a custodial wallet of the digital wallet system.

699. The method of any of claims 695–698, further comprising:

receiving a response message from the monitored public market participant;

determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction according to the set of asset control criteria of the prospective transaction configured into the smart contract.

700. The method of claim 699, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction, wherein the public append-only data structure is the distributed ledger, and storing a digital form of the asset includes being stored via one or more blocks of the distributed ledger.

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701. The method of any of claims 699 or 700, wherein facilitating fulfillment of the asset transaction request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

702. The method of claim 699, wherein storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a hot wallet of the digital wallet system.

703. The method of any of claims 699 or 701, wherein storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a cold wallet of the digital wallet system.

704. The method of any of claims 695–703, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

705. The method of any of claims 695–704, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

706. The method of any of claims 695–705, wherein the set of asset controls define transactional detail requirements for the asset that are configured into the smart contract.

707. A system comprising:

a network access layer including a processor and storage hardware in communication with the processor, wherein the storage hardware includes instructions that when executed by the processor perform operations, and wherein the operations include:

monitoring a plurality of public market participants in a plurality of markets via an interface system of a network access layer, wherein the network access layer is controlled by an enterprise and corresponds to an intelligence system that hosts exchangeable enterprise digital assets;

receiving, at the network access layer via the interface system, market data from the plurality of markets, the market data including an indication that a monitored public market participant requests a digital asset candidate; and

determining, by the intelligence system of the network access layer, whether the digital asset candidate matches an asset available in a digital wallet system associated with the network access layer; and

in response to the digital asset candidate matching the asset available in the digital wallet system:

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identifying a set of asset controls managed by a permission system of the network access layer, wherein the permission system is configured to assign the set of asset controls to exchangeable enterprise digital assets in the digital wallet system;

determining whether a prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies an asset control criteria corresponding to the asset available, the prospective transaction determined via a machine learned model, wherein the asset control criteria is configured in a smart contract, the smart contract having triggering conditions based on a threshold number of the set of asset control criteria of the prospective transaction have been violated and storing the smart contract via a distributed ledger being based on a blockchain, the smart contract being stored via one or more blocks of the distributed ledger; and

in response to the smart contract determining that the prospective transaction with the monitored public market participant that involves the asset available in the digital wallet system satisfies the asset control criteria, generating a message data packet requesting an actual transaction that includes the set of asset control criteria of the prospective transaction with the monitored public market participant involving the asset available, wherein the message data packet is configured for communication via the interface system.

708. The system of claim 707, wherein the asset is available in a hot wallet of the digital wallet system.

709. The system of claim 707, wherein the asset is available in a cold wallet of the digital wallet system.

710. The system of claim 707, wherein the asset is available in a custodial wallet of the digital wallet system.

711. The system of any of claims 707–710, wherein the operations further comprise:

receiving a response message from the monitored public market participant;

determining that the response message indicates an acknowledgement to fulfill the request for the actual transaction; and

facilitating fulfillment of the actual transaction according to the set of asset control criteria of the prospective transaction configured into the smart contract.

712. The system of claim 711, wherein facilitating fulfillment of the actual transaction includes storing a digital form of the asset in a public append-only data structure to represent execution of the actual transaction, wherein the public append-only data structure is the distributed ledger, and storing a digital form of the asset includes being stored via one or more blocks of the distributed ledger.

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713. The system of any of claims 711 or 712, wherein facilitating fulfillment of the asset request includes:

signing the actual transaction involving the asset on a cold wallet; and

relaying the signed transaction using a hot wallet of the digital wallet system that is associated with the cold wallet.

714. The system of claim 711, wherein storing the digital form of the asset to a public append-only data structure facilitates using at least one key from a hot wallet of the digital wallet system.

715. The system of any of claims 711 or 713, wherein storing the digital form of the asset to a public append-only data structure facilitating using at least one key from a cold wallet of the digital wallet system.

716. The system of any of claims 707–715, wherein the set of asset controls includes an asset control that matches an access control for an enterprise entity that submitted the asset to the digital wallet system.

717. The system of any of claims 707–716, wherein the set of asset controls includes an asset control that indicates a security clearance level for the asset.

718. The system of any of claims 707–717, wherein the set of asset controls defines transactional detail requirements for the asset that are configured into the smart contract.

Trust and transactions

719. A method, comprising:

identifying, by a device, an opportunity to engage in a transaction associated with a blockchain address of a blockchain ledger;

receiving, by the device and from another device that is a member of a consensus trust network, a consensus trust score that is associated with the blockchain address;

determining, by the device, whether to engage in the transaction with the blockchain address, wherein the determining is based on the consensus trust score received from the consensus trust network; and

performing, by the device, an action to initiate an engagement in the transaction in response to determining to engage in the transaction with the blockchain address based on the consensus trust score.

720. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information;

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receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

721. The method of claim 720, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

722. The method of claim 720, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

723. The method of claim 720, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

724. The method of claim 720, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

725. The method of claim 724, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

726. The method of claim 720, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

727. The method of claim 720, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

728. The method of claim 720, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

729. The method of claim 728, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

730. The method of claim 728, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

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731. The method of claim 720, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

732. The method of claim 720, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

733. A method, comprising:

receiving, by a device, a request to generate a trust score for a blockchain address associated with a blockchain ledger;

determining, by the device, information that associates the blockchain address with fraudulent activity;

generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information;

transmitting, by the device, the first trust score associated with the blockchain address to another device;

receiving, by the device and from another device, a consensus trust score for the blockchain address, wherein the consensus trust score is based on the first trust score and at least two additional trust scores associated with the blockchain address; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

734. The method of claim 733, wherein the device and the other device are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

735. The method of claim 733, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

736. The method of claim 733, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

737. The method of claim 733, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

738. The method of claim 737, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

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739. The method of claim 733, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

740. The method of claim 733, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

741. The method of claim 733, wherein the consensus trust score is based on a first reputation score associated with the device and an additional reputation score associated with the other device.

742. The method of claim 741, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

743. The method of claim 741, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

744. The method of claim 733, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

745. The method of claim 733, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

746. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

processing, by the device, the information with a machine learning model, wherein the machine learning model is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity;

receiving, by the device, an output of the machine learning model, wherein the output includes a first trust score for the blockchain address;

receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

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747. The method of claim 746, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

748. The method of claim 746, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

749. The method of claim 746, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

750. The method of claim 746, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

751. The method of claim 746, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

752. The method of claim 746, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

753. The method of claim 746, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

754. The method of claim 746, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

755. The method of claim 754, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

756. The method of claim 754, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

757. The method of claim 746, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

758. The method of claim 746, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

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759. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

processing, by the device, the information with a quantum computing system, wherein the quantum computing system is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity;

receiving, by the device, an output of the quantum computing system, wherein the output includes a first trust score for the blockchain address;

receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

760. The method of claim 759, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

761. The method of claim 759, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

762. The method of claim 759, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

763. The method of claim 759, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

764. The method of claim 759, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

765. The method of claim 759, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

766. The method of claim 759, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

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767. The method of claim 759, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

768. The method of claim 767, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

769. The method of claim 767, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

770. The method of claim 759, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

771. The method of claim 759, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

772. The method of claim 759, wherein the quantum computing system is configured to generate trust scores based on a graph clustering analysis of activities associated with the blockchain ledger, wherein the graph clustering analysis includes the blockchain address.

773. The method of claim 759, wherein the quantum computing system is further configured to detect a market trend associated with an asset, and the quantum prediction algorithm is configured to generate trust scores for respective blockchain addresses based on an activity of the respective blockchain address that is associated with the asset.

774. The method of claim 759, wherein the quantum computing system is further configured to generate trust scores based on a quantum principal component analysis of the information associated with the blockchain addresses.

775. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

generating, by the device, a digital twin of an entity associated with the blockchain address, wherein a response of the digital twin to a stimulus corresponds to a predicted response of the entity to the stimulus;

generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on an analysis of the digital twin;

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receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

776. The method of claim 775, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

777. The method of claim 775, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

778. The method of claim 777, wherein the request is associated with a transaction that includes the blockchain address, and the device is configured to determine the first trust score based on a simulation of the transaction including the digital twin and a behavior of the digital twin during the simulation.

779. The method of claim 775, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

780. The method of claim 779, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

781. The method of claim 779, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

782. The method of claim 775, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

783. The method of claim 775, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

784. The method of claim 775, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

785. The method of claim 784, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

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786. The method of claim 784, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

787. The method of claim 775, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

788. The method of claim 775, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

789. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

processing, by the device, the information with a dual purpose artificial neural network, wherein the dual purpose artificial neural network is configured to generate trust scores based on information that associates blockchain addresses with fraudulent activity;

receiving, by the device, an output of the dual purpose artificial neural network, wherein the output includes a first trust score for the blockchain address;

receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

generating, by the device, a blockchain entry on the blockchain ledger, a blockchain entry that associates the consensus trust score with the blockchain address.

790. The method of claim 789, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

791. The method of claim 789, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a request on the blockchain ledger for a trust evaluation of the blockchain address.

792. The method of claim 789, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to an activity of the blockchain address on the blockchain ledger.

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793. The method of claim 789, wherein the device is configured to generate the blockchain entry on the blockchain ledger in response to a transaction on the blockchain ledger, wherein the transaction is associated with the blockchain address.

794. The method of claim 789, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

795. The method of claim 789, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

796. The method of claim 789, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

797. The method of claim 789, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

798. The method of claim 797, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

799. The method of claim 797, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

800. The method of claim 789, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

801. The method of claim 789, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

802. The method of claim 789, further comprising:

updating, by the device, a data set that is associated with a training of the dual purpose artificial neural network; and

retraining, by the device, the dual purpose artificial neural network based on the updated data set.

803. The method of claim 802, wherein updating the data set includes adding, to the data set, one or more data samples based on a subsequent activity associated with the blockchain address.

804. A method, comprising:

receiving, by a device, information that associates a blockchain address with fraudulent activity, wherein the blockchain address is associated with a blockchain ledger;

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generating, by the device, a first trust score for the blockchain address, wherein the local node trust score is based on the information;

receiving, by the device and from at least two other devices, at least two additional trust scores for the blockchain address;

determining, by the device, a consensus trust score based on the first trust score and the at least two additional trust scores; and

processing, by the device, one or more transactions associated with the blockchain address by a robotic process automation module, wherein the robotic process automation module is configured to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on respective consensus trust scores associated with the respective blockchain addresses.

805. The method of claim 804, wherein the device and the at least two other devices are members of a trust network of devices that determine consensus trust scores for blockchain addresses of the blockchain ledger.

806. The method of claim 804, wherein the device is further configured to monitor the blockchain ledger to detect transaction with the blockchain address.

807. The method of claim 804, wherein the blockchain entry includes a blockchain report that provides a basis for the consensus trust rating.

808. The method of claim 804, further comprising: generating, on the blockchain ledger, a fraud entry associated with the blockchain address, wherein the fraud entry is based on a change of a consensus trust rating associated with the blockchain address.

809. The method of claim 804, wherein the consensus trust score is based on a first reputation score associated with the device and additional reputation scores associated with each of the at least two other devices.

810. The method of claim 809, wherein determining the consensus trust score includes weighting the trust score generated by and/or received from a respective device, wherein the weighting is based on the reputation score associated with the respective device.

811. The method of claim 809, wherein the reputation score associated with a respective device is based on an amount of work performed by the respective device in generating trust scores for blockchain addresses of the blockchain ledger.

812. The method of claim 804, wherein determining the consensus trust score includes excluding, from the determining of the consensus trust score, an outlier trust score that is statistically inconsistent with other trust scores included in the determining of the consensus trust score.

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813. The method of claim 804, wherein determining the consensus trust score includes determining that an average variance of the trust scores included in the determining of the consensus trust score is within a threshold variance.

814. The method of claim 804, wherein the robotic process automation module is further configured to determine whether or not to engage in transactions with respective blockchain addresses, and the determining is based on the respective consensus trust scores associated with the respective blockchain addresses.

815. The method of claim 804, wherein the robotic process automation module is configured to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on a training of the robotic process automation module, and the training is based on a training data set including data samples that correspond to actions taken by one or more users while engaging in transactions with blockchain addresses associated with the blockchain ledger.

816. The method of claim 804, wherein the robotic process automation module is configured to determine whether or not to engage in transactions with respective blockchain addresses associated with the blockchain ledger based on a training of the robotic process automation module, and the training is based on a training data set including data samples that correspond to actions taken by one or more users while determining whether or not to engage in transactions with blockchain addresses associated with the blockchain ledger.

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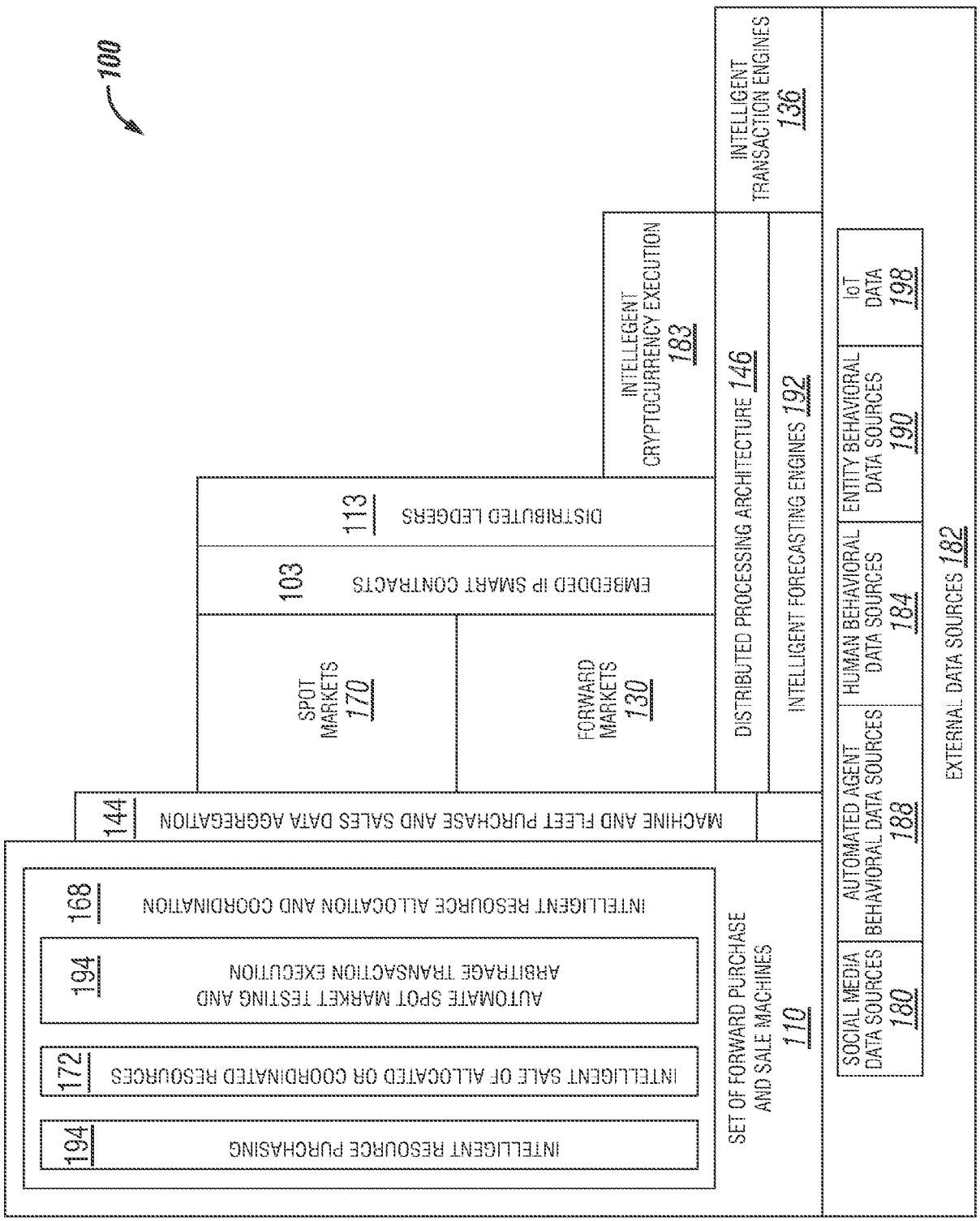

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FIG. 1

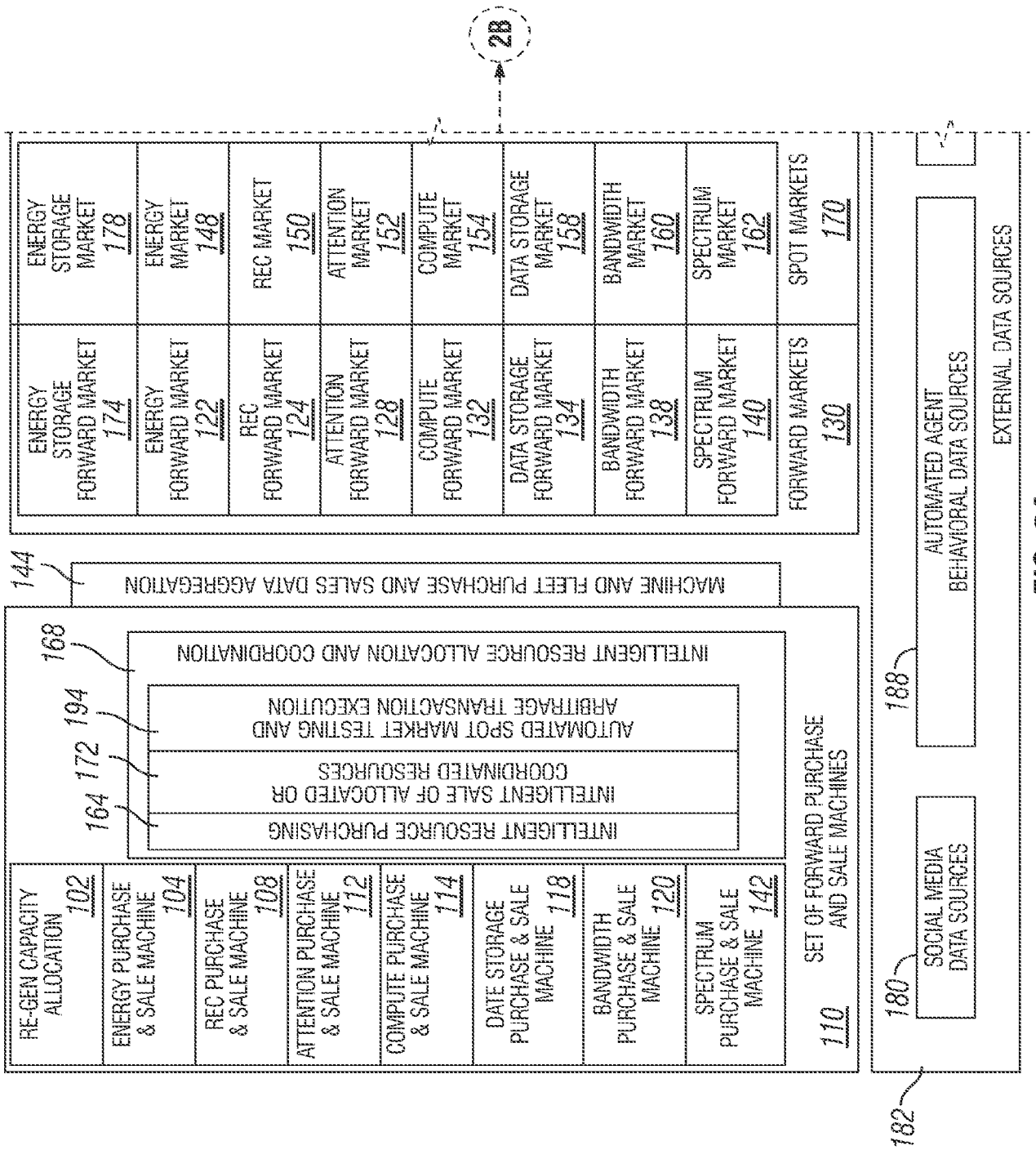

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COMPUTE FORWARD MARKET 132
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FIG. 2A

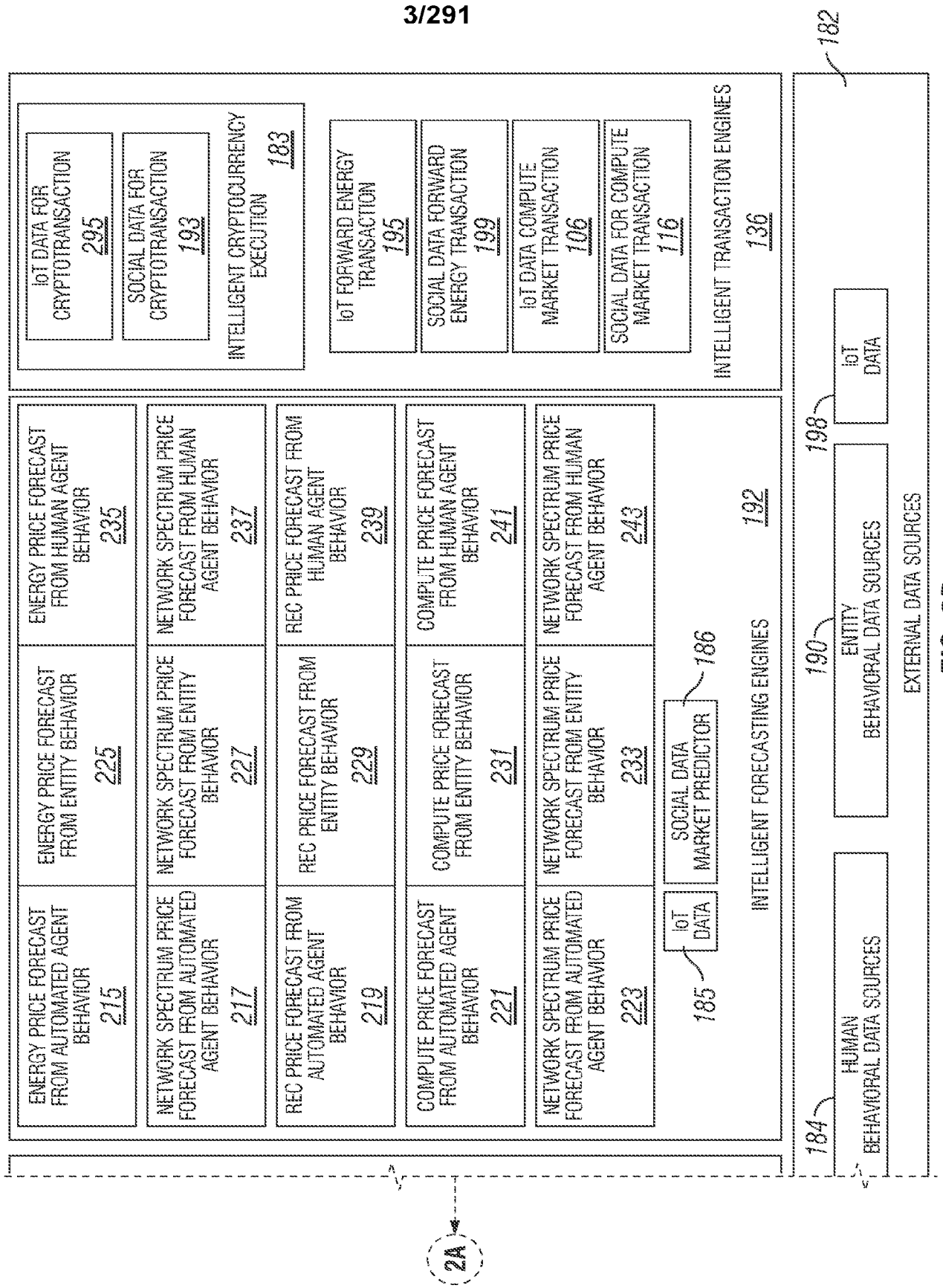

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FIG. 2B

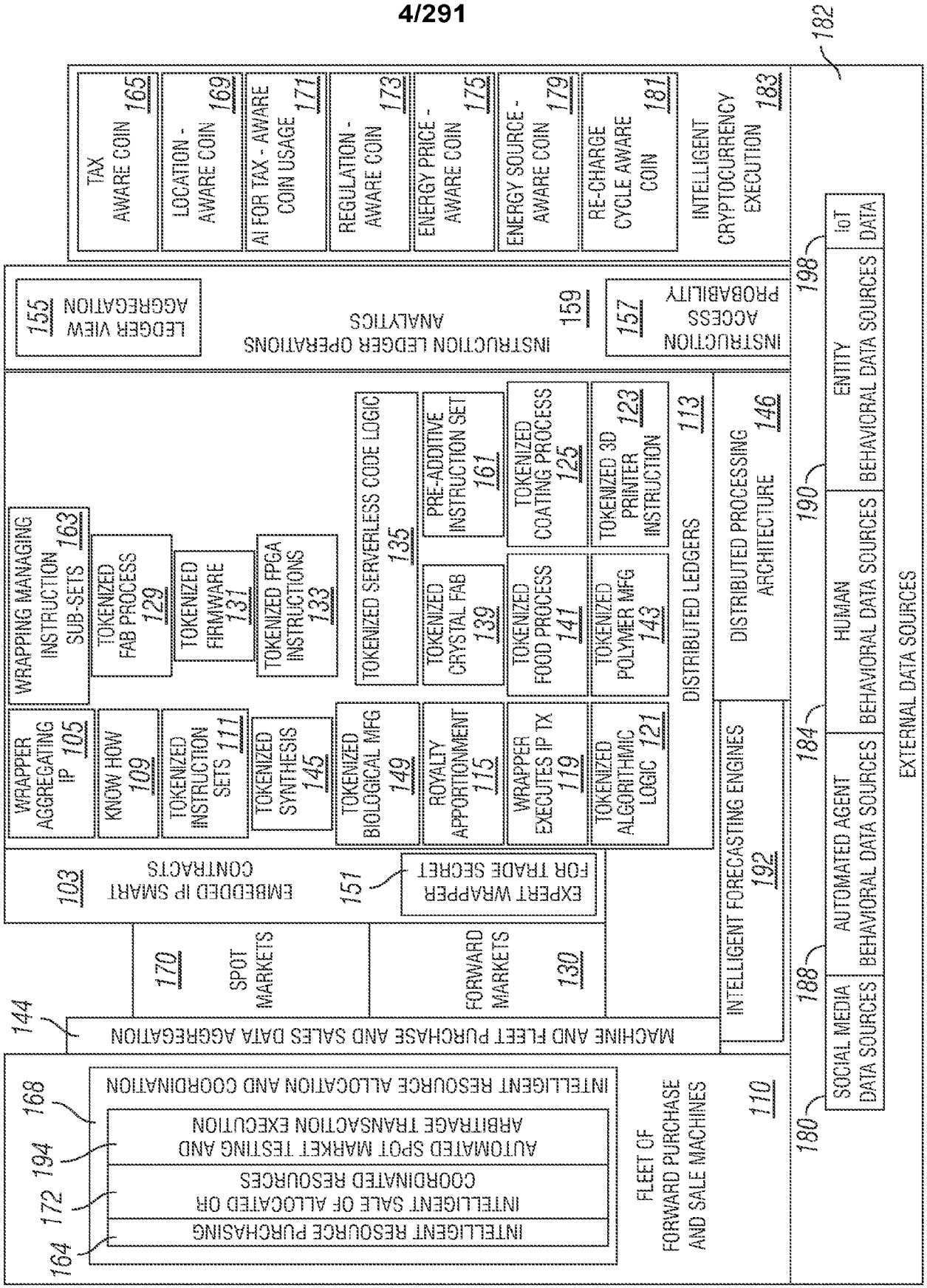

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INTELLIGENT RESOURCE ALLOCATION AND COORDINATION
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INTELLIGENT SALE OF ALLOCATED OR COORDINATED RESOURCES
164
INTELLIGENT RESOURCE PURCHASING

FIG. 3

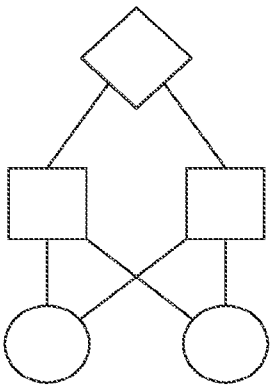


FIG. 6

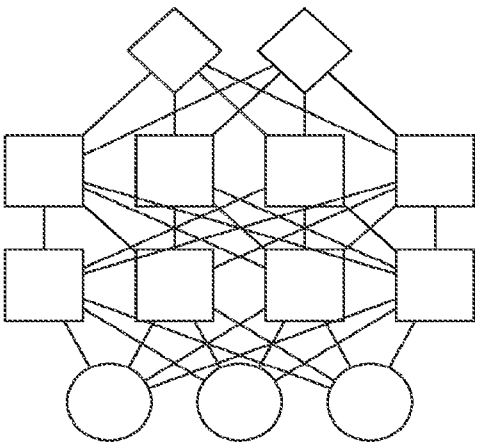


FIG. 8

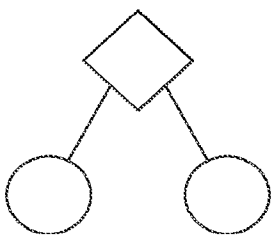


FIG. 5

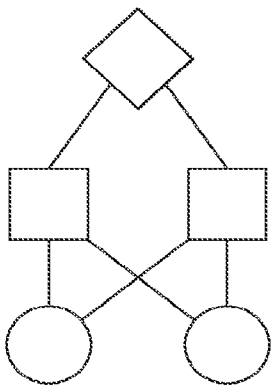


FIG. 7

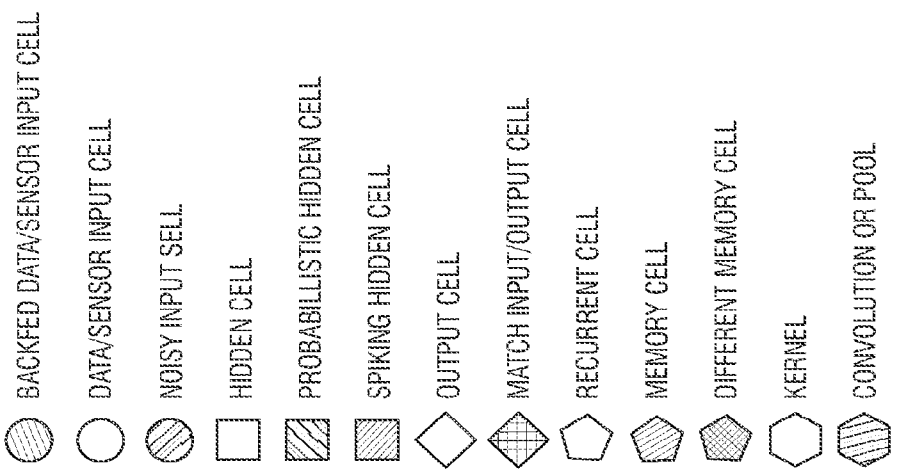


FIG. 4

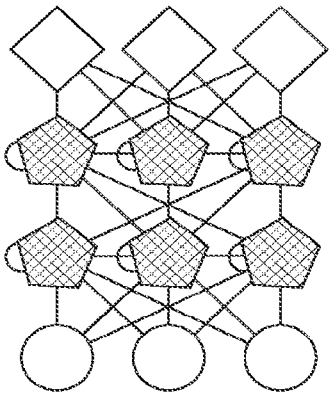


FIG. 11

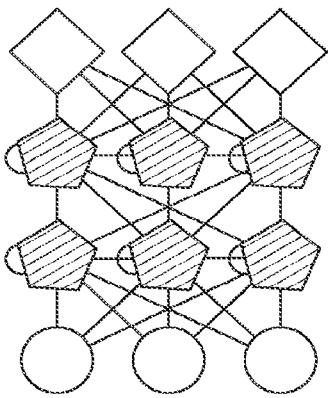


FIG. 10

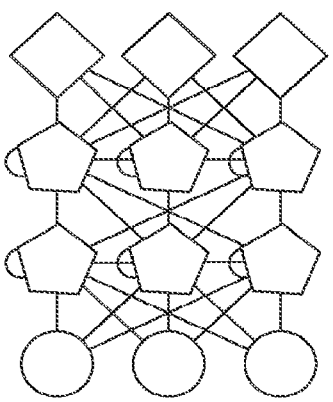


FIG. 9

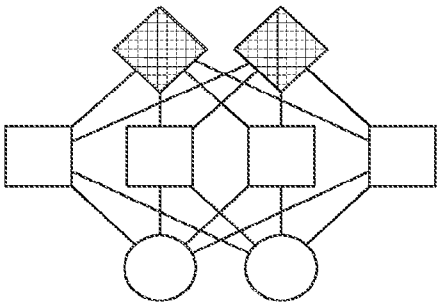


FIG. 15

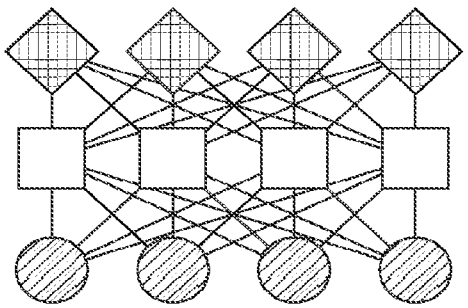


FIG. 14

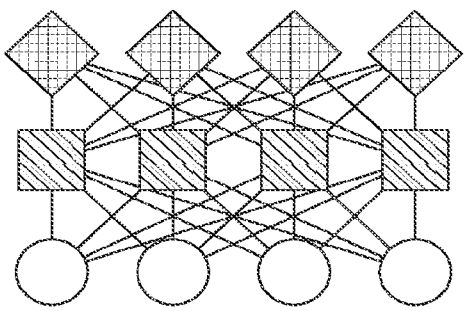


FIG. 13

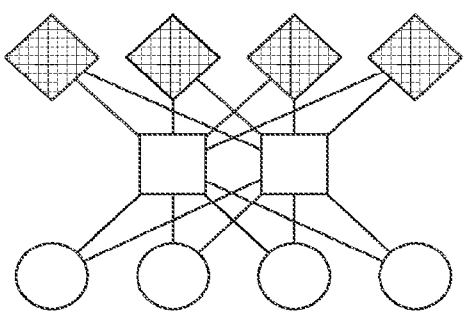


FIG. 12

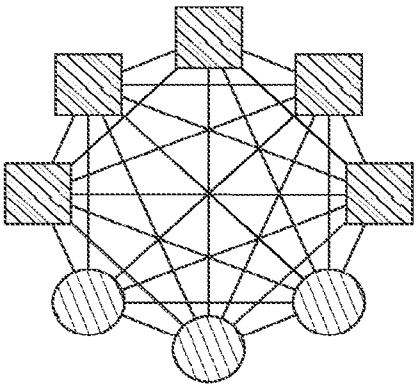


FIG. 18

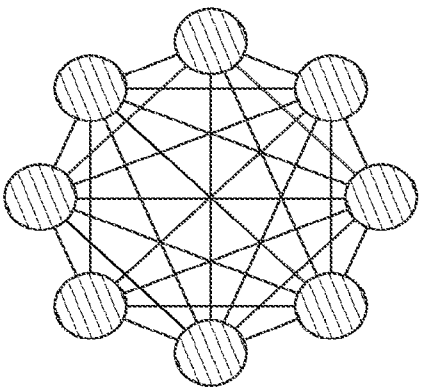


FIG. 17

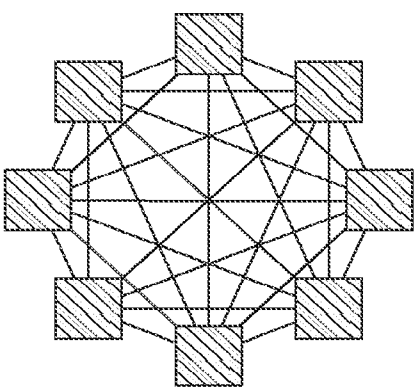


FIG. 16

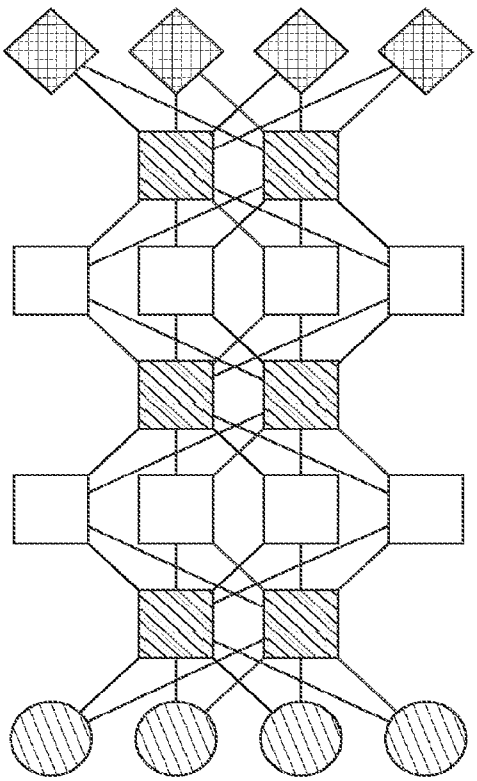


FIG. 20

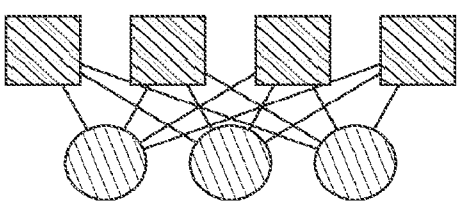


FIG. 19

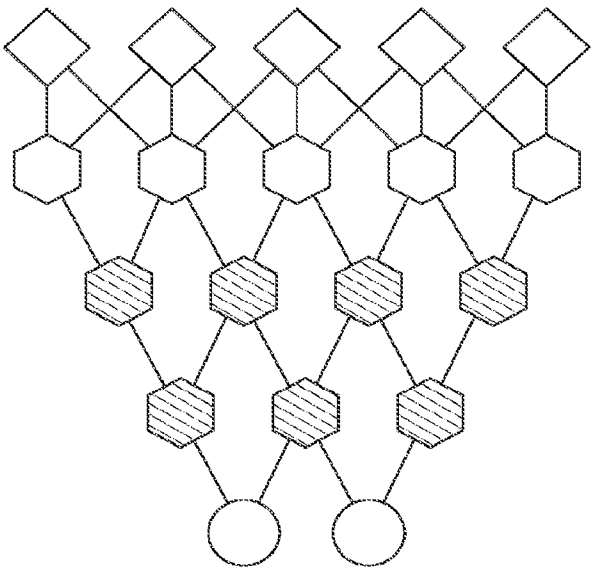


FIG. 22

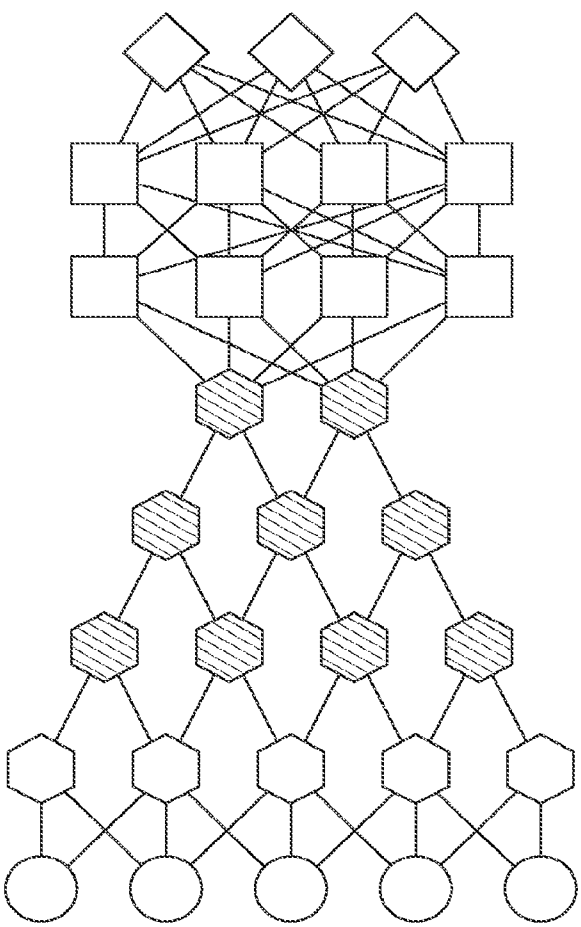


FIG. 21

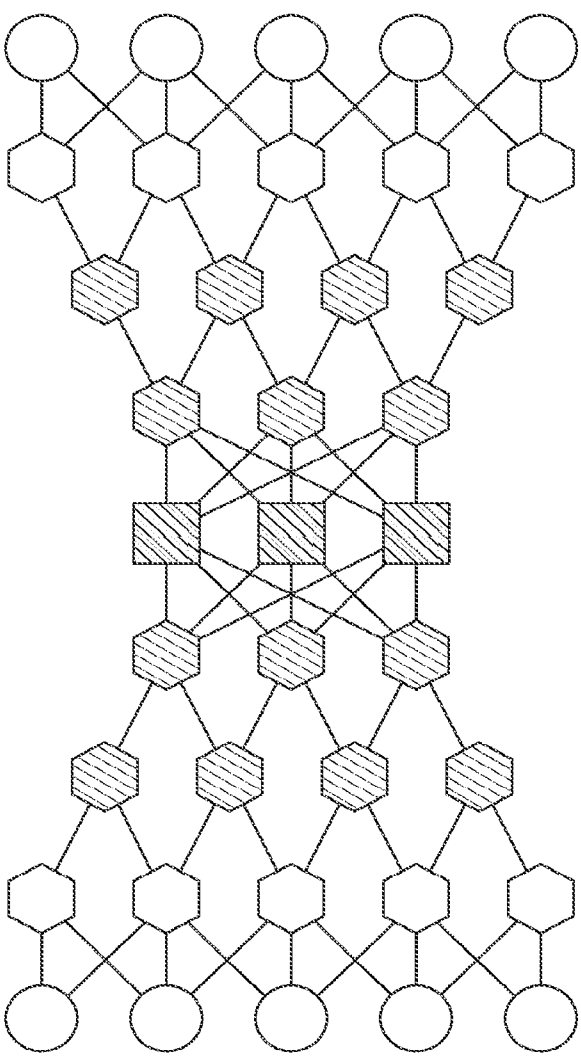


FIG. 23

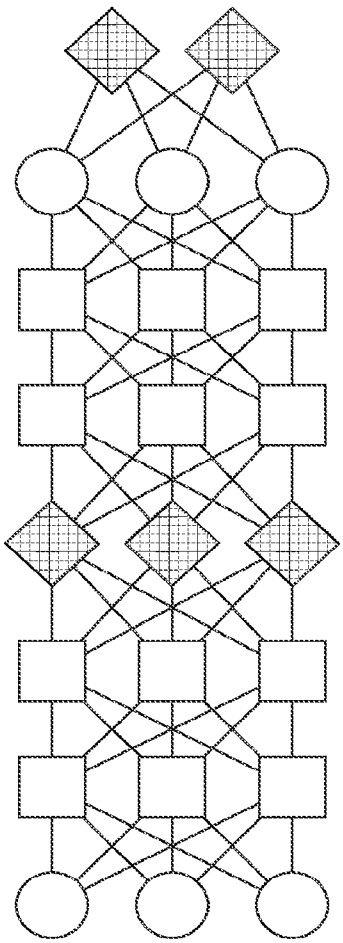


FIG. 24

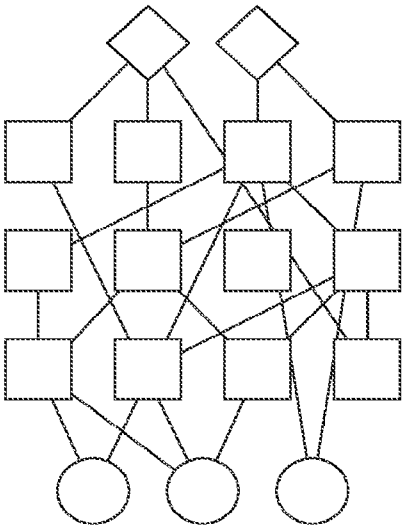


FIG. 26

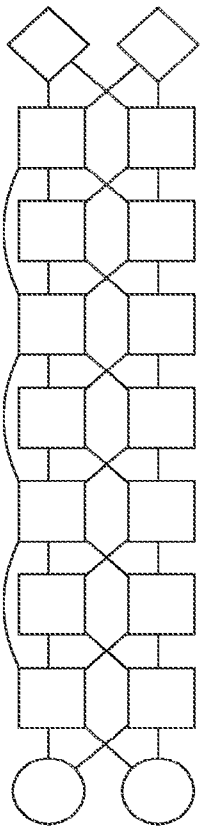


FIG. 28

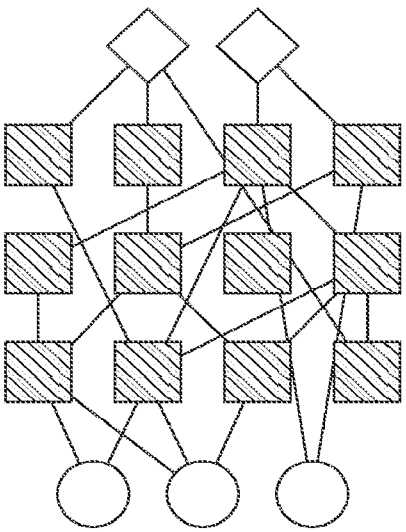


FIG. 25

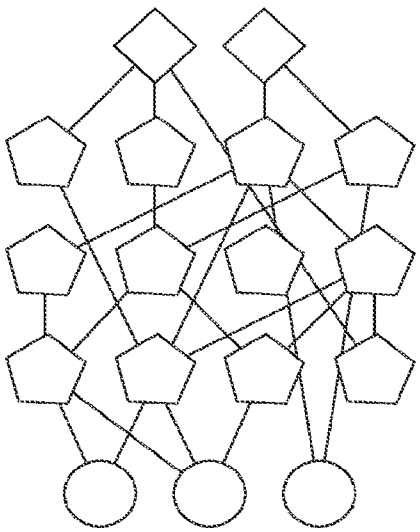


FIG. 27

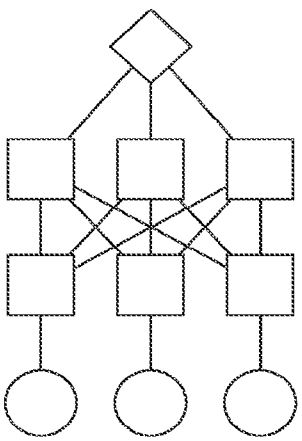


FIG. 30

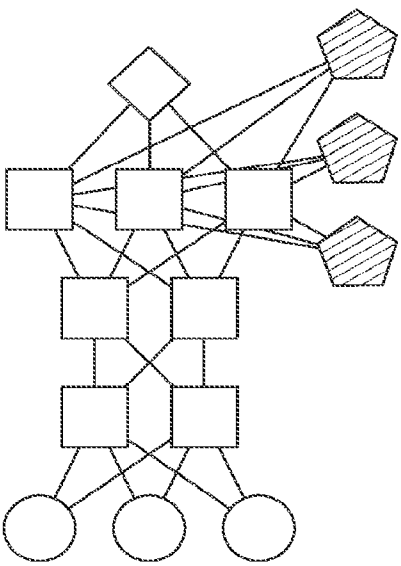


FIG. 31

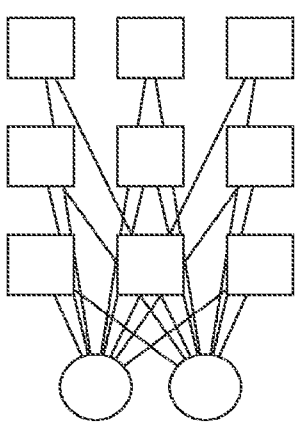


FIG. 29

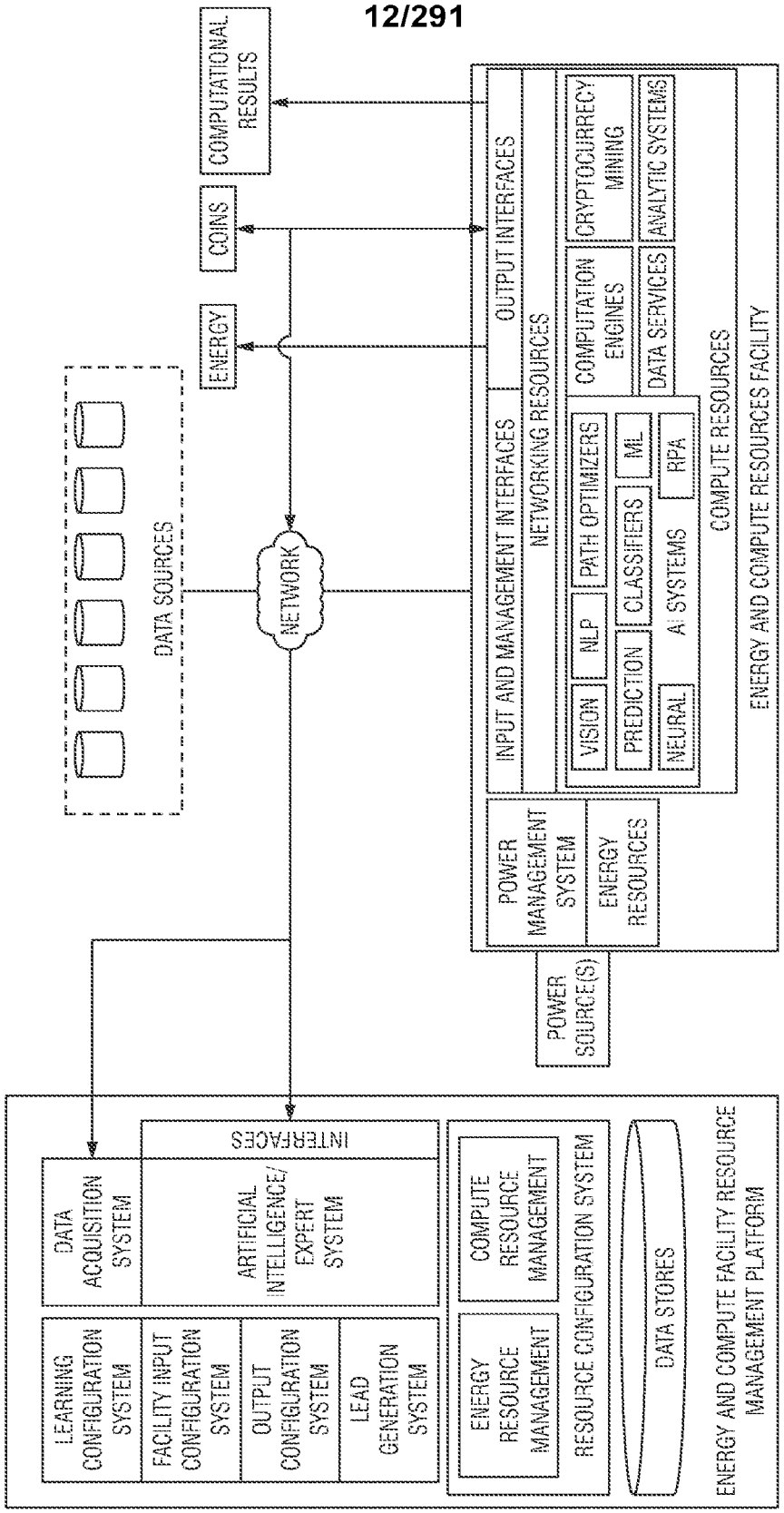

ENERGY AND COMPUTE FACILITY RESOURCE MANAGEMENT PLATFORM
LEARNING CONFIGURATION SYSTEM
FACILITY INPUT CONFIGURATION SYSTEM
OUTPUT CONFIGURATION SYSTEM
LEAD GENERATION SYSTEM
DATA ACQUISITION SYSTEM
INTERFACES
ARTIFICIAL INTELLIGENCE/ EXPERT SYSTEM
ENERGY RESOURCE MANAGEMENT
COMPUTE RESOURCE MANAGEMENT
RESOURCE CONFIGURATION SYSTEM
DATA STORES
POWER SOURCE(S)
POWER MANAGEMENT SYSTEM
ENERGY RESOURCES
ENERGY AND COMPUTE RESOURCES FACILITY
INPUT AND MANAGEMENT INTERFACES
OUTPUT INTERFACES
NETWORKING RESOURCES
COMPUTE RESOURCES
VISION
NLP
PATH OPTIMIZERS
PREDICTION
CLASSIFIERS
ML
NEURAL
AI SYSTEMS
RPA
COMPUTATION ENGINES
DATA SERVICES
CRYPTOCURRECY MINING
ANALYTIC SYSTEMS
NETWORK
DATA SOURCES
ENERGY
COINS
COMPUTATIONAL RESULTS

FIG. 32

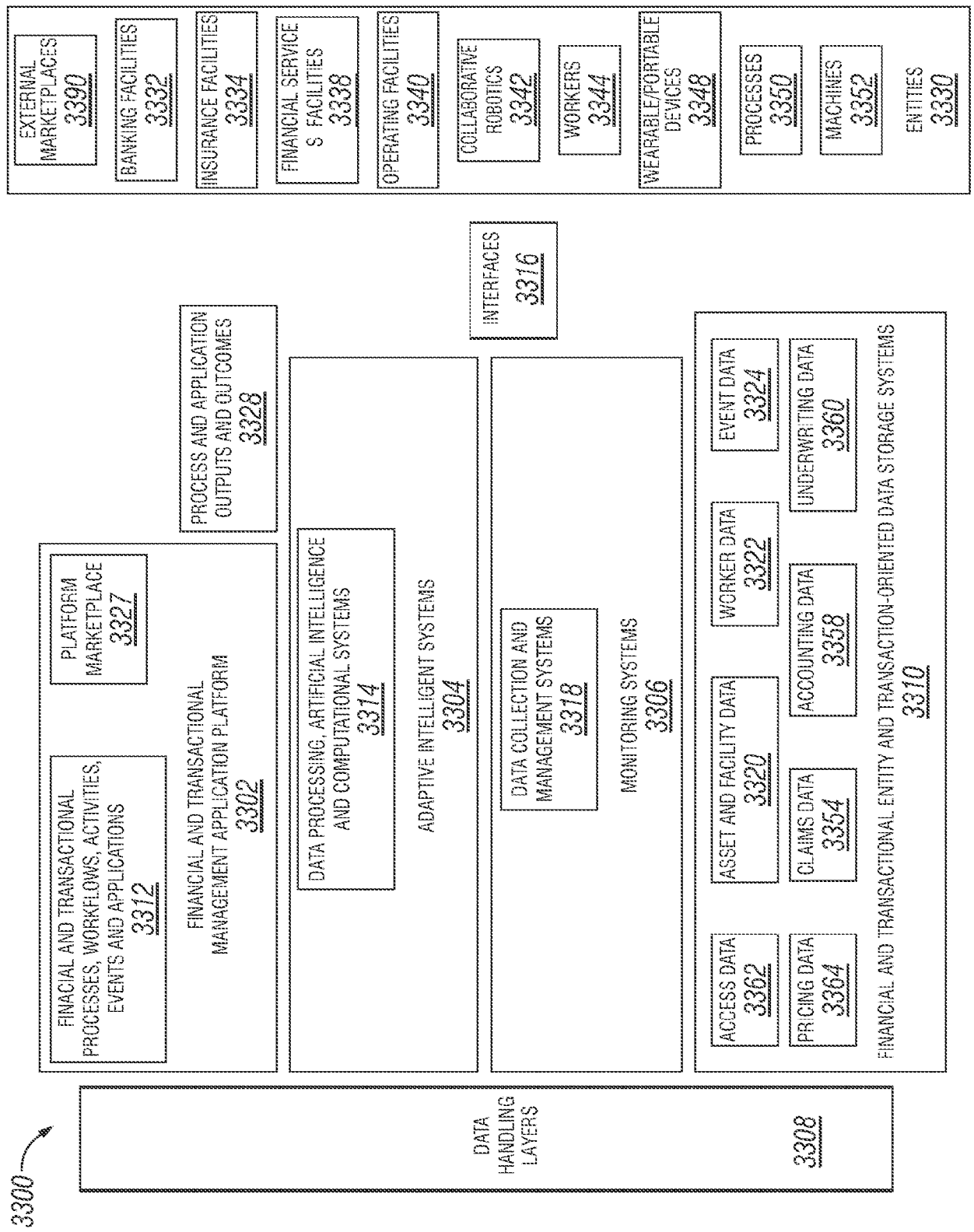

3300
DATA HANDLING LAYERS
3308
ACCESS DATA 3362
PRICING DATA 3364
ASSET AND FACILITY DATA 3320
CLAIMS DATA 3354
ACCOUNTING DATA 3358
WORKER DATA 3322
UNDERWRITING DATA 3360
EVENT DATA 3324
FINANCIAL AND TRANSACTIONAL ENTITY AND TRANSACTION-ORIENTED DATA STORAGE SYSTEMS 3310
DATA COLLECTION AND MANAGEMENT SYSTEMS 3318
MONITORING SYSTEMS 3306
DATA PROCESSING, ARTIFICIAL INTELLIGENCE AND COMPUTATIONAL SYSTEMS 3314
ADAPTIVE INTELLIGENT SYSTEMS 3304
FINACIAL AND TRANSACTIONAL PROCESSES, WORKFLOWS, ACTIVITIES, EVENTS AND APPLICATIONS 3312
PLATFORM MARKETPLACE 3327
FINANCIAL AND TRANSACTIONAL MANAGEMENT APPLICATION PLATFORM 3302
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
INTERFACES 3316
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330

FIG. 33

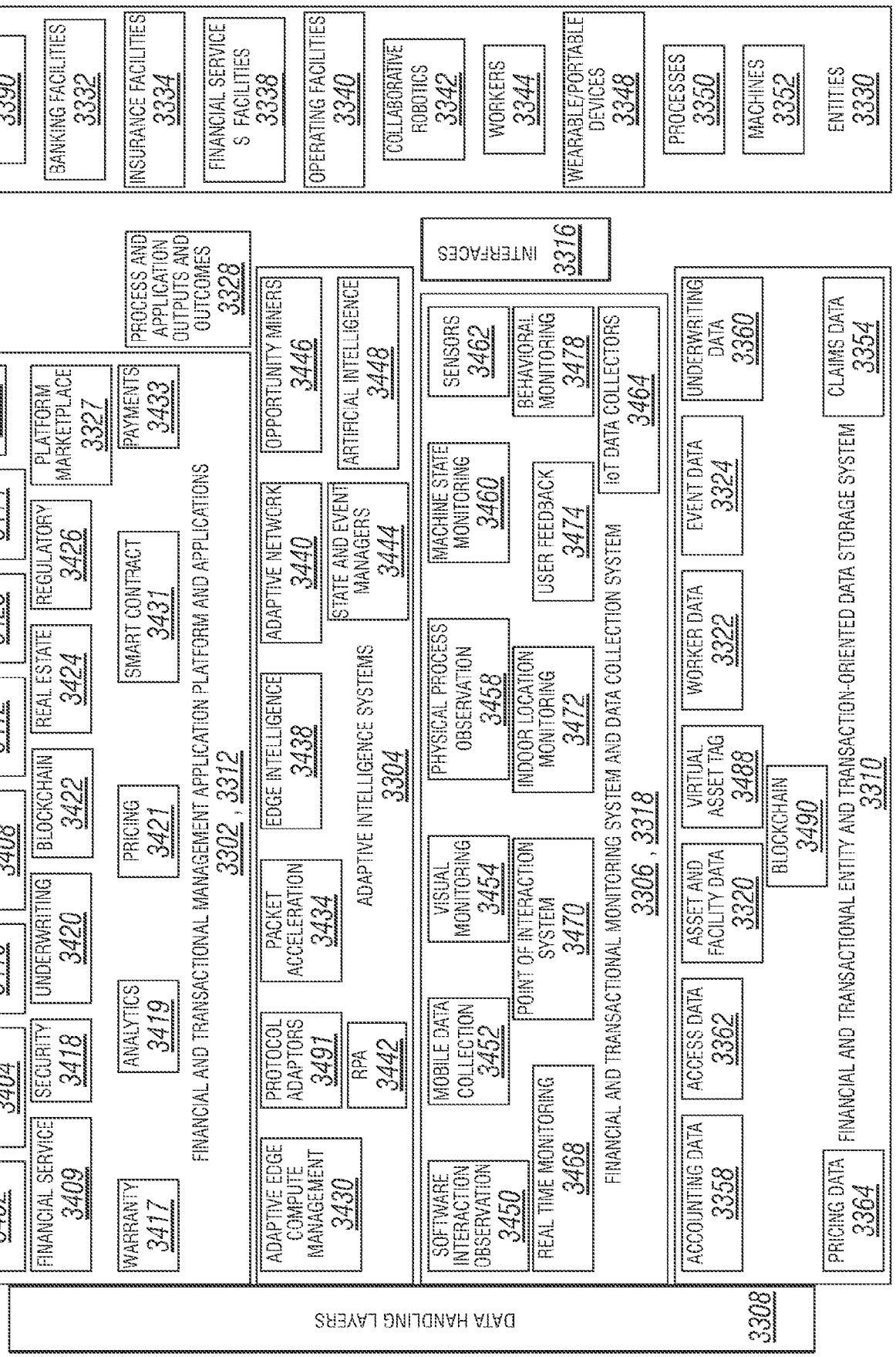

EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
INTERFACES 3316
SENSORS 3462
BEHAVIORAL MONITORING 3478
UNDERWRITING DATA 3360
CLAIMS DATA 3354
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
OPPORTUNITY MINERS 3446
ARTIFICIAL INTELLIGENCE 3448
PLATFORM MARKETPLACE 3327
PAYMENTS 3433
FRAUD 3416
TAX 3414
REGULATORY 3426
TRADING 3428
MARKETING 3412
RISK MANAGEMENT 3408
LENDING 3410
ASSET MANAGEMENT 3404
INVESTMENT 3402
FINANCIAL SERVICE 3409
SECURITY 3418
UNDERWRITING 3420
BLOCKCHAIN 3422
REAL ESTATE 3424
WARRANTY 3417
ANALYTICS 3419
PRICING 3421
SMART CONTRACT 3431
FINANCIAL AND TRANSACTIONAL MANAGEMENT APPLICATION PLATFORM AND APPLICATIONS 3302 , 3312
ADAPTIVE EDGE COMPUTE MANAGEMENT 3430
PROTOCOL ADAPTORS 3491
RPA 3442
PACKET ACCELERATION 3434
EDGE INTELLIGENCE 3438
ADAPTIVE NETWORK 3440
STATE AND EVENT MANAGERS 3444
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
MOBILE DATA COLLECTION 3452
VISUAL MONITORING 3454
PHYSICAL PROCESS OBSERVATION 3458
MACHINE STATE MONITORING 3460
REAL TIME MONITORING 3468
POINT OF INTERACTION SYSTEM 3470
INDOOR LOCATION MONITORING 3472
USER FEEDBACK 3474
IoT DATA COLLECTORS 3464
FINANCIAL AND TRANSACTIONAL MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
ACCOUNTING DATA 3358
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
VIRTUAL ASSET TAG 3488
WORKER DATA 3322
EVENT DATA 3324
BLOCKCHAIN 3490
PRICING DATA 3364
FINANCIAL AND TRANSACTIONAL ENTITY AND TRANSACTION-ORIENTED DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 34

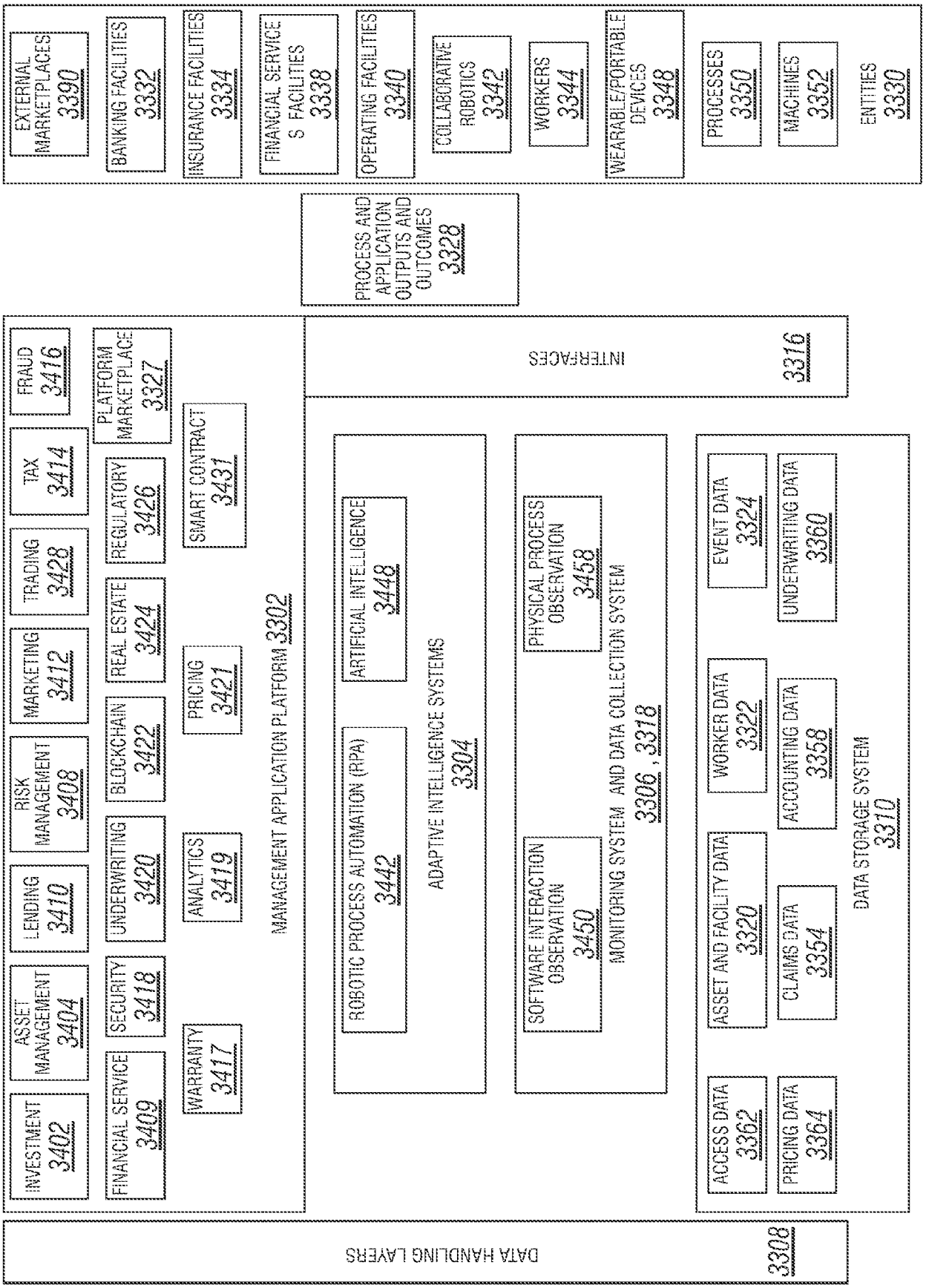

EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
INTERFACES 3316
INVESTMENT 3402
ASSET MANAGEMENT 3404
LENDING 3410
RISK MANAGEMENT 3408
MARKETING 3412
TRADING 3428
TAX 3414
FRAUD 3416
PLATFORM MARKETPLACE 3327
SMART CONTRACT 3431
REGULATORY 3426
REAL ESTATE 3424
BLOCKCHAIN 3422
PRICING 3421
UNDERWRITING 3420
ANALYTICS 3419
SECURITY 3418
WARRANTY 3417
FINANCIAL SERVICE 3409
MANAGEMENT APPLICATION PLATFORM 3302
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
EVENT DATA 3324
PRICING DATA 3364
CLAIMS DATA 3354
ACCOUNTING DATA 3358
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 35

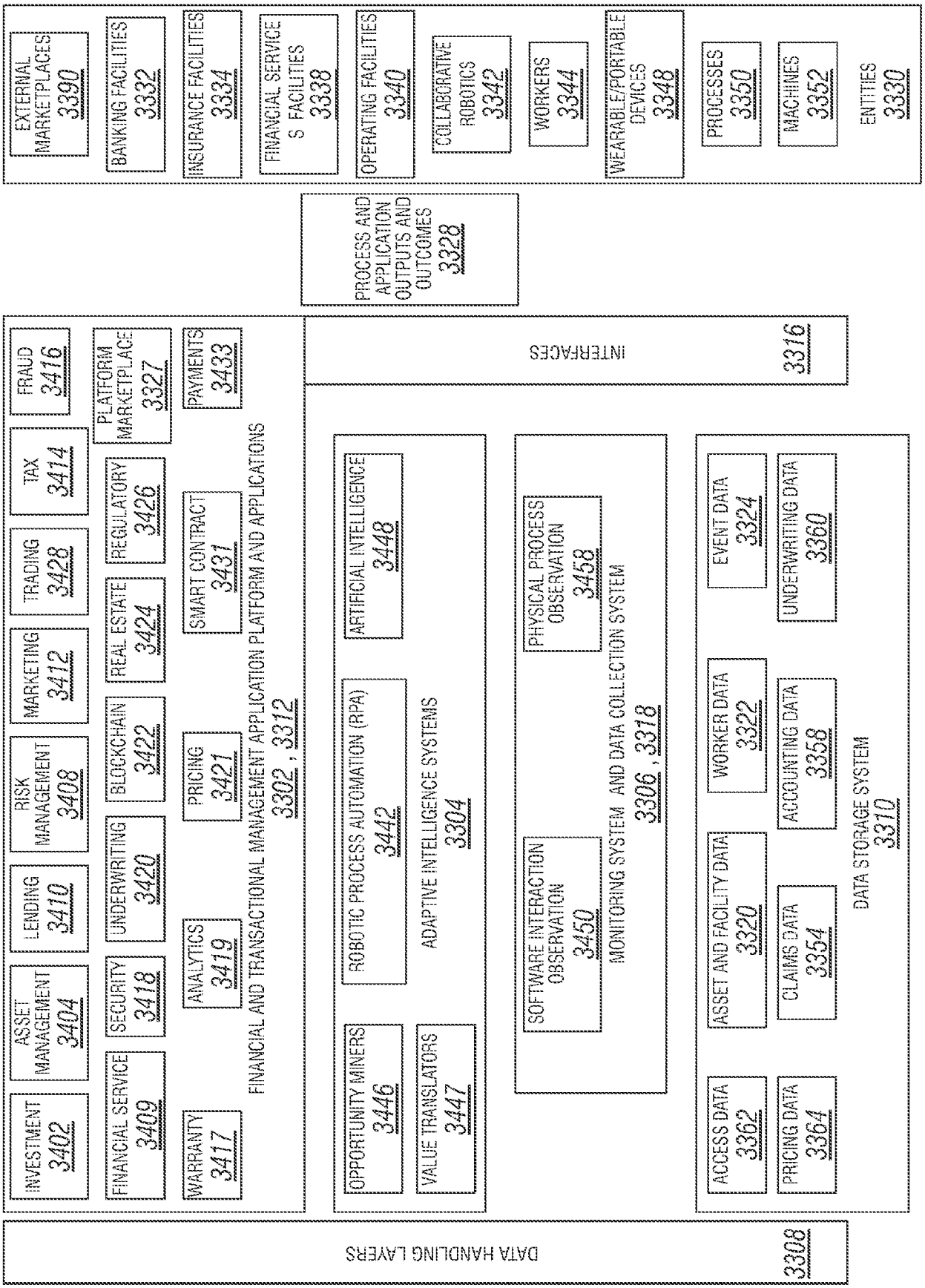

DATA HANDLING LAYERS
3308
INVESTMENT 3402
ASSET MANAGEMENT 3404
LENDING 3410
RISK MANAGEMENT 3408
MARKETING 3412
TRADING 3428
TAX 3414
FRAUD 3416
FINANCIAL SERVICE 3409
SECURITY 3418
UNDERWRITING 3420
BLOCKCHAIN 3422
REAL ESTATE 3424
REGULATORY 3426
PLATFORM MARKETPLACE 3327
WARRANTY 3417
ANALYTICS 3419
PRICING 3421
SMART CONTRACT 3431
PAYMENTS 3433
FINANCIAL AND TRANSACTIONAL MANAGEMENT APPLICATION PLATFORM AND APPLICATIONS
3302 , 3312
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
VALUE TRANSLATORS 3447
ADAPTIVE INTELLIGENCE SYSTEMS
3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM
3306 , 3318
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
EVENT DATA 3324
PRICING DATA 3364
CLAIMS DATA 3354
ACCOUNTING DATA 3358
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM
3310
INTERFACES
3316
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330

FIG. 36

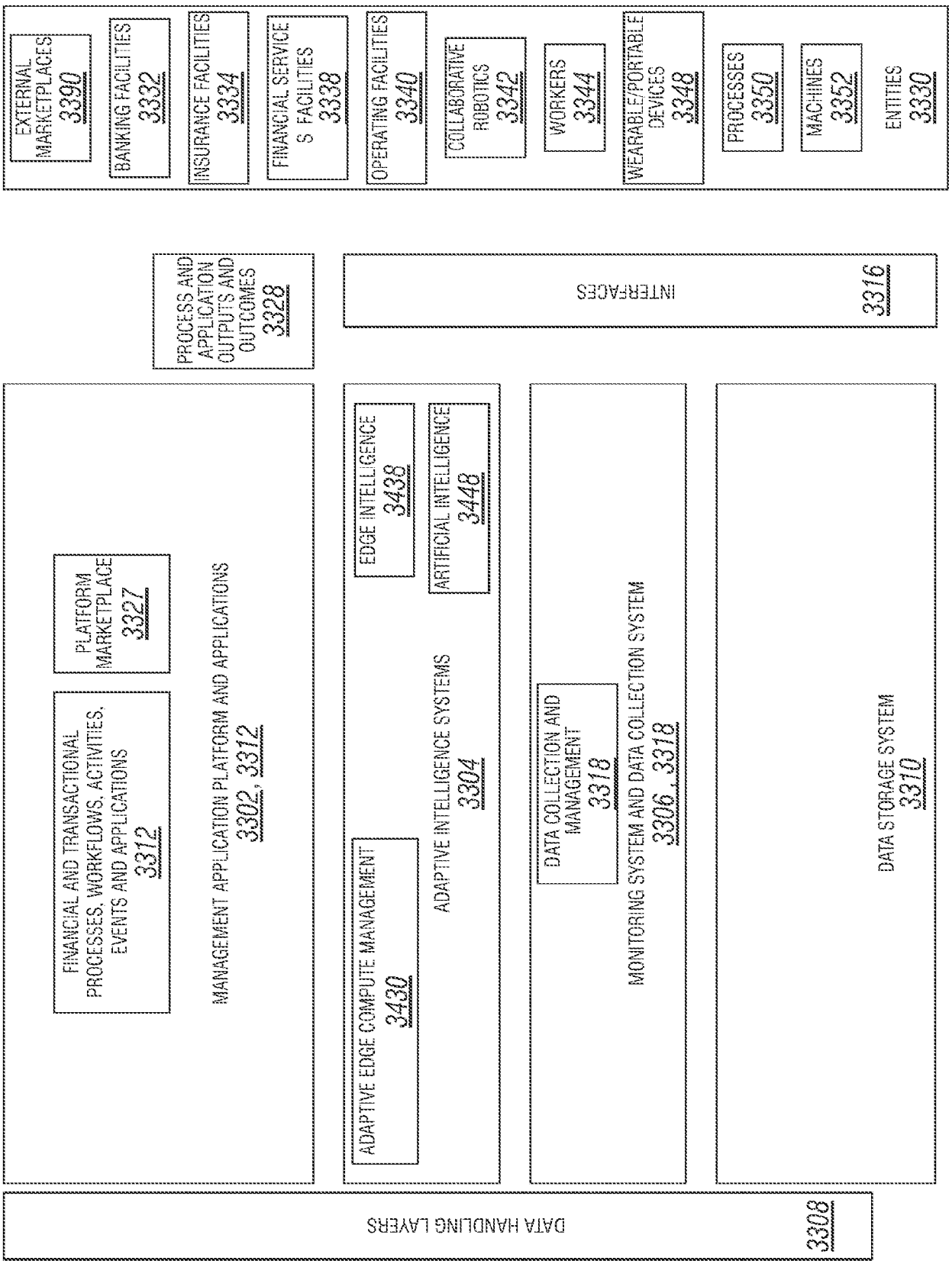

EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
INTERFACES 3316
FINANCIAL AND TRANSACTIONAL PROCESSES, WORKFLOWS, ACTIVITIES, EVENTS AND APPLICATIONS 3312
PLATFORM MARKETPLACE 3327
MANAGEMENT APPLICATION PLATFORM AND APPLICATIONS 3302, 3312
ADAPTIVE EDGE COMPUTE MANAGEMENT 3430
EDGE INTELLIGENCE 3438
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
DATA COLLECTION AND MANAGEMENT 3318
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 37

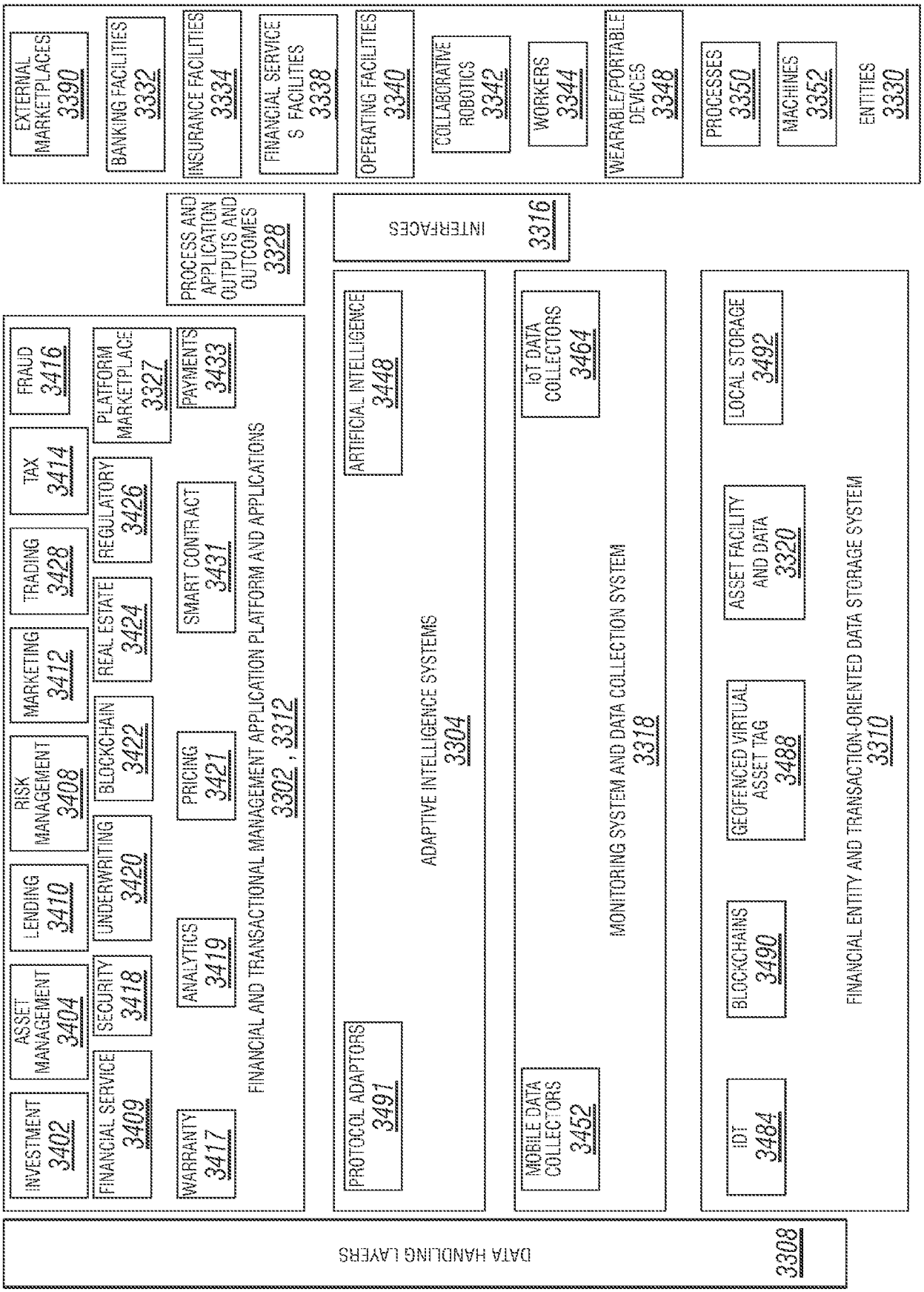

DATA HANDLING LAYERS
3308
IDT
3484
BLOCKCHAINS
3490
GEOFENCED VIRTUAL ASSET TAG
3488
ASSET FACILITY AND DATA
3320
LOCAL STORAGE
3492
FINANCIAL ENTITY AND TRANSACTION-ORIENTED DATA STORAGE SYSTEM
3310
MOBILE DATA COLLECTORS
3452
IOT DATA COLLECTORS
3464
MONITORING SYSTEM AND DATA COLLECTION SYSTEM
3318
PROTOCOL ADAPTORS
3491
ARTIFICIAL INTELLIGENCE
3448
ADAPTIVE INTELLIGENCE SYSTEMS
3304
WARRANTY
3417
FINANCIAL SERVICE
3409
INVESTMENT
3402
ANALYTICS
3419
SECURITY
3418
ASSET MANAGEMENT
3404
PRICING
3421
UNDERWRITING
3420
LENDING
3410
SMART CONTRACT
3431
BLOCKCHAIN
3422
RISK MANAGEMENT
3408
PAYMENTS
3433
REAL ESTATE
3424
MARKETING
3412
PLATFORM MARKETPLACE
3327
REGULATORY
3426
TRADING
3428
TAX
3414
FRAUD
3416
FINANCIAL AND TRANSACTIONAL MANAGEMENT APPLICATION PLATFORM AND APPLICATIONS
3302 , 3312
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES
3328
INTERFACES
3316
EXTERNAL MARKETPLACES
3390
BANKING FACILITIES
3332
INSURANCE FACILITIES
3334
FINANCIAL SERVICES FACILITIES
3338
OPERATING FACILITIES
3340
COLLABORATIVE ROBOTICS
3342
WORKERS
3344
WEARABLE/PORTABLE DEVICES
3348
PROCESSES
3350
MACHINES
3352
ENTITIES
3330

FIG. 38

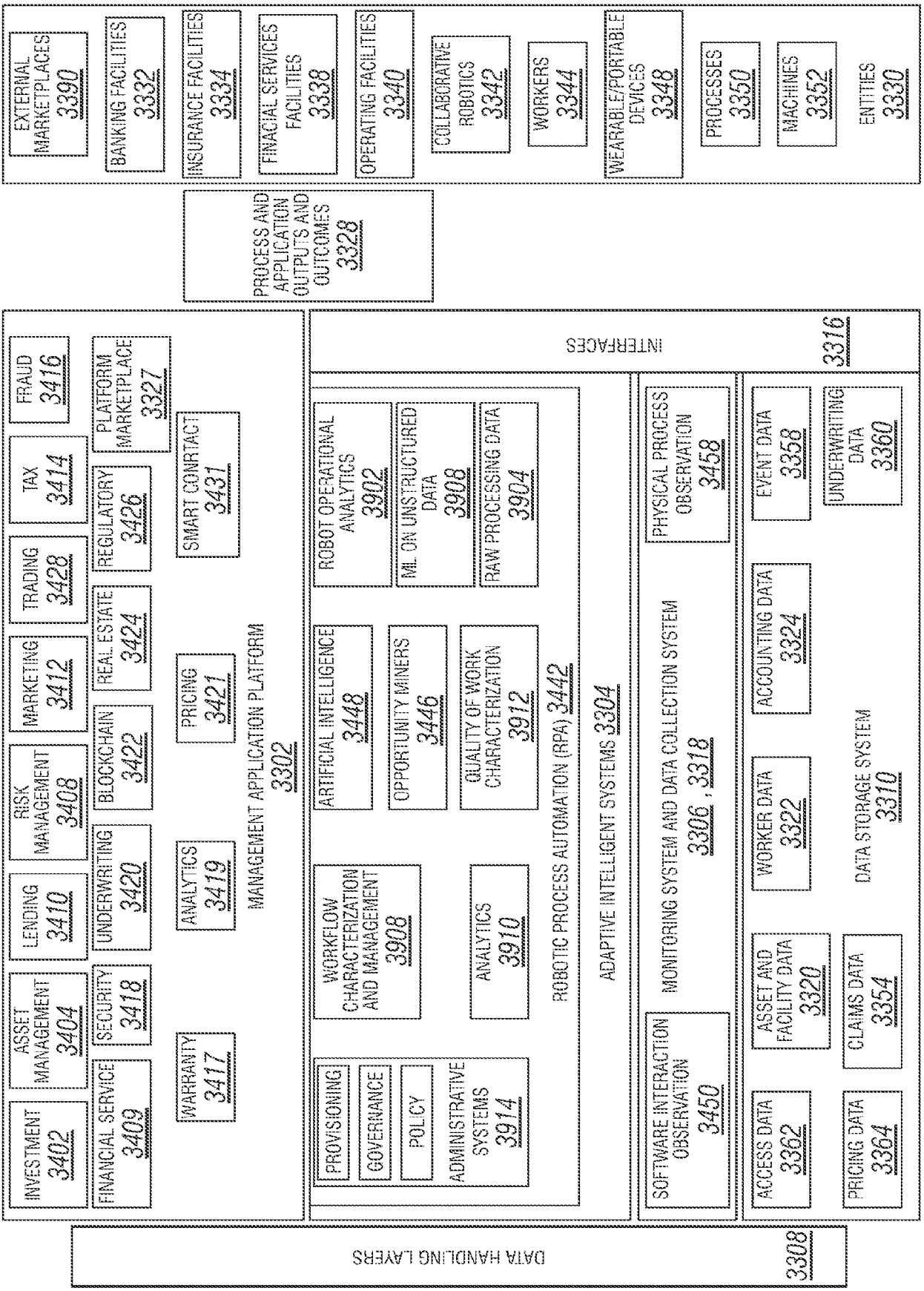

DATA HANDLING LAYERS 3308
MANAGEMENT APPLICATION PLATFORM 3302
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ASSET MANAGEMENT 3404
LENDING 3410
RISK MANAGEMENT 3408
MARKETING 3412
TRADING 3428
TAX 3414
FRAUD 3416
FINANCIAL SERVICE 3409
SECURITY 3418
UNDERWRITING 3420
BLOCKCHAIN 3422
REAL ESTATE 3424
REGULATORY 3426
PLATFORM MARKETPLACE 3327
WARRANTY 3417
ANALYTICS 3419
PRICING 3421
SMART CONRTACT 3431
ADMINISTRATIVE SYSTEMS 3914
PROVISIONING
GOVERNANCE
POLICY
WORKFLOW CHARACTERIZATION AND MANAGEMENT 3908
ANALYTICS 3910
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
OPPORTUNITY MINERS 3446
QUALITY OF WORK CHARACTERIZATION 3912
ADAPTIVE INTELLIGENT SYSTEMS 3304
ROBOT OPERATIONAL ANALYTICS 3902
ML ON UNSTRUCTURED DATA 3908
RAW PROCESSING DATA 3904
INTERFACES 3316
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINACIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
SOFTWARE INTERACTION OBSERVATION 3450
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
PHYSICAL PROCESS OBSERVATION 3458
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
ACCOUNTING DATA 3324
EVENT DATA 3358
UNDERWRITTING DATA 3360
PRICING DATA 3364
CLAIMS DATA 3354
DATA STORAGE SYSTEM 3310

FIG. 39

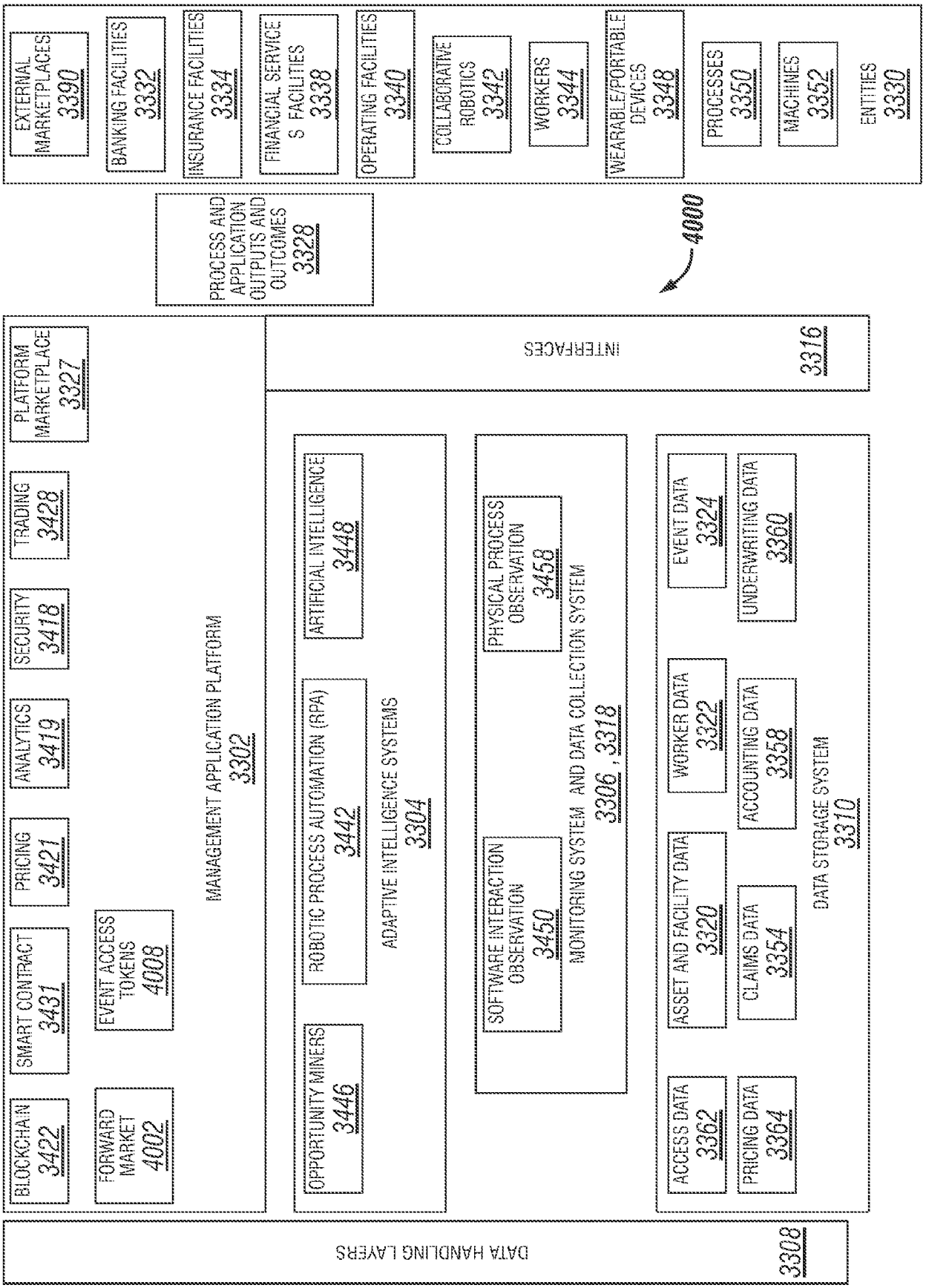

DATA HANDLING LAYERS
3308
BLOCKCHAIN 3422
SMART CONTRACT 3431
PRICING 3421
ANALYTICS 3419
SECURITY 3418
TRADING 3428
PLATFORM MARKETPLACE 3327
FORWARD MARKET 4002
EVENT ACCESS TOKENS 4008
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
INTERFACES 3316
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
EVENT DATA 3324
PRICING DATA 3364
CLAIMS DATA 3354
ACCOUNTING DATA 3358
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM 3310
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4000
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330

FIG. 40

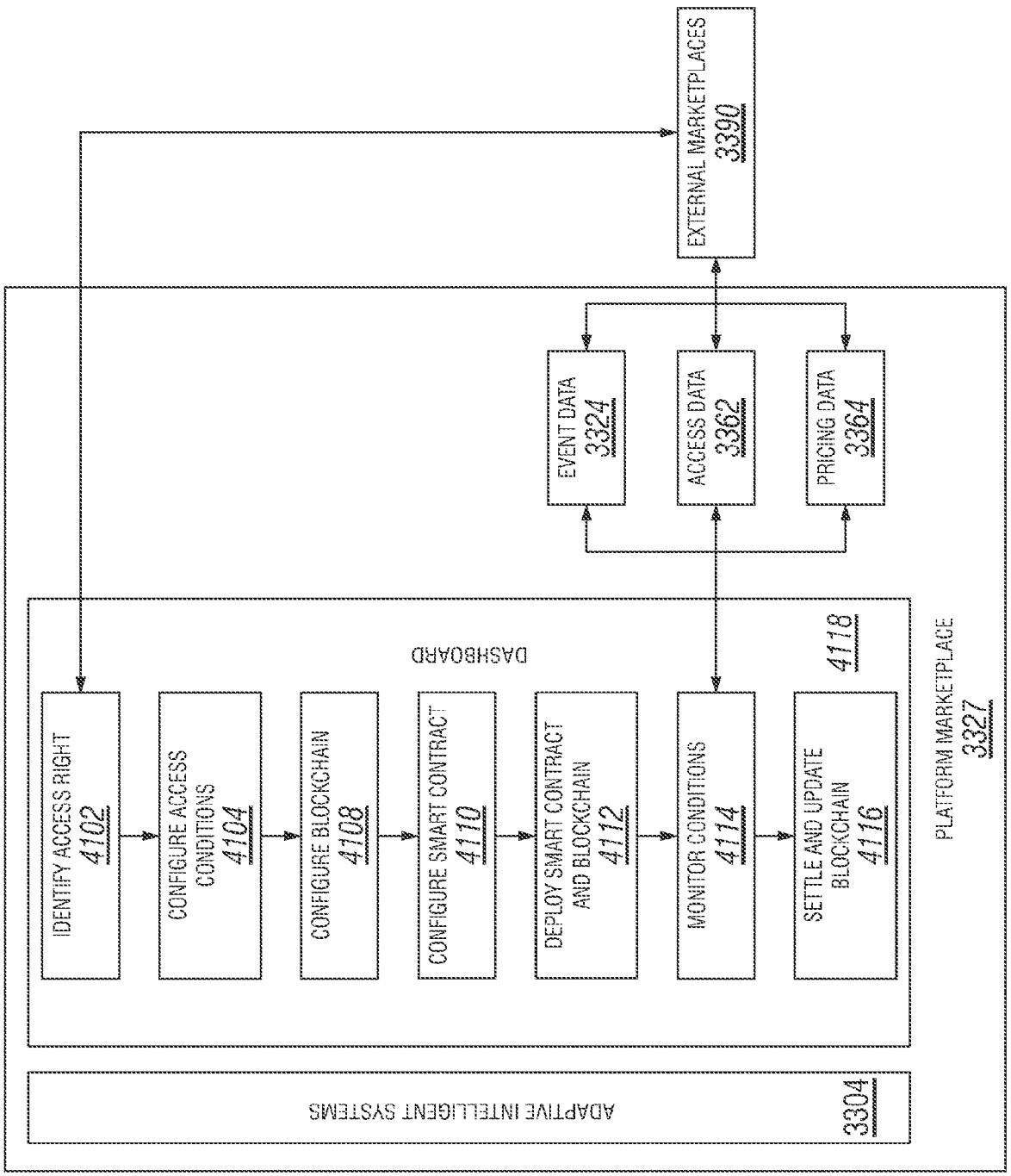

EXTERNAL MARKETPLACES
3390
EVENT DATA
3324
ACCESS DATA
3362
PRICING DATA
3364
PLATFORM MARKETPLACE
3327
DASHBOARD
4118
IDENTIFY ACCESS RIGHT
4102
CONFIGURE ACCESS CONDITIONS
4104
CONFIGURE BLOCKCHAIN
4108
CONFIGURE SMART CONTRACT
4110
DEPLOY SMART CONTRACT AND BLOCKCHAIN
4112
MONITOR CONDITIONS
4114
SETTLE AND UPDATE BLOCKCHAIN
4116
ADAPTIVE INTELLIGENT SYSTEMS
3304

FIG. 41

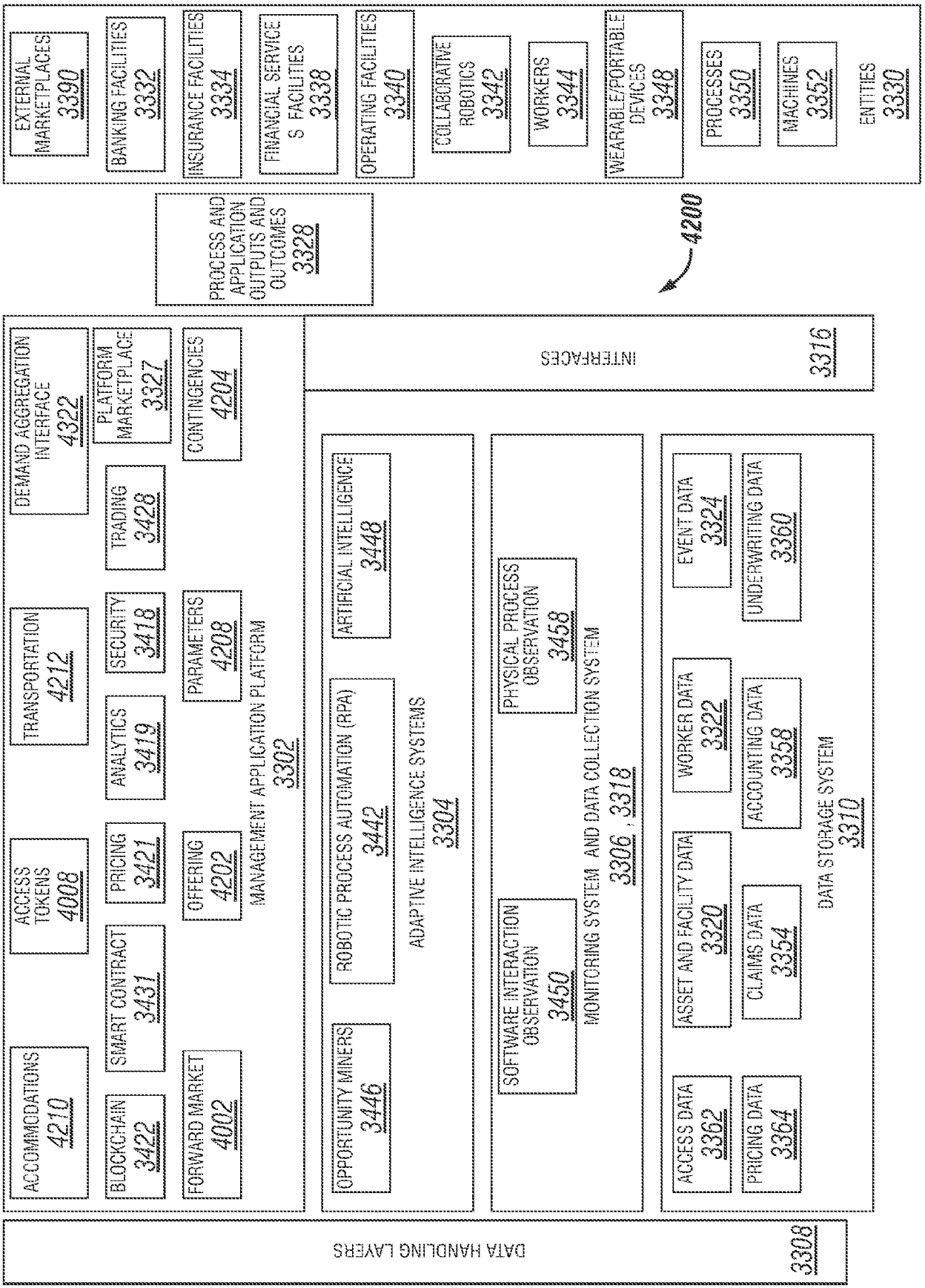

DATA HANDLING LAYERS
3308
ACCOMMODATIONS 4210
BLOCKCHAIN 3422
FORWARD MARKET 4002
ACCESS TOKENS 4008
SMART CONTRACT 3431
PRICING 3421
OFFERING 4202
ANALYTICS 3419
SECURITY 3418
PARAMETERS 4208
TRANSPORTATION 4212
TRADING 3428
CONTINGENCIES 4204
DEMAND AGGREGATION INTERFACE 4322
PLATFORM MARKETPLACE 3327
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
ACCESS DATA 3362
PRICING DATA 3364
ASSET AND FACILITY DATA 3320
CLAIMS DATA 3354
WORKER DATA 3322
ACCOUNTING DATA 3358
EVENT DATA 3324
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM 3310
INTERFACES 3316
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4200
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330

FIG. 42

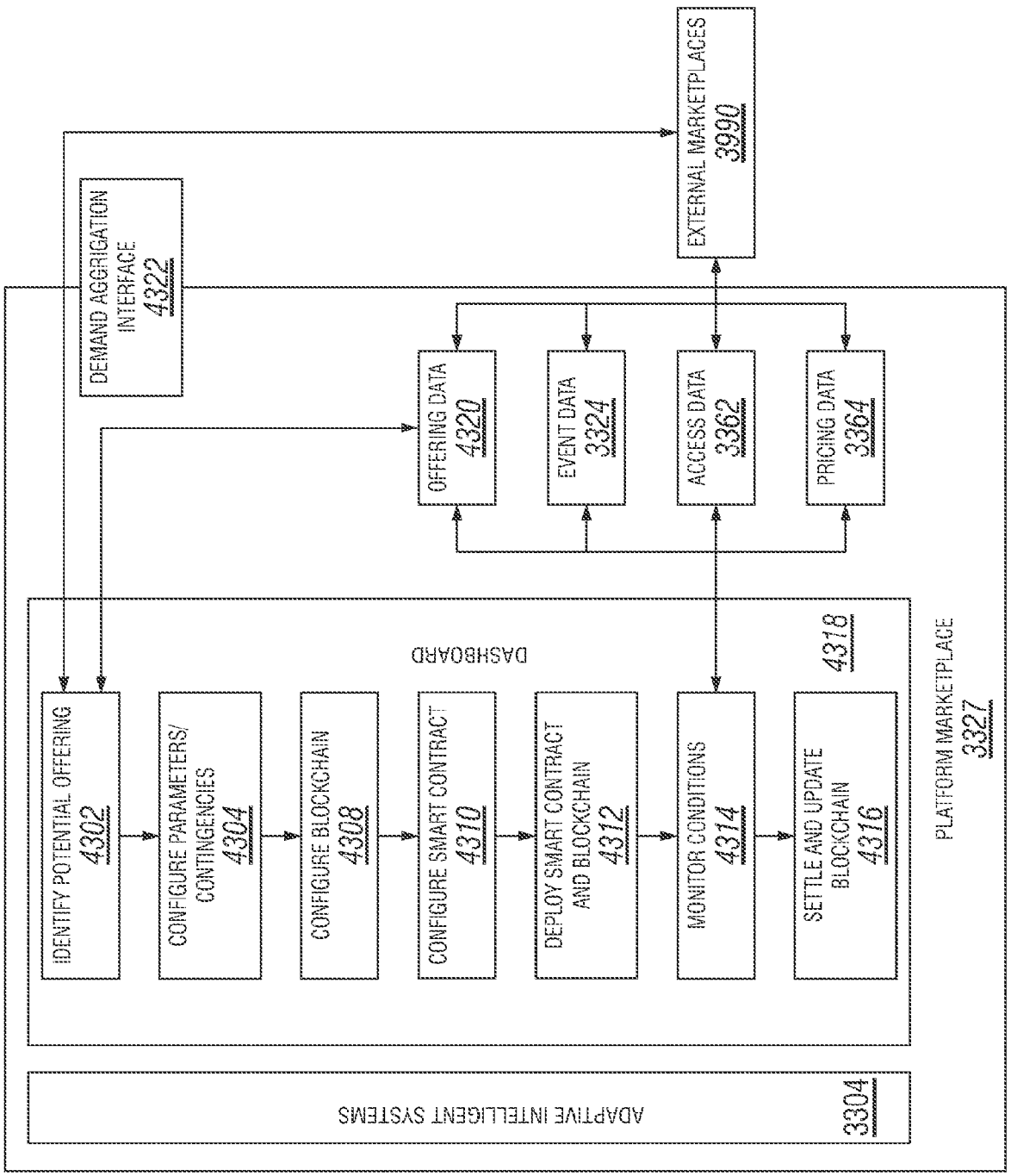

EXTERNAL MARKETPLACES
3990
DEMAND AGGRIGATION INTERFACE
4322
OFFERING DATA
4320
EVENT DATA
3324
ACCESS DATA
3362
PRICING DATA
3364
DASHBOARD
4318
IDENTIFY POTENTIAL OFFERING
4302
CONFIGURE PARAMETERS/ CONTINGENCIES
4304
CONFIGURE BLOCKCHAIN
4308
CONFIGURE SMART CONTRACT
4310
DEPLOY SMART CONTRACT AND BLOCKCHAIN
4312
MONITOR CONDITIONS
4314
SETTLE AND UPDATE BLOCKCHAIN
4316
PLATFORM MARKETPLACE
3327
ADAPTIVE INTELLIGENT SYSTEMS
3304

FIG. 43

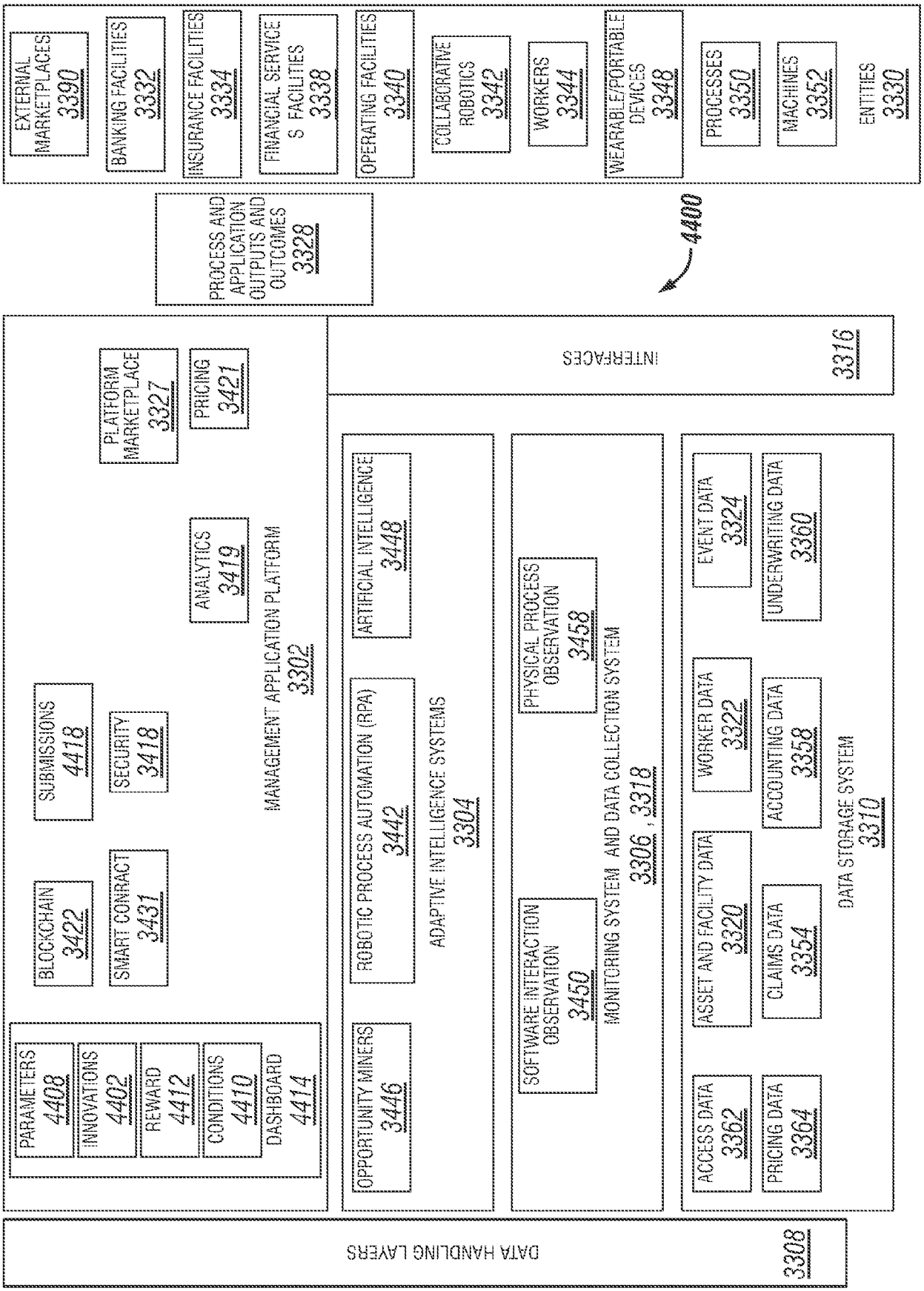

EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
4400
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
INTERFACES 3316
PLATFORM MARKETPLACE 3327
PRICING 3421
ANALYTICS 3419
SUBMISSIONS 4418
SECURITY 3418
BLOCKCHAIN 3422
SMART CONRACT 3431
MANAGEMENT APPLICATION PLATFORM 3302
PARAMETERS 4408
INNOVATIONS 4402
REWARD 4412
CONDITIONS 4410
DASHBOARD 4414
ARTIFICIAL INTELLIGENCE 3448
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
OPPORTUNITY MINERS 3446
PHYSICAL PROCESS OBSERVATION 3458
SOFTWARE INTERACTION OBSERVATION 3450
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
EVENT DATA 3324
UNDERWRITING DATA 3360
WORKER DATA 3322
ASSET AND FACILITY DATA 3320
ACCOUNTING DATA 3358
CLAIMS DATA 3354
DATA STORAGE SYSTEM 3310
ACCESS DATA 3362
PRICING DATA 3364
DATA HANDLING LAYERS 3308

FIG. 44

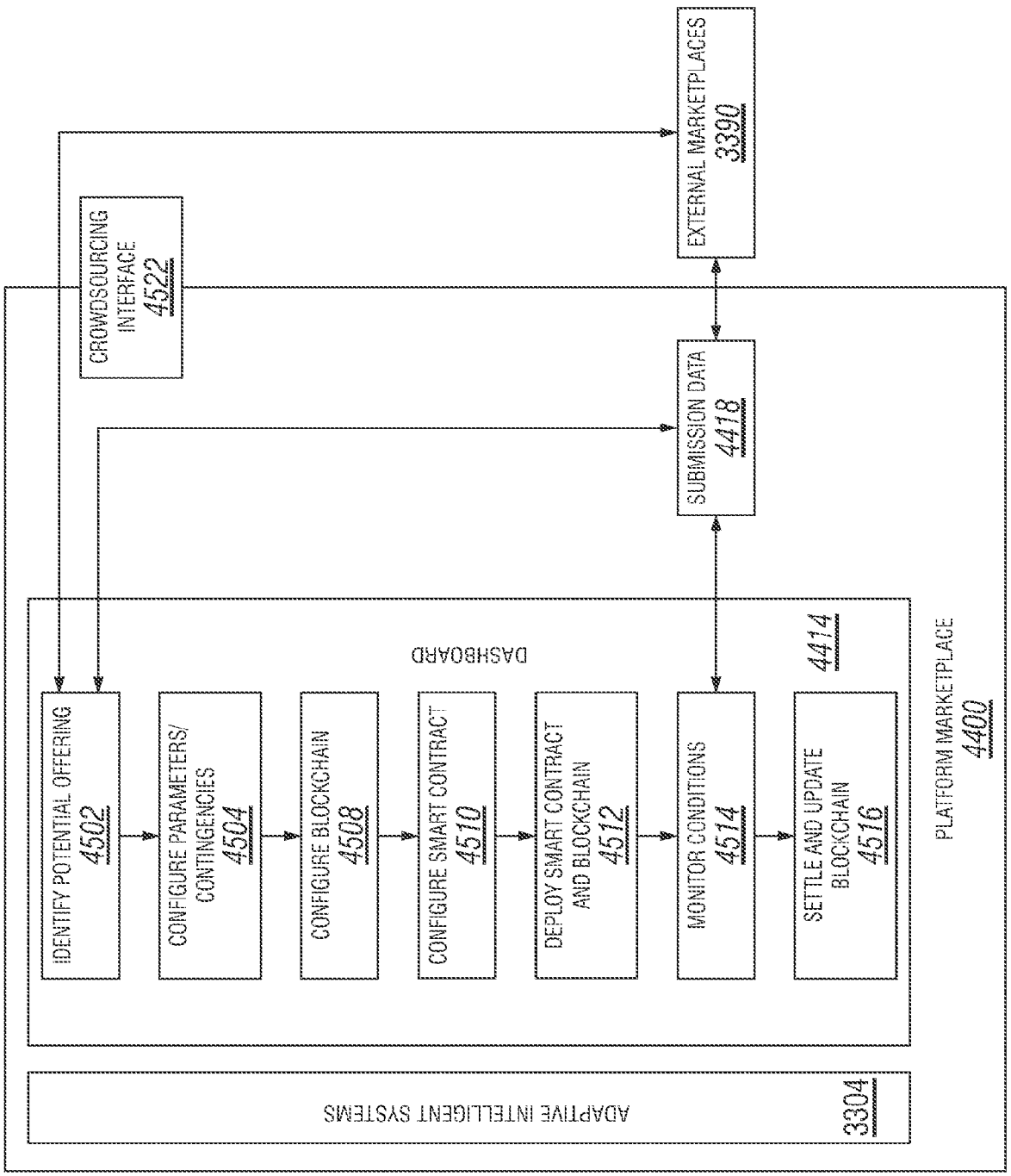

EXTERNAL MARKETPLACES
3390
CROWDSOURCING INTERFACE
4522
SUBMISSION DATA
4418
DASHBOARD
IDENTIFY POTENTIAL OFFERING
4502
CONFIGURE PARAMETERS/ CONTINGENCIES
4504
CONFIGURE BLOCKCHAIN
4508
CONFIGURE SMART CONTRACT
4510
DEPLOY SMART CONTRACT AND BLOCKCHAIN
4512
MONITOR CONDITIONS
4514
SETTLE AND UPDATE BLOCKCHAIN
4516
4414
ADAPTIVE INTELLIGENT SYSTEMS
3304
PLATFORM MARKETPLACE
4400

FIG. 45

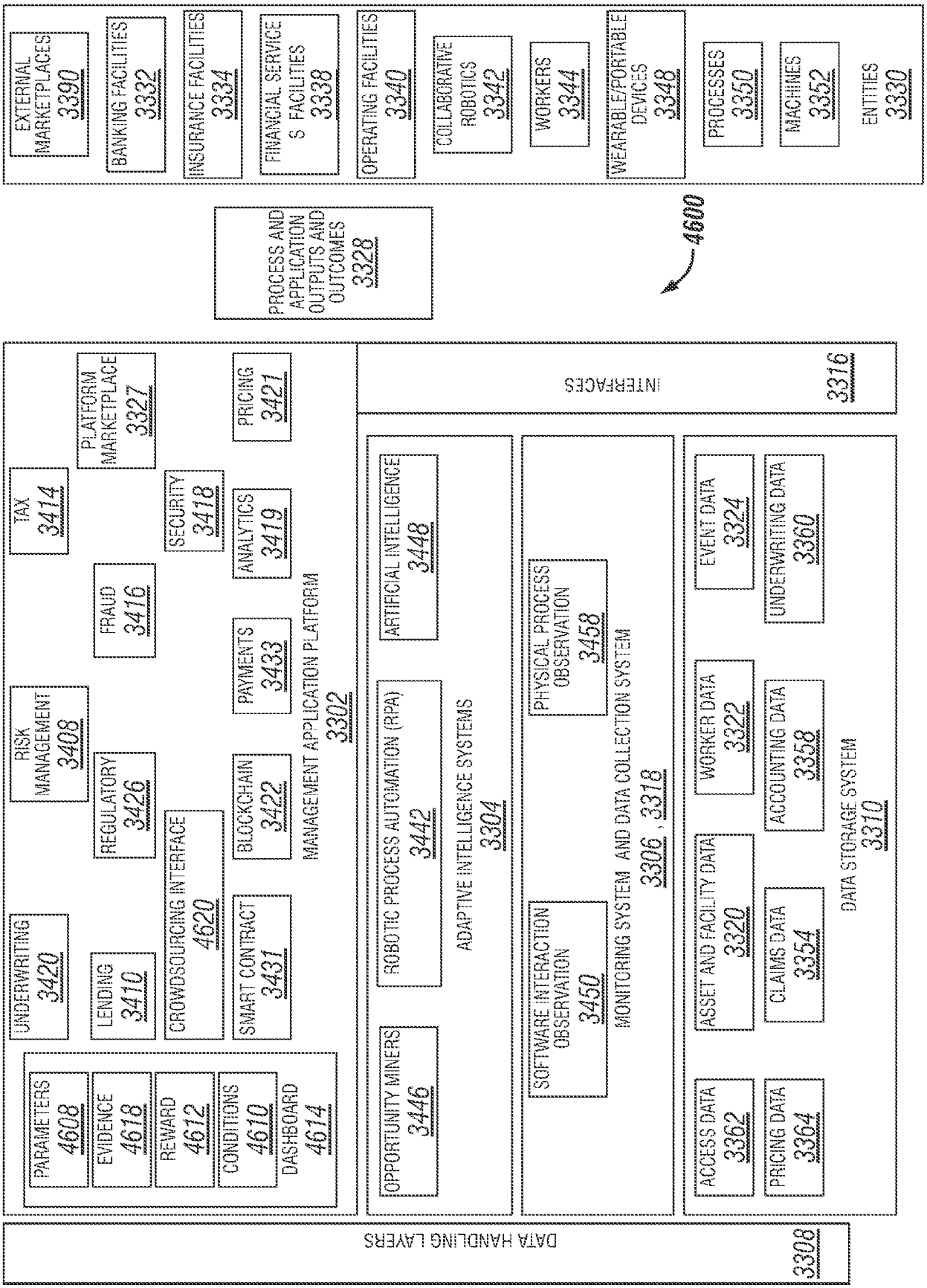

DATA HANDLING LAYERS
3308
PARAMETERS 4608
EVIDENCE 4618
REWARD 4612
CONDITIONS 4610
DASHBOARD 4614
UNDERWRITING 3420
LENDING 3410
CROWDSOURCING INTERFACE 4620
SMART CONTRACT 3431
RISK MANAGEMENT 3408
REGULATORY 3426
BLOCKCHAIN 3422
TAX 3414
FRAUD 3416
PAYMENTS 3433
PLATFORM MARKETPLACE 3327
SECURITY 3418
ANALYTICS 3419
PRICING 3421
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
INTERFACES 3316
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
EVENT DATA 3324
PRICING DATA 3364
CLAIMS DATA 3354
ACCOUNTING DATA 3358
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM 3310
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4600
EXTERNAL MARKETPLACES 3390
BANKING FACILITIES 3332
INSURANCE FACILITIES 3334
FINANCIAL SERVICES FACILITIES 3338
OPERATING FACILITIES 3340
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330

FIG. 46

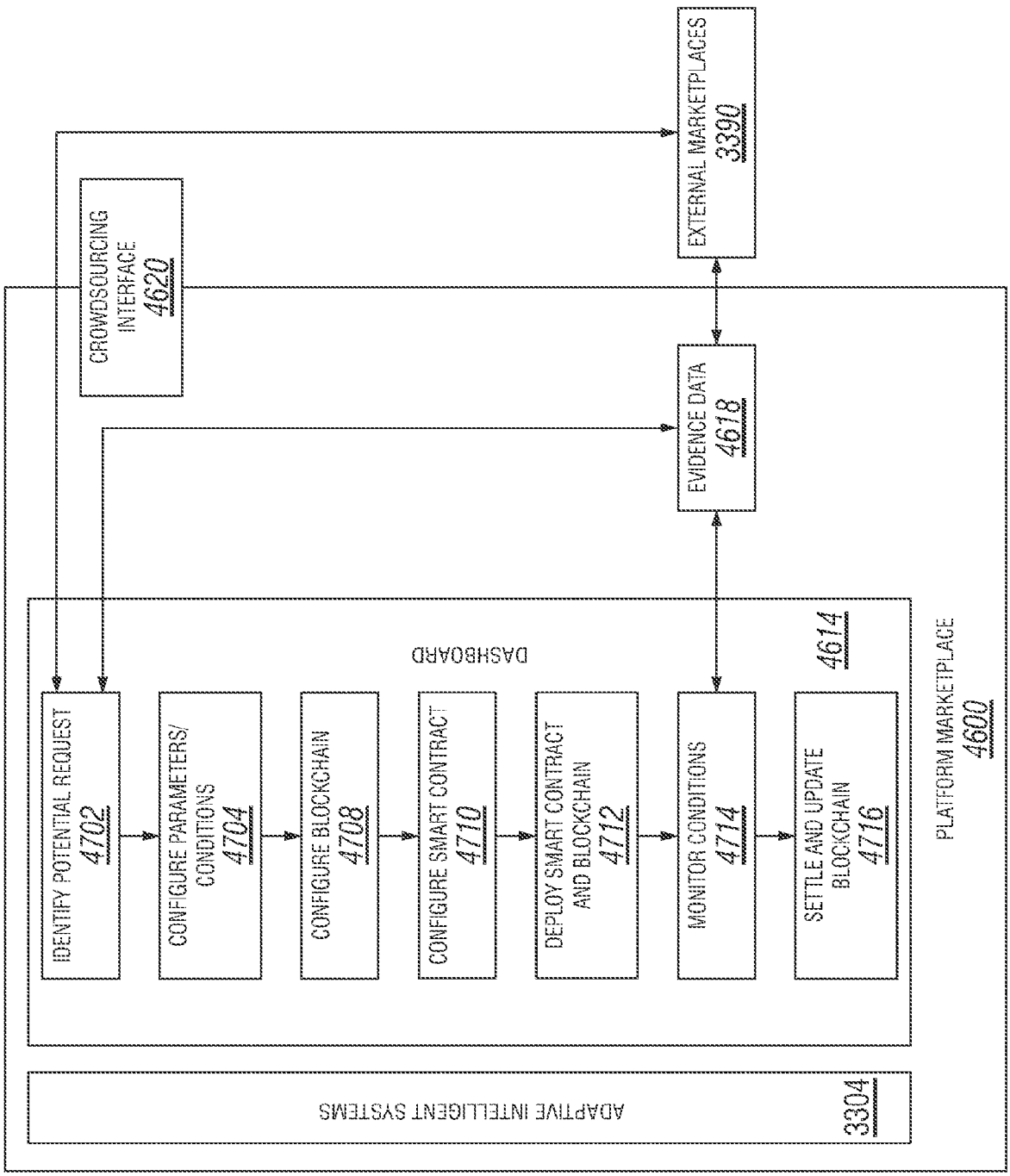

EXTERNAL MARKETPLACES
3390
CROWDSOURCING INTERFACE
4620
EVIDENCE DATA
4618
DASHBOARD
4614
IDENTIFY POTENTIAL REQUEST
4702
CONFIGURE PARAMETERS/ CONDITIONS
4704
CONFIGURE BLOCKCHAIN
4708
CONFIGURE SMART CONTRACT
4710
DEPLOY SMART CONTRACT AND BLOCKCHAIN
4712
MONITOR CONDITIONS
4714
SETTLE AND UPDATE BLOCKCHAIN
4716
ADAPTIVE INTELLIGENT SYSTEMS
3304
PLATFORM MARKETPLACE
4600

FIG. 47

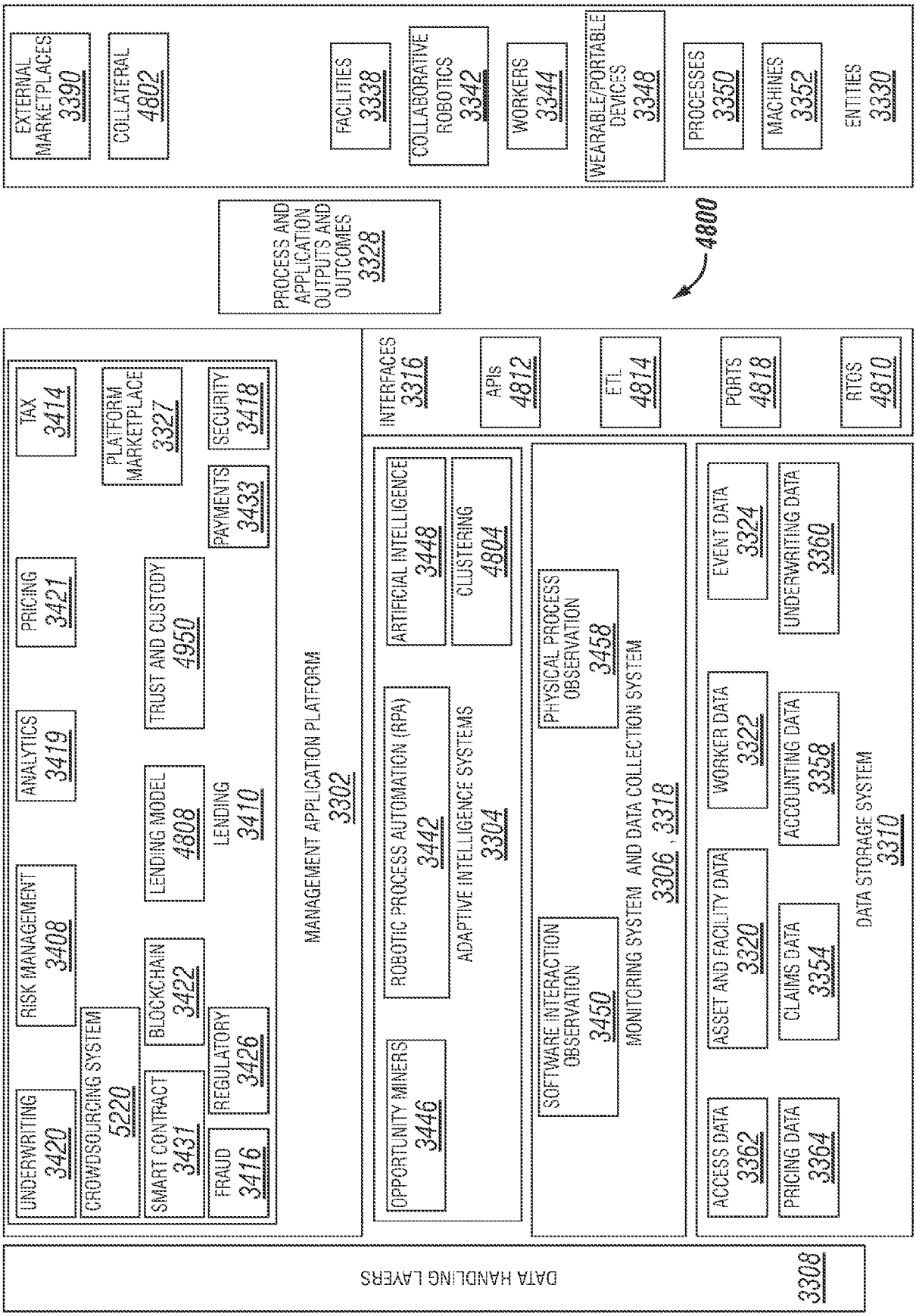

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
4800
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
UNDERWRITING 3420
RISK MANAGEMENT 3408
ANALYTICS 3419
PRICING 3421
TAX 3414
CROWDSOURCING SYSTEM 5220
PLATFORM MARKETPLACE 3327
SMART CONTRACT 3431
BLOCKCHAIN 3422
LENDING MODEL 4808
TRUST AND CUSTODY 4950
PAYMENTS 3433
SECURITY 3418
FRAUD 3416
REGULATORY 3426
LENDING 3410
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
APIs 4812
ETL 4814
PORTS 4818
RTOS 4810
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
EVENT DATA 3324
UNDERWRITING DATA 3360
ACCESS DATA 3362
ASSET AND FACILITY DATA 3320
WORKER DATA 3322
PRICING DATA 3364
CLAIMS DATA 3354
ACCOUNTING DATA 3358
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 48

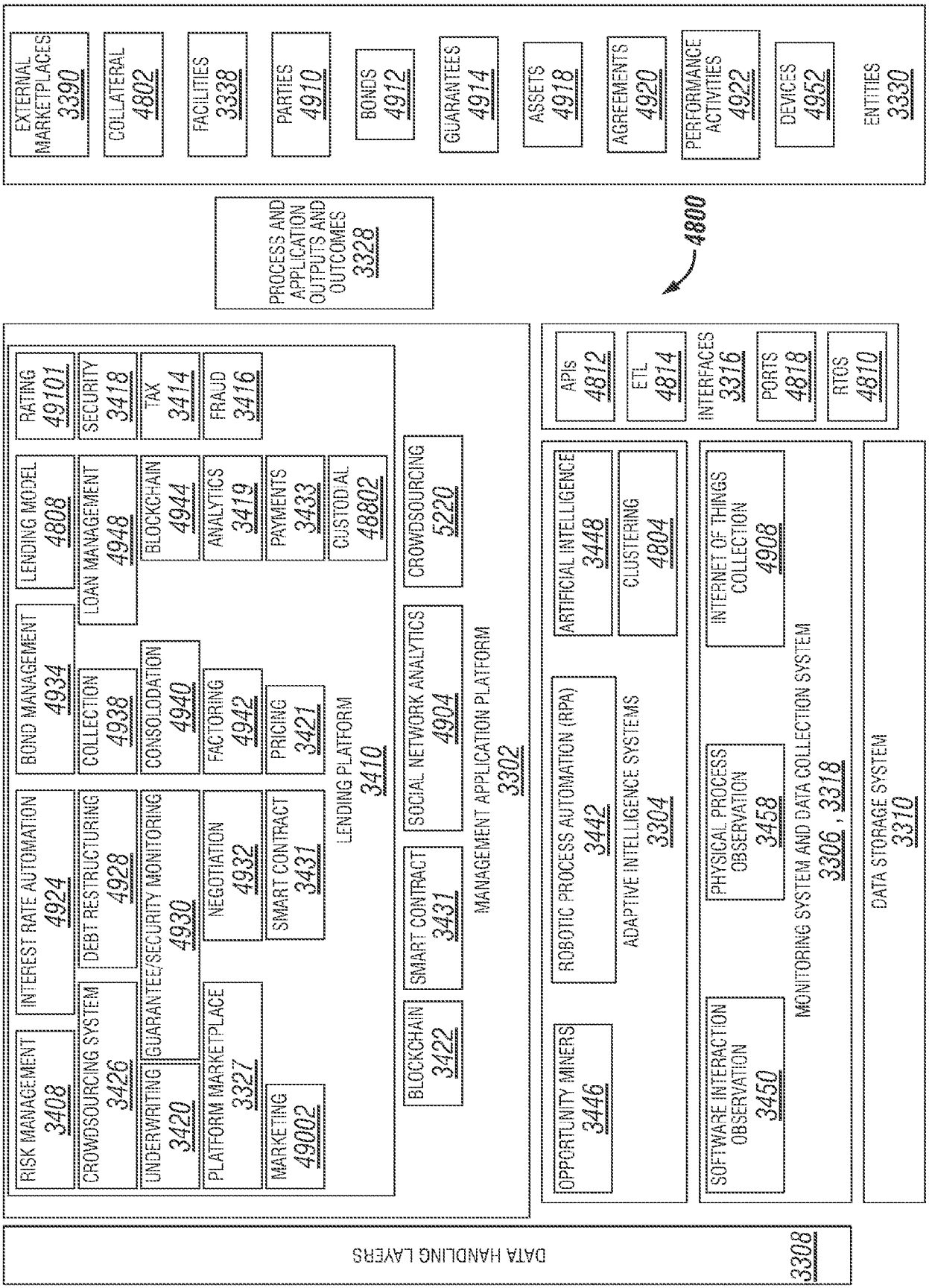

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
RISK MANAGEMENT 3408
INTEREST RATE AUTOMATION 4924
BOND MANAGEMENT 4934
LENDING MODEL 4808
RATING 49101
CROWDSOURCING SYSTEM 3426
DEBT RESTRUCTURING 4928
COLLECTION 4938
LOAN MANAGEMENT 4948
SECURITY 3418
UNDERWRITING 3420
GUARANTEE/SECURITY MONITORING 4930
CONSOLODATION 4940
BLOCKCHAIN 4944
TAX 3414
PLATFORM MARKETPLACE 3327
NEGOTIATION 4932
FACTORING 4942
ANALYTICS 3419
FRAUD 3416
MARKETING 49002
SMART CONTRACT 3431
PRICING 3421
PAYMENTS 3433
LENDING PLATFORM 3410
CUSTODIAL 48802
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
APIs 4812
ETL 4814
INTERFACES 3316
PORTS 4818
RTOS 4810
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 49

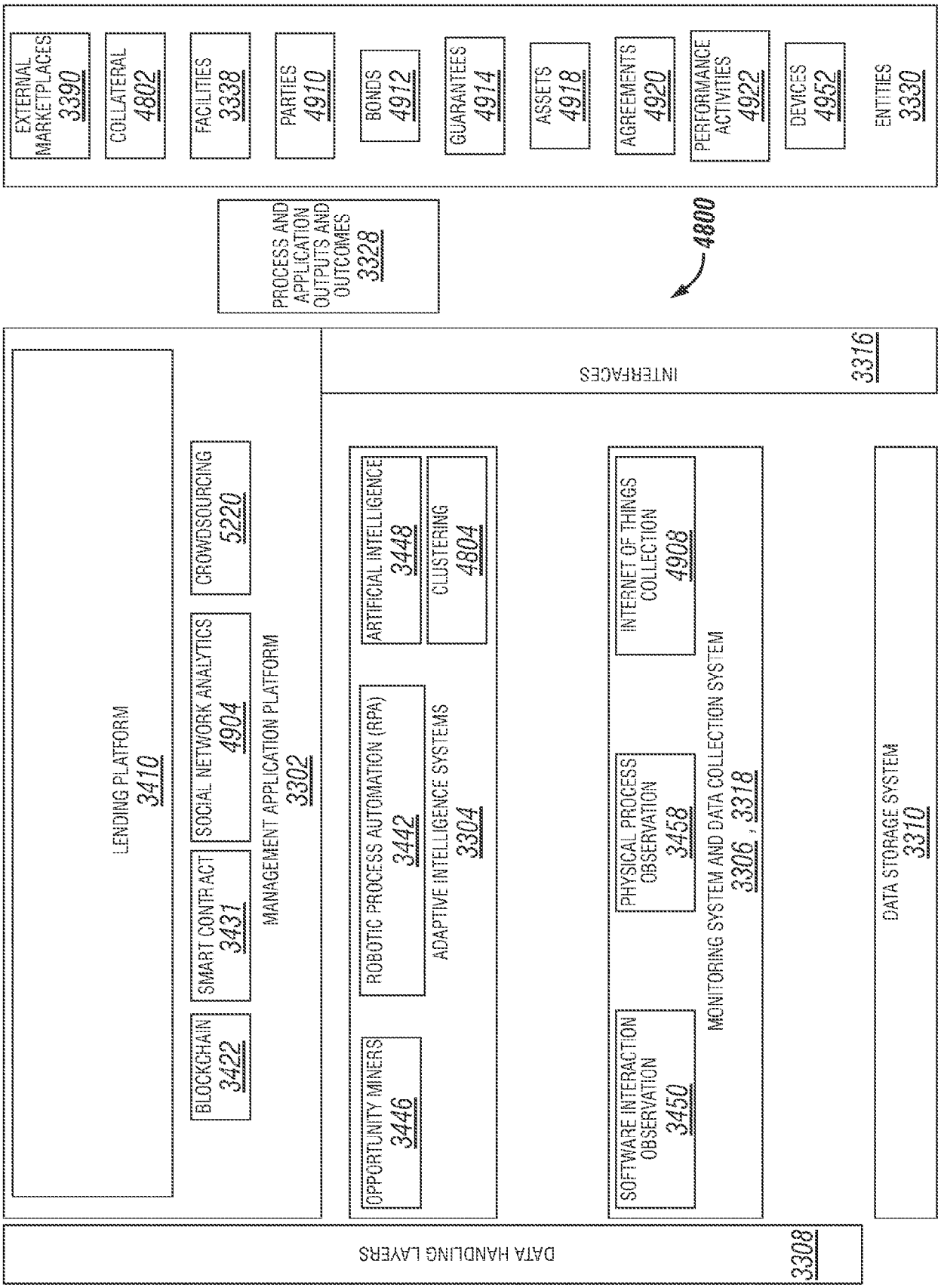

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 50

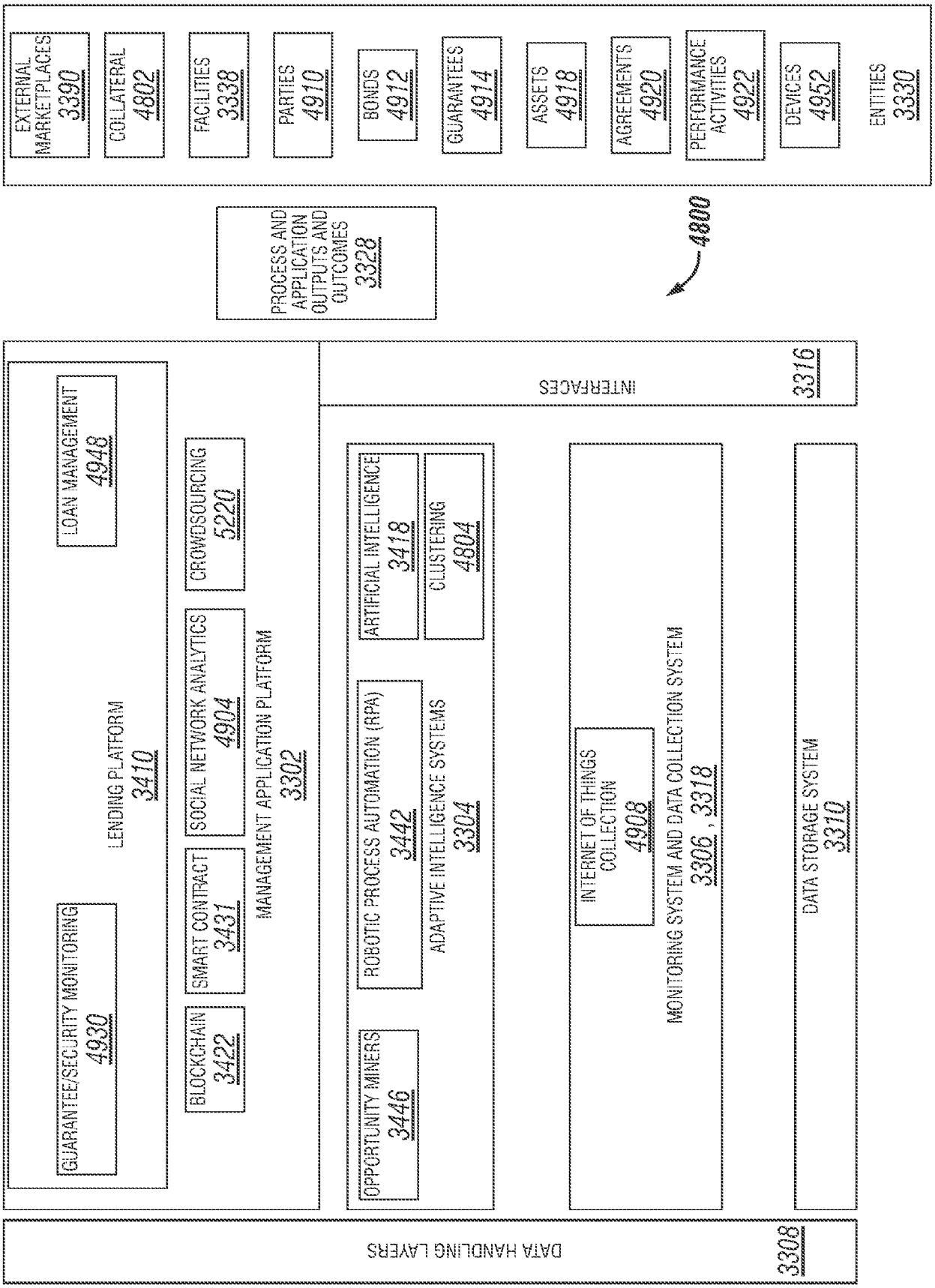

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
4800
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
GUARANTEE/SECURITY MONITORING 4930
LOAN MANAGEMENT 4948
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3418
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 51

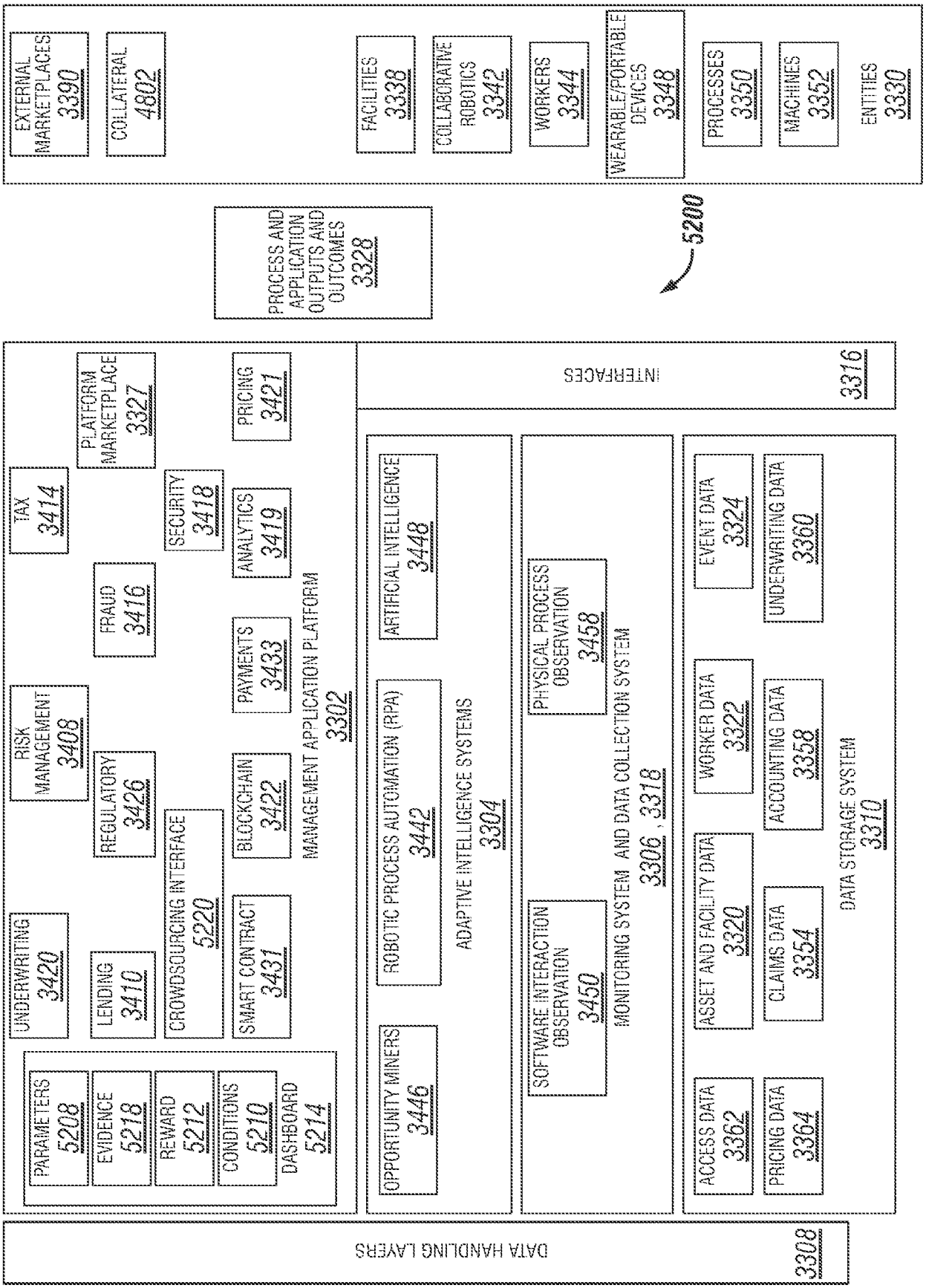

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
COLLABORATIVE ROBOTICS 3342
WORKERS 3344
WEARABLE/PORTABLE DEVICES 3348
PROCESSES 3350
MACHINES 3352
ENTITIES 3330
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PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
INTERFACES 3316
PARAMETERS 5208
EVIDENCE 5218
REWARD 5212
CONDITIONS 5210
DASHBOARD 5214
UNDERWRITING 3420
LENDING 3410
CROWDSOURCING INTERFACE 5220
SMART CONTRACT 3431
REGULATORY 3426
RISK MANAGEMENT 3408
BLOCKCHAIN 3422
TAX 3414
FRAUD 3416
PAYMENTS 3433
SECURITY 3418
ANALYTICS 3419
PLATFORM MARKETPLACE 3327
PRICING 3421
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
ACCESS DATA 3362
PRICING DATA 3364
ASSET AND FACILITY DATA 3320
CLAIMS DATA 3354
WORKER DATA 3322
ACCOUNTING DATA 3358
EVENT DATA 3324
UNDERWRITING DATA 3360
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 52

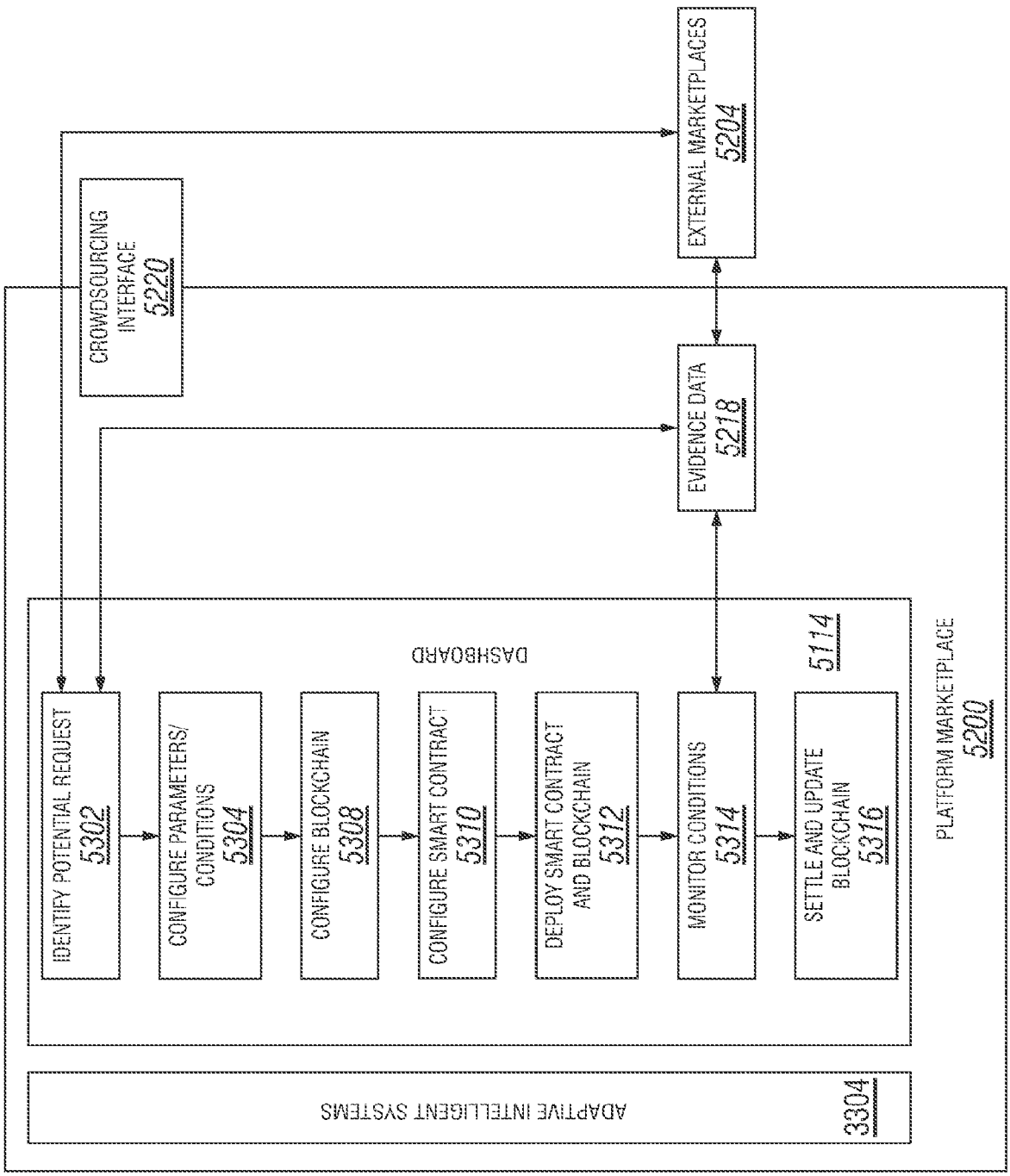

EXTERNAL MARKETPLACES
5204
CROWDSOURCING INTERFACE
5220
EVIDENCE DATA
5218
PLATFORM MARKETPLACE
5200
DASHBOARD
5114
IDENTIFY POTENTIAL REQUEST
5302
CONFIGURE PARAMETERS/ CONDITIONS
5304
CONFIGURE BLOCKCHAIN
5308
CONFIGURE SMART CONTRACT
5310
DEPLOY SMART CONTRACT AND BLOCKCHAIN
5312
MONITOR CONDITIONS
5314
SETTLE AND UPDATE BLOCKCHAIN
5316
ADAPTIVE INTELLIGENT SYSTEMS
3304

FIG. 53

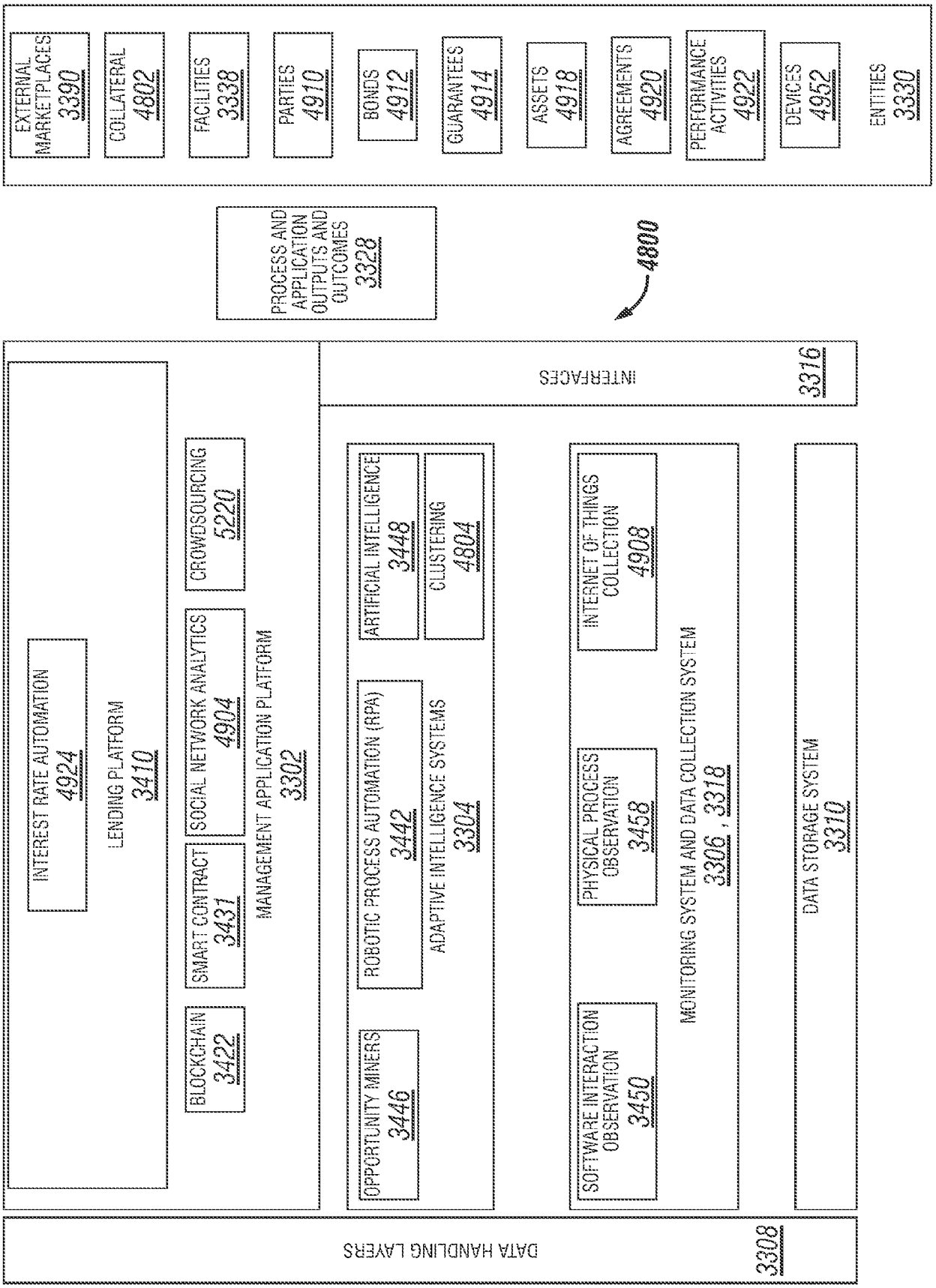

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
INTERFACES 3316
INTEREST RATE AUTOMATION 4924
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 54

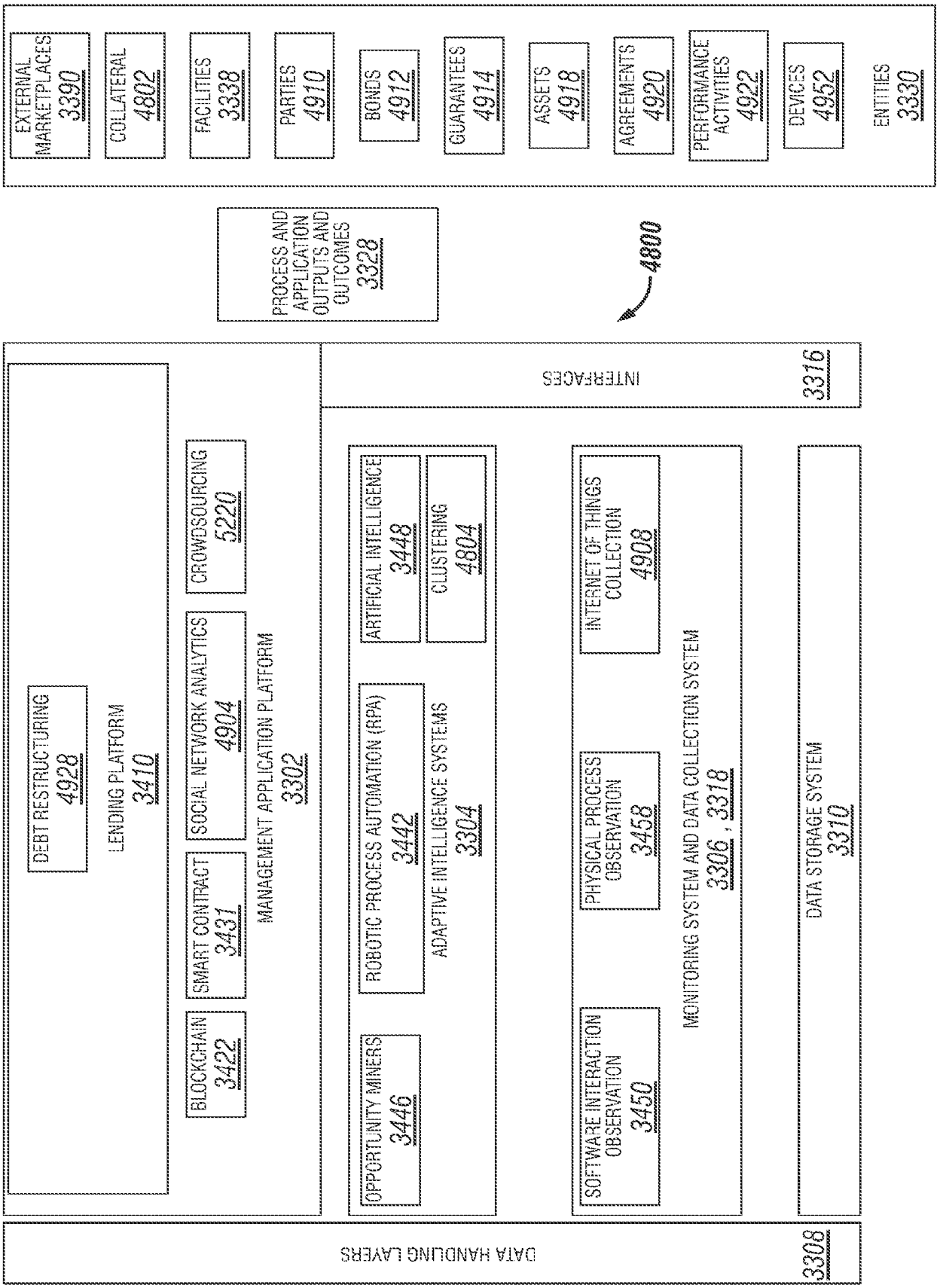

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
DEBT RESTRUCTURING 4928
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 55

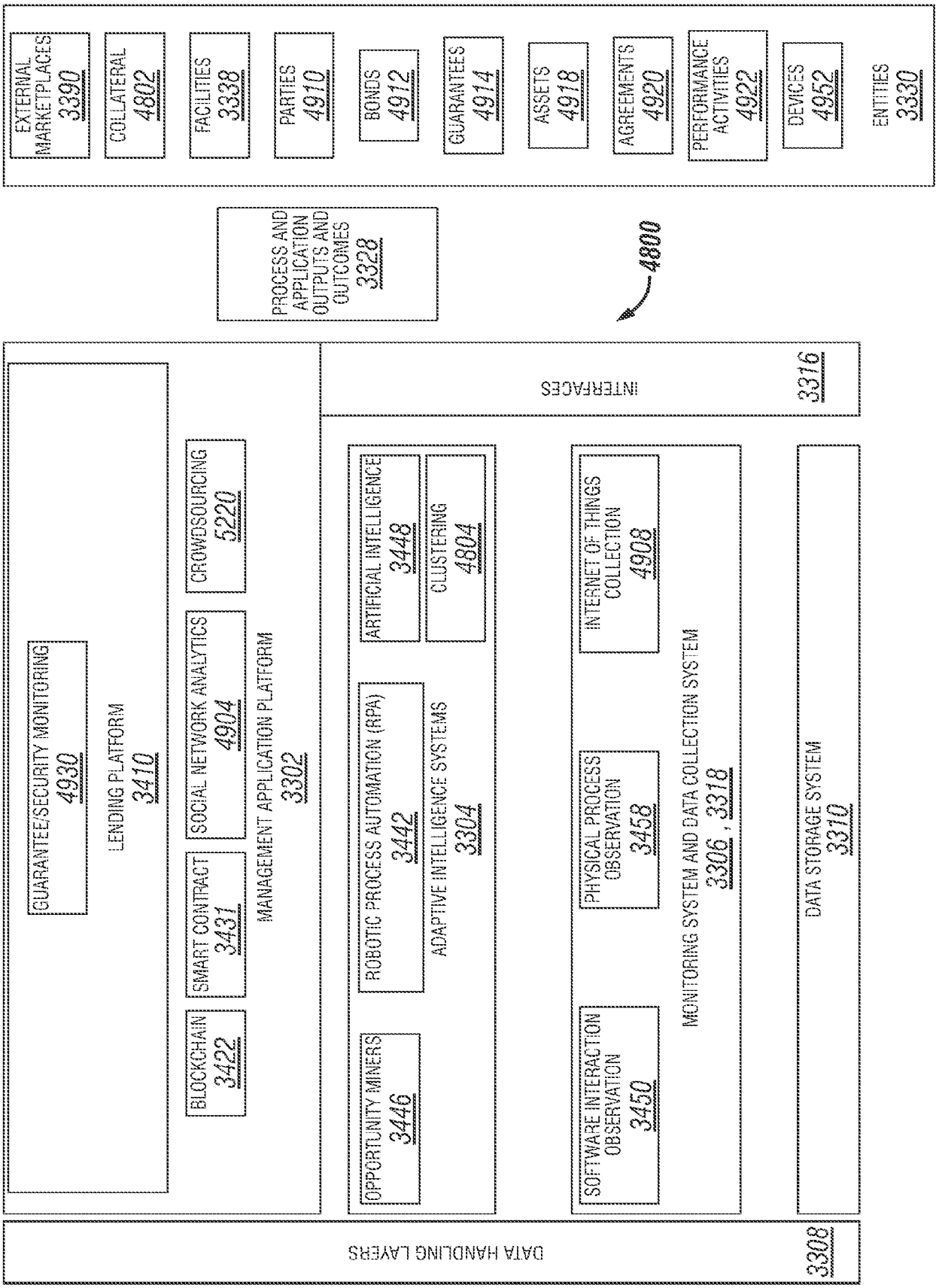

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
GUARANTEE/SECURITY MONITORING 4930
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 56

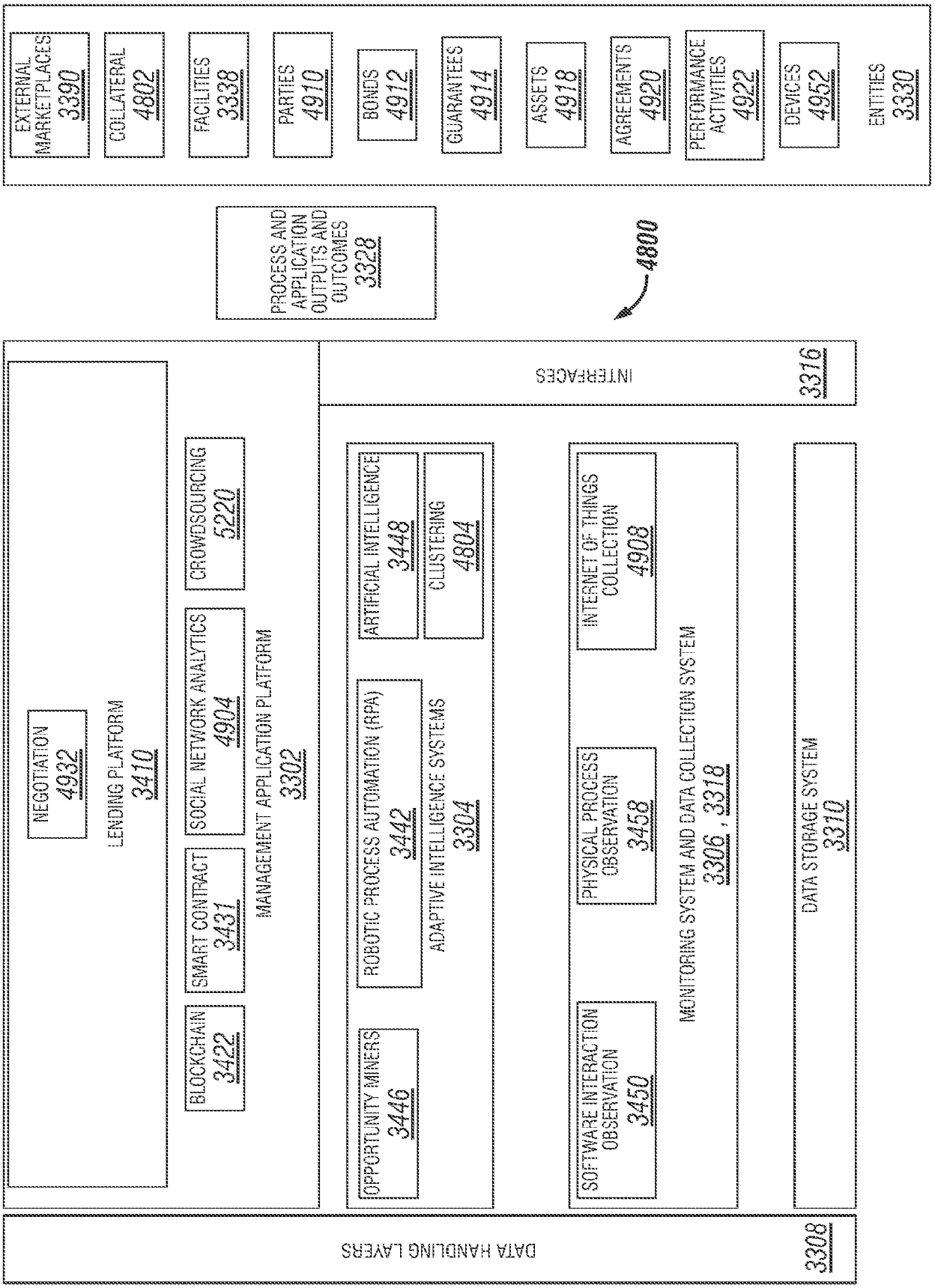

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
NEGOTIATION 4932
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 57

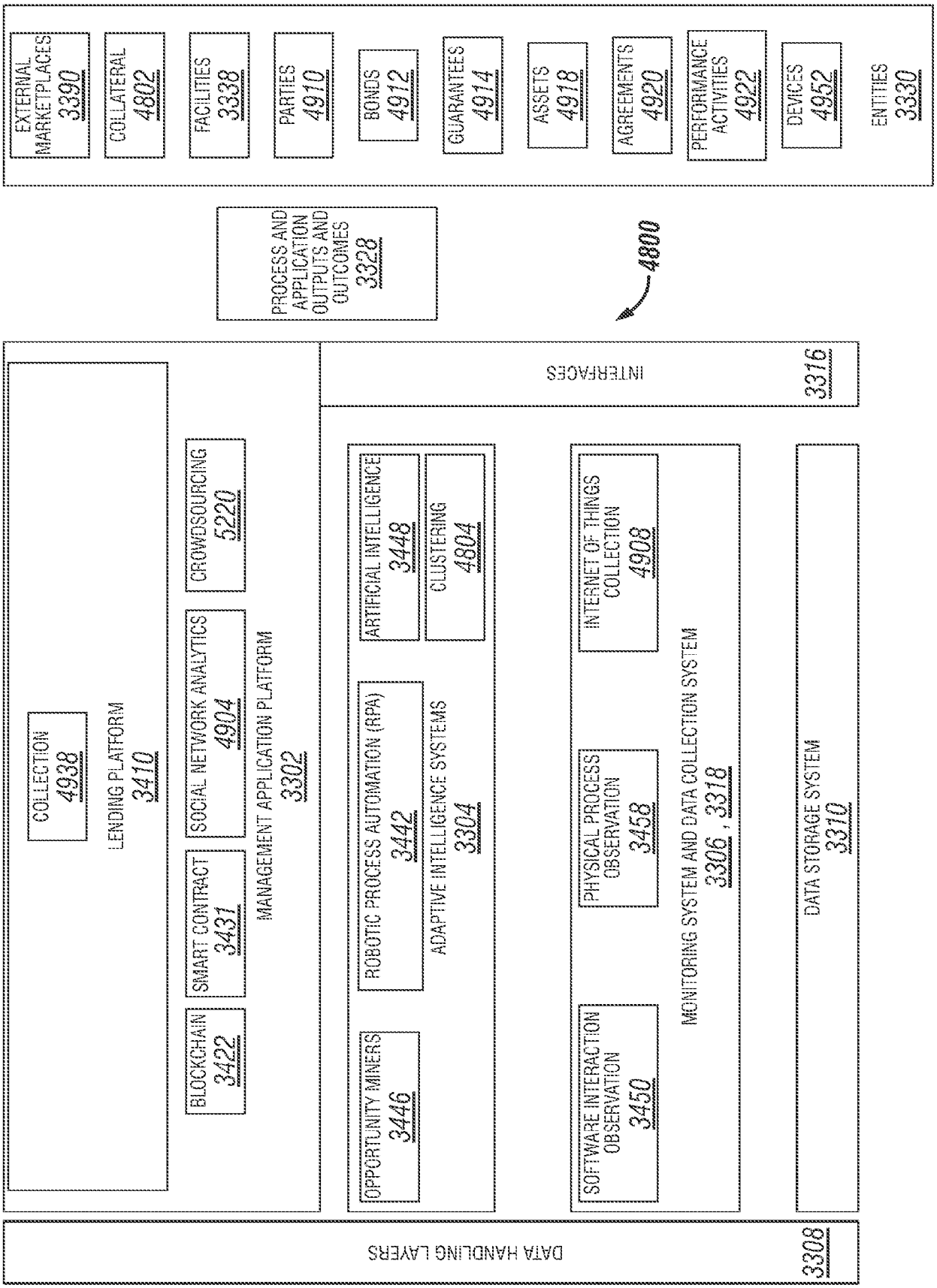

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
INTERFACES 3316
COLLECTION 4938
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 58

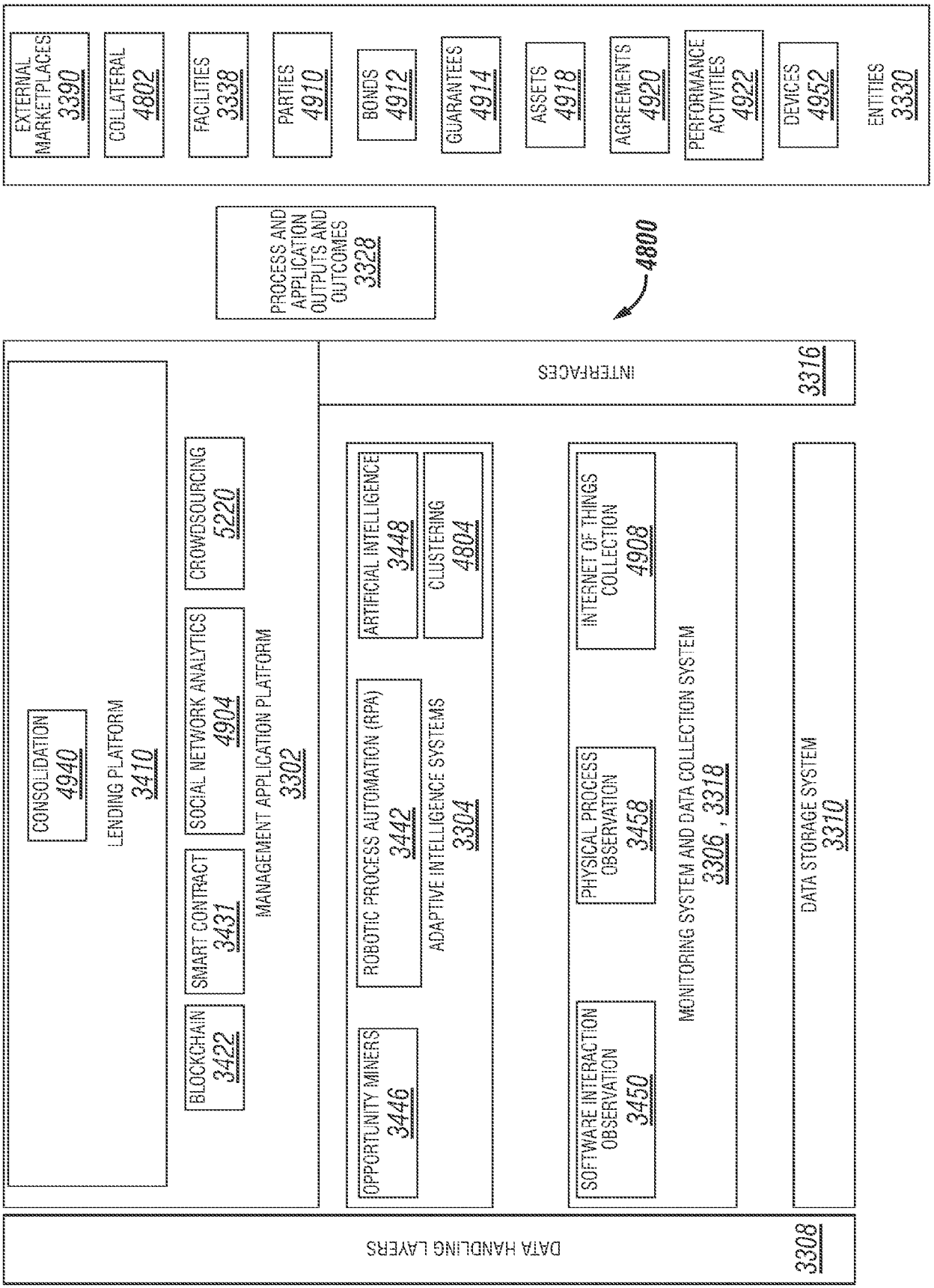

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
CONSOLIDATION 4940
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 59

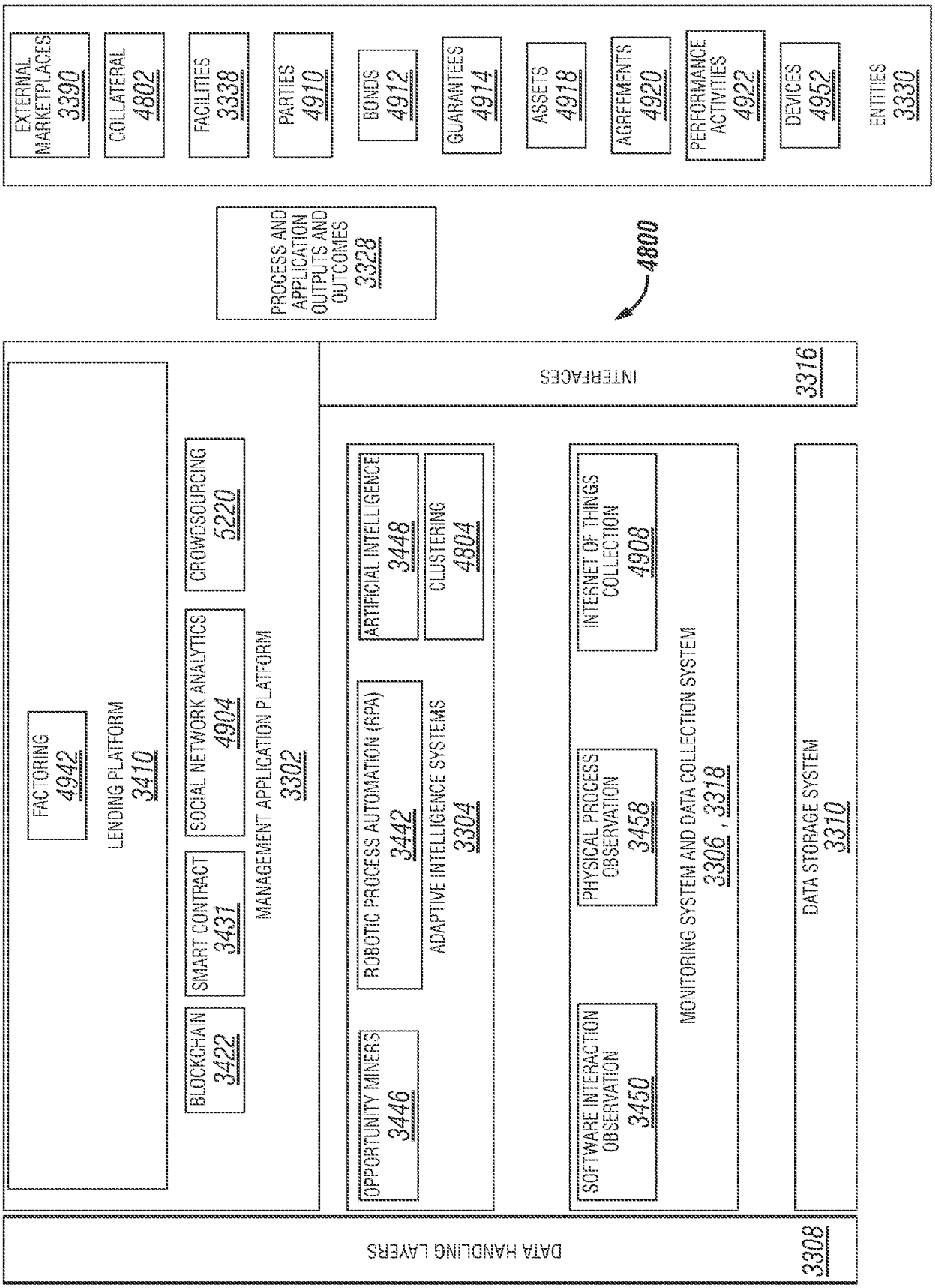

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
FACTORING 4942
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 60

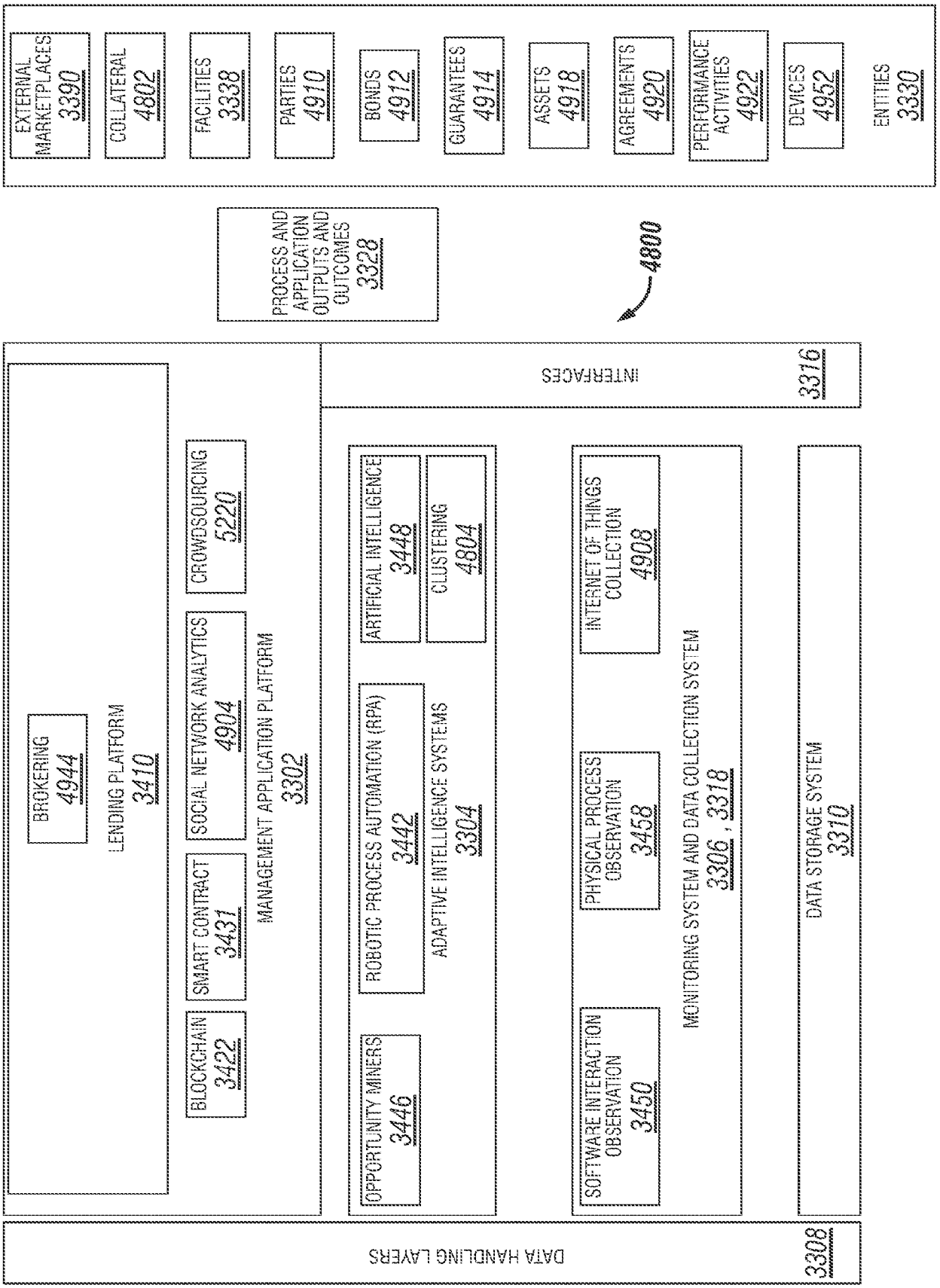

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
BROKERING 4944
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 61

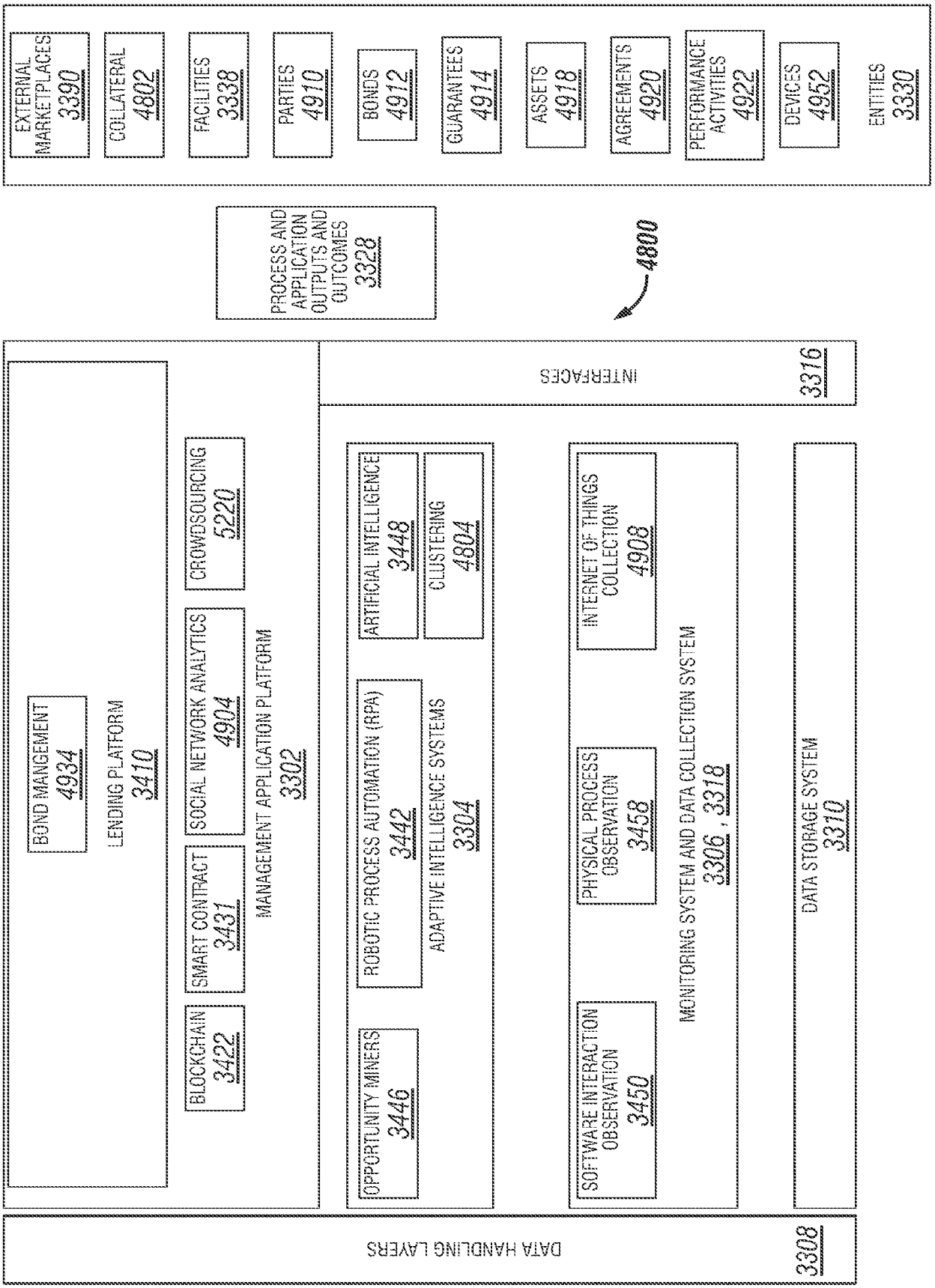

DATA HANDLING LAYERS
3308
MANAGEMENT APPLICATION PLATFORM
3302
LENDING PLATFORM
3410
BOND MANGEMENT
4934
BLOCKCHAIN
3422
SMART CONTRACT
3431
SOCIAL NETWORK ANALYTICS
4904
CROWDSOURCING
5220
ADAPTIVE INTELLIGENCE SYSTEMS
3304
OPPORTUNITY MINERS
3446
ROBOTIC PROCESS AUTOMATION (RPA)
3442
ARTIFICIAL INTELLIGENCE
3448
CLUSTERING
4804
MONITORING SYSTEM AND DATA COLLECTION SYSTEM
3306 , 3318
SOFTWARE INTERACTION OBSERVATION
3450
PHYSICAL PROCESS OBSERVATION
3458
INTERNET OF THINGS COLLECTION
4908
DATA STORAGE SYSTEM
3310
INTERFACES
3316
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES
3328
4800
ENTITIES
3330
EXTERNAL MARKETPLACES
3390
COLLATERAL
4802
FACILITIES
3338
PARTIES
4910
BONDS
4912
GUARANTEES
4914
ASSETS
4918
AGREEMENTS
4920
PERFORMANCE ACTIVITIES
4922
DEVICES
4952

FIG. 62

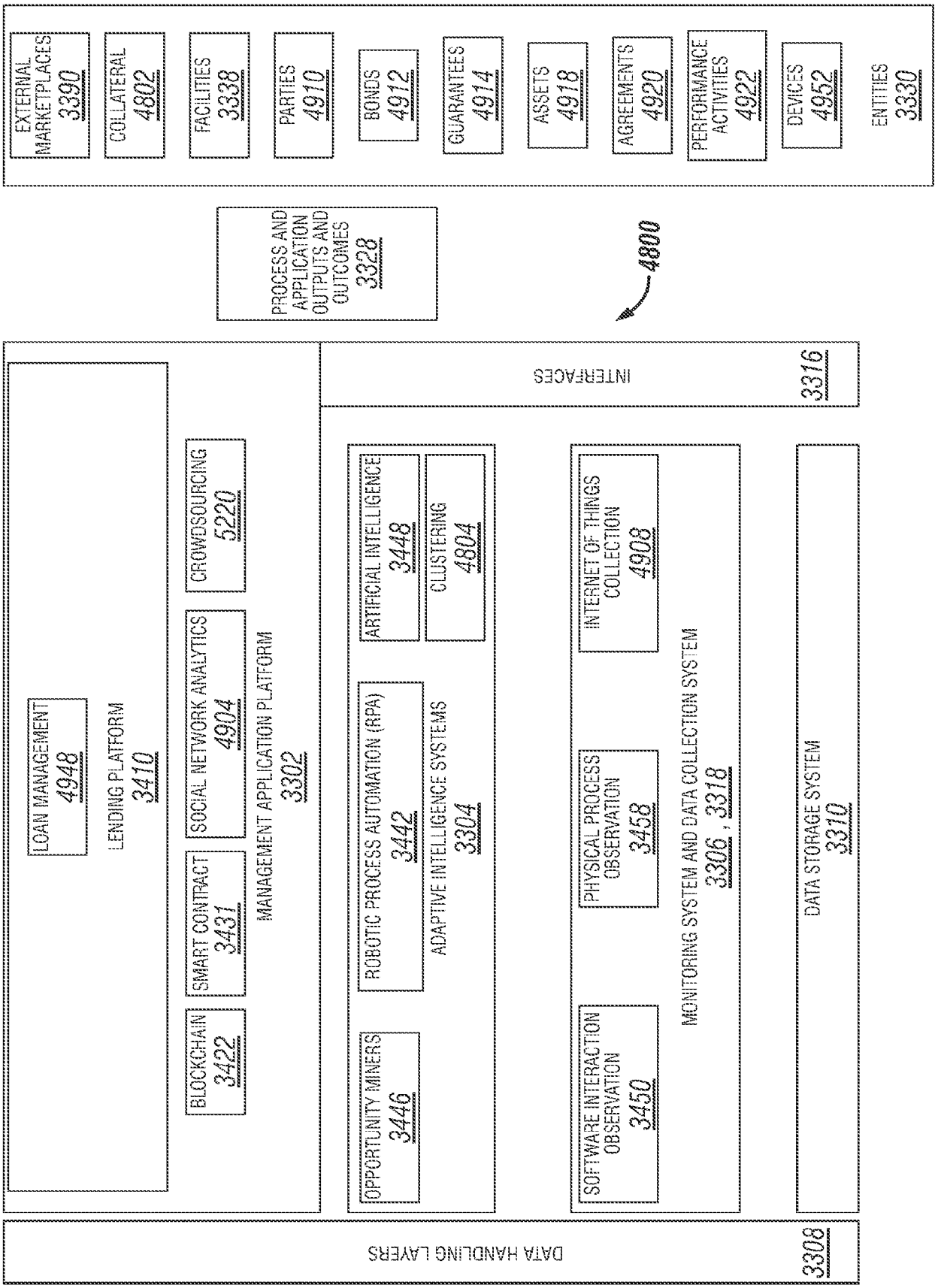

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
LOAN MANAGEMENT 4948
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306, 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 63

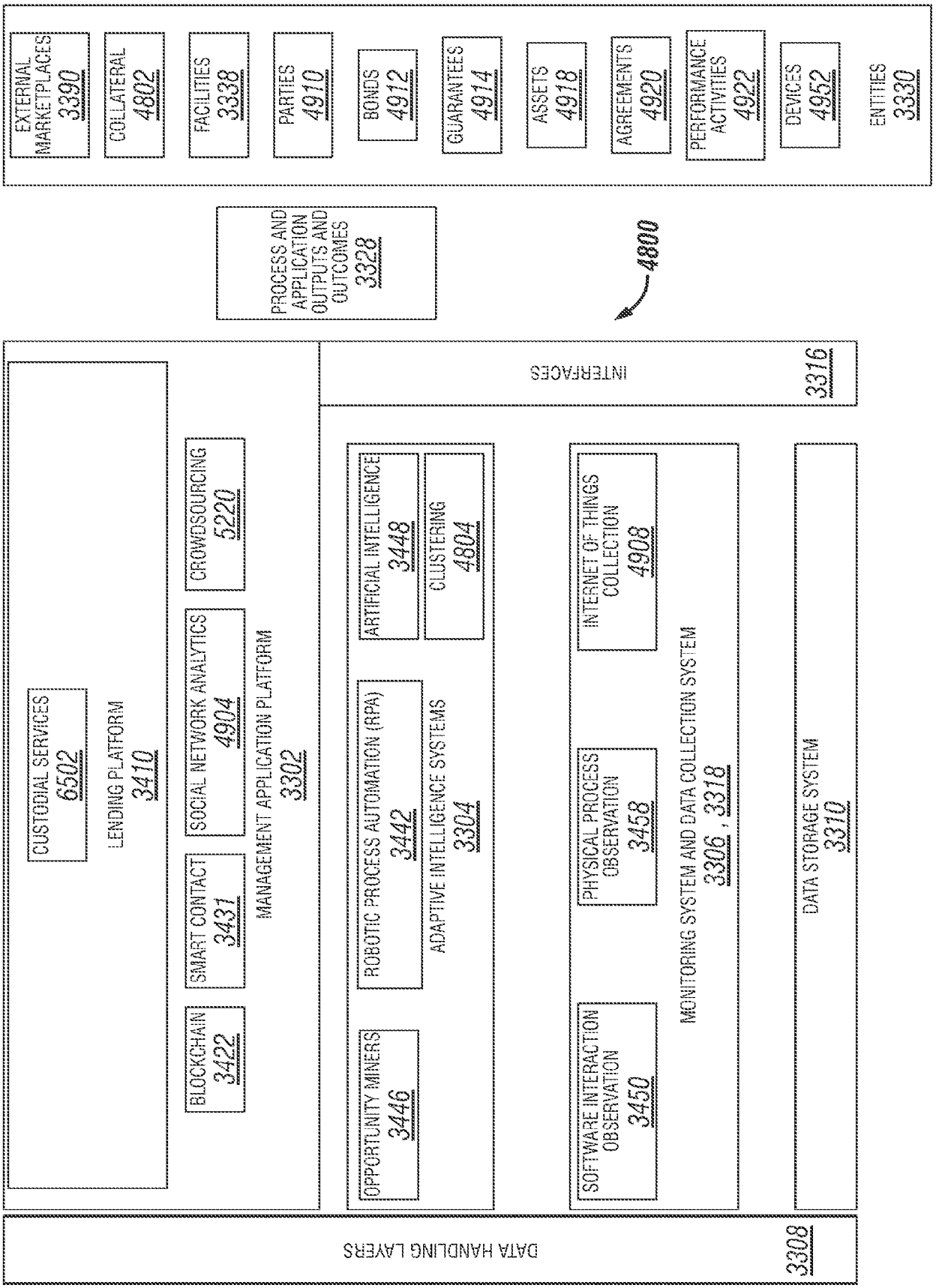

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
INTERFACES 3316
CUSTODIAL SERVICES 6502
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 64

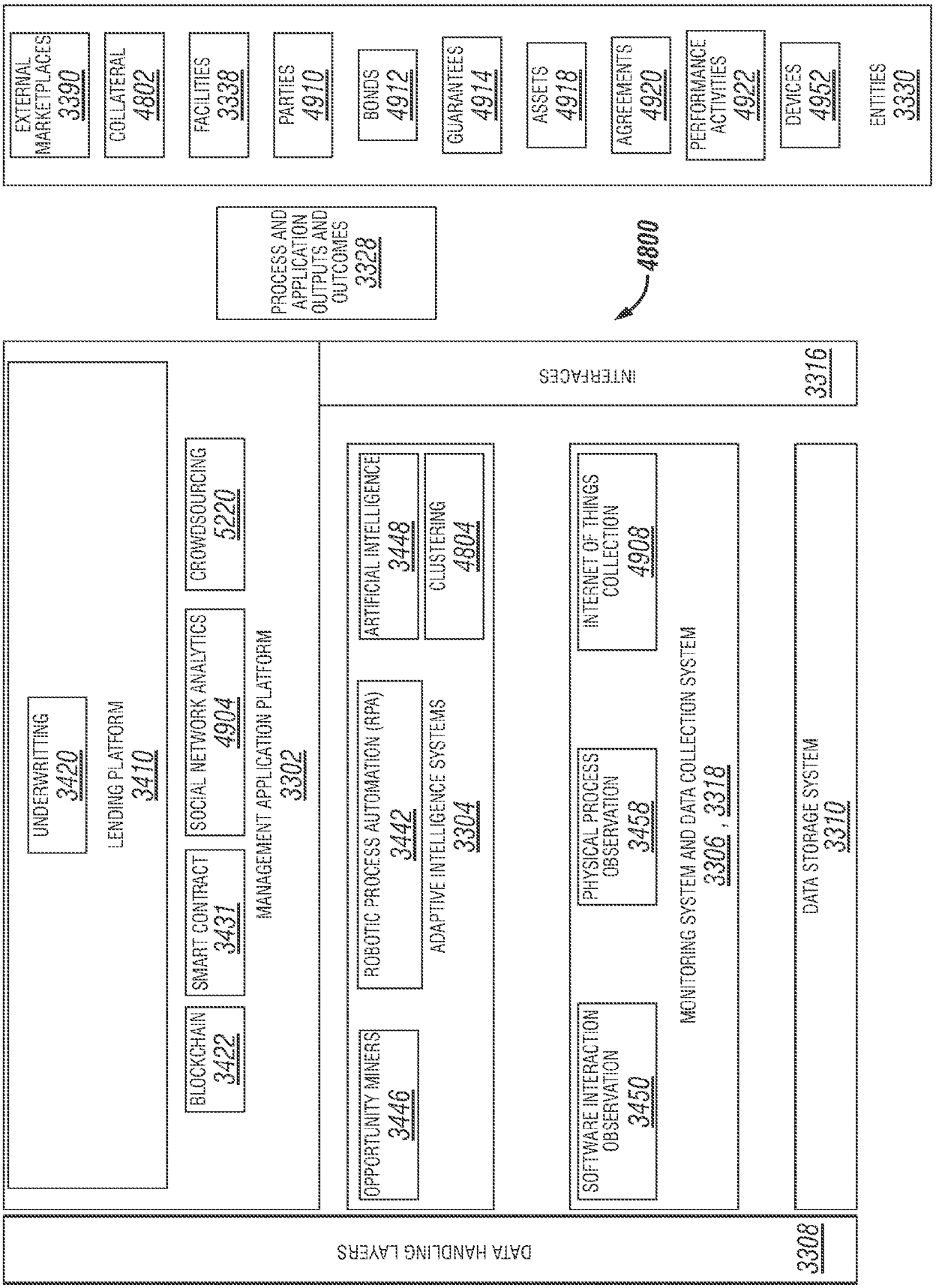

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
UNDERWRITTING 3420
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ADAPTIVE INTELLIGENCE SYSTEMS 3304
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 65

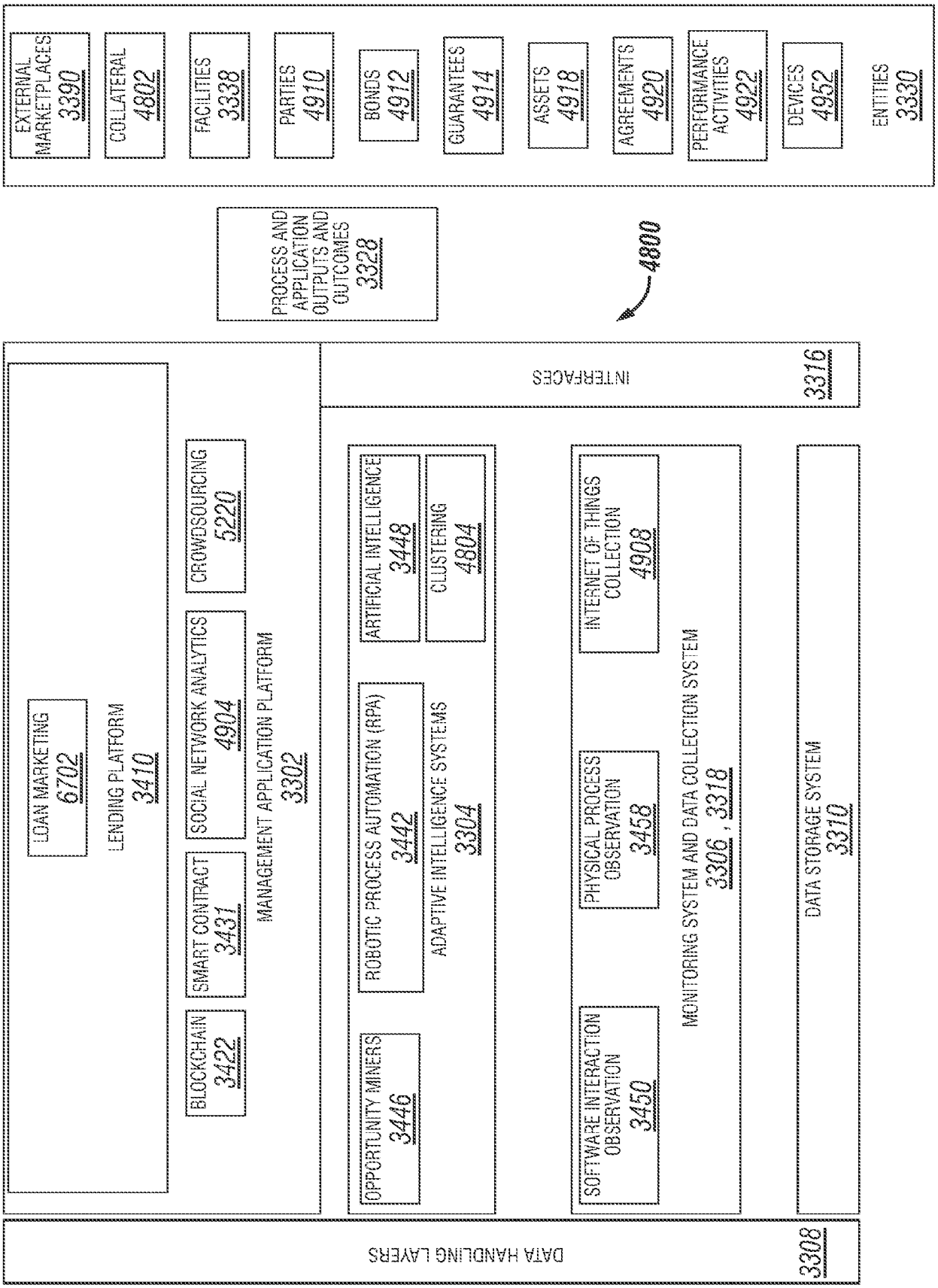

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
LOAN MARKETING 6702
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 66

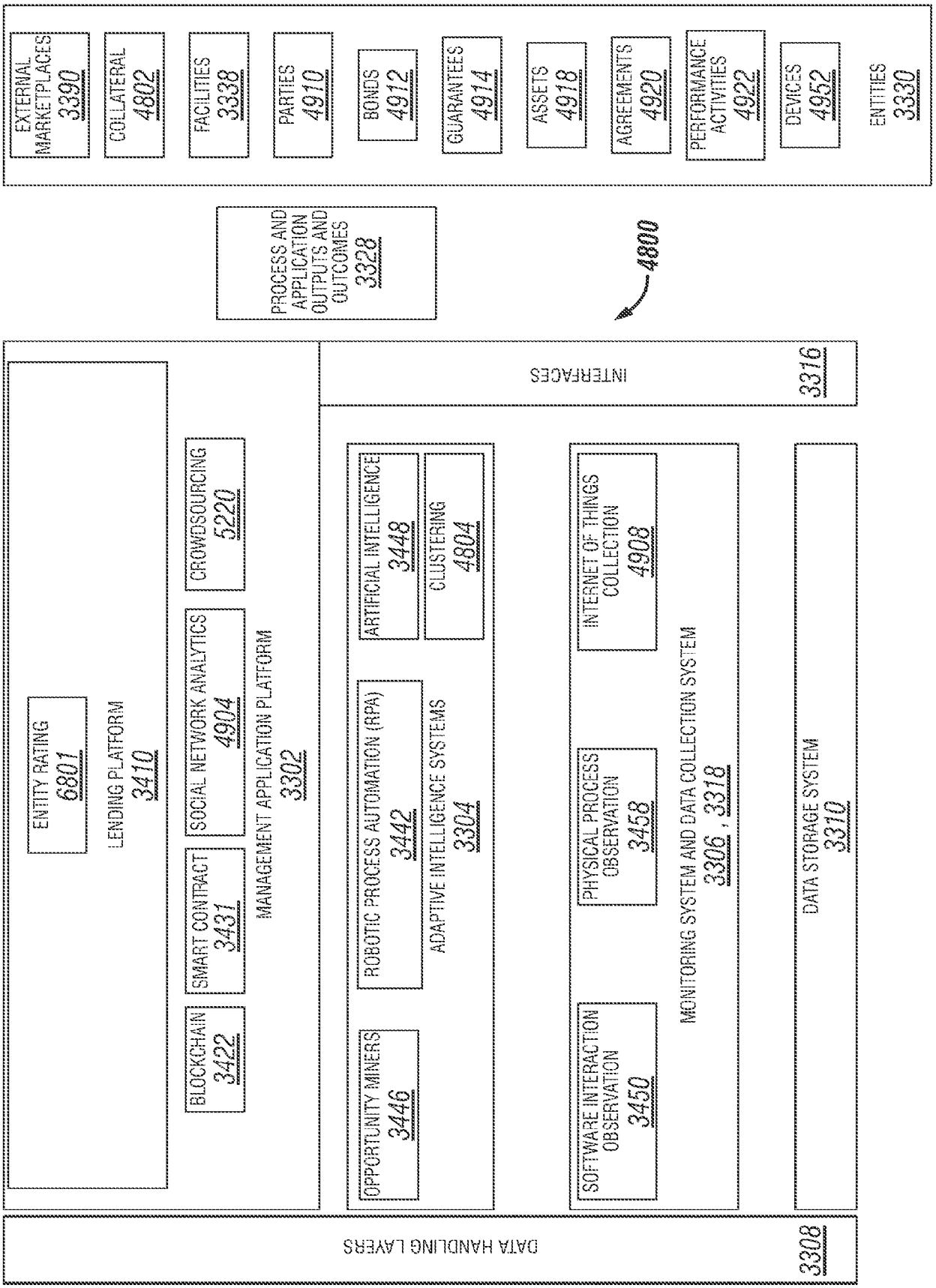

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
ENTITY RATING 6801
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTRACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
INTERFACES 3316
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 67

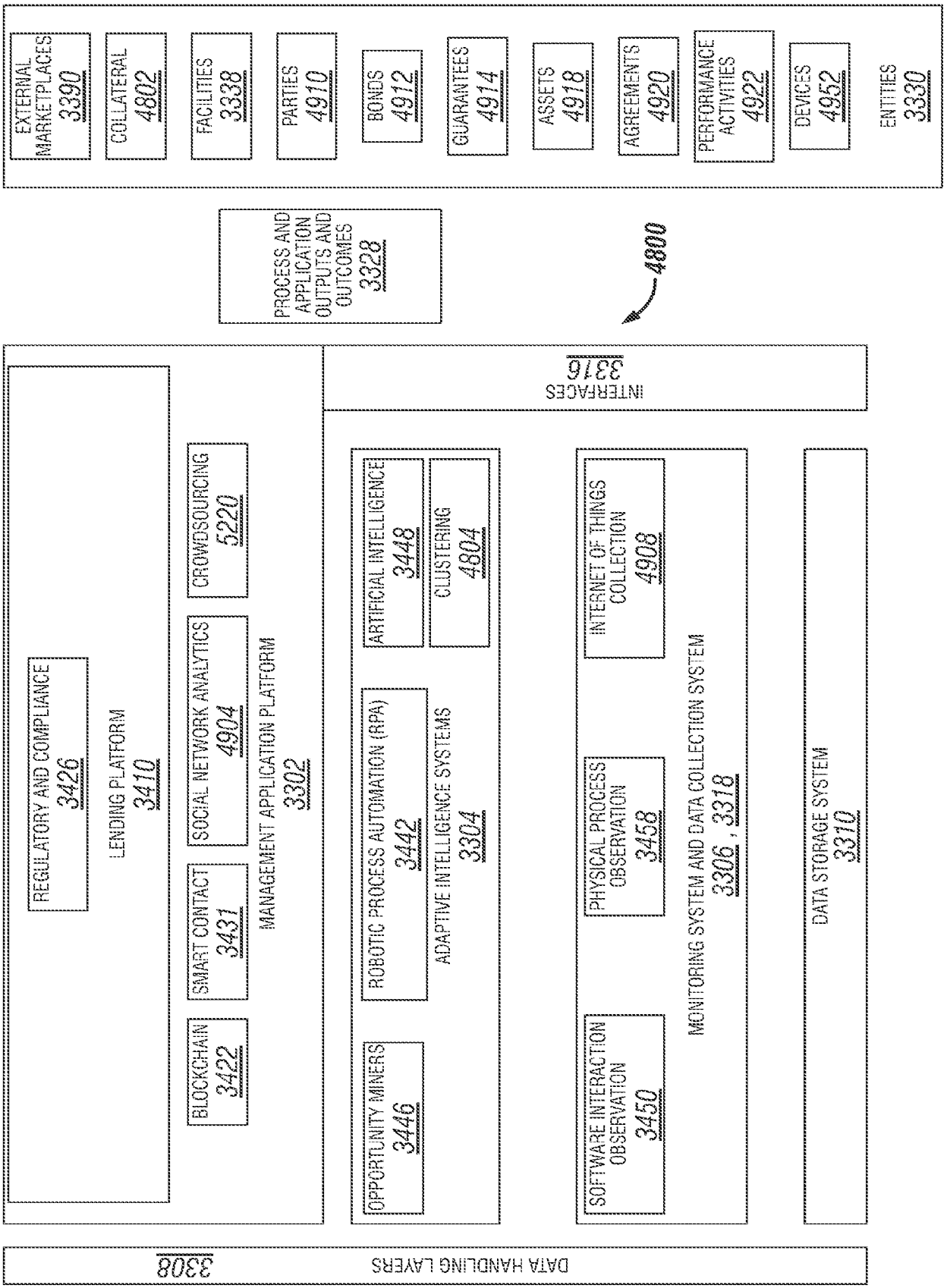

EXTERNAL MARKETPLACES 3390
COLLATERAL 4802
FACILITIES 3338
PARTIES 4910
BONDS 4912
GUARANTEES 4914
ASSETS 4918
AGREEMENTS 4920
PERFORMANCE ACTIVITIES 4922
DEVICES 4952
ENTITIES 3330
PROCESS AND APPLICATION OUTPUTS AND OUTCOMES 3328
4800
INTERFACES 3316
REGULATORY AND COMPLIANCE 3426
LENDING PLATFORM 3410
BLOCKCHAIN 3422
SMART CONTACT 3431
SOCIAL NETWORK ANALYTICS 4904
CROWDSOURCING 5220
MANAGEMENT APPLICATION PLATFORM 3302
OPPORTUNITY MINERS 3446
ROBOTIC PROCESS AUTOMATION (RPA) 3442
ARTIFICIAL INTELLIGENCE 3448
CLUSTERING 4804
ADAPTIVE INTELLIGENCE SYSTEMS 3304
SOFTWARE INTERACTION OBSERVATION 3450
PHYSICAL PROCESS OBSERVATION 3458
INTERNET OF THINGS COLLECTION 4908
MONITORING SYSTEM AND DATA COLLECTION SYSTEM 3306 , 3318
DATA STORAGE SYSTEM 3310
DATA HANDLING LAYERS 3308

FIG. 68

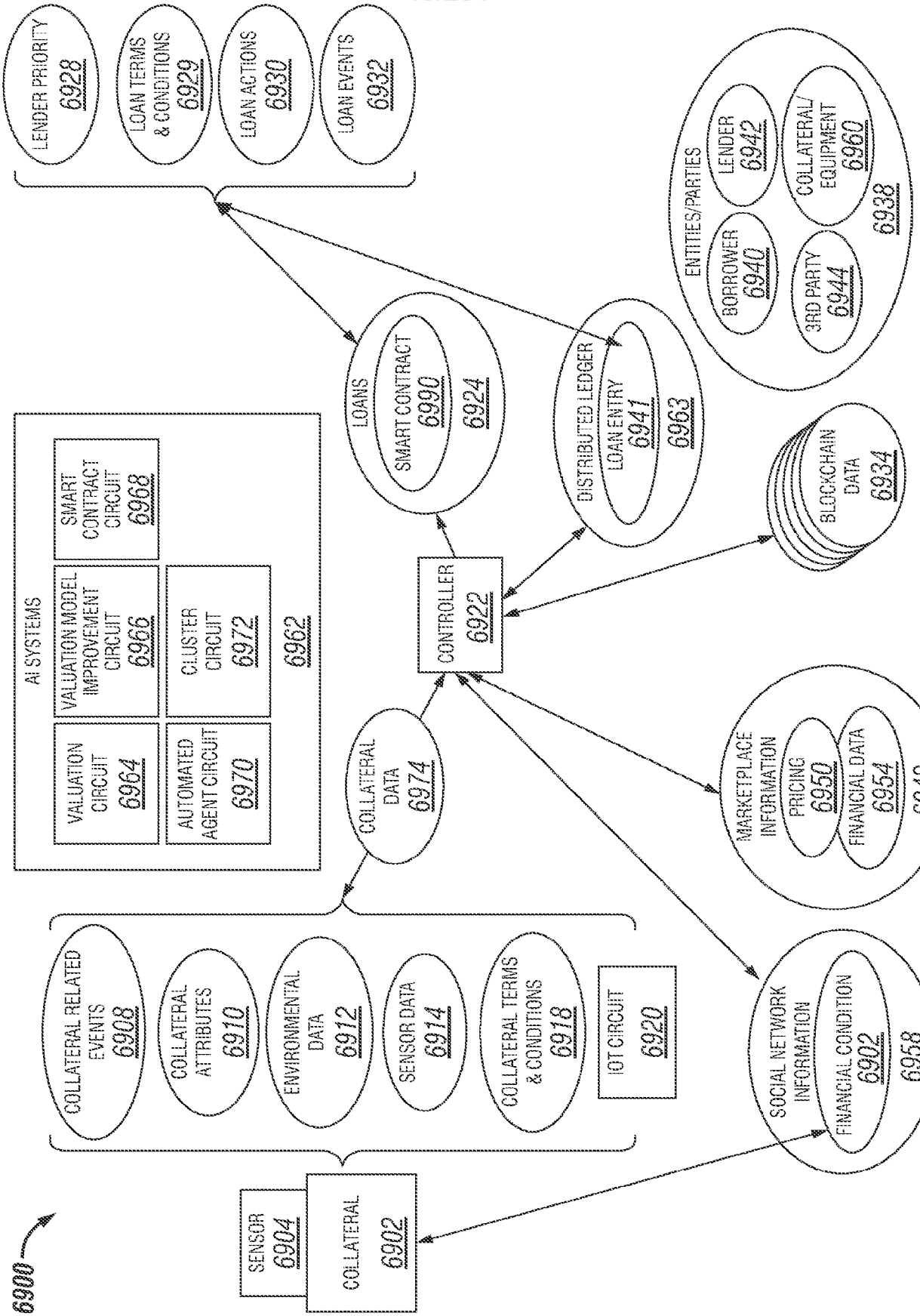

6900
SENSOR 6904
COLLATERAL 6902
COLLATERAL RELATED EVENTS 6908
COLLATERAL ATTRIBUTES 6910
ENVIRONMENTAL DATA 6912
SENSOR DATA 6914
COLLATERAL TERMS & CONDITIONS 6918
IOT CIRCUIT 6920
COLLATERAL DATA 6974
AI SYSTEMS
VALUATION CIRCUIT 6964
VALUATION MODEL IMPROVEMENT CIRCUIT 6966
SMART CONTRACT CIRCUIT 6968
AUTOMATED AGENT CIRCUIT 6970
CLUSTER CIRCUIT 6972
6962
CONTROLLER 6922
LENDER PRIORITY 6928
LOAN TERMS & CONDITIONS 6929
LOAN ACTIONS 6930
LOAN EVENTS 6932
LOANS
SMART CONTRACT 6990
6924
DISTRIBUTED LEDGER
LOAN ENTRY 6941
6963
BLOCKCHAIN DATA 6934
ENTITIES/PARTIES
BORROWER 6940
LENDER 6942
3RD PARTY 6944
COLLATERAL/ EQUIPMENT 6960
6938
MARKETPLACE INFORMATION
PRICING 6950
FINANCIAL DATA 6954
6948
SOCIAL NETWORK INFORMATION
FINANCIAL CONDITION 6902
6958

FIG. 69

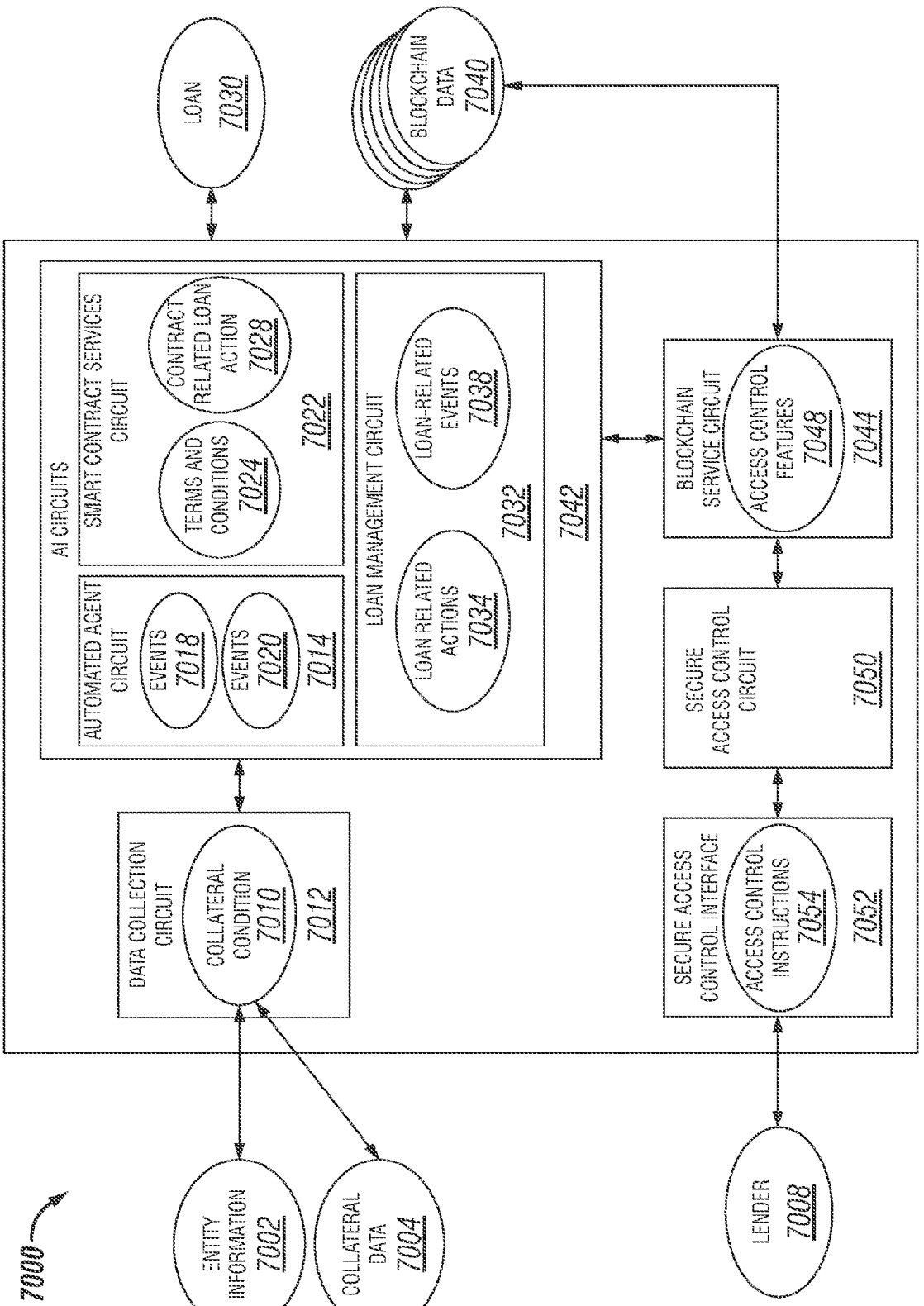

7000
ENTITY INFORMATION 7002
COLLATERAL DATA 7004
LENDER 7008
LOAN 7030
BLOCKCHAIN DATA 7040
AI CIRCUITS
DATA COLLECTION CIRCUIT
COLLATERAL CONDITION 7010
7012
AUTOMATED AGENT CIRCUIT
EVENTS 7018
EVENTS 7020
7014
SMART CONTRACT SERVICES CIRCUIT
TERMS AND CONDITIONS 7024
CONTRACT RELATED LOAN ACTION 7028
7022
LOAN MANAGEMENT CIRCUIT
LOAN RELATED ACTIONS 7034
LOAN-RELATED EVENTS 7038
7032
7042
SECURE ACCESS CONTROL CIRCUIT
7050
SECURE ACCESS CONTROL INTERFACE
ACCESS CONTROL INSTRUCTIONS 7054
7052
BLOCKCHAIN SERVICE CIRCUIT
ACCESS CONTROL FEATURES 7048
7044

FIG. 70

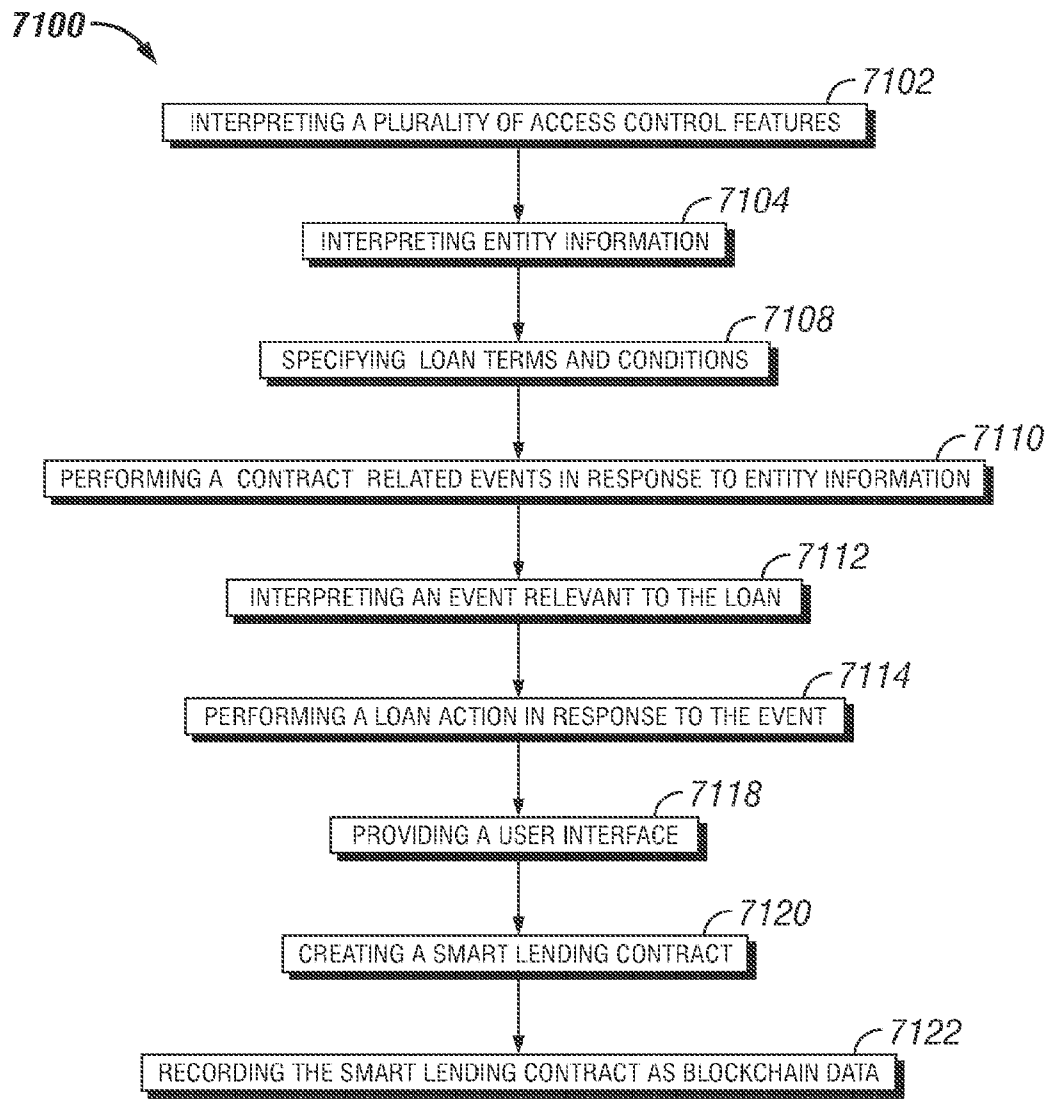

7100
7102
INTERPRETING A PLURALITY OF ACCESS CONTROL FEATURES
7104
INTERPRETING ENTITY INFORMATION
7108
SPECIFYING LOAN TERMS AND CONDITIONS
7110
PERFORMING A CONTRACT RELATED EVENTS IN RESPONSE TO ENTITY INFORMATION
7112
INTERPRETING AN EVENT RELEVANT TO THE LOAN
7114
PERFORMING A LOAN ACTION IN RESPONSE TO THE EVENT
7118
PROVIDING A USER INTERFACE
7120
CREATING A SMART LENDING CONTRACT
7122
RECORDING THE SMART LENDING CONTRACT AS BLOCKCHAIN DATA

FIG. 71

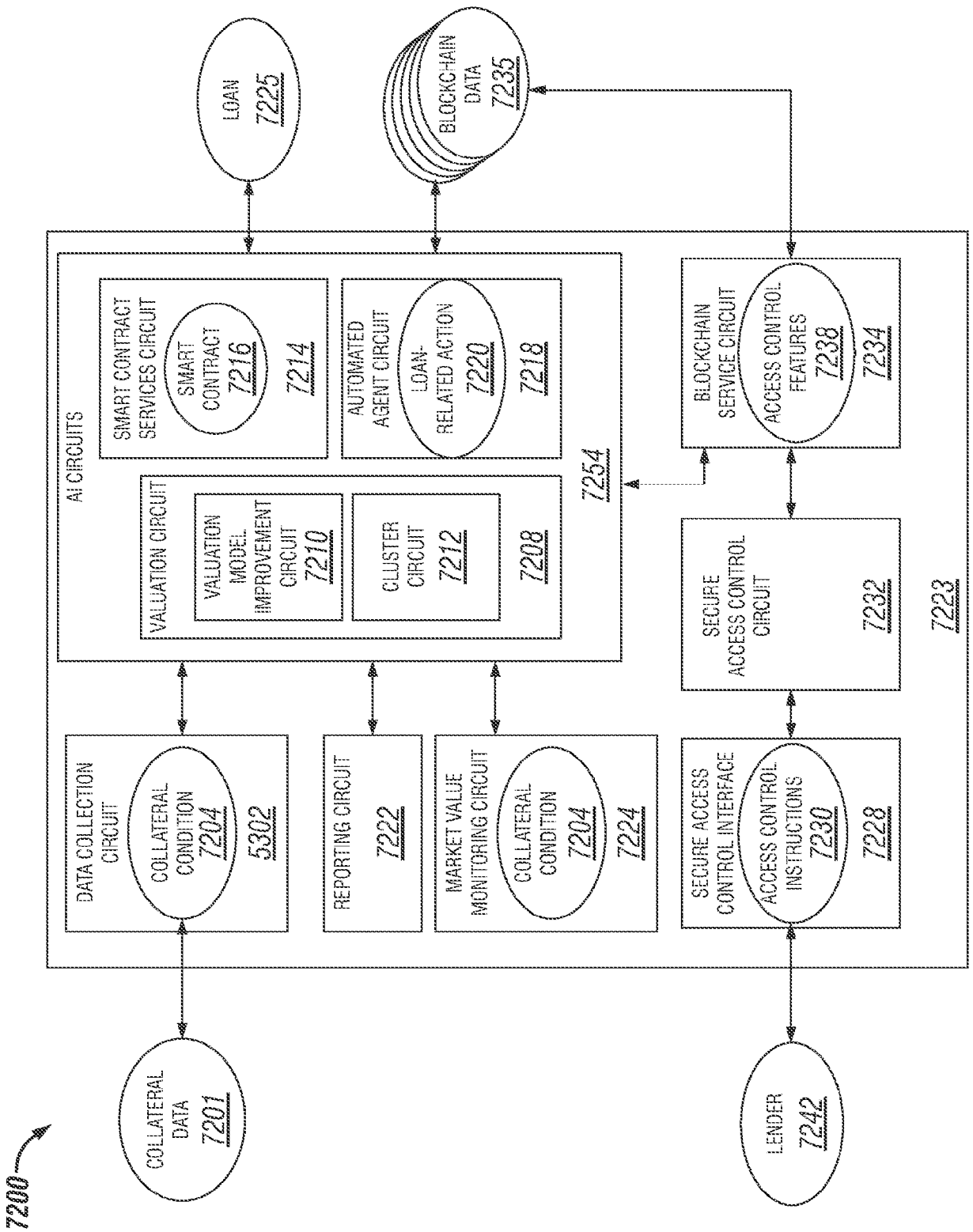

7200
COLLATERAL DATA 7201
LENDER 7242
LOAN 7225
BLOCKCHAIN DATA 7235
AI CIRCUITS
SMART CONTRACT SERVICES CIRCUIT
SMART CONTRACT 7216
7214
AUTOMATED AGENT CIRCUIT
LOAN-RELATED ACTION 7220
7218
VALUATION CIRCUIT
VALUATION MODEL IMPROVEMENT CIRCUIT 7210
CLUSTER CIRCUIT 7212
7208
7254
BLOCKCHAIN SERVICE CIRCUIT
ACCESS CONTROL FEATURES 7238
7234
SECURE ACCESS CONTROL CIRCUIT
7232
7223
DATA COLLECTION CIRCUIT
COLLATERAL CONDITION 7204
5302
REPORTING CIRCUIT
7222
MARKET VALUE MONITORING CIRCUIT
COLLATERAL CONDITION 7204
7224
SECURE ACCESS CONTROL INTERFACE
ACCESS CONTROL INSTRUCTIONS 7230
7228

FIG. 72

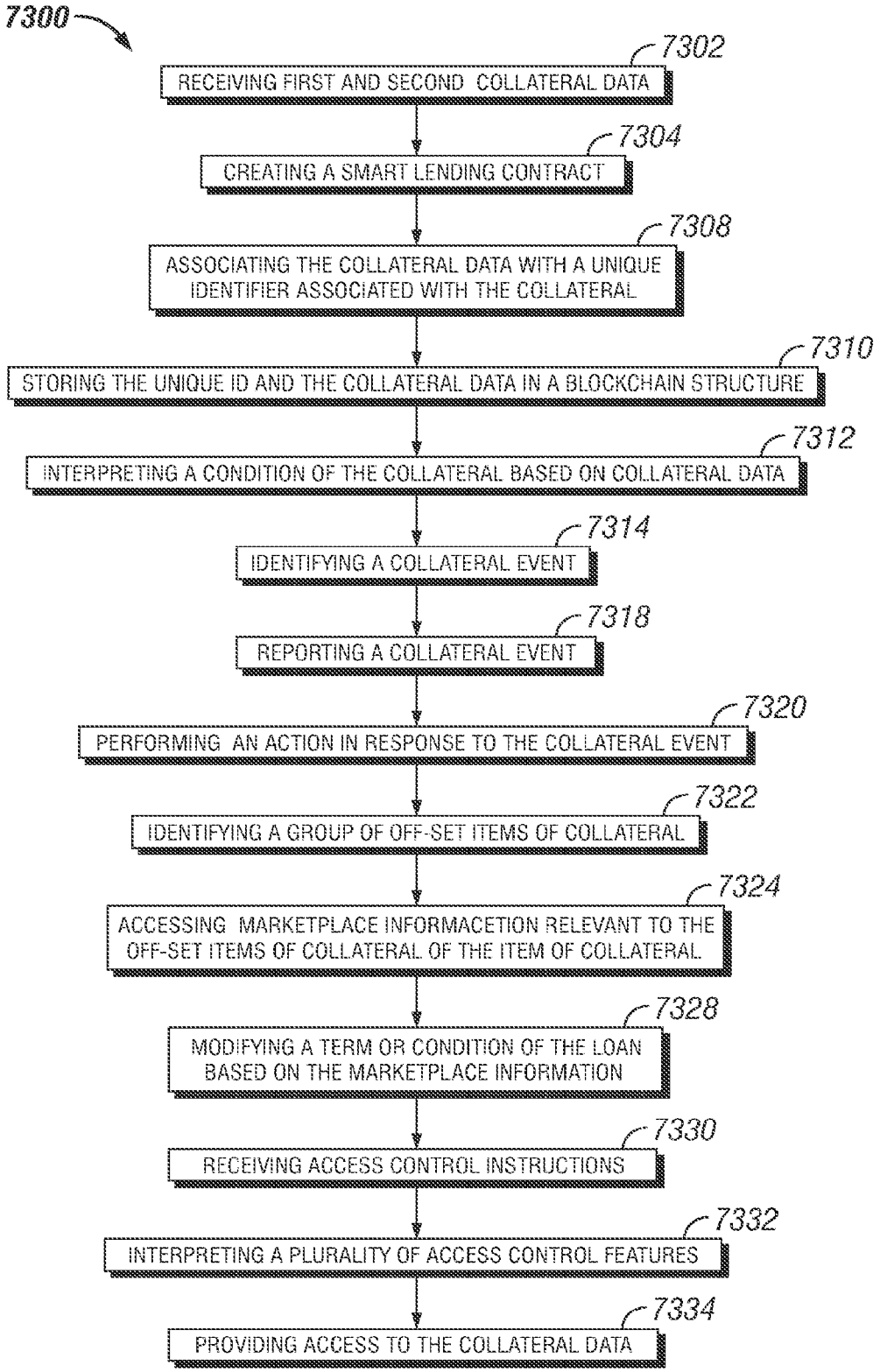

7300
7302
RECEIVING FIRST AND SECOND COLLATERAL DATA
7304
CREATING A SMART LENDING CONTRACT
7308
ASSOCIATING THE COLLATERAL DATA WITH A UNIQUE IDENTIFIER ASSOCIATED WITH THE COLLATERAL
7310
STORING THE UNIQUE ID AND THE COLLATERAL DATA IN A BLOCKCHAIN STRUCTURE
7312
INTERPRETING A CONDITION OF THE COLLATERAL BASED ON COLLATERAL DATA
7314
IDENTIFYING A COLLATERAL EVENT
7318
REPORTING A COLLATERAL EVENT
7320
PERFORMING AN ACTION IN RESPONSE TO THE COLLATERAL EVENT
7322
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL
7324
ACCESSING MARKETPLACE INFORMACETION RELEVANT TO THE OFF-SET ITEMS OF COLLATERAL OF THE ITEM OF COLLATERAL
7328
MODIFYING A TERM OR CONDITION OF THE LOAN BASED ON THE MARKETPLACE INFORMATION
7330
RECEIVING ACCESS CONTROL INSTRUCTIONS
7332
INTERPRETING A PLURALITY OF ACCESS CONTROL FEATURES
7334
PROVIDING ACCESS TO THE COLLATERAL DATA

FIG. 73

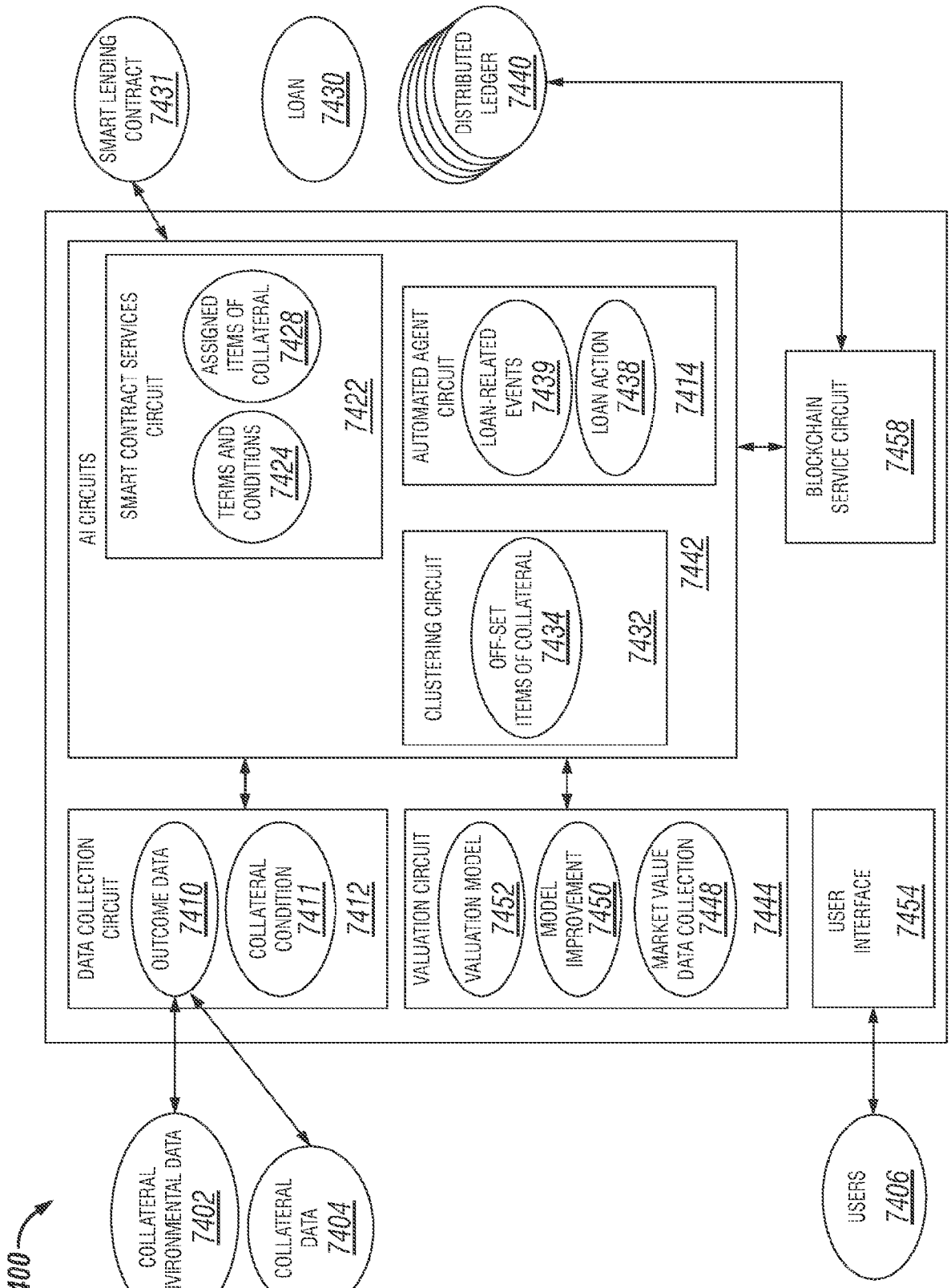

7400
COLLATERAL ENVIRONMENTAL DATA 7402
COLLATERAL DATA 7404
USERS 7406
AI CIRCUITS
DATA COLLECTION CIRCUIT
OUTCOME DATA 7410
COLLATERAL CONDITION 7411
7412
VALUATION CIRCUIT
VALUATION MODEL 7452
MODEL IMPROVEMENT 7450
MARKET VALUE DATA COLLECTION 7448
7444
USER INTERFACE 7454
SMART CONTRACT SERVICES CIRCUIT
TERMS AND CONDITIONS 7424
ASSIGNED ITEMS OF COLLATERAL 7428
7422
CLUSTERING CIRCUIT
OFF-SET ITEMS OF COLLATERAL 7434
7432
7442
AUTOMATED AGENT CIRCUIT
LOAN-RELATED EVENTS 7439
LOAN ACTION 7438
7414
BLOCKCHAIN SERVICE CIRCUIT 7458
SMART LENDING CONTRACT 7431
LOAN 7430
DISTRIBUTED LEDGER 7440

FIG. 74

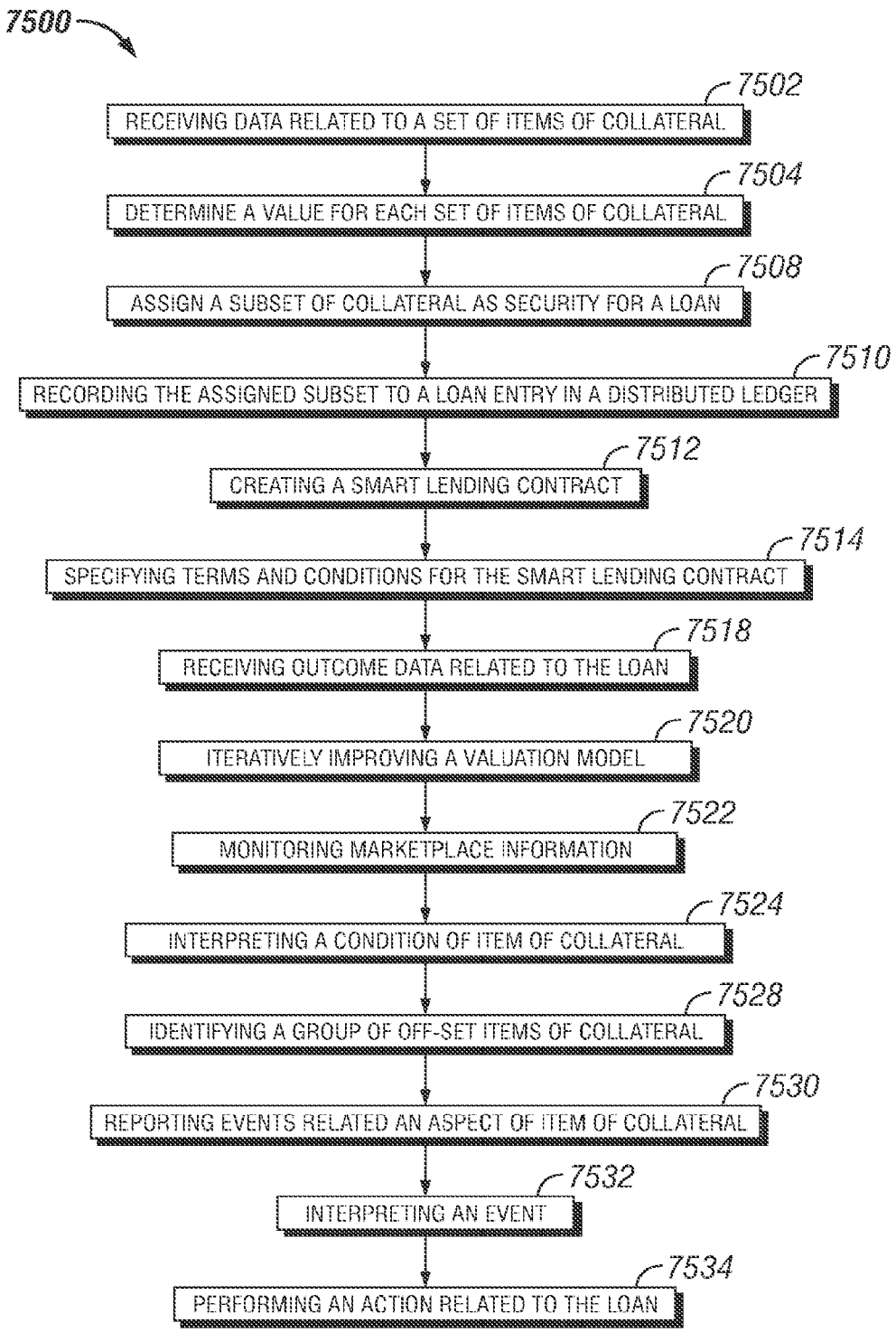

7500
7502
RECEIVING DATA RELATED TO A SET OF ITEMS OF COLLATERAL
7504
DETERMINE A VALUE FOR EACH SET OF ITEMS OF COLLATERAL
7508
ASSIGN A SUBSET OF COLLATERAL AS SECURITY FOR A LOAN
7510
RECORDING THE ASSIGNED SUBSET TO A LOAN ENTRY IN A DISTRIBUTED LEDGER
7512
CREATING A SMART LENDING CONTRACT
7514
SPECIFYING TERMS AND CONDITIONS FOR THE SMART LENDING CONTRACT
7518
RECEIVING OUTCOME DATA RELATED TO THE LOAN
7520
ITERATIVELY IMPROVING A VALUATION MODEL
7522
MONITORING MARKETPLACE INFORMATION
7524
INTERPRETING A CONDITION OF ITEM OF COLLATERAL
7528
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL
7530
REPORTING EVENTS RELATED AN ASPECT OF ITEM OF COLLATERAL
7532
INTERPRETING AN EVENT
7534
PERFORMING AN ACTION RELATED TO THE LOAN

FIG. 75

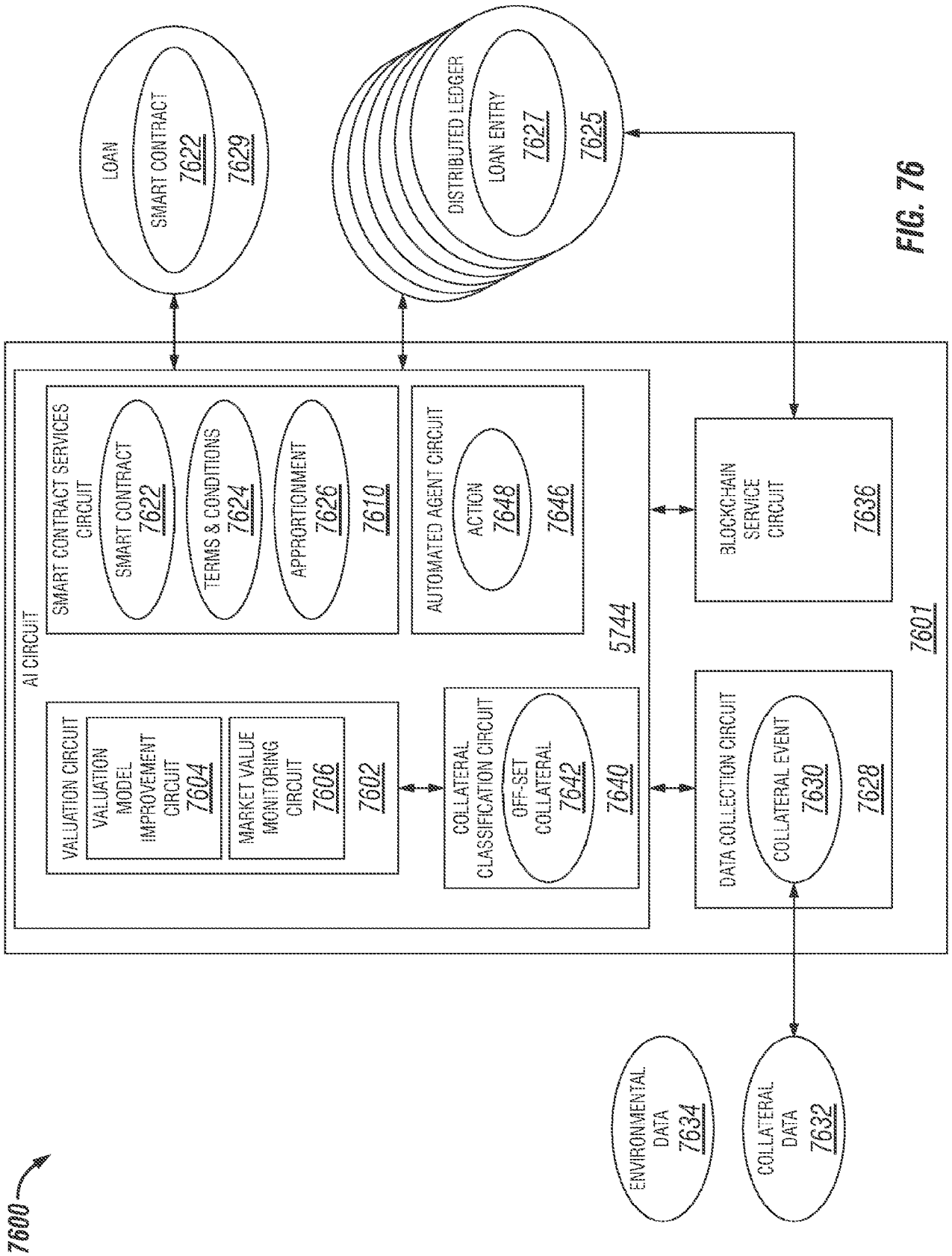

7600
AI CIRCUIT
VALUATION CIRCUIT
VALUATION MODEL IMPROVEMENT CIRCUIT 7604
MARKET VALUE MONITORING CIRCUIT 7606
7602
COLLATERAL CLASSIFICATION CIRCUIT
OFF-SET COLLATERAL 7642
7640
SMART CONTRACT SERVICES CIRCUIT
SMART CONTRACT 7622
TERMS & CONDITIONS 7624
APPRORTIONMENT 7626
7610
AUTOMATED AGENT CIRCUIT
ACTION 7648
7646
5744
DATA COLLECTION CIRCUIT
COLLATERAL EVENT 7630
7628
BLOCKCHAIN SERVICE CIRCUIT 7636
7601
LOAN
SMART CONTRACT 7622
7629
DISTRIBUTED LEDGER
LOAN ENTRY 7627
7625
ENVIRONMENTAL DATA 7634
COLLATERAL DATA 7632

FIG. 76

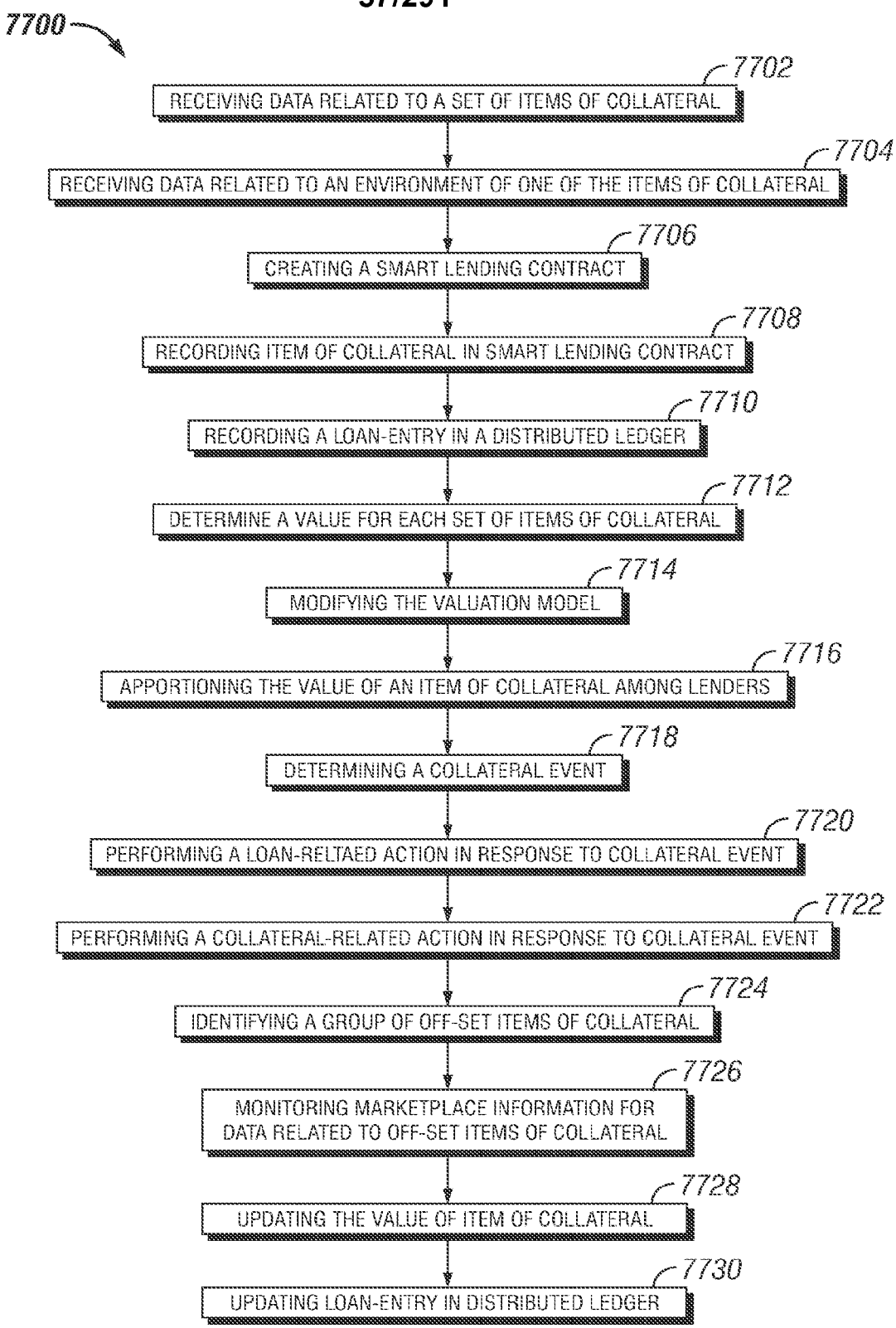

7700
7702
RECEIVING DATA RELATED TO A SET OF ITEMS OF COLLATERAL
7704
RECEIVING DATA RELATED TO AN ENVIRONMENT OF ONE OF THE ITEMS OF COLLATERAL
7706
CREATING A SMART LENDING CONTRACT
7708
RECORDING ITEM OF COLLATERAL IN SMART LENDING CONTRACT
7710
RECORDING A LOAN-ENTRY IN A DISTRIBUTED LEDGER
7712
DETERMINE A VALUE FOR EACH SET OF ITEMS OF COLLATERAL
7714
MODIFYING THE VALUATION MODEL
7716
APPORTIONING THE VALUE OF AN ITEM OF COLLATERAL AMONG LENDERS
7718
DETERMINING A COLLATERAL EVENT
7720
PERFORMING A LOAN-RELTAED ACTION IN RESPONSE TO COLLATERAL EVENT
7722
PERFORMING A COLLATERAL-RELATED ACTION IN RESPONSE TO COLLATERAL EVENT
7724
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL
7726
MONITORING MARKETPLACE INFORMATION FOR DATA RELATED TO OFF-SET ITEMS OF COLLATERAL
7728
UPDATING THE VALUE OF ITEM OF COLLATERAL
7730
UPDATING LOAN-ENTRY IN DISTRIBUTED LEDGER

FIG. 77

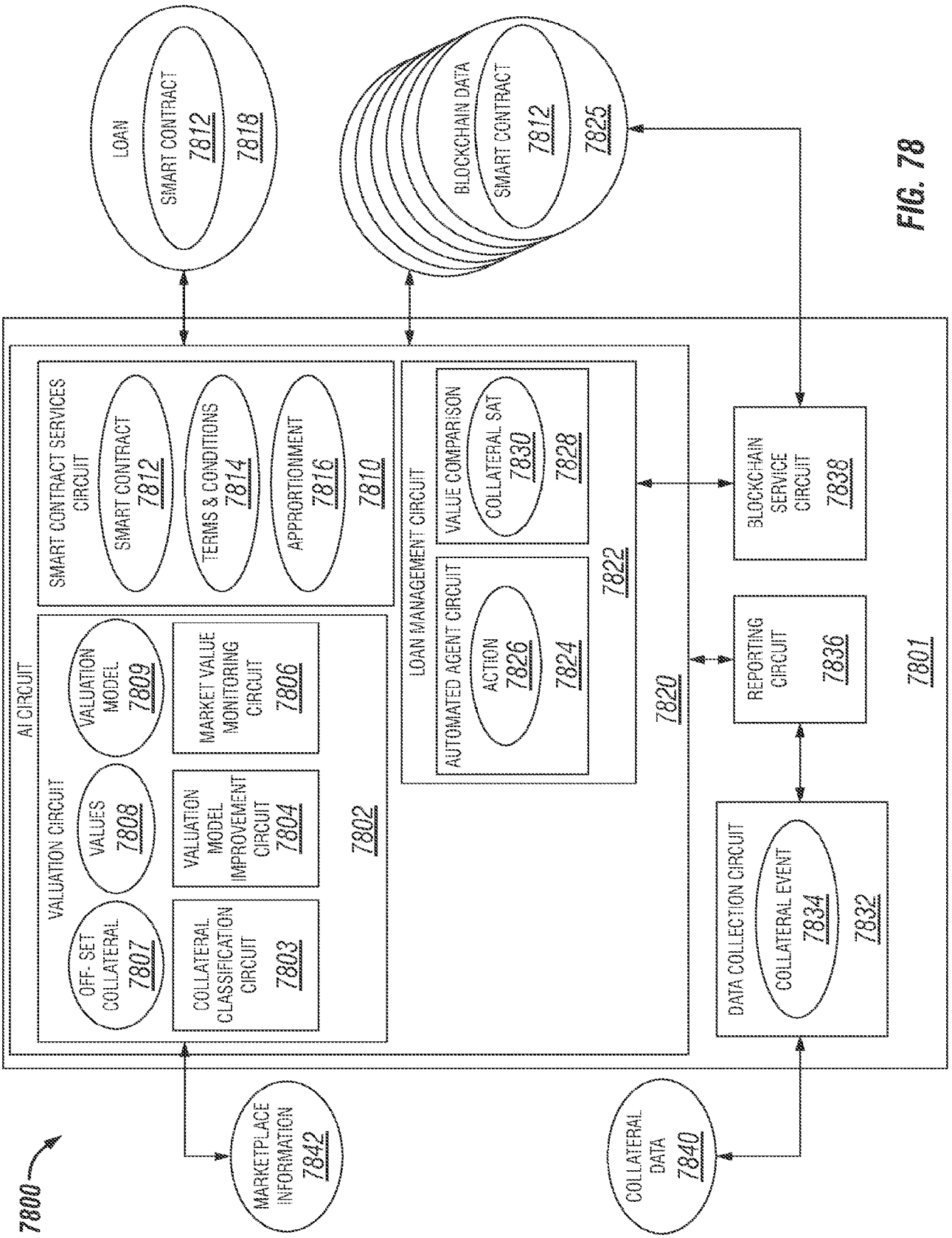

7800
MARKETPLACE INFORMATION 7842
COLLATERAL DATA 7840
AI CIRCUIT
VALUATION CIRCUIT
OFF- SET COLLATERAL 7807
VALUES 7808
VALUATION MODEL 7809
COLLATERAL CLASSIFICATION CIRCUIT 7803
VALUATION MODEL IMPROVEMENT CIRCUIT 7804
MARKET VALUE MONITORING CIRCUIT 7806
7802
SMART CONTRACT SERVICES CIRCUIT
SMART CONTRACT 7812
TERMS & CONDITIONS 7814
APPRORTIONMENT 7816
7810
LOAN MANAGEMENT CIRCUIT
AUTOMATED AGENT CIRCUIT
ACTION 7826
7824
VALUE COMPARISON
COLLATERAL SAT 7830
7828
7822
7820
DATA COLLECTION CIRCUIT
COLLATERAL EVENT 7834
7832
REPORTING CIRCUIT 7836
BLOCKCHAIN SERVICE CIRCUIT 7838
7801
LOAN
SMART CONTRACT 7812
7818
BLOCKCHAIN DATA
SMART CONTRACT 7812
7825

FIG. 78

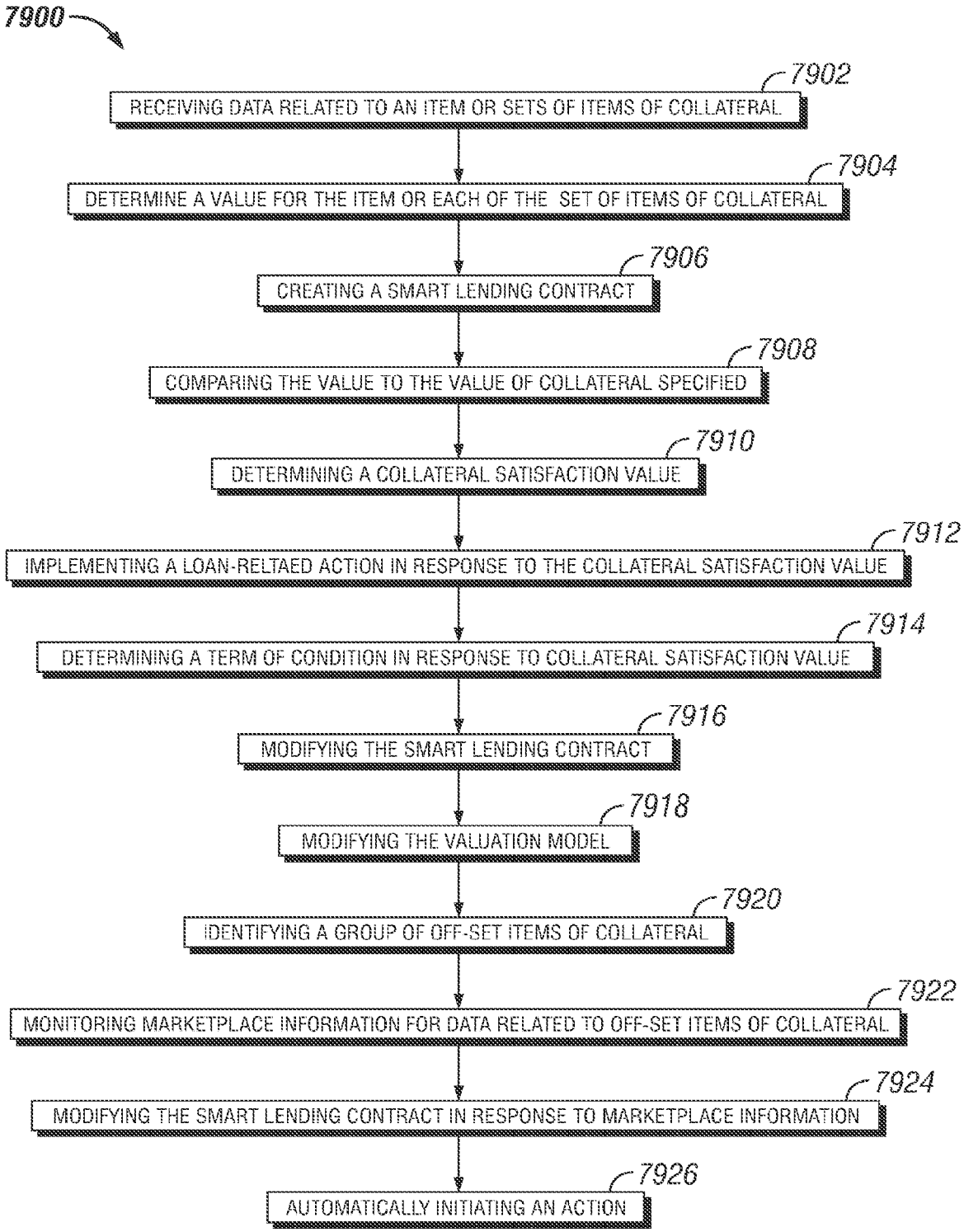

7900
7902
RECEIVING DATA RELATED TO AN ITEM OR SETS OF ITEMS OF COLLATERAL
7904
DETERMINE A VALUE FOR THE ITEM OR EACH OF THE SET OF ITEMS OF COLLATERAL
7906
CREATING A SMART LENDING CONTRACT
7908
COMPARING THE VALUE TO THE VALUE OF COLLATERAL SPECIFIED
7910
DETERMINING A COLLATERAL SATISFACTION VALUE
7912
IMPLEMENTING A LOAN-RELTAED ACTION IN RESPONSE TO THE COLLATERAL SATISFACTION VALUE
7914
DETERMINING A TERM OF CONDITION IN RESPONSE TO COLLATERAL SATISFACTION VALUE
7916
MODIFYING THE SMART LENDING CONTRACT
7918
MODIFYING THE VALUATION MODEL
7920
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL
7922
MONITORING MARKETPLACE INFORMATION FOR DATA RELATED TO OFF-SET ITEMS OF COLLATERAL
7924
MODIFYING THE SMART LENDING CONTRACT IN RESPONSE TO MARKETPLACE INFORMATION
7926
AUTOMATICALLY INITIATING AN ACTION

FIG. 79

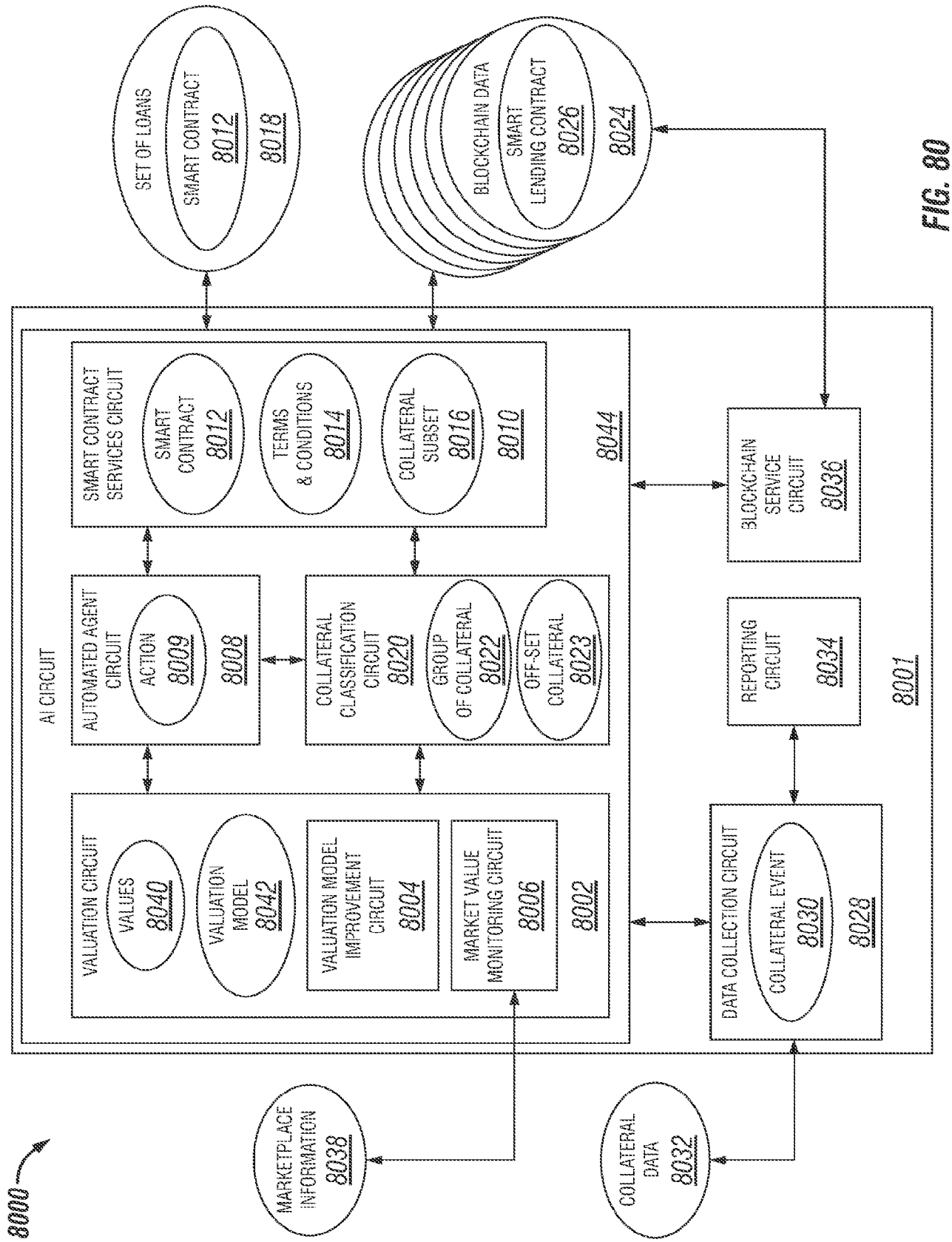

8000
MARKETPLACE INFORMATION 8038
COLLATERAL DATA 8032
AI CIRCUIT
VALUATION CIRCUIT 8002
VALUES 8040
VALUATION MODEL 8042
VALUATION MODEL IMPROVEMENT CIRCUIT 8004
MARKET VALUE MONITORING CIRCUIT 8006
AUTOMATED AGENT CIRCUIT 8008
ACTION 8009
COLLATERAL CLASSIFICATION CIRCUIT 8020
GROUP OF COLLATERAL 8022
OFF-SET COLLATERAL 8023
SMART CONTRACT SERVICES CIRCUIT 8010
SMART CONTRACT 8012
TERMS & CONDITIONS 8014
COLLATERAL SUBSET 8016
8044
DATA COLLECTION CIRCUIT 8028
COLLATERAL EVENT 8030
REPORTING CIRCUIT 8034
BLOCKCHAIN SERVICE CIRCUIT 8036
8001
SET OF LOANS 8018
SMART CONTRACT 8012
BLOCKCHAIN DATA 8024
SMART LENDING CONTRACT 8026

FIG. 80

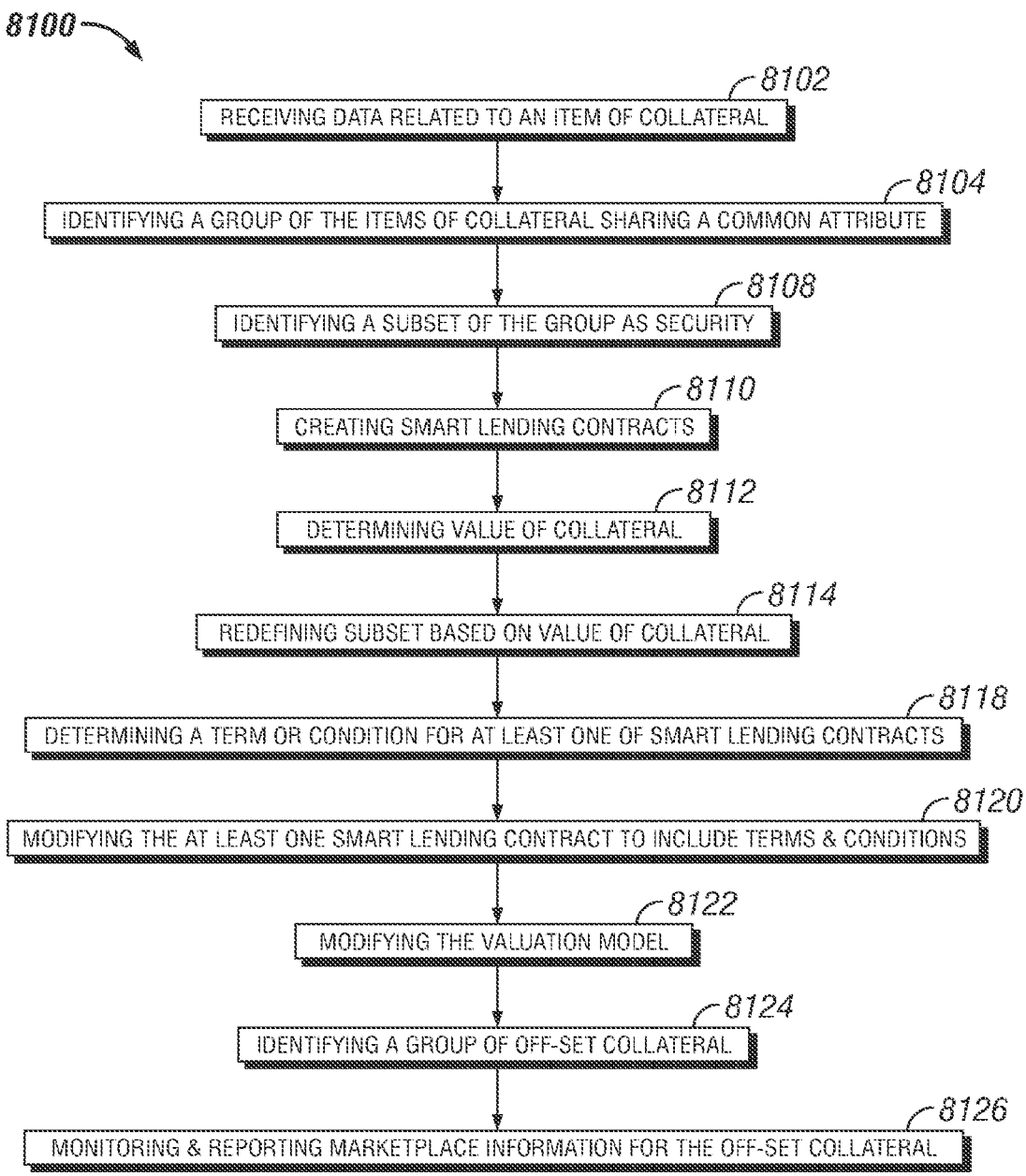

8100
8102
RECEIVING DATA RELATED TO AN ITEM OF COLLATERAL
8104
IDENTIFYING A GROUP OF THE ITEMS OF COLLATERAL SHARING A COMMON ATTRIBUTE
8108
IDENTIFYING A SUBSET OF THE GROUP AS SECURITY
8110
CREATING SMART LENDING CONTRACTS
8112
DETERMINING VALUE OF COLLATERAL
8114
REDEFINING SUBSET BASED ON VALUE OF COLLATERAL
8118
DETERMINING A TERM OR CONDITION FOR AT LEAST ONE OF SMART LENDING CONTRACTS
8120
MODIFYING THE AT LEAST ONE SMART LENDING CONTRACT TO INCLUDE TERMS & CONDITIONS
8122
MODIFYING THE VALUATION MODEL
8124
IDENTIFYING A GROUP OF OFF-SET COLLATERAL
8126
MONITORING & REPORTING MARKETPLACE INFORMATION FOR THE OFF-SET COLLATERAL

FIG. 81

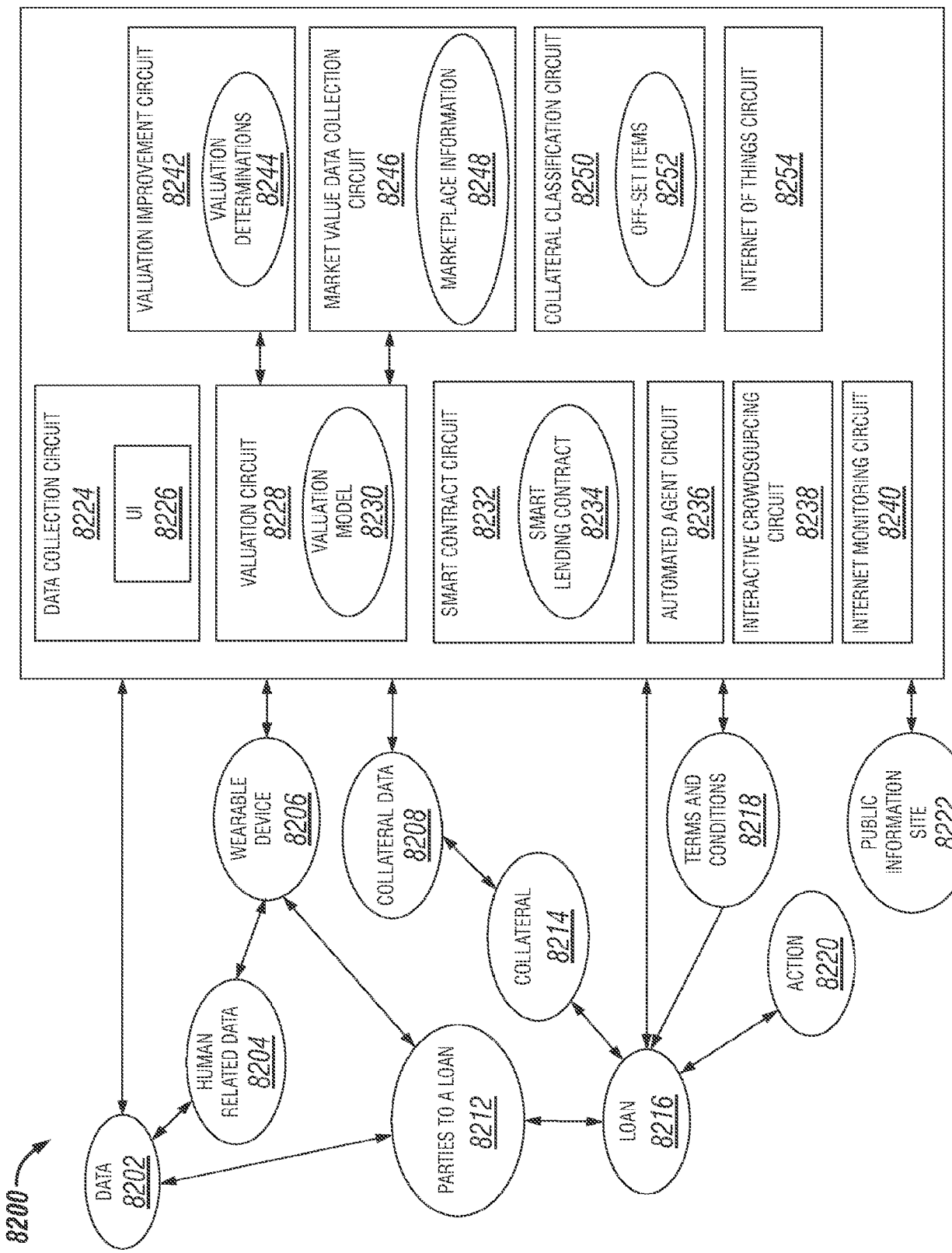

8200
DATA
8202
HUMAN RELATED DATA
8204
WEARABLE DEVICE
8206
COLLATERAL DATA
8208
PARTIES TO A LOAN
8212
COLLATERAL
8214
LOAN
8216
TERMS AND CONDITIONS
8218
ACTION
8220
PUBLIC INFORMATION SITE
8222
DATA COLLECTION CIRCUIT
8224
UI
8226
VALUATION CIRCUIT
8228
VALUATION MODEL
8230
SMART CONTRACT CIRCUIT
8232
SMART LENDING CONTRACT
8234
AUTOMATED AGENT CIRCUIT
8236
INTERACTIVE CROWDSOURCING CIRCUIT
8238
INTERNET MONITORING CIRCUIT
8240
VALUATION IMPROVEMENT CIRCUIT
8242
VALUATION DETERMINATIONS
8244
MARKET VALUE DATA COLLECTION CIRCUIT
8246
MARKETPLACE INFORMATION
8248
COLLATERAL CLASSIFICATION CIRCUIT
8250
OFF-SET ITEMS
8252
INTERNET OF THINGS CIRCUIT
8254

FIG. 82

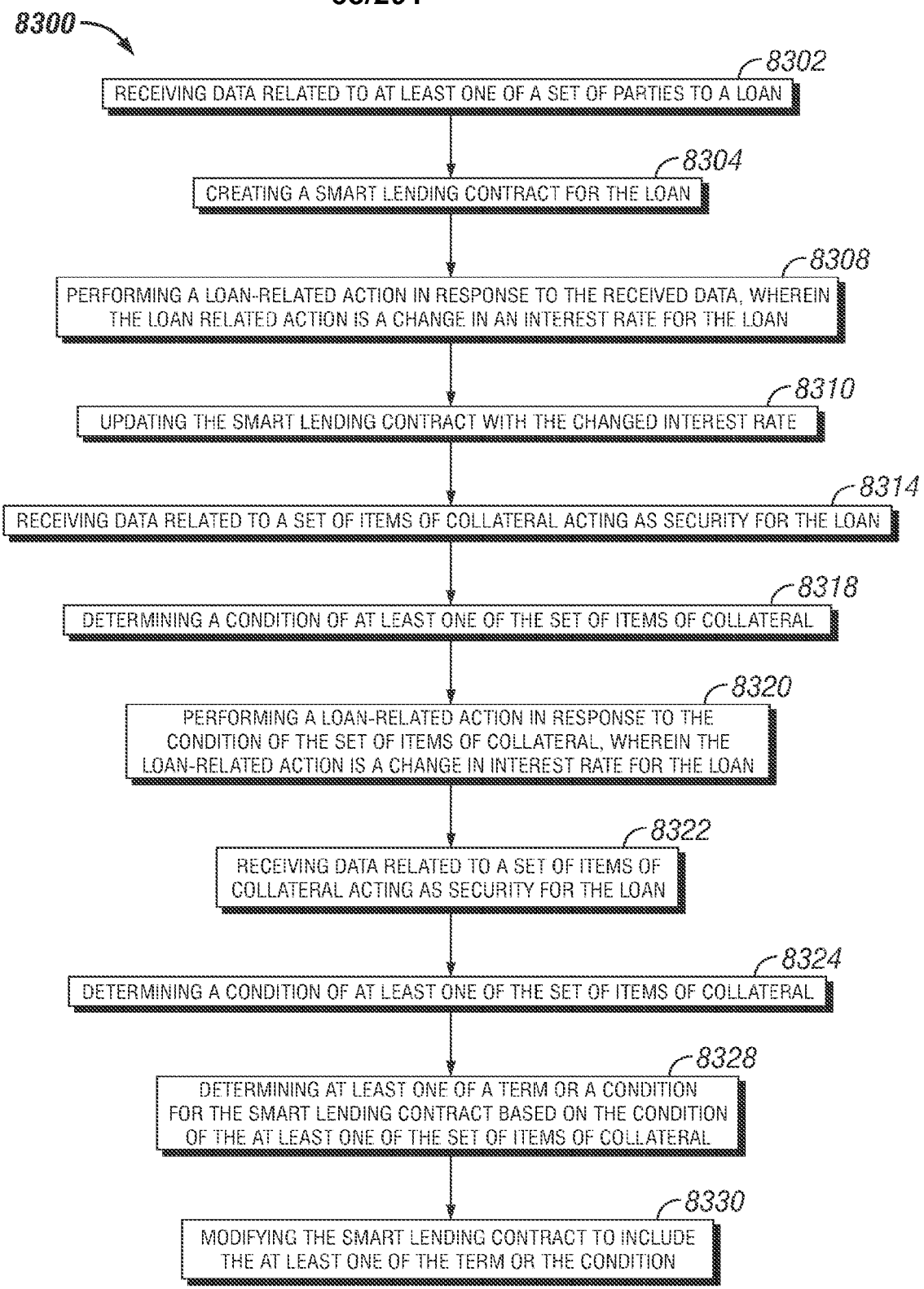

8300
8302
RECEIVING DATA RELATED TO AT LEAST ONE OF A SET OF PARTIES TO A LOAN
8304
CREATING A SMART LENDING CONTRACT FOR THE LOAN
8308
PERFORMING A LOAN-RELATED ACTION IN RESPONSE TO THE RECEIVED DATA, WHEREIN THE LOAN RELATED ACTION IS A CHANGE IN AN INTEREST RATE FOR THE LOAN
8310
UPDATING THE SMART LENDING CONTRACT WITH THE CHANGED INTEREST RATE
8314
RECEIVING DATA RELATED TO A SET OF ITEMS OF COLLATERAL ACTING AS SECURITY FOR THE LOAN
8318
DETERMINING A CONDITION OF AT LEAST ONE OF THE SET OF ITEMS OF COLLATERAL
8320
PERFORMING A LOAN-RELATED ACTION IN RESPONSE TO THE CONDITION OF THE SET OF ITEMS OF COLLATERAL, WHEREIN THE LOAN-RELATED ACTION IS A CHANGE IN INTEREST RATE FOR THE LOAN
8322
RECEIVING DATA RELATED TO A SET OF ITEMS OF COLLATERAL ACTING AS SECURITY FOR THE LOAN
8324
DETERMINING A CONDITION OF AT LEAST ONE OF THE SET OF ITEMS OF COLLATERAL
8328
DETERMINING AT LEAST ONE OF A TERM OR A CONDITION FOR THE SMART LENDING CONTRACT BASED ON THE CONDITION OF THE AT LEAST ONE OF THE SET OF ITEMS OF COLLATERAL
8330
MODIFYING THE SMART LENDING CONTRACT TO INCLUDE THE AT LEAST ONE OF THE TERM OR THE CONDITION

FIG. 83

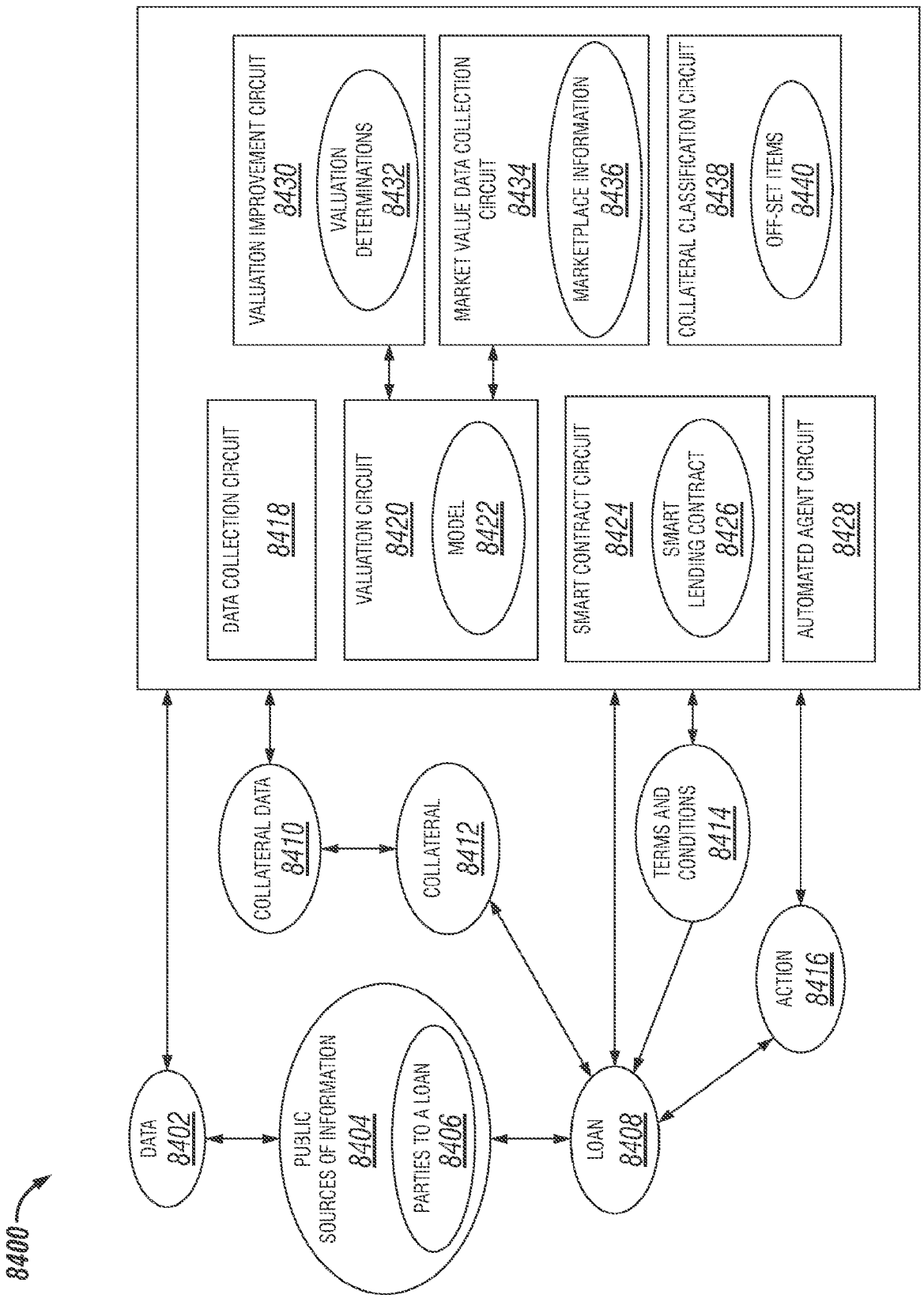

8400
DATA 8402
PUBLIC SOURCES OF INFORMATION 8404
PARTIES TO A LOAN 8406
COLLATERAL DATA 8410
COLLATERAL 8412
LOAN 8408
TERMS AND CONDITIONS 8414
ACTION 8416
DATA COLLECTION CIRCUIT 8418
VALUATION CIRCUIT 8420
MODEL 8422
SMART CONTRACT CIRCUIT 8424
SMART LENDING CONTRACT 8426
AUTOMATED AGENT CIRCUIT 8428
VALUATION IMPROVEMENT CIRCUIT 8430
VALUATION DETERMINATIONS 8432
MARKET VALUE DATA COLLECTION CIRCUIT 8434
MARKETPLACE INFORMATION 8436
COLLATERAL CLASSIFICATION CIRCUIT 8438
OFF-SET ITEMS 8440

FIG. 84

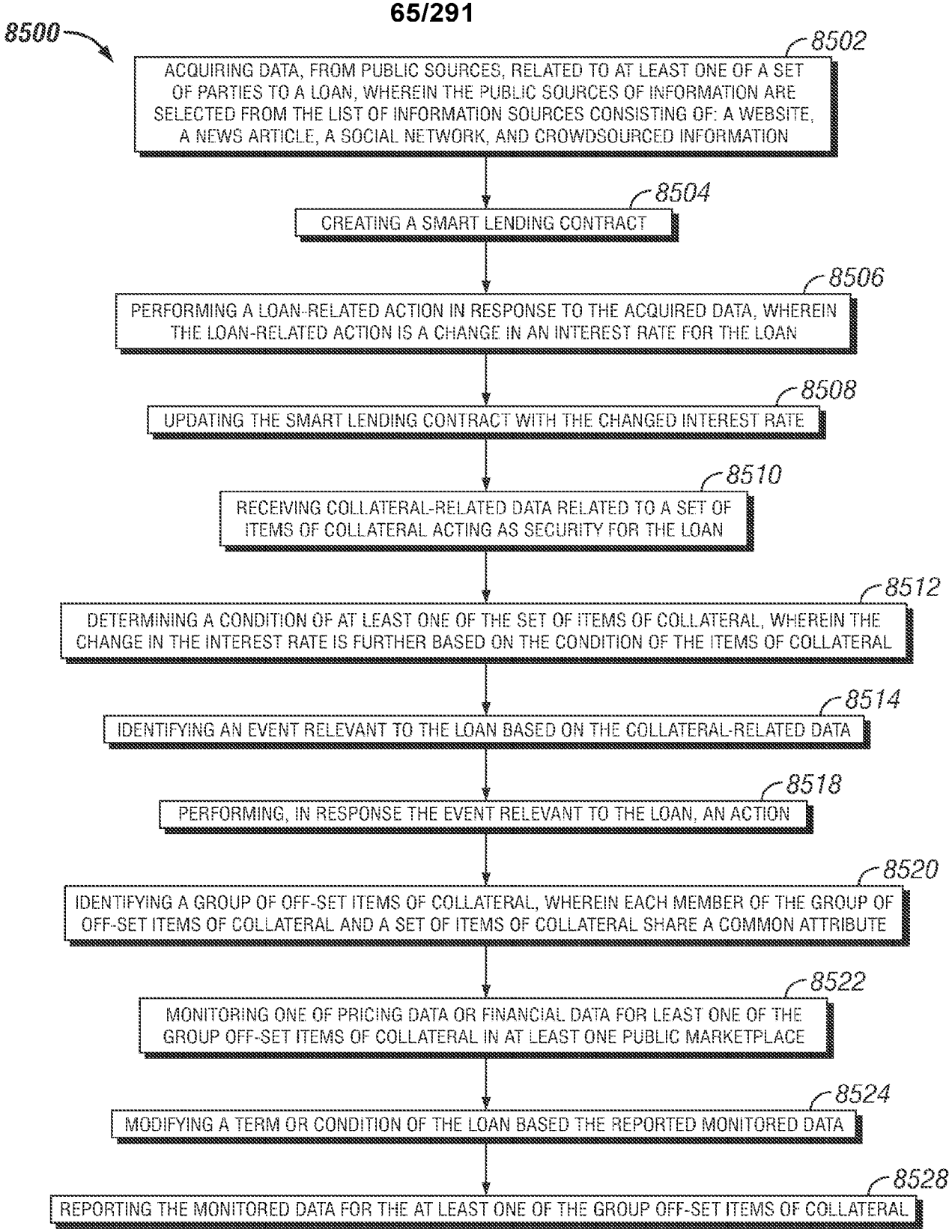

8500
8502
ACQUIRING DATA, FROM PUBLIC SOURCES, RELATED TO AT LEAST ONE OF A SET OF PARTIES TO A LOAN, WHEREIN THE PUBLIC SOURCES OF INFORMATION ARE SELECTED FROM THE LIST OF INFORMATION SOURCES CONSISTING OF: A WEBSITE, A NEWS ARTICLE, A SOCIAL NETWORK, AND CROWDSOURCED INFORMATION
8504
CREATING A SMART LENDING CONTRACT
8506
PERFORMING A LOAN-RELATED ACTION IN RESPONSE TO THE ACQUIRED DATA, WHEREIN THE LOAN-RELATED ACTION IS A CHANGE IN AN INTEREST RATE FOR THE LOAN
8508
UPDATING THE SMART LENDING CONTRACT WITH THE CHANGED INTEREST RATE
8510
RECEIVING COLLATERAL-RELATED DATA RELATED TO A SET OF ITEMS OF COLLATERAL ACTING AS SECURITY FOR THE LOAN
8512
DETERMINING A CONDITION OF AT LEAST ONE OF THE SET OF ITEMS OF COLLATERAL, WHEREIN THE CHANGE IN THE INTEREST RATE IS FURTHER BASED ON THE CONDITION OF THE ITEMS OF COLLATERAL
8514
IDENTIFYING AN EVENT RELEVANT TO THE LOAN BASED ON THE COLLATERAL-RELATED DATA
8518
PERFORMING, IN RESPONSE THE EVENT RELEVANT TO THE LOAN, AN ACTION
8520
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL, WHEREIN EACH MEMBER OF THE GROUP OF OFF-SET ITEMS OF COLLATERAL AND A SET OF ITEMS OF COLLATERAL SHARE A COMMON ATTRIBUTE
8522
MONITORING ONE OF PRICING DATA OR FINANCIAL DATA FOR LEAST ONE OF THE GROUP OFF-SET ITEMS OF COLLATERAL IN AT LEAST ONE PUBLIC MARKETPLACE
8524
MODIFYING A TERM OR CONDITION OF THE LOAN BASED THE REPORTED MONITORED DATA
8528
REPORTING THE MONITORED DATA FOR THE AT LEAST ONE OF THE GROUP OFF-SET ITEMS OF COLLATERAL

FIG. 85

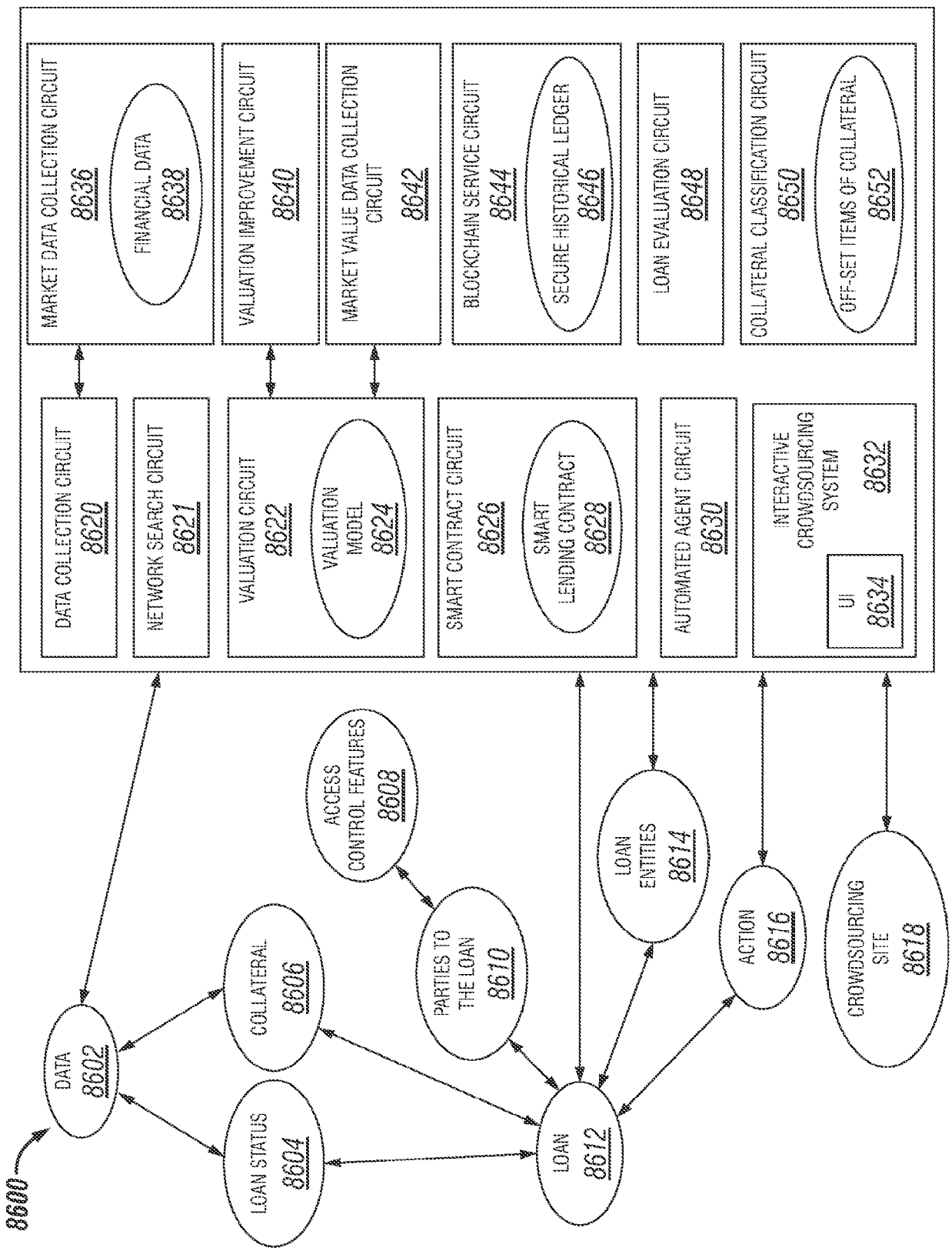

8600
DATA 8602
LOAN STATUS 8604
COLLATERAL 8606
ACCESS CONTROL FEATURES 8608
PARTIES TO THE LOAN 8610
LOAN 8612
LOAN ENTITIES 8614
ACTION 8616
CROWDSOURCING SITE 8618
DATA COLLECTION CIRCUIT 8620
NETWORK SEARCH CIRCUIT 8621
VALUATION CIRCUIT 8622
VALUATION MODEL 8624
SMART CONTRACT CIRCUIT 8626
SMART LENDING CONTRACT 8628
AUTOMATED AGENT CIRCUIT 8630
INTERACTIVE CROWDSOURCING SYSTEM 8632
UI 8634
MARKET DATA COLLECTION CIRCUIT 8636
FINANCIAL DATA 8638
VALUATION IMPROVEMENT CIRCUIT 8640
MARKET VALUE DATA COLLECTION CIRCUIT 8642
BLOCKCHAIN SERVICE CIRCUIT 8644
SECURE HISTORICAL LEDGER 8646
LOAN EVALUATION CIRCUIT 8648
COLLATERAL CLASSIFICATION CIRCUIT 8650
OFF-SET ITEMS OF COLLATERAL 8652

FIG. 86

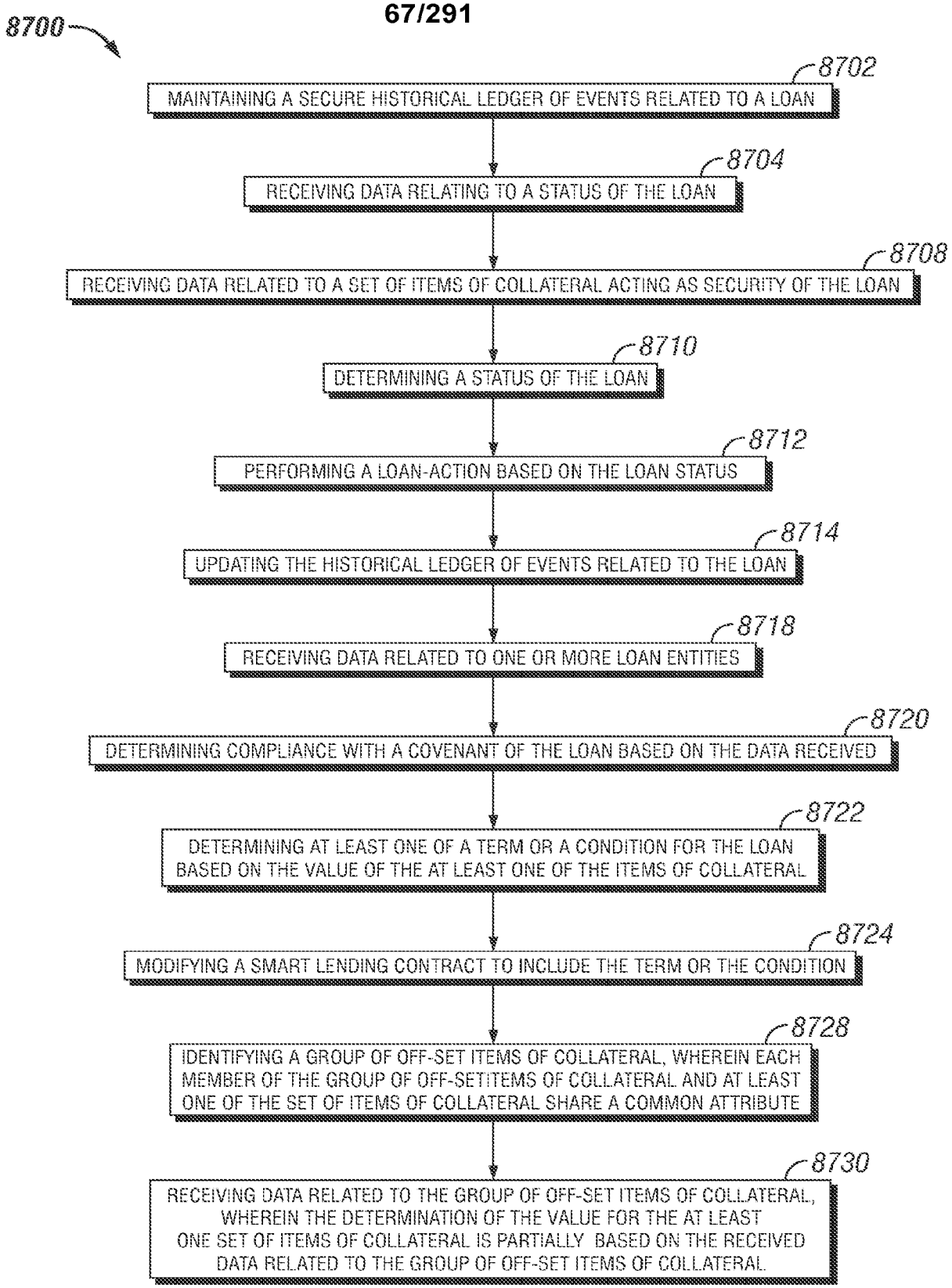

8700
8702
MAINTAINING A SECURE HISTORICAL LEDGER OF EVENTS RELATED TO A LOAN
8704
RECEIVING DATA RELATING TO A STATUS OF THE LOAN
8708
RECEIVING DATA RELATED TO A SET OF ITEMS OF COLLATERAL ACTING AS SECURITY OF THE LOAN
8710
DETERMINING A STATUS OF THE LOAN
8712
PERFORMING A LOAN-ACTION BASED ON THE LOAN STATUS
8714
UPDATING THE HISTORICAL LEDGER OF EVENTS RELATED TO THE LOAN
8718
RECEIVING DATA RELATED TO ONE OR MORE LOAN ENTITIES
8720
DETERMINING COMPLIANCE WITH A COVENANT OF THE LOAN BASED ON THE DATA RECEIVED
8722
DETERMINING AT LEAST ONE OF A TERM OR A CONDITION FOR THE LOAN BASED ON THE VALUE OF THE AT LEAST ONE OF THE ITEMS OF COLLATERAL
8724
MODIFYING A SMART LENDING CONTRACT TO INCLUDE THE TERM OR THE CONDITION
8728
IDENTIFYING A GROUP OF OFF-SET ITEMS OF COLLATERAL, WHEREIN EACH MEMBER OF THE GROUP OF OFF-SETITEMS OF COLLATERAL AND AT LEAST ONE OF THE SET OF ITEMS OF COLLATERAL SHARE A COMMON ATTRIBUTE
8730
RECEIVING DATA RELATED TO THE GROUP OF OFF-SET ITEMS OF COLLATERAL, WHEREIN THE DETERMINATION OF THE VALUE FOR THE AT LEAST ONE SET OF ITEMS OF COLLATERAL IS PARTIALLY BASED ON THE RECEIVED DATA RELATED TO THE GROUP OF OFF-SET ITEMS OF COLLATERAL

FIG. 87

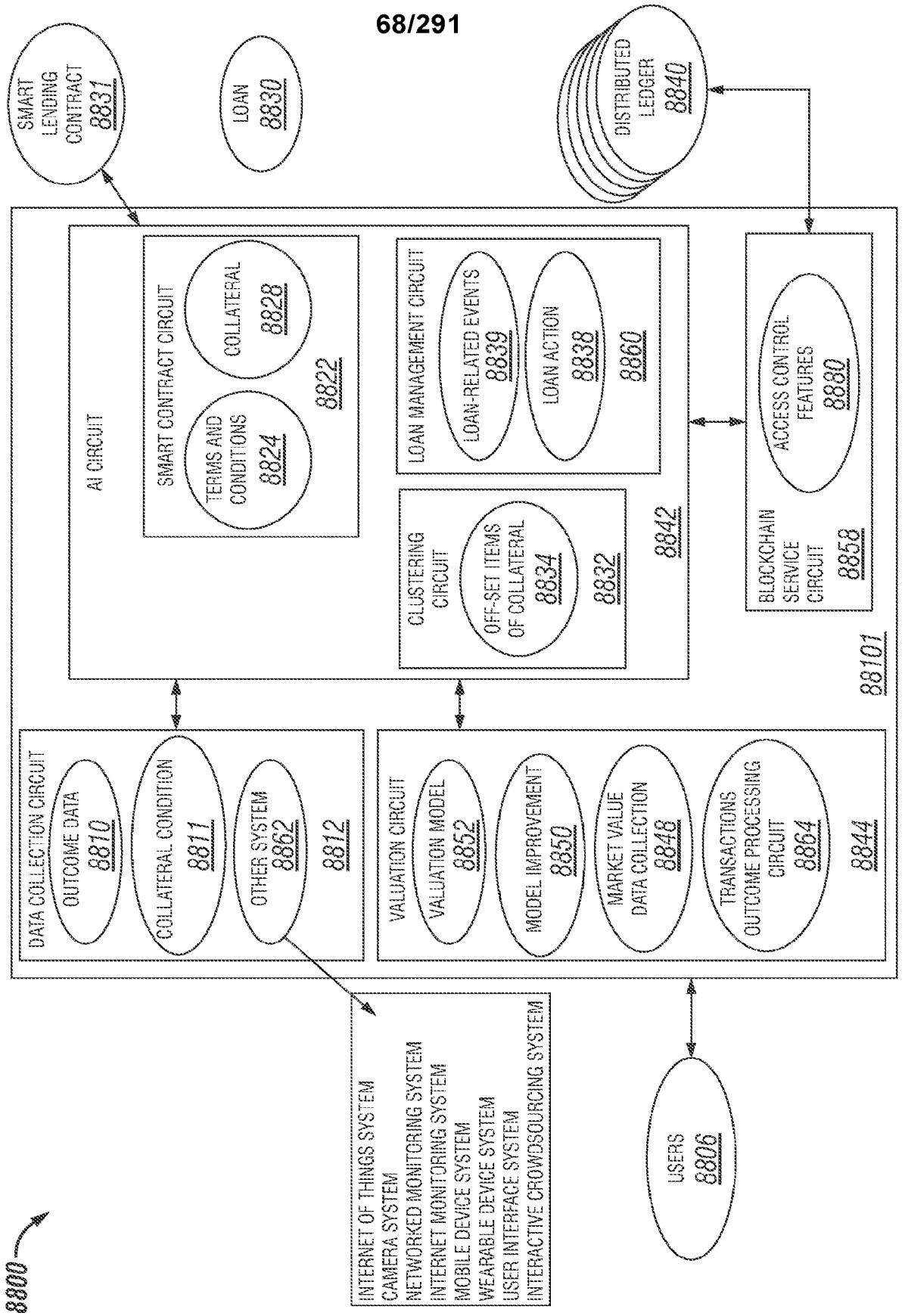

8800
SMART LENDING CONTRACT 8831
LOAN 8830
DISTRIBUTED LEDGER 8840
AI CIRCUIT
SMART CONTRACT CIRCUIT
TERMS AND CONDITIONS 8824
COLLATERAL 8828
8822
LOAN MANAGEMENT CIRCUIT
LOAN-RELATED EVENTS 8839
LOAN ACTION 8838
8860
CLUSTERING CIRCUIT
OFF-SET ITEMS OF COLLATERAL 8834
8832
8842
BLOCKCHAIN SERVICE CIRCUIT 8858
ACCESS CONTROL FEATURES 8880
88101
DATA COLLECTION CIRCUIT
OUTCOME DATA 8810
COLLATERAL CONDITION 8811
OTHER SYSTEM 8862
8812
VALUATION CIRCUIT
VALUATION MODEL 8852
MODEL IMPROVEMENT 8850
MARKET VALUE DATA COLLECTION 8848
TRANSACTIONS OUTCOME PROCESSING CIRCUIT 8864
8844
INTERNET OF THINGS SYSTEM
CAMERA SYSTEM
NETWORKED MONITORING SYSTEM
INTERNET MONITORING SYSTEM
MOBILE DEVICE SYSTEM
WEARABLE DEVICE SYSTEM
USER INTERFACE SYSTEM
INTERACTIVE CROWDSOURCING SYSTEM
USERS 8806

FIG. 88

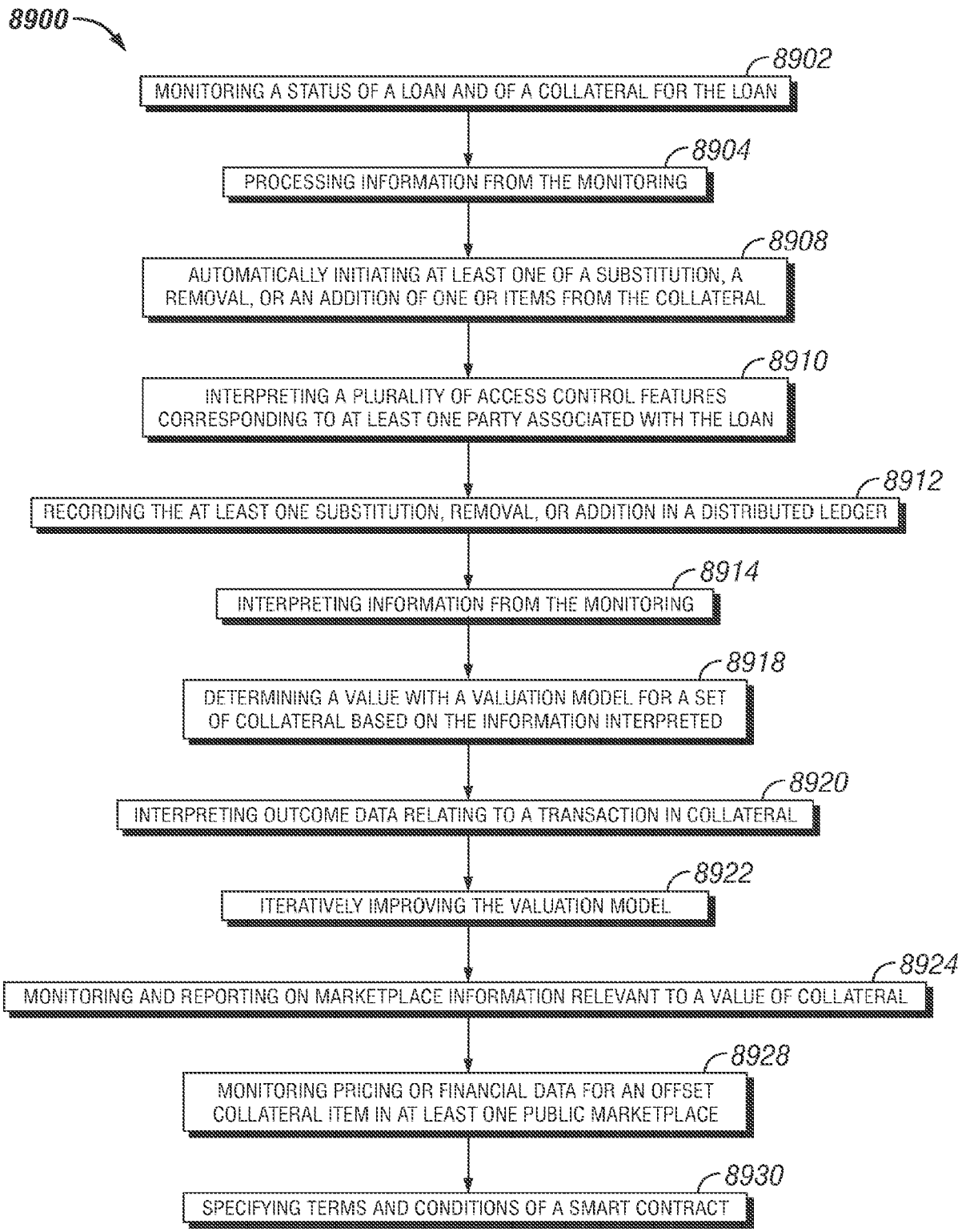

8900
8902
MONITORING A STATUS OF A LOAN AND OF A COLLATERAL FOR THE LOAN
8904
PROCESSING INFORMATION FROM THE MONITORING
8908
AUTOMATICALLY INITIATING AT LEAST ONE OF A SUBSTITUTION, A REMOVAL, OR AN ADDITION OF ONE OR ITEMS FROM THE COLLATERAL
8910
INTERPRETING A PLURALITY OF ACCESS CONTROL FEATURES CORRESPONDING TO AT LEAST ONE PARTY ASSOCIATED WITH THE LOAN
8912
RECORDING THE AT LEAST ONE SUBSTITUTION, REMOVAL, OR ADDITION IN A DISTRIBUTED LEDGER
8914
INTERPRETING INFORMATION FROM THE MONITORING
8918
DETERMINING A VALUE WITH A VALUATION MODEL FOR A SET OF COLLATERAL BASED ON THE INFORMATION INTERPRETED
8920
INTERPRETING OUTCOME DATA RELATING TO A TRANSACTION IN COLLATERAL
8922
ITERATIVELY IMPROVING THE VALUATION MODEL
8924
MONITORING AND REPORTING ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF COLLATERAL
8928
MONITORING PRICING OR FINANCIAL DATA FOR AN OFFSET COLLATERAL ITEM IN AT LEAST ONE PUBLIC MARKETPLACE
8930
SPECIFYING TERMS AND CONDITIONS OF A SMART CONTRACT

FIG. 89

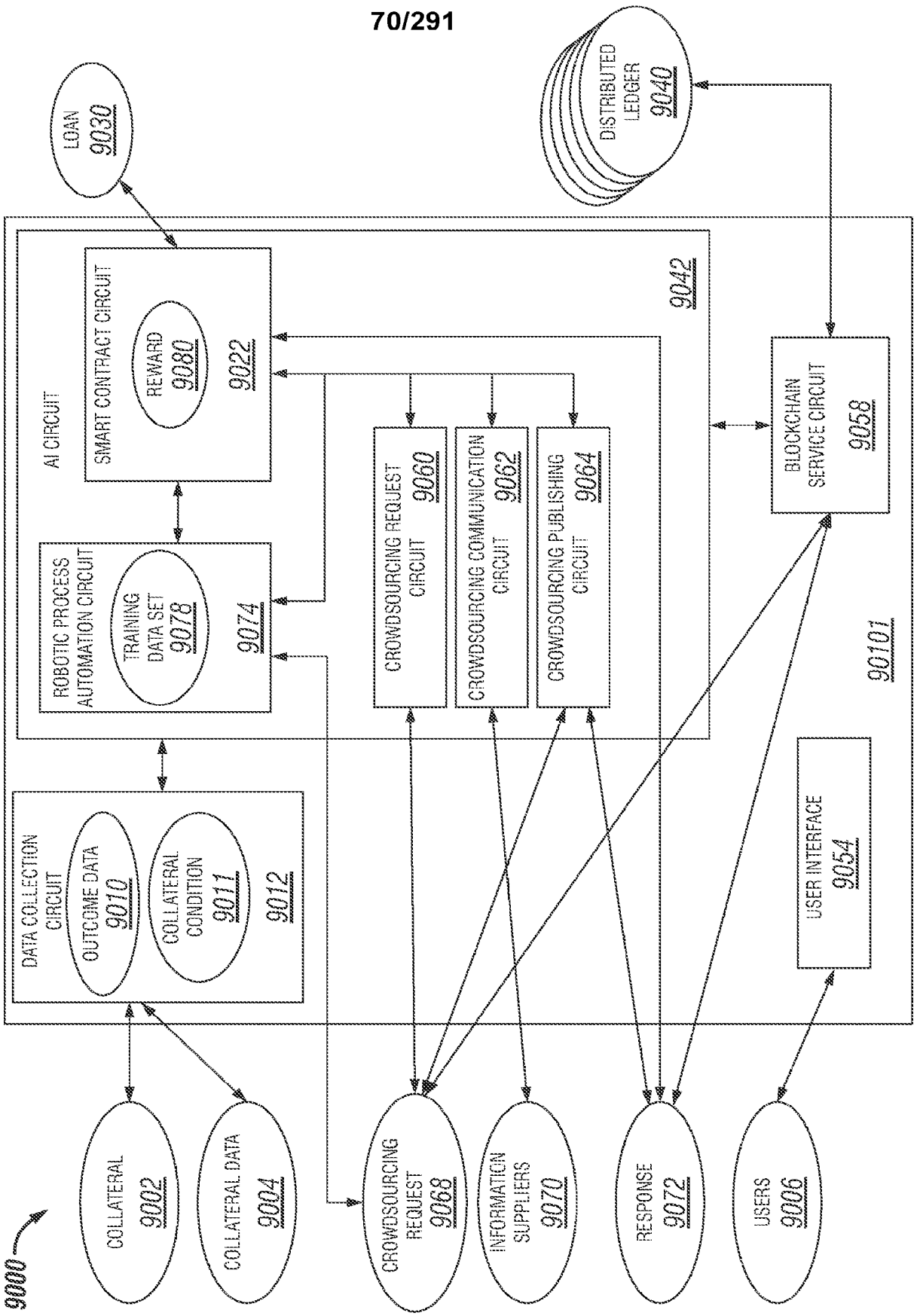

9000
COLLATERAL 9002
COLLATERAL DATA 9004
CROWDSOURCING REQUEST 9068
INFORMATION SUPPLIERS 9070
RESPONSE 9072
USERS 9006
DATA COLLECTION CIRCUIT 9012
OUTCOME DATA 9010
COLLATERAL CONDITION 9011
USER INTERFACE 9054
90101
AI CIRCUIT 9042
ROBOTIC PROCESS AUTOMATION CIRCUIT 9074
TRAINING DATA SET 9078
SMART CONTRACT CIRCUIT 9022
REWARD 9080
CROWDSOURCING REQUEST CIRCUIT 9060
CROWDSOURCING COMMUNICATION CIRCUIT 9062
CROWDSOURCING PUBLISHING CIRCUIT 9064
BLOCKCHAIN SERVICE CIRCUIT 9058
LOAN 9030
DISTRIBUTED LEDGER 9040

FIG. 90

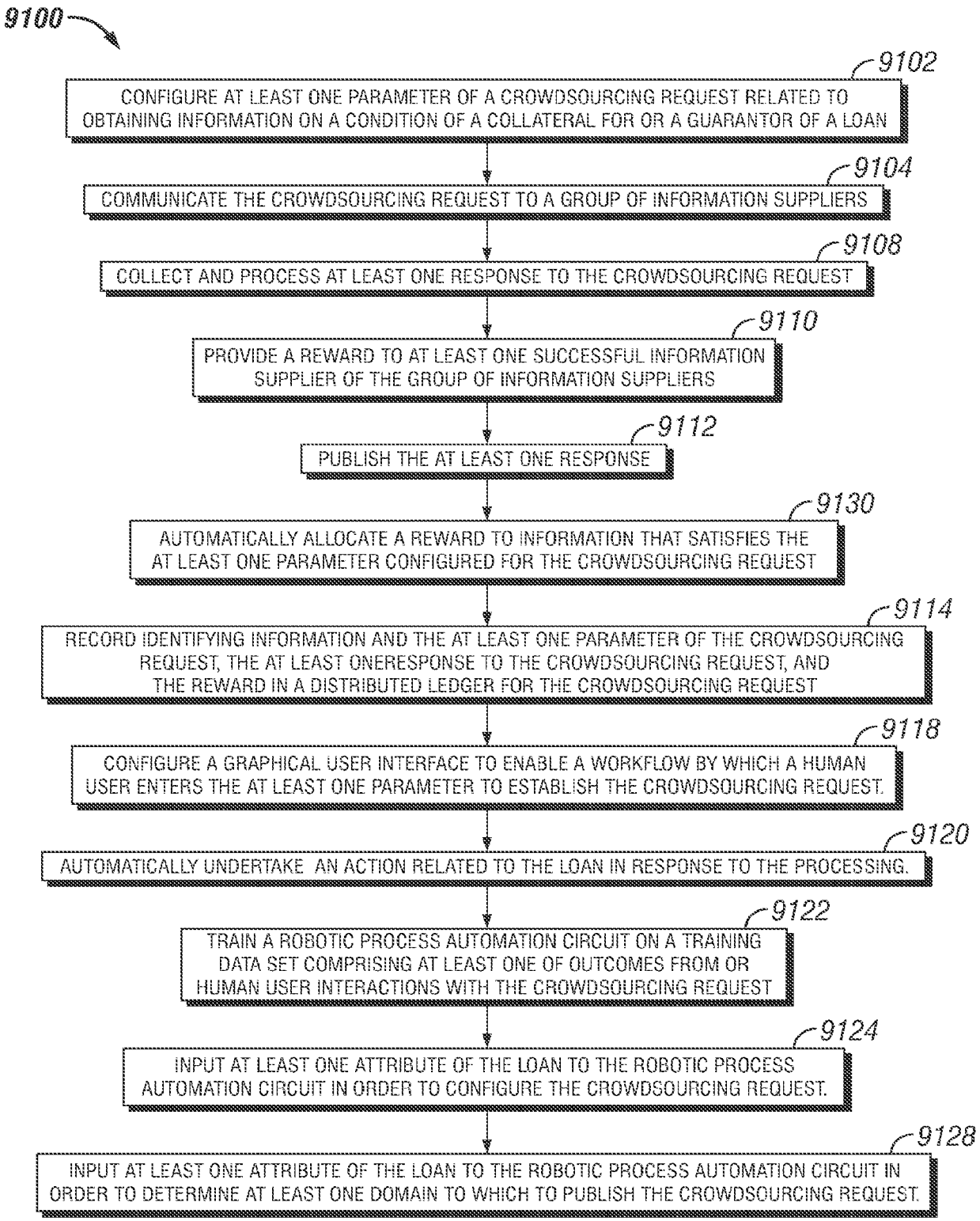

9100
9102
CONFIGURE AT LEAST ONE PARAMETER OF A CROWDSOURCING REQUEST RELATED TO OBTAINING INFORMATION ON A CONDITION OF A COLLATERAL FOR OR A GUARANTOR OF A LOAN
9104
COMMUNICATE THE CROWDSOURCING REQUEST TO A GROUP OF INFORMATION SUPPLIERS
9108
COLLECT AND PROCESS AT LEAST ONE RESPONSE TO THE CROWDSOURCING REQUEST
9110
PROVIDE A REWARD TO AT LEAST ONE SUCCESSFUL INFORMATION SUPPLIER OF THE GROUP OF INFORMATION SUPPLIERS
9112
PUBLISH THE AT LEAST ONE RESPONSE
9130
AUTOMATICALLY ALLOCATE A REWARD TO INFORMATION THAT SATISFIES THE AT LEAST ONE PARAMETER CONFIGURED FOR THE CROWDSOURCING REQUEST
9114
RECORD IDENTIFYING INFORMATION AND THE AT LEAST ONE PARAMETER OF THE CROWDSOURCING REQUEST, THE AT LEAST ONERESPONSE TO THE CROWDSOURCING REQUEST, AND THE REWARD IN A DISTRIBUTED LEDGER FOR THE CROWDSOURCING REQUEST
9118
CONFIGURE A GRAPHICAL USER INTERFACE TO ENABLE A WORKFLOW BY WHICH A HUMAN USER ENTERS THE AT LEAST ONE PARAMETER TO ESTABLISH THE CROWDSOURCING REQUEST.
9120
AUTOMATICALLY UNDERTAKE AN ACTION RELATED TO THE LOAN IN RESPONSE TO THE PROCESSING.
9122
TRAIN A ROBOTIC PROCESS AUTOMATION CIRCUIT ON A TRAINING DATA SET COMPRISING AT LEAST ONE OF OUTCOMES FROM OR HUMAN USER INTERACTIONS WITH THE CROWDSOURCING REQUEST
9124
INPUT AT LEAST ONE ATTRIBUTE OF THE LOAN TO THE ROBOTIC PROCESS AUTOMATION CIRCUIT IN ORDER TO CONFIGURE THE CROWDSOURCING REQUEST.
9128
INPUT AT LEAST ONE ATTRIBUTE OF THE LOAN TO THE ROBOTIC PROCESS AUTOMATION CIRCUIT IN ORDER TO DETERMINE AT LEAST ONE DOMAIN TO WHICH TO PUBLISH THE CROWDSOURCING REQUEST.

FIG. 91

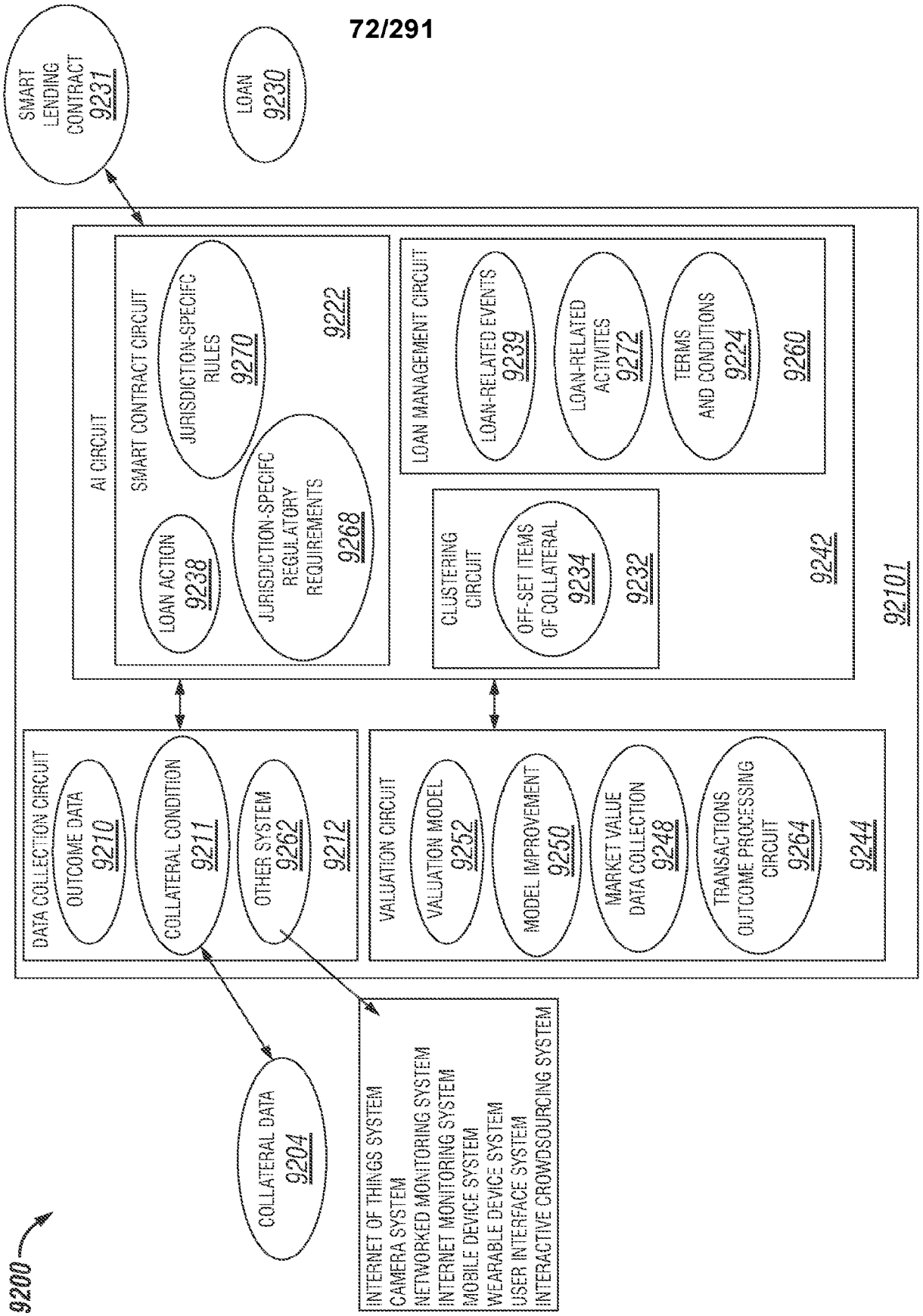

9200
SMART LENDING CONTRACT 9231
LOAN 9230
92101
AI CIRCUIT
SMART CONTRACT CIRCUIT
LOAN ACTION 9238
JURISDICTION-SPECIFC RULES 9270
JURISDICTION-SPECIFC REGULATORY REQUIREMENTS 9268
9222
LOAN MANAGEMENT CIRCUIT
LOAN-RELATED EVENTS 9239
LOAN-RELATED ACTIVITES 9272
TERMS AND CONDITIONS 9224
9260
CLUSTERING CIRCUIT
OFF-SET ITEMS OF COLLATERAL 9234
9232
9242
DATA COLLECTION CIRCUIT
OUTCOME DATA 9210
COLLATERAL CONDITION 9211
OTHER SYSTEM 9262
9212
VALUATION CIRCUIT
VALUATION MODEL 9252
MODEL IMPROVEMENT 9250
MARKET VALUE DATA COLLECTION 9248
TRANSACTIONS OUTCOME PROCESSING CIRCUIT 9264
9244
COLLATERAL DATA 9204
INTERNET OF THINGS SYSTEM
CAMERA SYSTEM
NETWORKED MONITORING SYSTEM
INTERNET MONITORING SYSTEM
MOBILE DEVICE SYSTEM
WEARABLE DEVICE SYSTEM
USER INTERFACE SYSTEM
INTERACTIVE CROWDSOURCING SYSTEM

FIG. 92

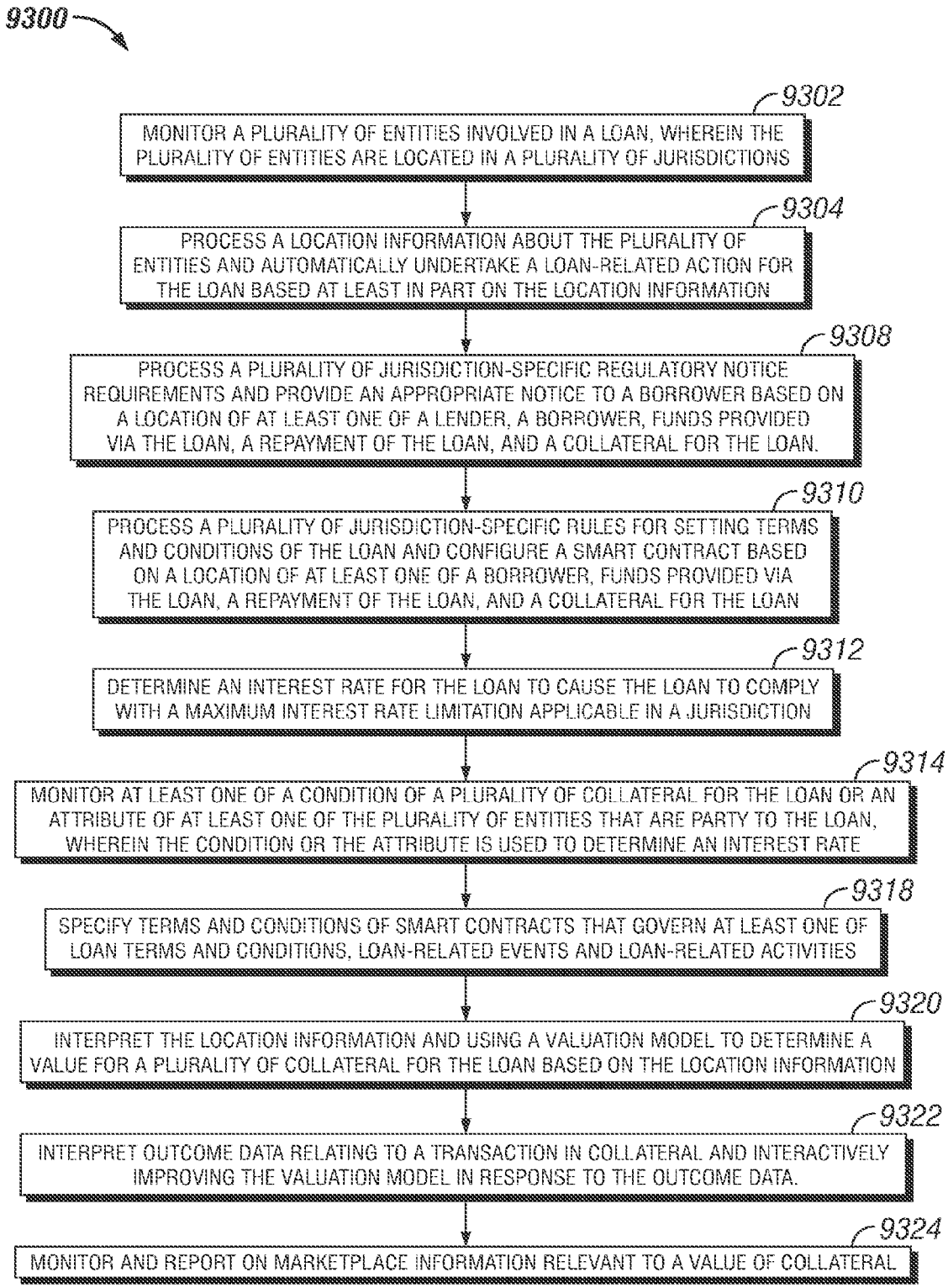

9300
9302
MONITOR A PLURALITY OF ENTITIES INVOLVED IN A LOAN, WHEREIN THE PLURALITY OF ENTITIES ARE LOCATED IN A PLURALITY OF JURISDICTIONS
9304
PROCESS A LOCATION INFORMATION ABOUT THE PLURALITY OF ENTITIES AND AUTOMATICALLY UNDERTAKE A LOAN-RELATED ACTION FOR THE LOAN BASED AT LEAST IN PART ON THE LOCATION INFORMATION
9308
PROCESS A PLURALITY OF JURISDICTION-SPECIFIC REGULATORY NOTICE REQUIREMENTS AND PROVIDE AN APPROPRIATE NOTICE TO A BORROWER BASED ON A LOCATION OF AT LEAST ONE OF A LENDER, A BORROWER, FUNDS PROVIDED VIA THE LOAN, A REPAYMENT OF THE LOAN, AND A COLLATERAL FOR THE LOAN.
9310
PROCESS A PLURALITY OF JURISDICTION-SPECIFIC RULES FOR SETTING TERMS AND CONDITIONS OF THE LOAN AND CONFIGURE A SMART CONTRACT BASED ON A LOCATION OF AT LEAST ONE OF A BORROWER, FUNDS PROVIDED VIA THE LOAN, A REPAYMENT OF THE LOAN, AND A COLLATERAL FOR THE LOAN
9312
DETERMINE AN INTEREST RATE FOR THE LOAN TO CAUSE THE LOAN TO COMPLY WITH A MAXIMUM INTEREST RATE LIMITATION APPLICABLE IN A JURISDICTION
9314
MONITOR AT LEAST ONE OF A CONDITION OF A PLURALITY OF COLLATERAL FOR THE LOAN OR AN ATTRIBUTE OF AT LEAST ONE OF THE PLURALITY OF ENTITIES THAT ARE PARTY TO THE LOAN, WHEREIN THE CONDITION OR THE ATTRIBUTE IS USED TO DETERMINE AN INTEREST RATE
9318
SPECIFY TERMS AND CONDITIONS OF SMART CONTRACTS THAT GOVERN AT LEAST ONE OF LOAN TERMS AND CONDITIONS, LOAN-RELATED EVENTS AND LOAN-RELATED ACTIVITIES
9320
INTERPRET THE LOCATION INFORMATION AND USING A VALUATION MODEL TO DETERMINE A VALUE FOR A PLURALITY OF COLLATERAL FOR THE LOAN BASED ON THE LOCATION INFORMATION
9322
INTERPRET OUTCOME DATA RELATING TO A TRANSACTION IN COLLATERAL AND INTERACTIVELY IMPROVING THE VALUATION MODEL IN RESPONSE TO THE OUTCOME DATA.
9324
MONITOR AND REPORT ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF COLLATERAL

FIG. 93

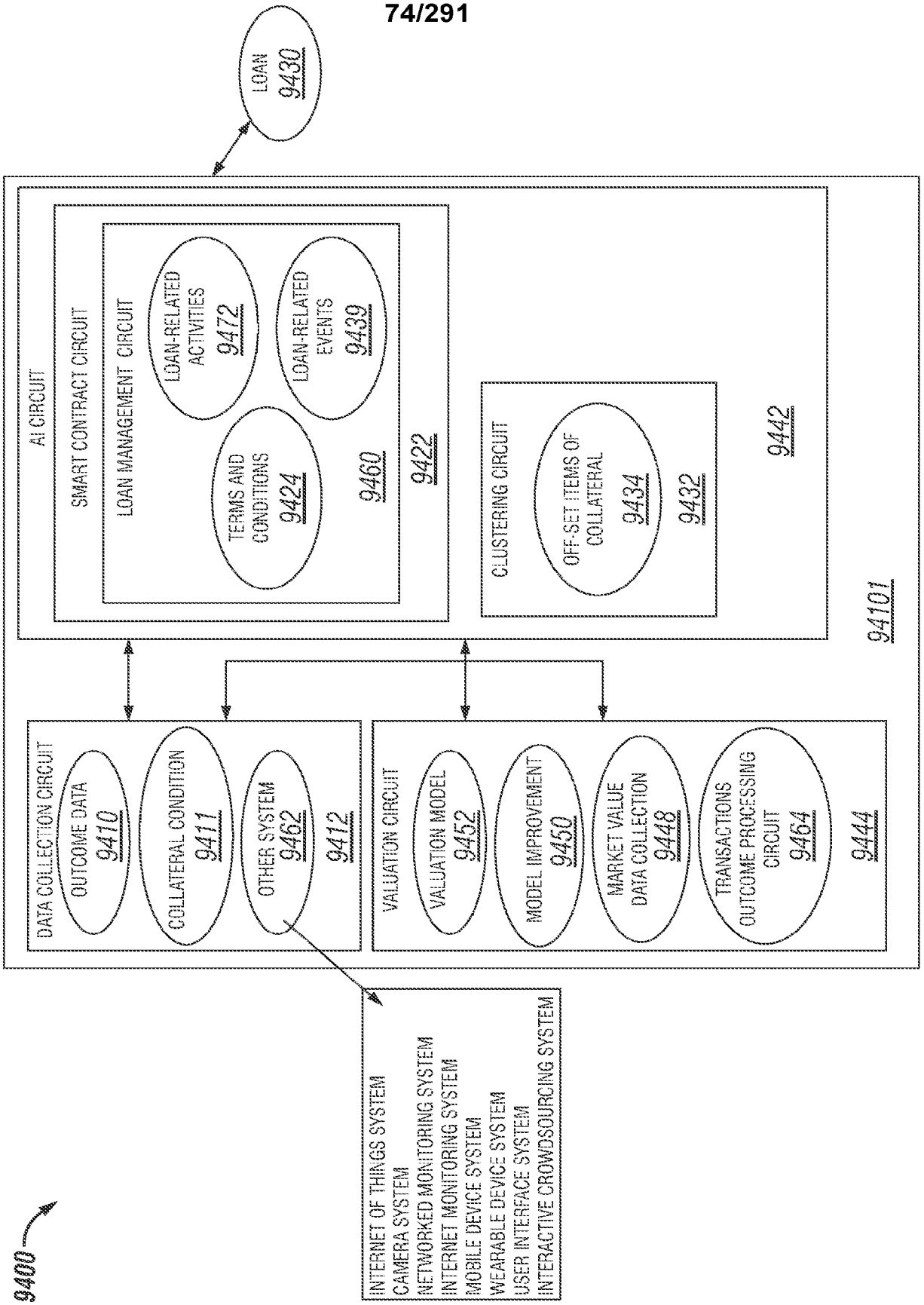

9400
LOAN 9430
AI CIRCUIT
SMART CONTRACT CIRCUIT
LOAN MANAGEMENT CIRCUIT
LOAN-RELATED ACTIVITIES 9472
LOAN-RELATED EVENTS 9439
TERMS AND CONDITIONS 9424
9460
9422
CLUSTERING CIRCUIT
OFF-SET ITEMS OF COLLATERAL 9434
9432
9442
94101
DATA COLLECTION CIRCUIT
OUTCOME DATA 9410
COLLATERAL CONDITION 9411
OTHER SYSTEM 9462
9412
VALUATION CIRCUIT
VALUATION MODEL 9452
MODEL IMPROVEMENT 9450
MARKET VALUE DATA COLLECTION 9448
TRANSACTIONS OUTCOME PROCESSING CIRCUIT 9464
9444
INTERNET OF THINGS SYSTEM
CAMERA SYSTEM
NETWORKED MONITORING SYSTEM
INTERNET MONITORING SYSTEM
MOBILE DEVICE SYSTEM
WEARABLE DEVICE SYSTEM
USER INTERFACE SYSTEM
INTERACTIVE CROWDSOURCING SYSTEM

FIG. 94

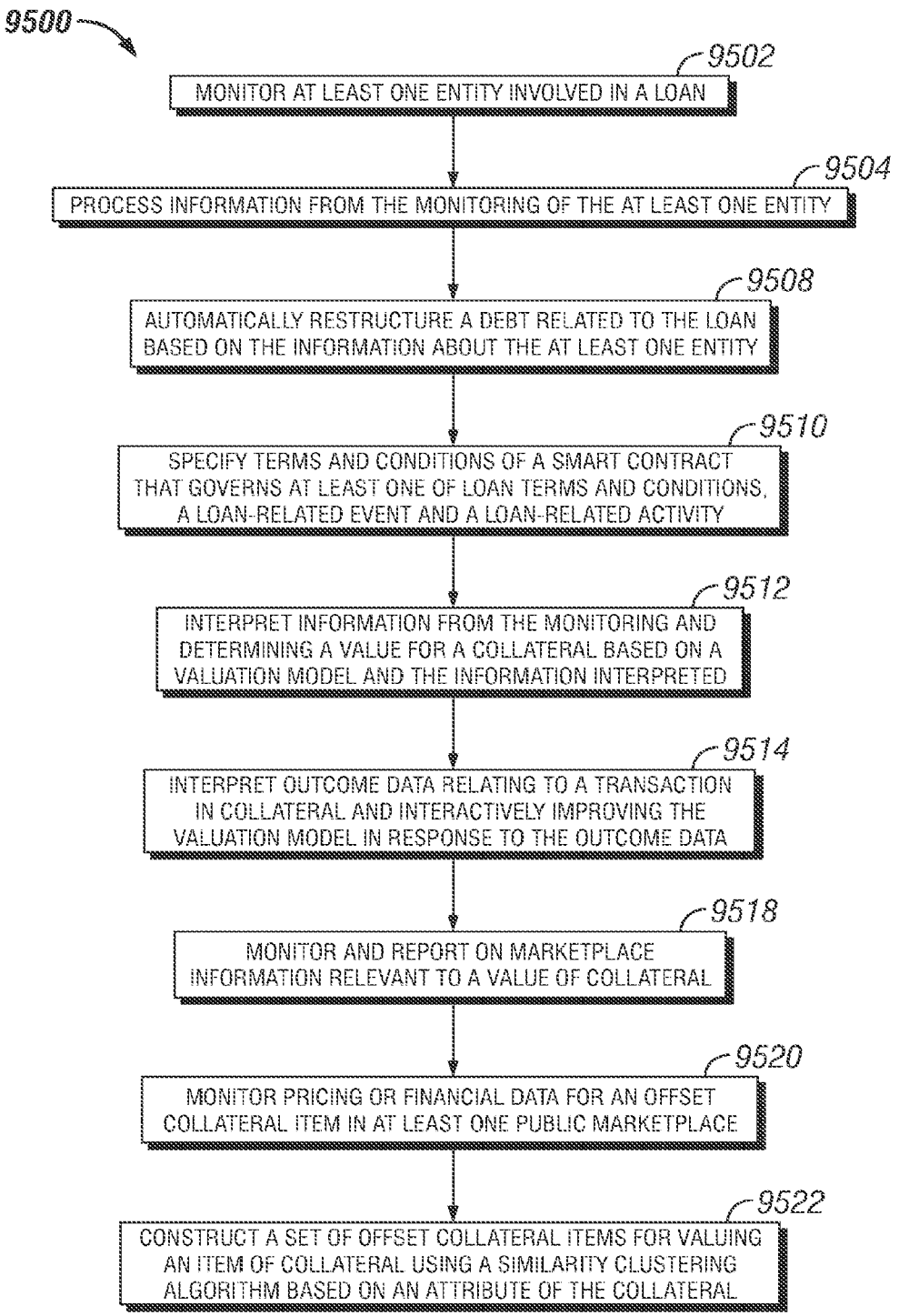

9500
9502
MONITOR AT LEAST ONE ENTITY INVOLVED IN A LOAN
9504
PROCESS INFORMATION FROM THE MONITORING OF THE AT LEAST ONE ENTITY
9508
AUTOMATICALLY RESTRUCTURE A DEBT RELATED TO THE LOAN BASED ON THE INFORMATION ABOUT THE AT LEAST ONE ENTITY
9510
SPECIFY TERMS AND CONDITIONS OF A SMART CONTRACT THAT GOVERNS AT LEAST ONE OF LOAN TERMS AND CONDITIONS, A LOAN-RELATED EVENT AND A LOAN-RELATED ACTIVITY
9512
INTERPRET INFORMATION FROM THE MONITORING AND DETERMINING A VALUE FOR A COLLATERAL BASED ON A VALUATION MODEL AND THE INFORMATION INTERPRETED
9514
INTERPRET OUTCOME DATA RELATING TO A TRANSACTION IN COLLATERAL AND INTERACTIVELY IMPROVING THE VALUATION MODEL IN RESPONSE TO THE OUTCOME DATA
9518
MONITOR AND REPORT ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF COLLATERAL
9520
MONITOR PRICING OR FINANCIAL DATA FOR AN OFFSET COLLATERAL ITEM IN AT LEAST ONE PUBLIC MARKETPLACE
9522
CONSTRUCT A SET OF OFFSET COLLATERAL ITEMS FOR VALUING AN ITEM OF COLLATERAL USING A SIMILARITY CLUSTERING ALGORITHM BASED ON AN ATTRIBUTE OF THE COLLATERAL

FIG. 95

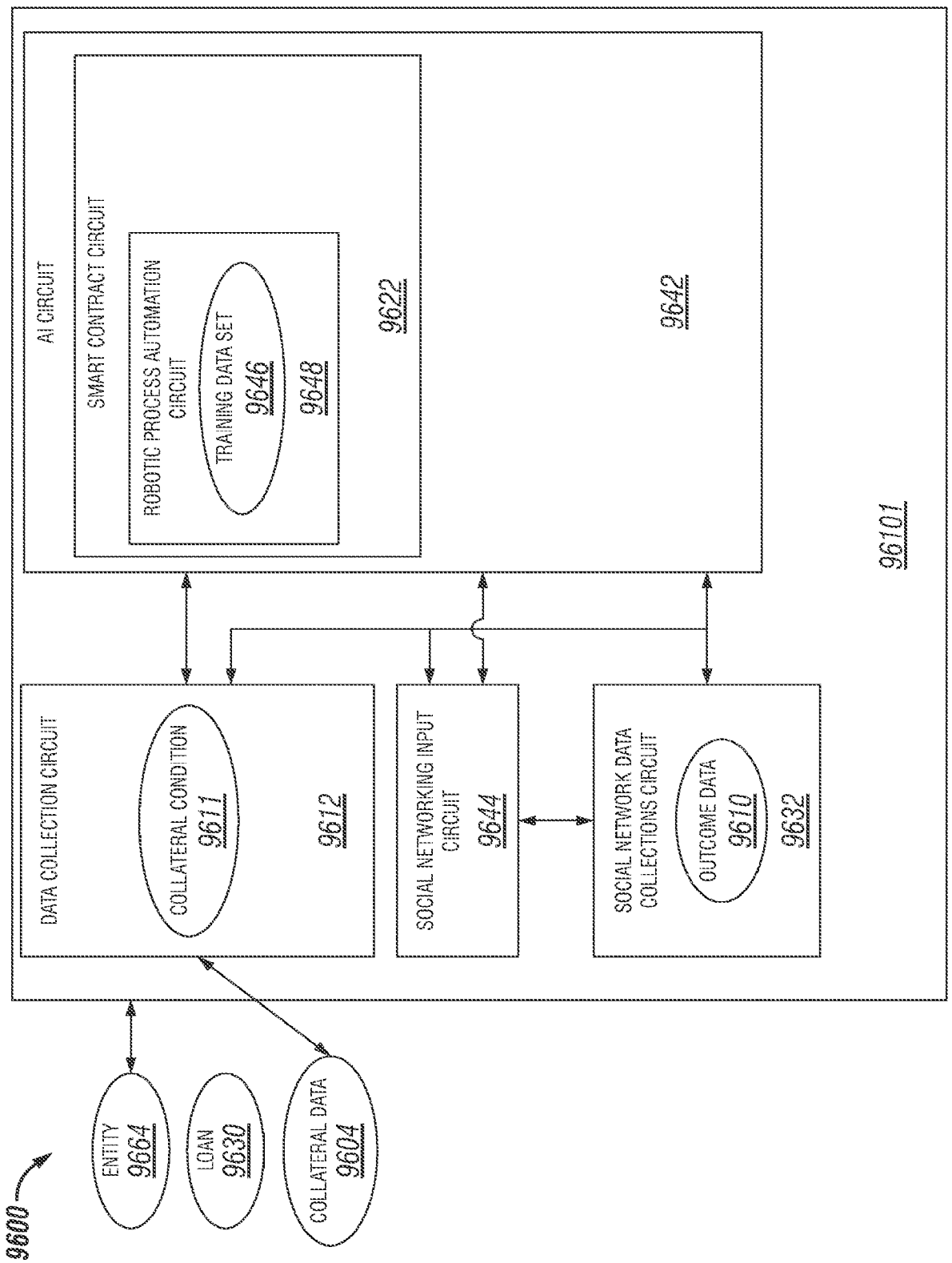

9600
ENTITY
9664
LOAN
9630
COLLATERAL DATA
9604
96101
AI CIRCUIT
SMART CONTRACT CIRCUIT
ROBOTIC PROCESS AUTOMATION CIRCUIT
TRAINING DATA SET
9646
9648
9622
9642
DATA COLLECTION CIRCUIT
COLLATERAL CONDITION
9611
9612
SOCIAL NETWORKING INPUT CIRCUIT
9644
SOCIAL NETWORK DATA COLLECTIONS CIRCUIT
OUTCOME DATA
9610
9632

FIG. 96

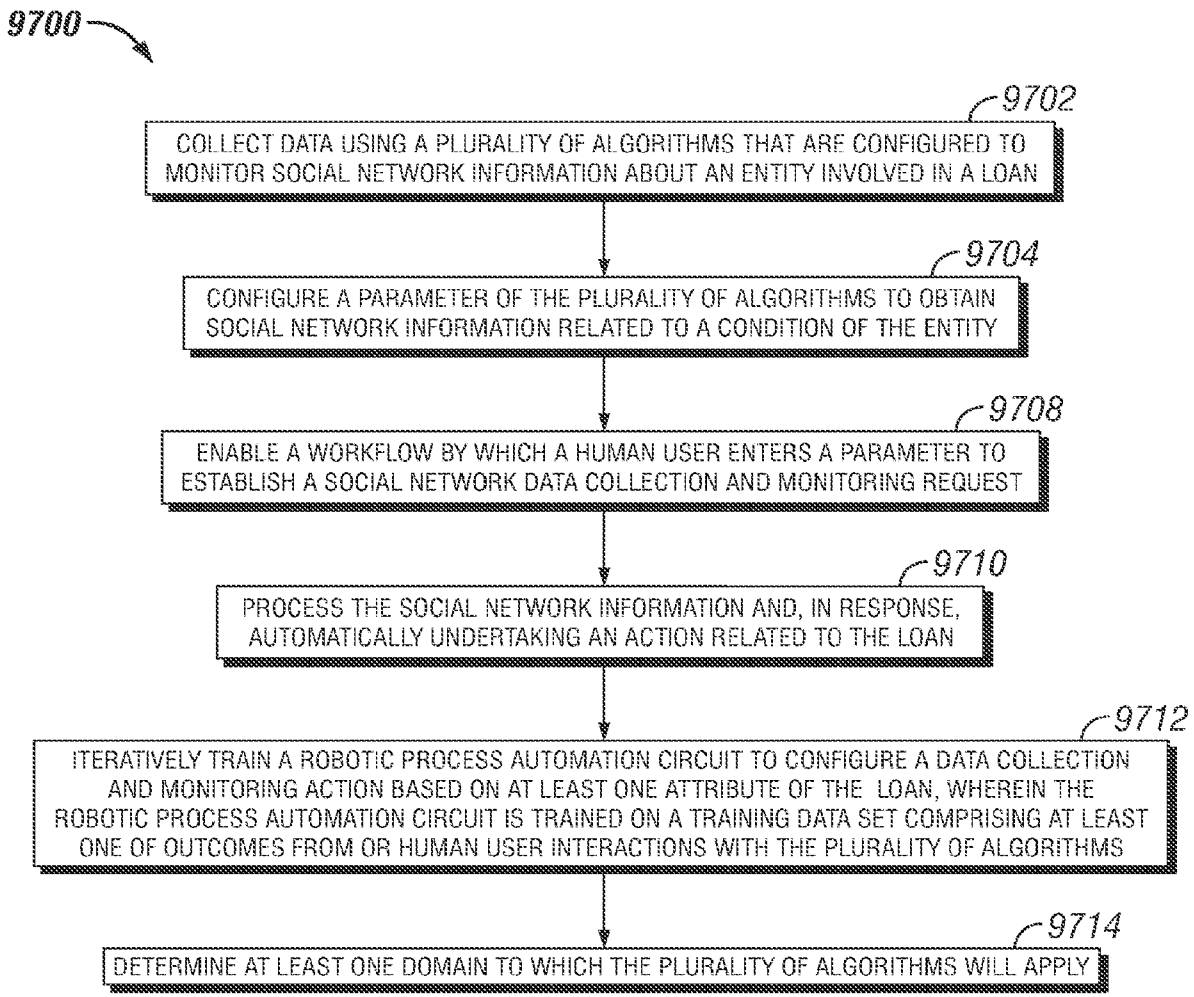

9700
9702
COLLECT DATA USING A PLURALITY OF ALGORITHMS THAT ARE CONFIGURED TO MONITOR SOCIAL NETWORK INFORMATION ABOUT AN ENTITY INVOLVED IN A LOAN
9704
CONFIGURE A PARAMETER OF THE PLURALITY OF ALGORITHMS TO OBTAIN SOCIAL NETWORK INFORMATION RELATED TO A CONDITION OF THE ENTITY
9708
ENABLE A WORKFLOW BY WHICH A HUMAN USER ENTERS A PARAMETER TO ESTABLISH A SOCIAL NETWORK DATA COLLECTION AND MONITORING REQUEST
9710
PROCESS THE SOCIAL NETWORK INFORMATION AND, IN RESPONSE, AUTOMATICALLY UNDERTAKING AN ACTION RELATED TO THE LOAN
9712
ITERATIVELY TRAIN A ROBOTIC PROCESS AUTOMATION CIRCUIT TO CONFIGURE A DATA COLLECTION AND MONITORING ACTION BASED ON AT LEAST ONE ATTRIBUTE OF THE LOAN, WHEREIN THE ROBOTIC PROCESS AUTOMATION CIRCUIT IS TRAINED ON A TRAINING DATA SET COMPRISING AT LEAST ONE OF OUTCOMES FROM OR HUMAN USER INTERACTIONS WITH THE PLURALITY OF ALGORITHMS
9714
DETERMINE AT LEAST ONE DOMAIN TO WHICH THE PLURALITY OF ALGORITHMS WILL APPLY

FIG. 97

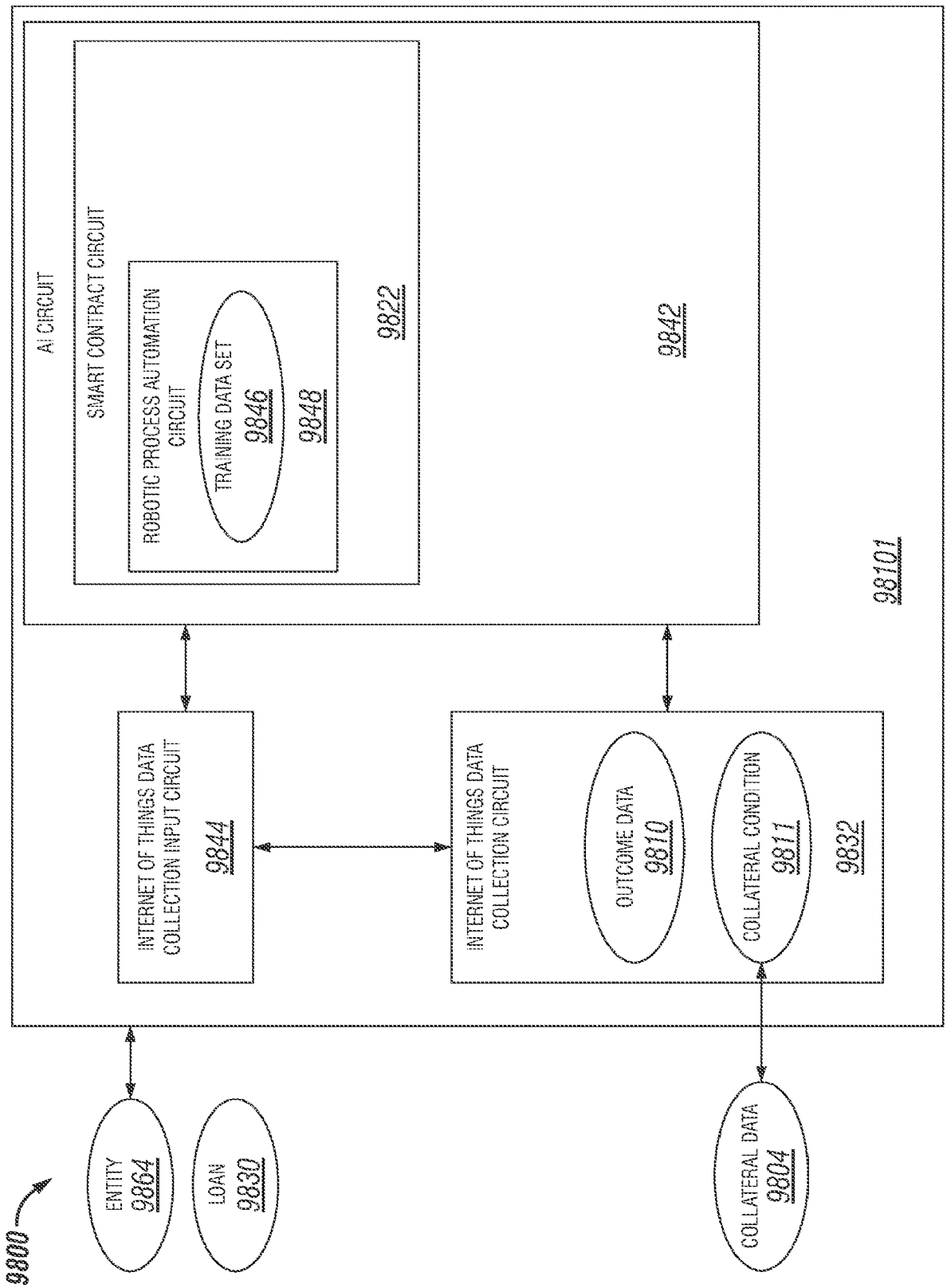

9800
ENTITY
9864
LOAN
9830
AI CIRCUIT
SMART CONTRACT CIRCUIT
ROBOTIC PROCESS AUTOMATION CIRCUIT
TRAINING DATA SET
9846
9848
9822
9842
98101
INTERNET OF THINGS DATA COLLECTION INPUT CIRCUIT
9844
INTERNET OF THINGS DATA COLLECTION CIRCUIT
OUTCOME DATA
9810
COLLATERAL CONDITION
9811
9832
COLLATERAL DATA
9804

FIG. 98

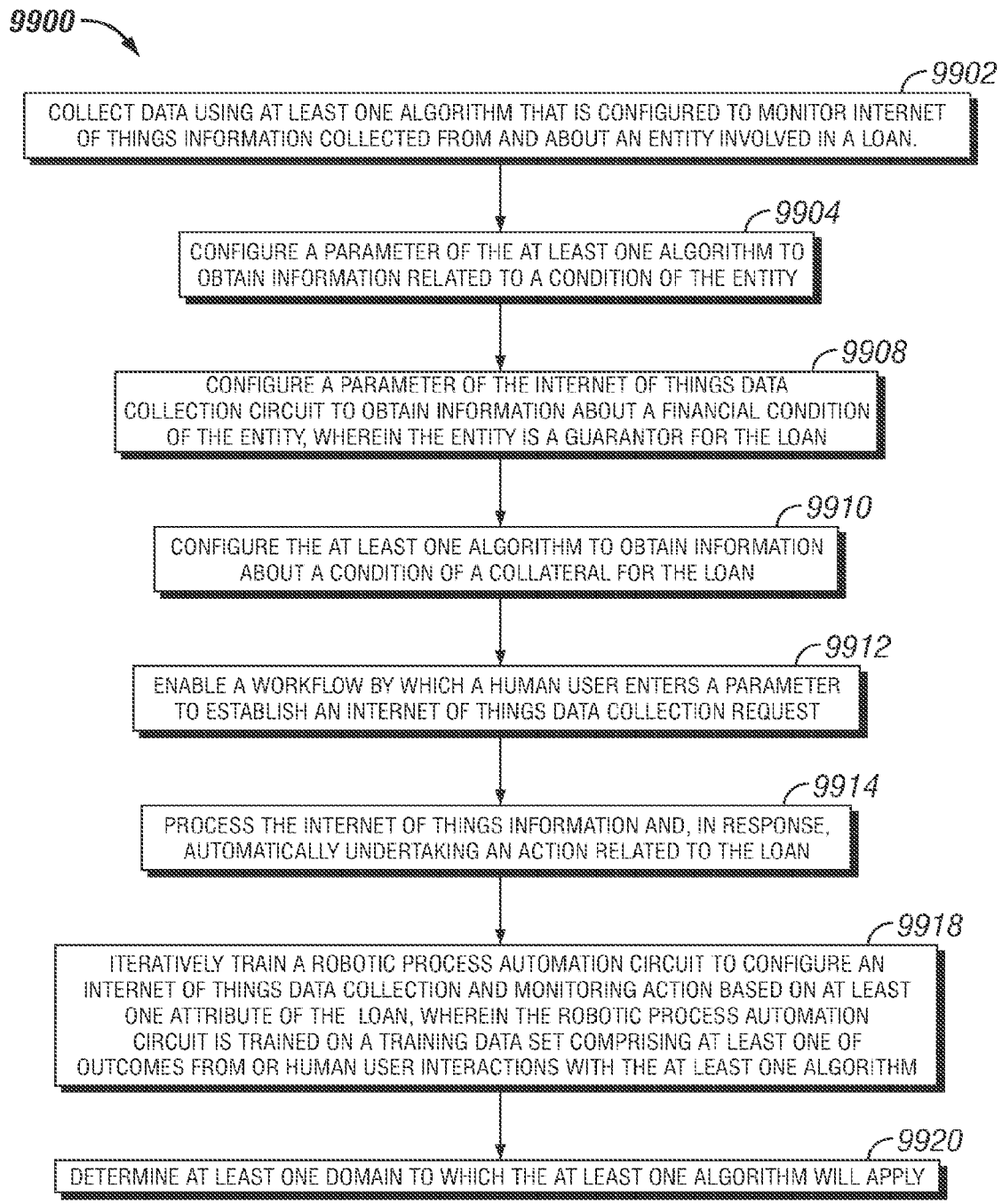

9900
9902
COLLECT DATA USING AT LEAST ONE ALGORITHM THAT IS CONFIGURED TO MONITOR INTERNET OF THINGS INFORMATION COLLECTED FROM AND ABOUT AN ENTITY INVOLVED IN A LOAN.
9904
CONFIGURE A PARAMETER OF THE AT LEAST ONE ALGORITHM TO OBTAIN INFORMATION RELATED TO A CONDITION OF THE ENTITY
9908
CONFIGURE A PARAMETER OF THE INTERNET OF THINGS DATA COLLECTION CIRCUIT TO OBTAIN INFORMATION ABOUT A FINANCIAL CONDITION OF THE ENTITY, WHEREIN THE ENTITY IS A GUARANTOR FOR THE LOAN
9910
CONFIGURE THE AT LEAST ONE ALGORITHM TO OBTAIN INFORMATION ABOUT A CONDITION OF A COLLATERAL FOR THE LOAN
9912
ENABLE A WORKFLOW BY WHICH A HUMAN USER ENTERS A PARAMETER TO ESTABLISH AN INTERNET OF THINGS DATA COLLECTION REQUEST
9914
PROCESS THE INTERNET OF THINGS INFORMATION AND, IN RESPONSE, AUTOMATICALLY UNDERTAKING AN ACTION RELATED TO THE LOAN
9918
ITERATIVELY TRAIN A ROBOTIC PROCESS AUTOMATION CIRCUIT TO CONFIGURE AN INTERNET OF THINGS DATA COLLECTION AND MONITORING ACTION BASED ON AT LEAST ONE ATTRIBUTE OF THE LOAN, WHEREIN THE ROBOTIC PROCESS AUTOMATION CIRCUIT IS TRAINED ON A TRAINING DATA SET COMPRISING AT LEAST ONE OF OUTCOMES FROM OR HUMAN USER INTERACTIONS WITH THE AT LEAST ONE ALGORITHM
9920
DETERMINE AT LEAST ONE DOMAIN TO WHICH THE AT LEAST ONE ALGORITHM WILL APPLY

FIG. 99

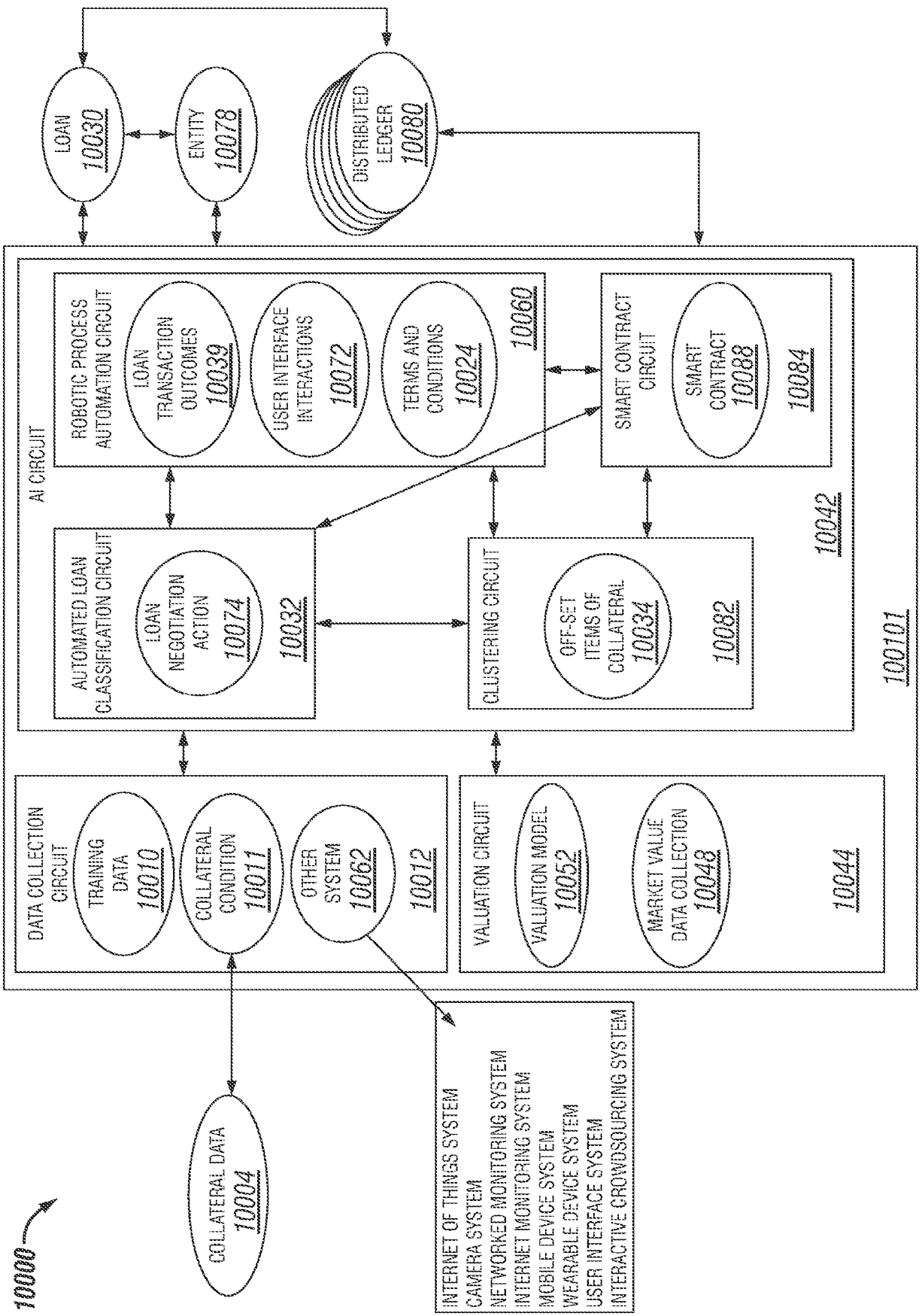

10000
COLLATERAL DATA 10004
INTERNET OF THINGS SYSTEM
CAMERA SYSTEM
NETWORKED MONITORING SYSTEM
INTERNET MONITORING SYSTEM
MOBILE DEVICE SYSTEM
WEARABLE DEVICE SYSTEM
USER INTERFACE SYSTEM
INTERACTIVE CROWDSOURCING SYSTEM
DATA COLLECTION CIRCUIT
TRAINING DATA 10010
COLLATERAL CONDITION 10011
OTHER SYSTEM 10062
10012
VALUATION CIRCUIT
VALUATION MODEL 10052
MARKET VALUE DATA COLLECTION 10048
10044
AI CIRCUIT
AUTOMATED LOAN CLASSIFICATION CIRCUIT
LOAN NEGOTIATION ACTION 10074
10032
CLUSTERING CIRCUIT
OFF-SET ITEMS OF COLLATERAL 10034
10082
ROBOTIC PROCESS AUTOMATION CIRCUIT
LOAN TRANSACTION OUTCOMES 10039
USER INTERFACE INTERACTIONS 10072
TERMS AND CONDITIONS 10024
10060
SMART CONTRACT CIRCUIT
SMART CONTRACT 10088
10084
10042
100101
LOAN 10030
ENTITY 10078
DISTRIBUTED LEDGER 10080

FIG. 100

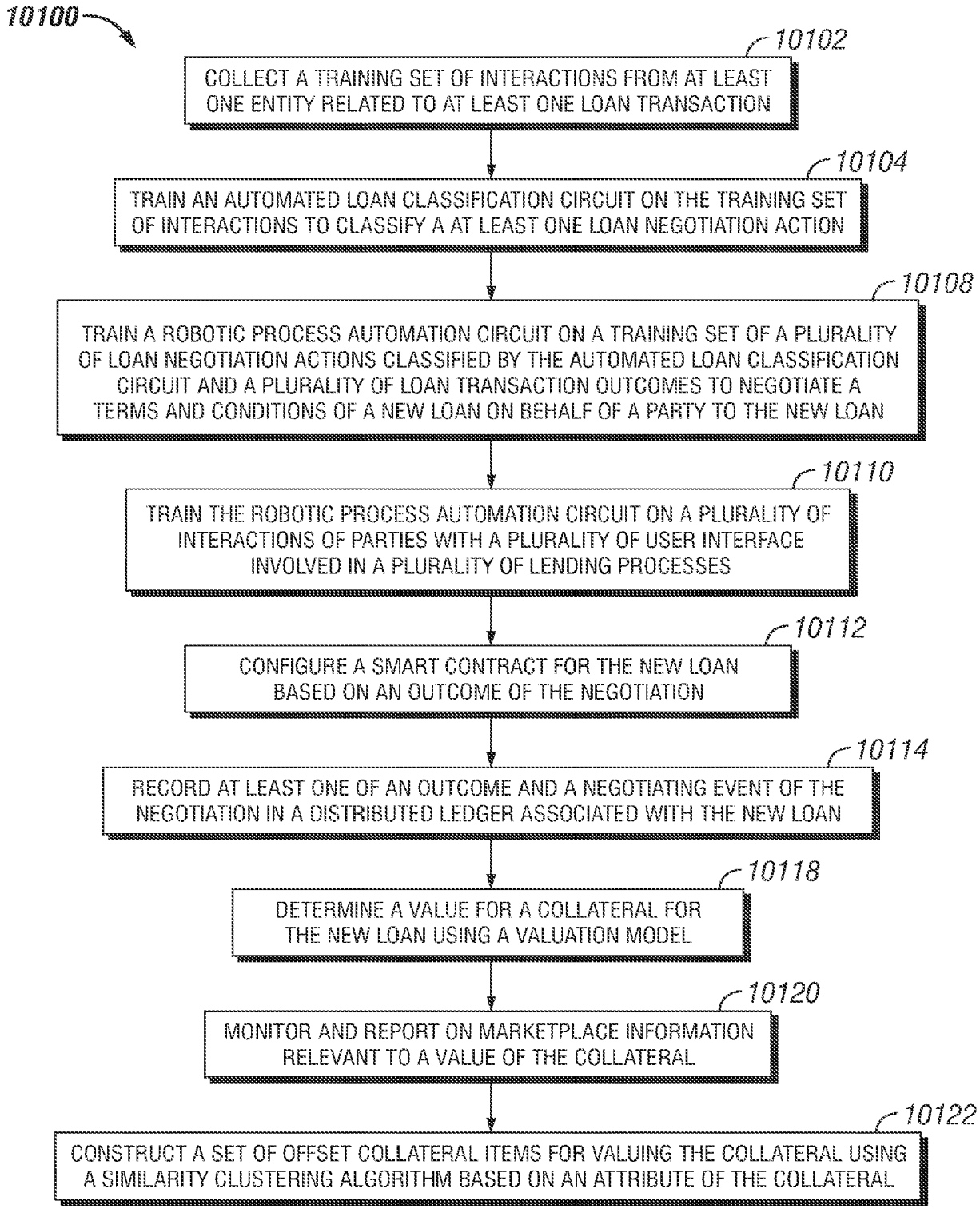

10100
10102
COLLECT A TRAINING SET OF INTERACTIONS FROM AT LEAST ONE ENTITY RELATED TO AT LEAST ONE LOAN TRANSACTION
10104
TRAIN AN AUTOMATED LOAN CLASSIFICATION CIRCUIT ON THE TRAINING SET OF INTERACTIONS TO CLASSIFY A AT LEAST ONE LOAN NEGOTIATION ACTION
10108
TRAIN A ROBOTIC PROCESS AUTOMATION CIRCUIT ON A TRAINING SET OF A PLURALITY OF LOAN NEGOTIATION ACTIONS CLASSIFIED BY THE AUTOMATED LOAN CLASSIFICATION CIRCUIT AND A PLURALITY OF LOAN TRANSACTION OUTCOMES TO NEGOTIATE A TERMS AND CONDITIONS OF A NEW LOAN ON BEHALF OF A PARTY TO THE NEW LOAN
10110
TRAIN THE ROBOTIC PROCESS AUTOMATION CIRCUIT ON A PLURALITY OF INTERACTIONS OF PARTIES WITH A PLURALITY OF USER INTERFACE INVOLVED IN A PLURALITY OF LENDING PROCESSES
10112
CONFIGURE A SMART CONTRACT FOR THE NEW LOAN BASED ON AN OUTCOME OF THE NEGOTIATION
10114
RECORD AT LEAST ONE OF AN OUTCOME AND A NEGOTIATING EVENT OF THE NEGOTIATION IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE NEW LOAN
10118
DETERMINE A VALUE FOR A COLLATERAL FOR THE NEW LOAN USING A VALUATION MODEL
10120
MONITOR AND REPORT ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF THE COLLATERAL
10122
CONSTRUCT A SET OF OFFSET COLLATERAL ITEMS FOR VALUING THE COLLATERAL USING A SIMILARITY CLUSTERING ALGORITHM BASED ON AN ATTRIBUTE OF THE COLLATERAL

FIG. 101

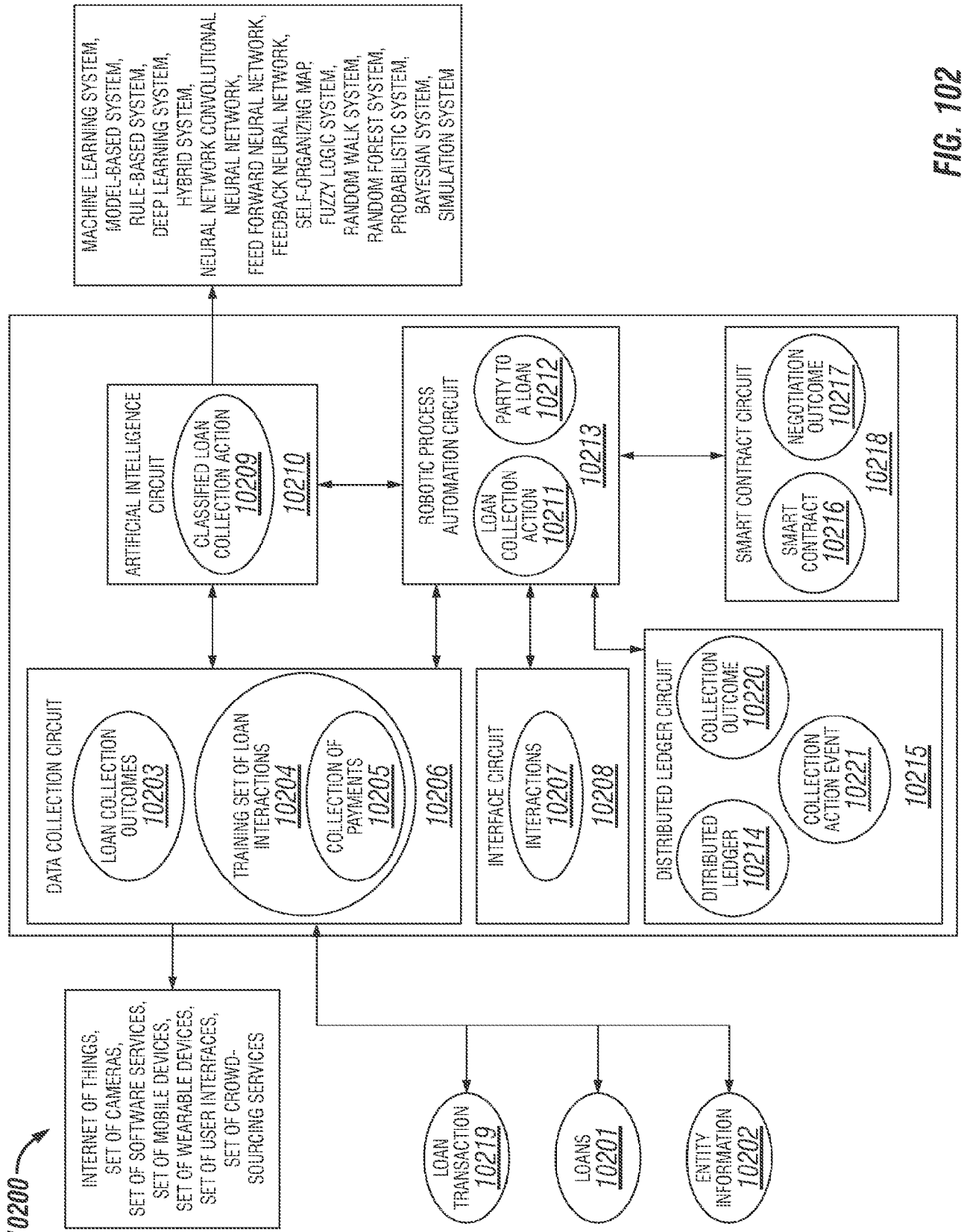

10200
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
LOAN TRANSACTION 10219
LOANS 10201
ENTITY INFORMATION 10202
DATA COLLECTION CIRCUIT
LOAN COLLECTION OUTCOMES 10203
TRAINING SET OF LOAN INTERACTIONS 10204
COLLECTION OF PAYMENTS 10205
10206
INTERFACE CIRCUIT
INTERACTIONS 10207
10208
DISTRIBUTED LEDGER CIRCUIT
DITRIBUTED LEDGER 10214
COLLECTION OUTCOME 10220
COLLECTION ACTION EVENT 10221
10215
ARTIFICIAL INTELLIGENCE CIRCUIT
CLASSIFIED LOAN COLLECTION ACTION 10209
10210
ROBOTIC PROCESS AUTOMATION CIRCUIT
LOAN COLLECTION ACTION 10211
PARTY TO A LOAN 10212
10213
SMART CONTRACT CIRCUIT
SMART CONTRACT 10216
NEGOTIATION OUTCOME 10217
10218
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM

FIG. 102

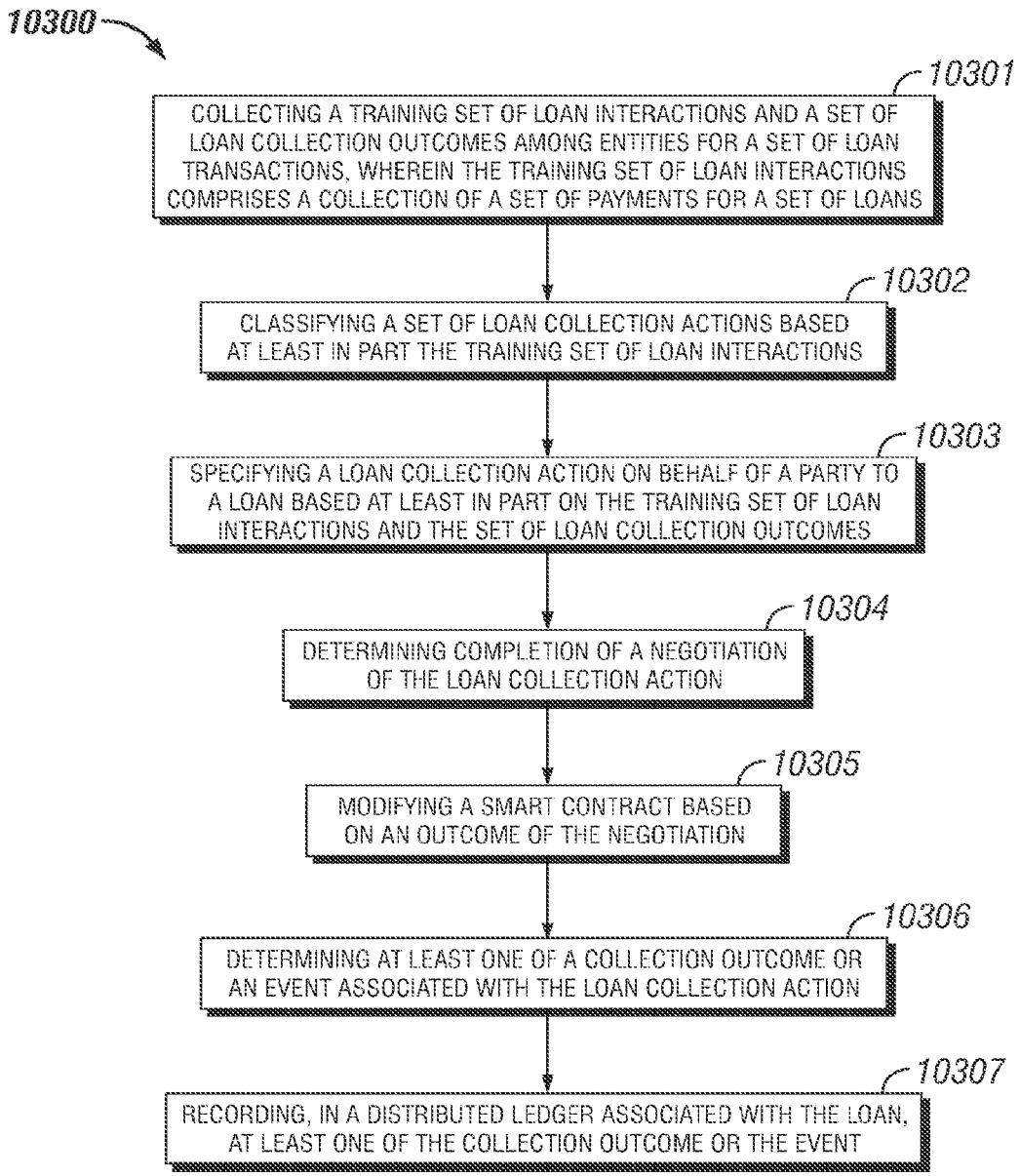

10300
10301
COLLECTING A TRAINING SET OF LOAN INTERACTIONS AND A SET OF LOAN COLLECTION OUTCOMES AMONG ENTITIES FOR A SET OF LOAN TRANSACTIONS, WHEREIN THE TRAINING SET OF LOAN INTERACTIONS COMPRISES A COLLECTION OF A SET OF PAYMENTS FOR A SET OF LOANS
10302
CLASSIFYING A SET OF LOAN COLLECTION ACTIONS BASED AT LEAST IN PART THE TRAINING SET OF LOAN INTERACTIONS
10303
SPECIFYING A LOAN COLLECTION ACTION ON BEHALF OF A PARTY TO A LOAN BASED AT LEAST IN PART ON THE TRAINING SET OF LOAN INTERACTIONS AND THE SET OF LOAN COLLECTION OUTCOMES
10304
DETERMINING COMPLETION OF A NEGOTIATION OF THE LOAN COLLECTION ACTION
10305
MODIFYING A SMART CONTRACT BASED ON AN OUTCOME OF THE NEGOTIATION
10306
DETERMINING AT LEAST ONE OF A COLLECTION OUTCOME OR AN EVENT ASSOCIATED WITH THE LOAN COLLECTION ACTION
10307
RECORDING, IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE LOAN, AT LEAST ONE OF THE COLLECTION OUTCOME OR THE EVENT

FIG. 103

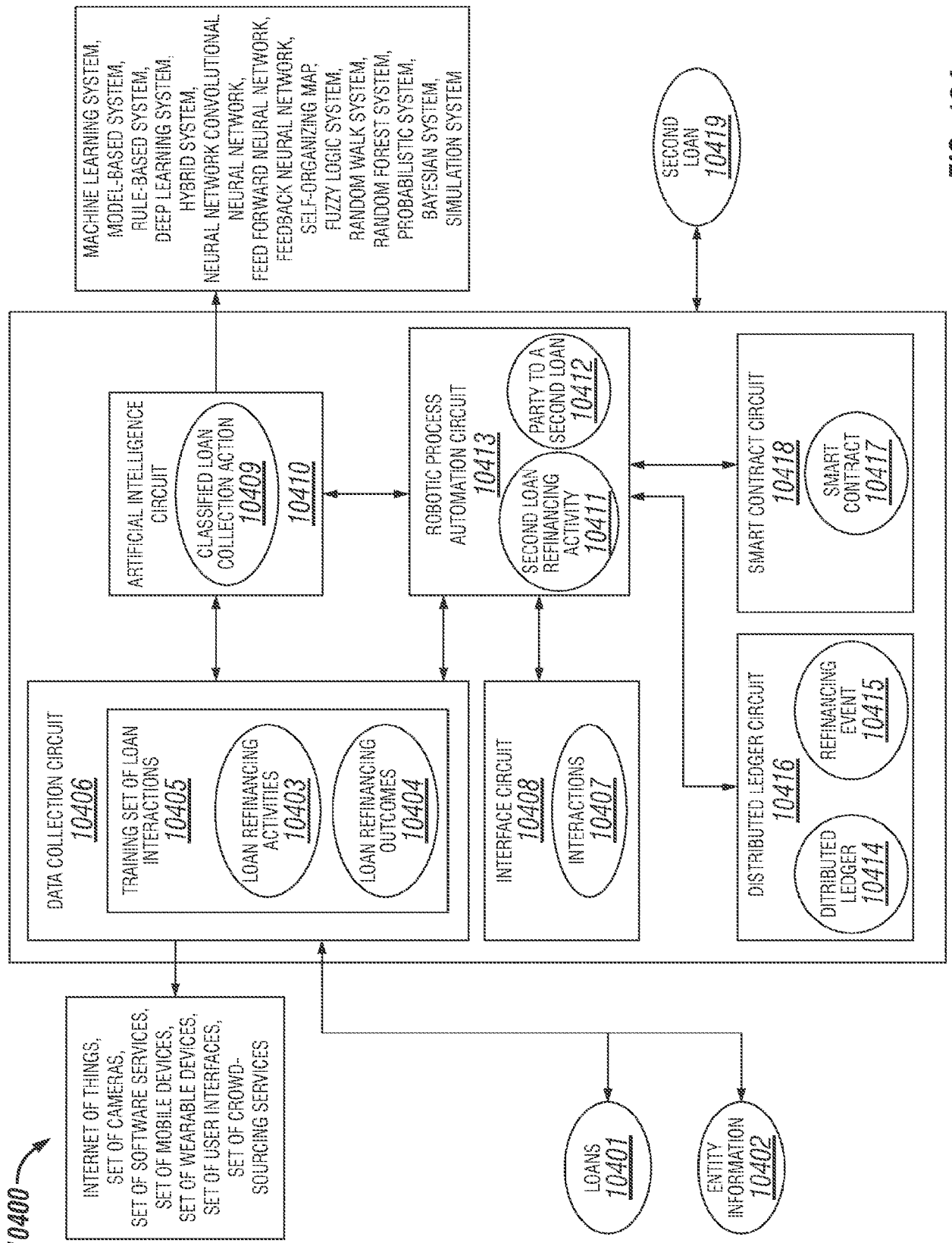

10400
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
LOANS 10401
ENTITY INFORMATION 10402
DATA COLLECTION CIRCUIT 10406
TRAINING SET OF LOAN INTERACTIONS 10405
LOAN REFINANCING ACTIVITIES 10403
LOAN REFINANCING OUTCOMES 10404
INTERFACE CIRCUIT 10408
INTERACTIONS 10407
ARTIFICIAL INTELLIGENCE CIRCUIT 10410
CLASSIFIED LOAN COLLECTION ACTION 10409
ROBOTIC PROCESS AUTOMATION CIRCUIT 10413
SECOND LOAN REFINANCING ACTIVITY 10411
PARTY TO A SECOND LOAN 10412
DISTRIBUTED LEDGER CIRCUIT 10416
DITRIBUTED LEDGER 10414
REFINANCING EVENT 10415
SMART CONTRACT CIRCUIT 10418
SMART CONTRACT 10417
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM
SECOND LOAN 10419

FIG. 104

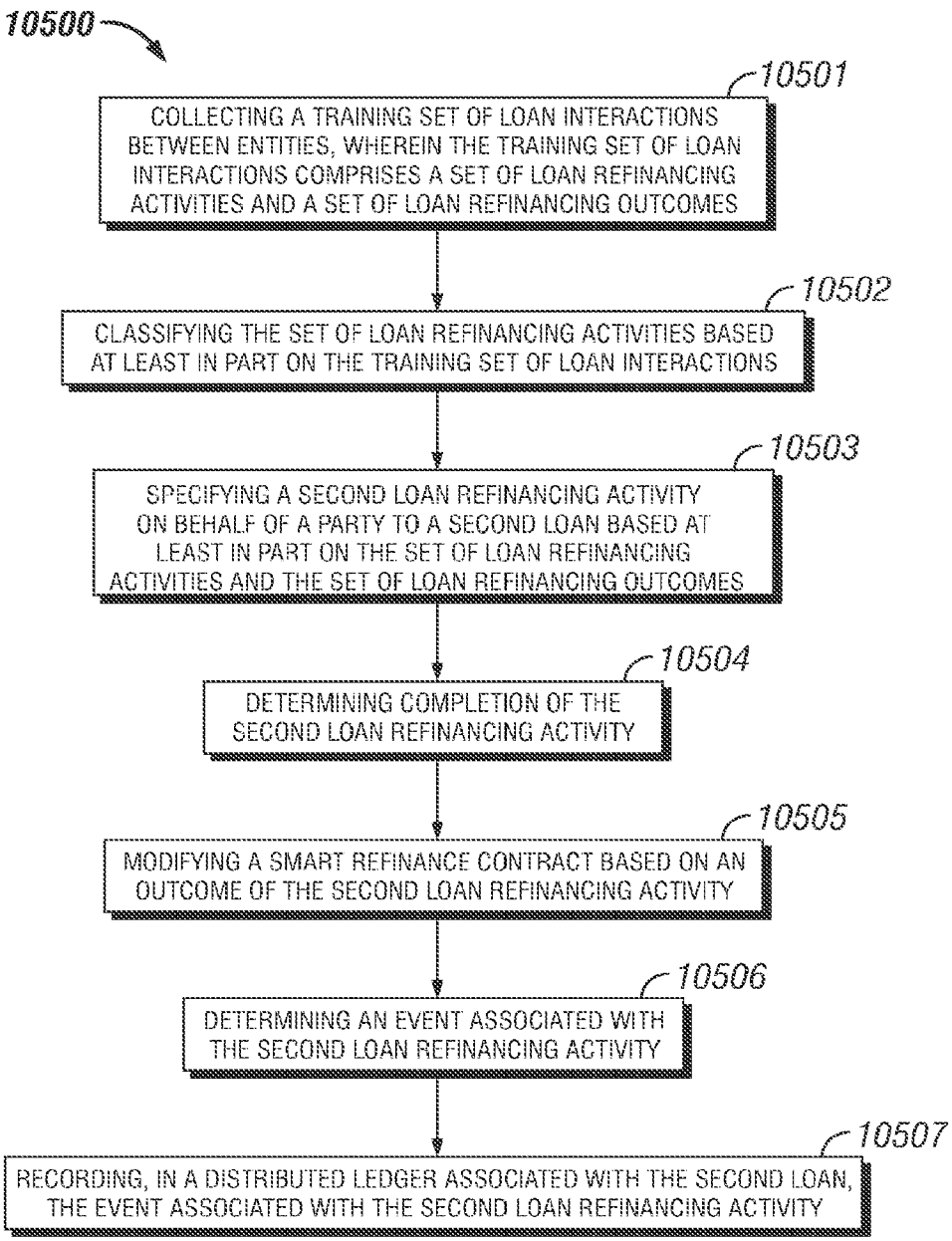

10500
10501
COLLECTING A TRAINING SET OF LOAN INTERACTIONS BETWEEN ENTITIES, WHEREIN THE TRAINING SET OF LOAN INTERACTIONS COMPRISES A SET OF LOAN REFINANCING ACTIVITIES AND A SET OF LOAN REFINANCING OUTCOMES
10502
CLASSIFYING THE SET OF LOAN REFINANCING ACTIVITIES BASED AT LEAST IN PART ON THE TRAINING SET OF LOAN INTERACTIONS
10503
SPECIFYING A SECOND LOAN REFINANCING ACTIVITY ON BEHALF OF A PARTY TO A SECOND LOAN BASED AT LEAST IN PART ON THE SET OF LOAN REFINANCING ACTIVITIES AND THE SET OF LOAN REFINANCING OUTCOMES
10504
DETERMINING COMPLETION OF THE SECOND LOAN REFINANCING ACTIVITY
10505
MODIFYING A SMART REFINANCE CONTRACT BASED ON AN OUTCOME OF THE SECOND LOAN REFINANCING ACTIVITY
10506
DETERMINING AN EVENT ASSOCIATED WITH THE SECOND LOAN REFINANCING ACTIVITY
10507
RECORDING, IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE SECOND LOAN, THE EVENT ASSOCIATED WITH THE SECOND LOAN REFINANCING ACTIVITY

FIG. 105

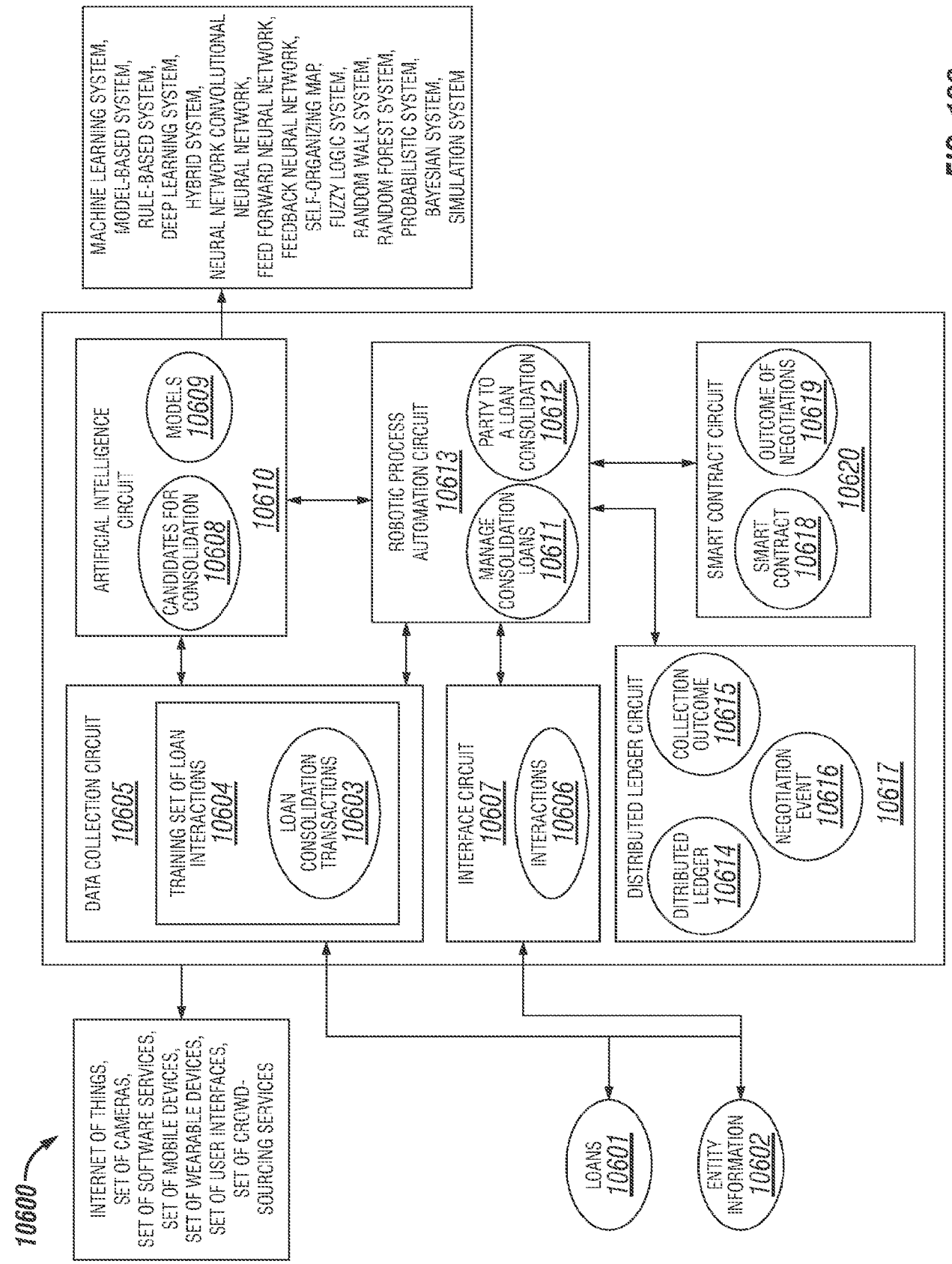

10600
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
LOANS 10601
ENTITY INFORMATION 10602
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM
DATA COLLECTION CIRCUIT 10605
TRAINING SET OF LOAN INTERACTIONS 10604
LOAN CONSOLIDATION TRANSACTIONS 10603
ARTIFICIAL INTELLIGENCE CIRCUIT 10610
CANDIDATES FOR CONSOLIDATION 10608
MODELS 10609
ROBOTIC PROCESS AUTOMATION CIRCUIT 10613
MANAGE CONSOLIDATION LOANS 10611
PARTY TO A LOAN CONSOLIDATION 10612
INTERFACE CIRCUIT 10607
INTERACTIONS 10606
DISTRIBUTED LEDGER CIRCUIT 10617
DITRIBUTED LEDGER 10614
COLLECTION OUTCOME 10615
NEGOTIATION EVENT 10616
SMART CONTRACT CIRCUIT 10620
SMART CONTRACT 10618
OUTCOME OF NEGOTIATIONS 10619

FIG. 106

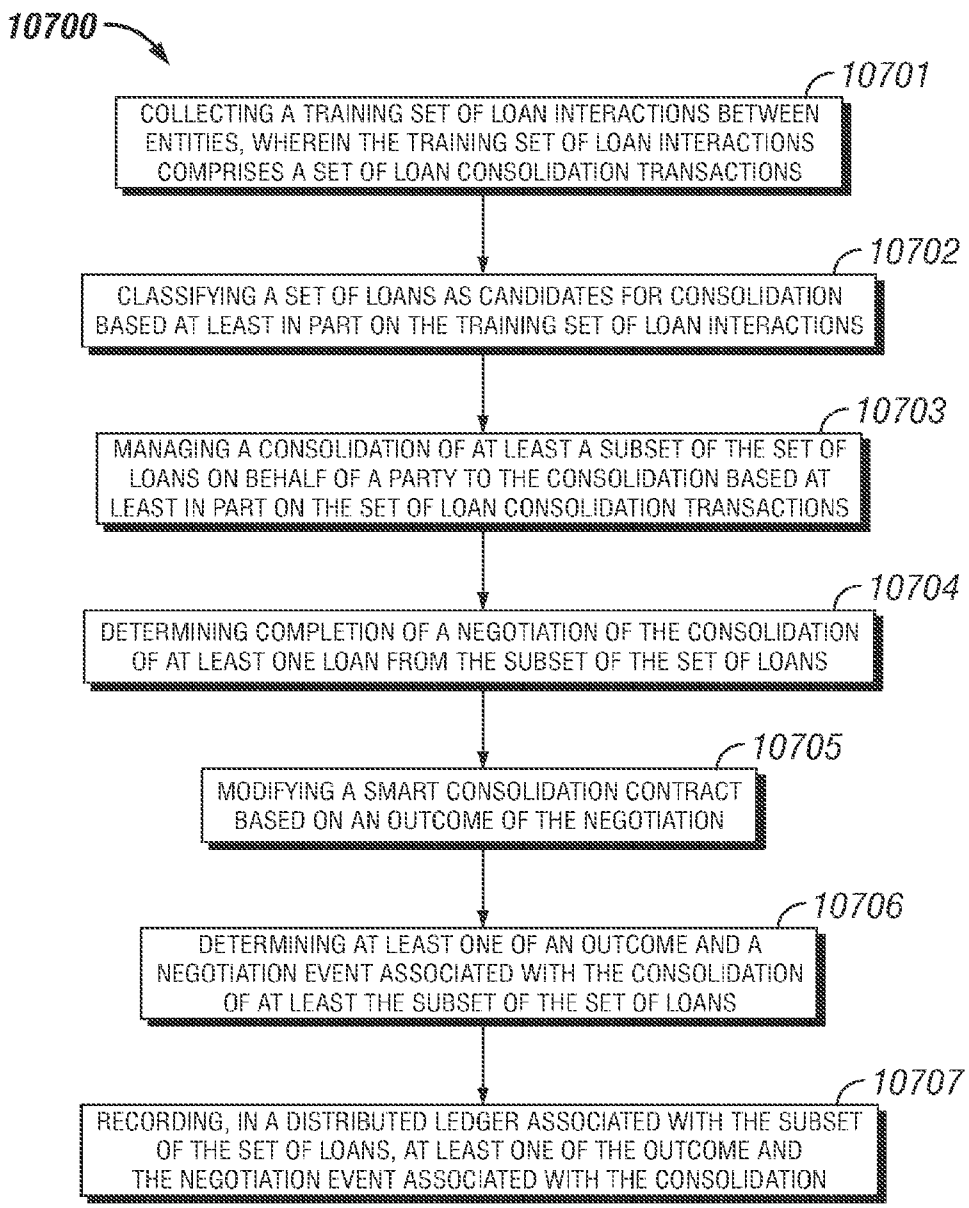

10700
10701
COLLECTING A TRAINING SET OF LOAN INTERACTIONS BETWEEN ENTITIES, WHEREIN THE TRAINING SET OF LOAN INTERACTIONS COMPRISES A SET OF LOAN CONSOLIDATION TRANSACTIONS
10702
CLASSIFYING A SET OF LOANS AS CANDIDATES FOR CONSOLIDATION BASED AT LEAST IN PART ON THE TRAINING SET OF LOAN INTERACTIONS
10703
MANAGING A CONSOLIDATION OF AT LEAST A SUBSET OF THE SET OF LOANS ON BEHALF OF A PARTY TO THE CONSOLIDATION BASED AT LEAST IN PART ON THE SET OF LOAN CONSOLIDATION TRANSACTIONS
10704
DETERMINING COMPLETION OF A NEGOTIATION OF THE CONSOLIDATION OF AT LEAST ONE LOAN FROM THE SUBSET OF THE SET OF LOANS
10705
MODIFYING A SMART CONSOLIDATION CONTRACT BASED ON AN OUTCOME OF THE NEGOTIATION
10706
DETERMINING AT LEAST ONE OF AN OUTCOME AND A NEGOTIATION EVENT ASSOCIATED WITH THE CONSOLIDATION OF AT LEAST THE SUBSET OF THE SET OF LOANS
10707
RECORDING, IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE SUBSET OF THE SET OF LOANS, AT LEAST ONE OF THE OUTCOME AND THE NEGOTIATION EVENT ASSOCIATED WITH THE CONSOLIDATION

FIG. 107

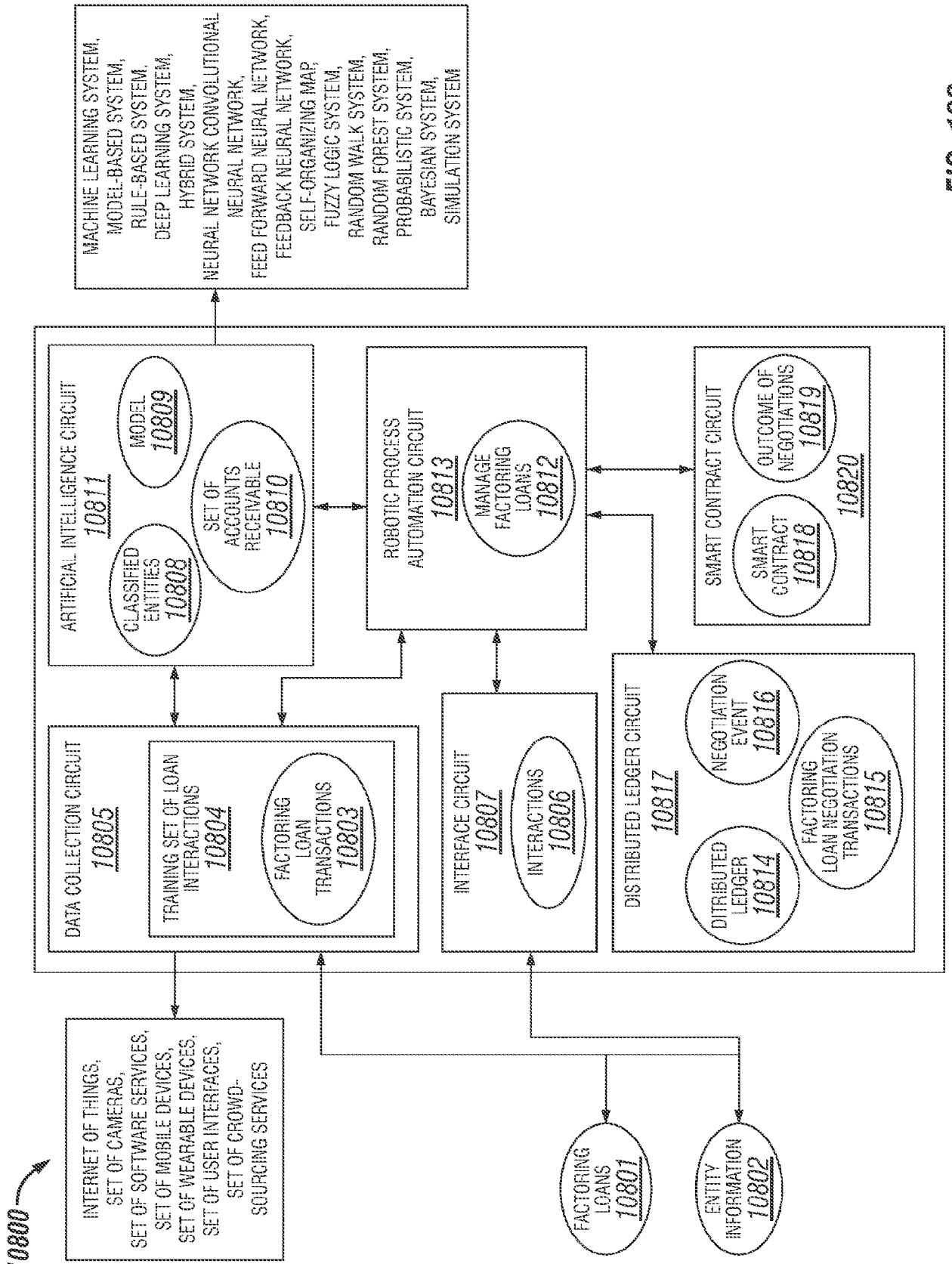

10800
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
FACTORING LOANS 10801
ENTITY INFORMATION 10802
DATA COLLECTION CIRCUIT 10805
TRAINING SET OF LOAN INTERACTIONS 10804
FACTORING LOAN TRANSACTIONS 10803
INTERFACE CIRCUIT 10807
INTERACTIONS 10806
ARTIFICIAL INTELLIGENCE CIRCUIT 10811
CLASSIFIED ENTITIES 10808
MODEL 10809
SET OF ACCOUNTS RECEIVABLE 10810
ROBOTIC PROCESS AUTOMATION CIRCUIT 10813
MANAGE FACTORING LOANS 10812
DISTRIBUTED LEDGER CIRCUIT 10817
DITRIBUTED LEDGER 10814
NEGOTIATION EVENT 10816
FACTORING LOAN NEGOTIATION TRANSACTIONS 10815
SMART CONTRACT CIRCUIT 10820
SMART CONTRACT 10818
OUTCOME OF NEGOTIATIONS 10819
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM

FIG. 108

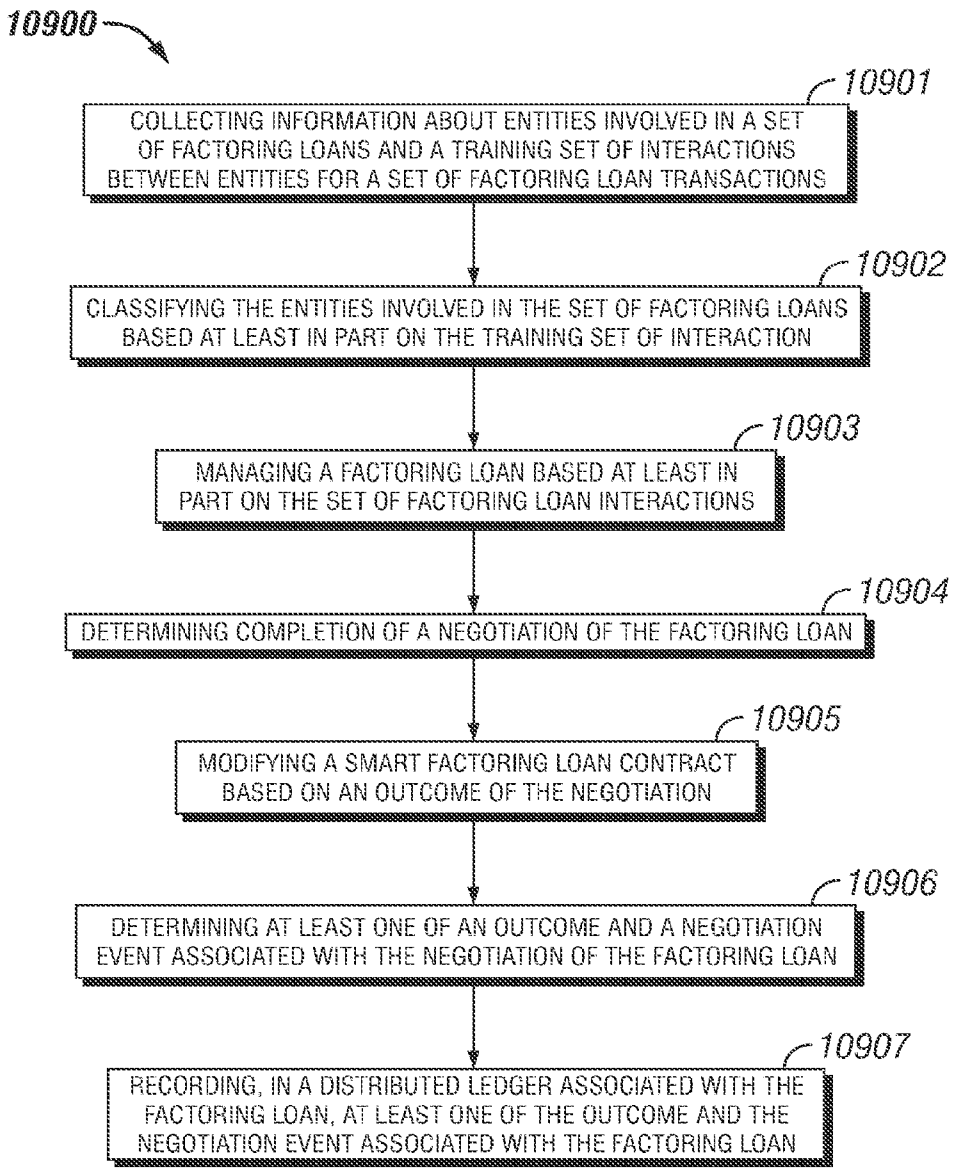

10900
10901
COLLECTING INFORMATION ABOUT ENTITIES INVOLVED IN A SET OF FACTORING LOANS AND A TRAINING SET OF INTERACTIONS BETWEEN ENTITIES FOR A SET OF FACTORING LOAN TRANSACTIONS
10902
CLASSIFYING THE ENTITIES INVOLVED IN THE SET OF FACTORING LOANS BASED AT LEAST IN PART ON THE TRAINING SET OF INTERACTION
10903
MANAGING A FACTORING LOAN BASED AT LEAST IN PART ON THE SET OF FACTORING LOAN INTERACTIONS
10904
DETERMINING COMPLETION OF A NEGOTIATION OF THE FACTORING LOAN
10905
MODIFYING A SMART FACTORING LOAN CONTRACT BASED ON AN OUTCOME OF THE NEGOTIATION
10906
DETERMINING AT LEAST ONE OF AN OUTCOME AND A NEGOTIATION EVENT ASSOCIATED WITH THE NEGOTIATION OF THE FACTORING LOAN
10907
RECORDING, IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE FACTORING LOAN, AT LEAST ONE OF THE OUTCOME AND THE NEGOTIATION EVENT ASSOCIATED WITH THE FACTORING LOAN

FIG. 109

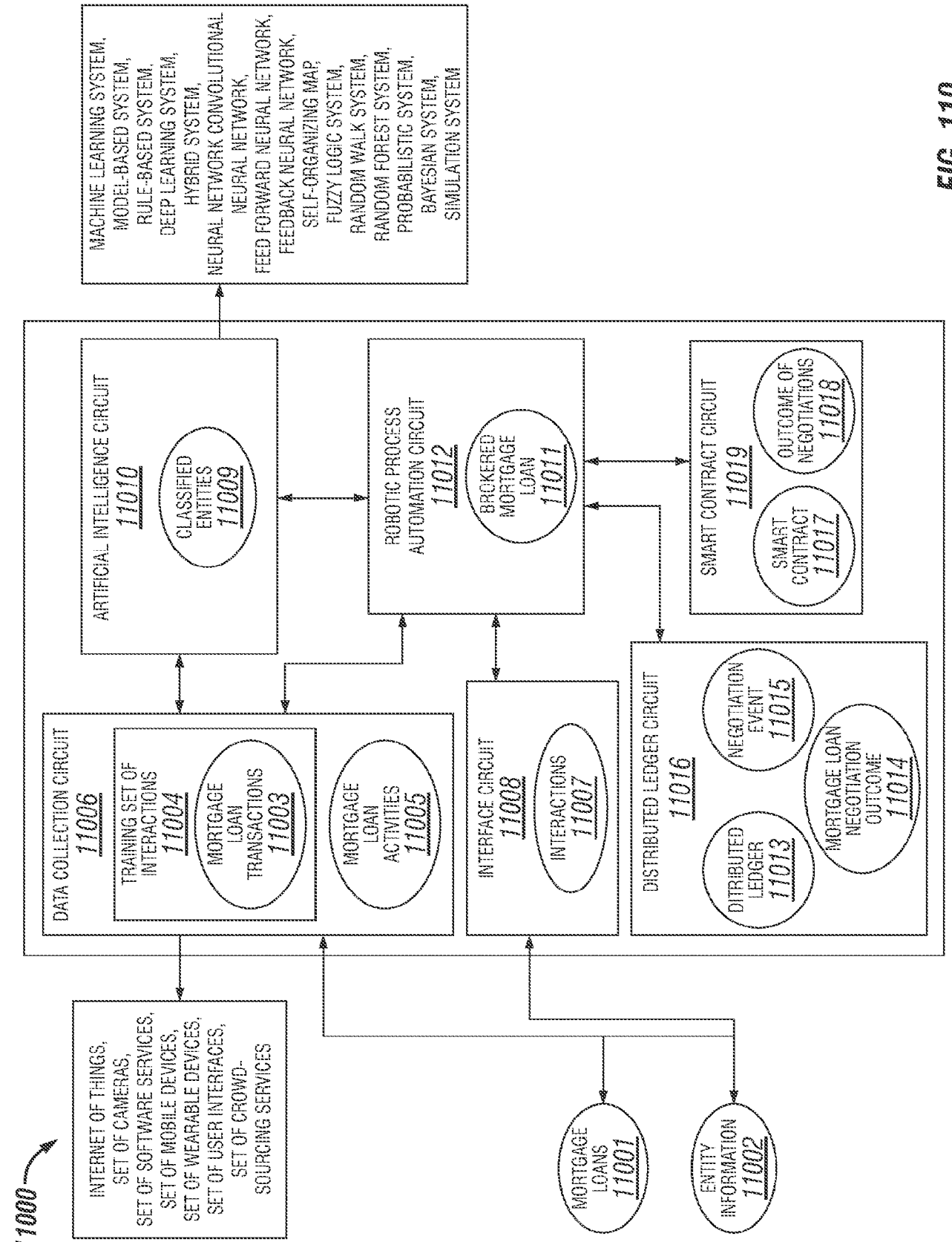

11000
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
MORTGAGE LOANS 11001
ENTITY INFORMATION 11002
DATA COLLECTION CIRCUIT 11006
TRAINING SET OF INTERACTIONS 11004
MORTGAGE LOAN TRANSACTIONS 11003
MORTGAGE LOAN ACTIVITIES 11005
INTERFACE CIRCUIT 11008
INTERACTIONS 11007
DISTRIBUTED LEDGER CIRCUIT 11016
DITRIBUTED LEDGER 11013
NEGOTIATION EVENT 11015
MORTGAGE LOAN NEGOTIATION OUTCOME 11014
ARTIFICIAL INTELLIGENCE CIRCUIT 11010
CLASSIFIED ENTITIES 11009
ROBOTIC PROCESS AUTOMATION CIRCUIT 11012
BROKERED MORTGAGE LOAN 11011
SMART CONTRACT CIRCUIT 11019
SMART CONTRACT 11017
OUTCOME OF NEGOTIATIONS 11018
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM

FIG. 110

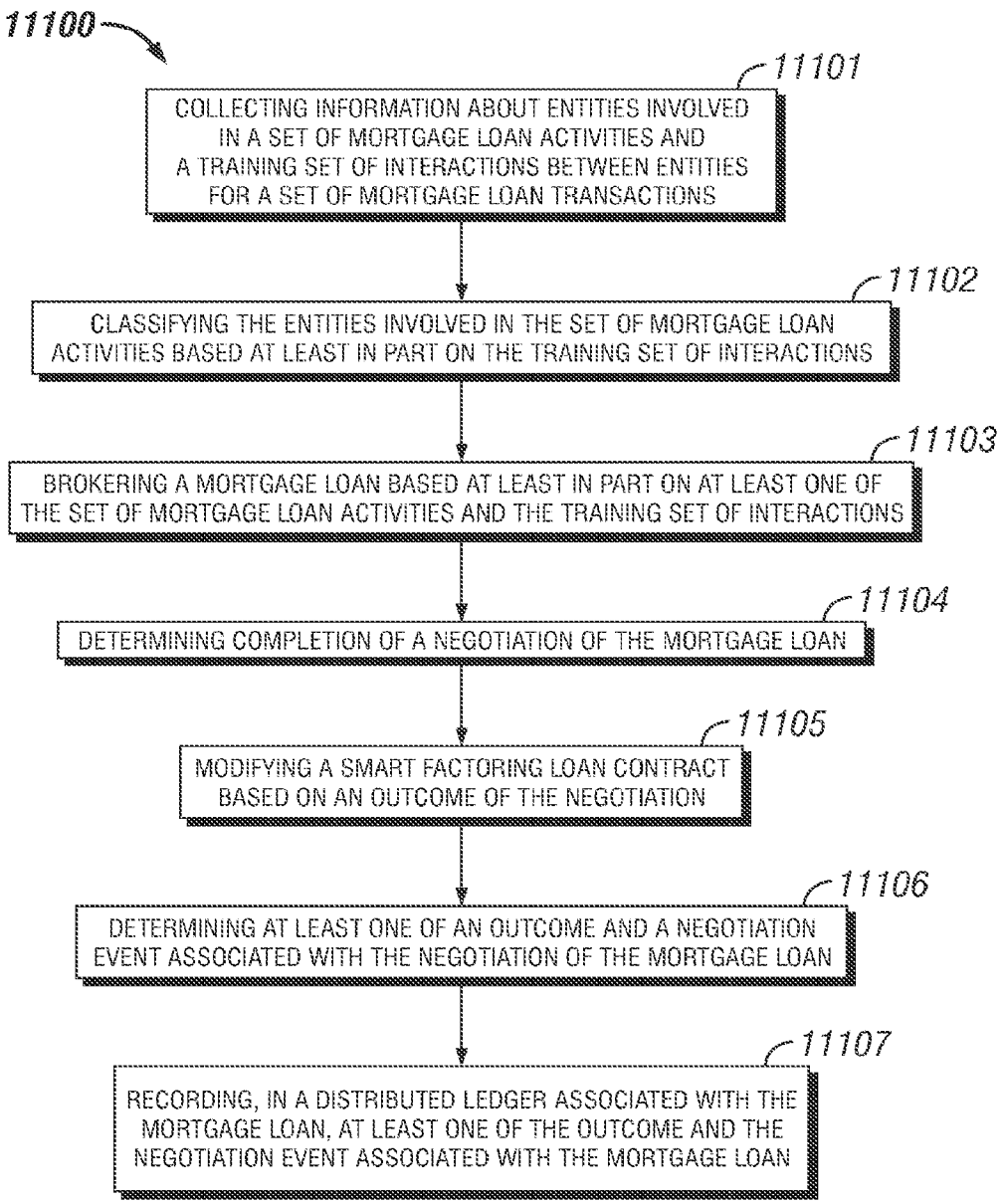

11100
11101
COLLECTING INFORMATION ABOUT ENTITIES INVOLVED IN A SET OF MORTGAGE LOAN ACTIVITIES AND A TRAINING SET OF INTERACTIONS BETWEEN ENTITIES FOR A SET OF MORTGAGE LOAN TRANSACTIONS
11102
CLASSIFYING THE ENTITIES INVOLVED IN THE SET OF MORTGAGE LOAN ACTIVITIES BASED AT LEAST IN PART ON THE TRAINING SET OF INTERACTIONS
11103
BROKERING A MORTGAGE LOAN BASED AT LEAST IN PART ON AT LEAST ONE OF THE SET OF MORTGAGE LOAN ACTIVITIES AND THE TRAINING SET OF INTERACTIONS
11104
DETERMINING COMPLETION OF A NEGOTIATION OF THE MORTGAGE LOAN
11105
MODIFYING A SMART FACTORING LOAN CONTRACT BASED ON AN OUTCOME OF THE NEGOTIATION
11106
DETERMINING AT LEAST ONE OF AN OUTCOME AND A NEGOTIATION EVENT ASSOCIATED WITH THE NEGOTIATION OF THE MORTGAGE LOAN
11107
RECORDING, IN A DISTRIBUTED LEDGER ASSOCIATED WITH THE MORTGAGE LOAN, AT LEAST ONE OF THE OUTCOME AND THE NEGOTIATION EVENT ASSOCIATED WITH THE MORTGAGE LOAN

FIG. 111

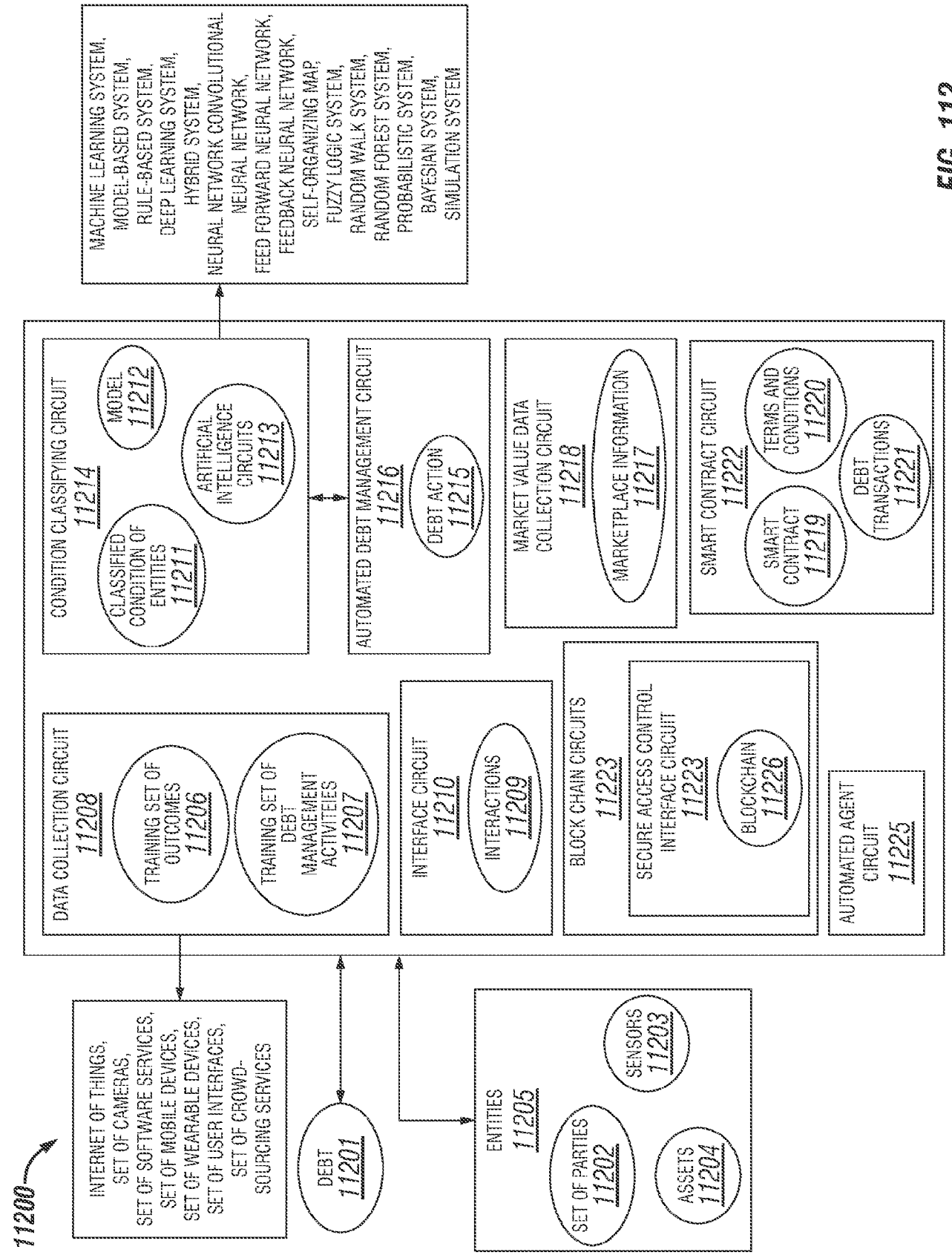

11200
INTERNET OF THINGS, SET OF CAMERAS, SET OF SOFTWARE SERVICES, SET OF MOBILE DEVICES, SET OF WEARABLE DEVICES, SET OF USER INTERFACES, SET OF CROWD-SOURCING SERVICES
DEBT 11201
ENTITIES 11205
SET OF PARTIES 11202
ASSETS 11204
SENSORS 11203
DATA COLLECTION CIRCUIT 11208
TRAINING SET OF OUTCOMES 11206
TRAINING SET OF DEBT MANAGEMENT ACTIVITIES 11207
INTERFACE CIRCUIT 11210
INTERACTIONS 11209
BLOCK CHAIN CIRCUITS 11223
SECURE ACCESS CONTROL INTERFACE CIRCUIT 11223
BLOCKCHAIN 11226
AUTOMATED AGENT CIRCUIT 11225
CONDITION CLASSIFYING CIRCUIT 11214
CLASSIFIED CONDITION OF ENTITIES 11211
ARTIFICIAL INTELLIGENCE CIRCUITS 11213
MODEL 11212
AUTOMATED DEBT MANAGEMENT CIRCUIT 11216
DEBT ACTION 11215
MARKET VALUE DATA COLLECTION CIRCUIT 11218
MARKETPLACE INFORMATION 11217
SMART CONTRACT CIRCUIT 11222
SMART CONTRACT 11219
TERMS AND CONDITIONS 11220
DEBT TRANSACTIONS 11221
MACHINE LEARNING SYSTEM, MODEL-BASED SYSTEM, RULE-BASED SYSTEM, DEEP LEARNING SYSTEM, HYBRID SYSTEM, NEURAL NETWORK CONVOLUTIONAL NEURAL NETWORK, FEED FORWARD NEURAL NETWORK, FEEDBACK NEURAL NETWORK, SELF-ORGANIZING MAP, FUZZY LOGIC SYSTEM, RANDOM WALK SYSTEM, RANDOM FOREST SYSTEM, PROBABILISTIC SYSTEM, BAYESIAN SYSTEM, SIMULATION SYSTEM

FIG. 112

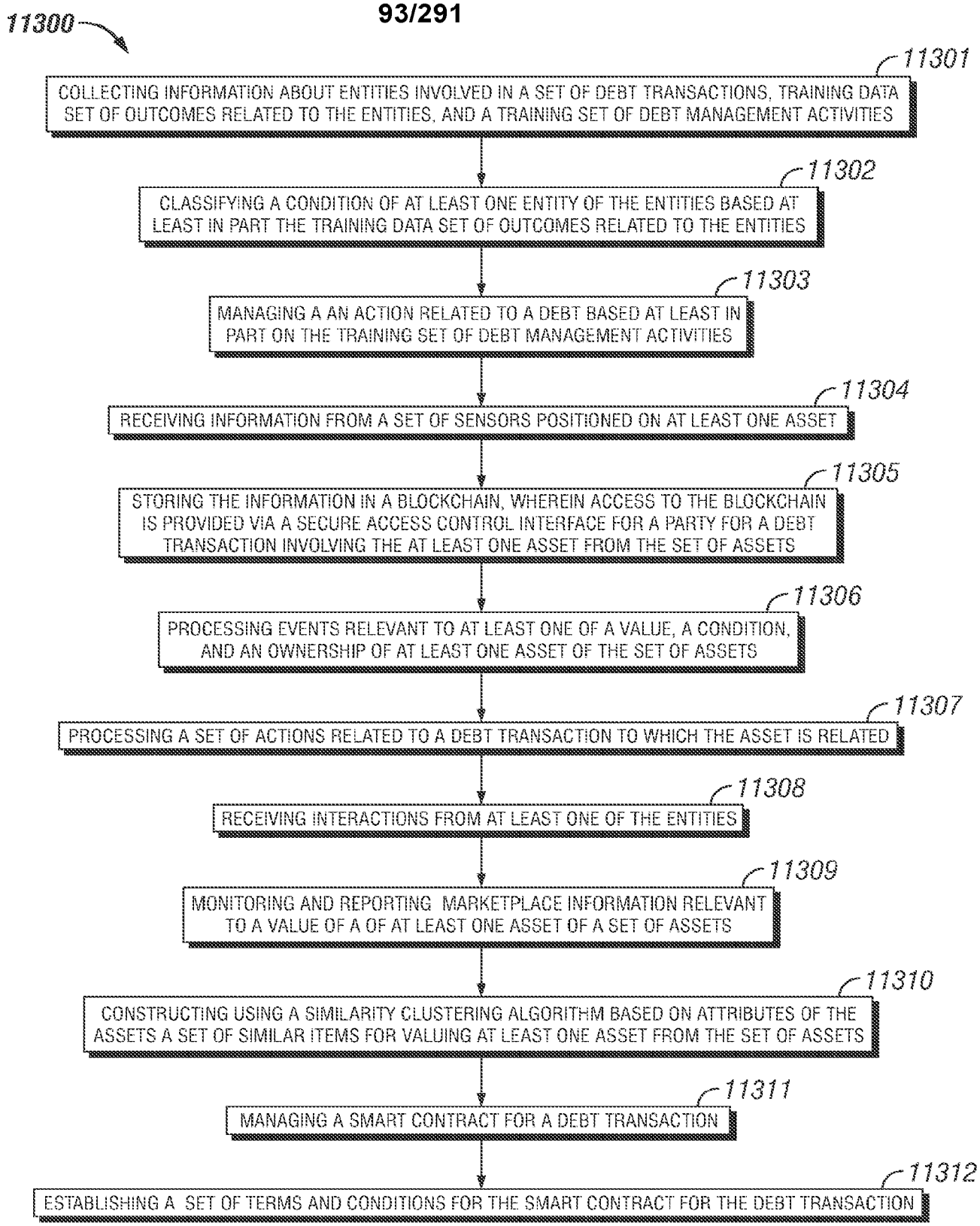

11300
11301
COLLECTING INFORMATION ABOUT ENTITIES INVOLVED IN A SET OF DEBT TRANSACTIONS, TRAINING DATA SET OF OUTCOMES RELATED TO THE ENTITIES, AND A TRAINING SET OF DEBT MANAGEMENT ACTIVITIES
11302
CLASSIFYING A CONDITION OF AT LEAST ONE ENTITY OF THE ENTITIES BASED AT LEAST IN PART THE TRAINING DATA SET OF OUTCOMES RELATED TO THE ENTITIES
11303
MANAGING A AN ACTION RELATED TO A DEBT BASED AT LEAST IN PART ON THE TRAINING SET OF DEBT MANAGEMENT ACTIVITIES
11304
RECEIVING INFORMATION FROM A SET OF SENSORS POSITIONED ON AT LEAST ONE ASSET
11305
STORING THE INFORMATION IN A BLOCKCHAIN, WHEREIN ACCESS TO THE BLOCKCHAIN IS PROVIDED VIA A SECURE ACCESS CONTROL INTERFACE FOR A PARTY FOR A DEBT TRANSACTION INVOLVING THE AT LEAST ONE ASSET FROM THE SET OF ASSETS
11306
PROCESSING EVENTS RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION, AND AN OWNERSHIP OF AT LEAST ONE ASSET OF THE SET OF ASSETS
11307
PROCESSING A SET OF ACTIONS RELATED TO A DEBT TRANSACTION TO WHICH THE ASSET IS RELATED
11308
RECEIVING INTERACTIONS FROM AT LEAST ONE OF THE ENTITIES
11309
MONITORING AND REPORTING MARKETPLACE INFORMATION RELEVANT TO A VALUE OF A OF AT LEAST ONE ASSET OF A SET OF ASSETS
11310
CONSTRUCTING USING A SIMILARITY CLUSTERING ALGORITHM BASED ON ATTRIBUTES OF THE ASSETS A SET OF SIMILAR ITEMS FOR VALUING AT LEAST ONE ASSET FROM THE SET OF ASSETS
11311
MANAGING A SMART CONTRACT FOR A DEBT TRANSACTION
11312
ESTABLISHING A SET OF TERMS AND CONDITIONS FOR THE SMART CONTRACT FOR THE DEBT TRANSACTION

FIG. 113

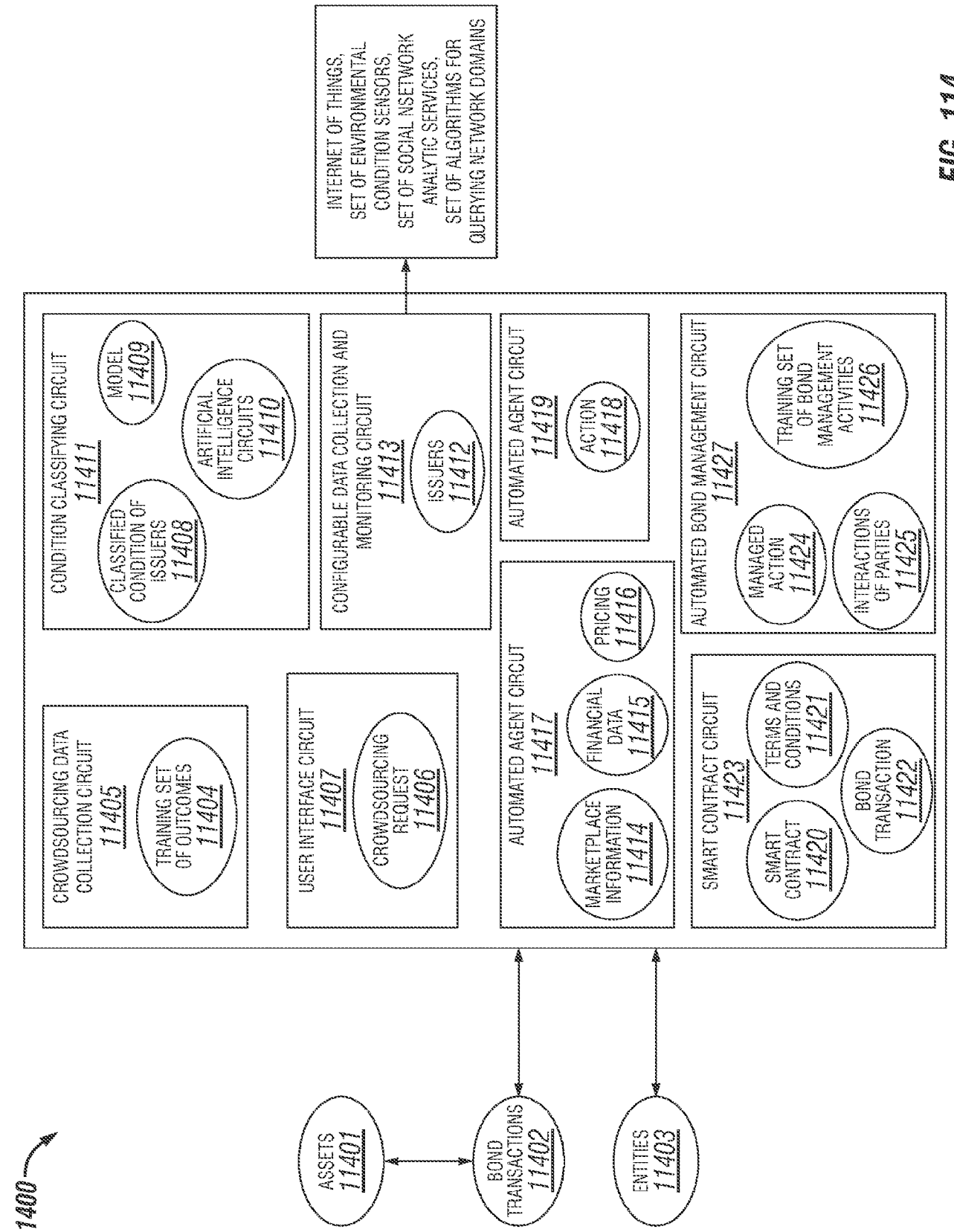

11400
ASSETS 11401
BOND TRANSACTIONS 11402
ENTITIES 11403
CROWDSOURCING DATA COLLECTION CIRCUIT 11405
TRAINING SET OF OUTCOMES 11404
USER INTERFACE CIRCUIT 11407
CROWDSOURCING REQUEST 11406
CONDITION CLASSIFYING CIRCUIT 11411
CLASSIFIED CONDITION OF ISSUERS 11408
MODEL 11409
ARTIFICIAL INTELLIGENCE CIRCUITS 11410
CONFIGURABLE DATA COLLECTION AND MONITORING CIRCUIT 11413
ISSUERS 11412
AUTOMATED AGENT CIRCUIT 11417
MARKETPLACE INFORMATION 11414
FINANCIAL DATA 11415
PRICING 11416
AUTOMATED AGENT CIRCUIT 11419
ACTION 11418
SMART CONTRACT CIRCUIT 11423
SMART CONTRACT 11420
TERMS AND CONDITIONS 11421
BOND TRANSACTION 11422
AUTOMATED BOND MANAGEMENT CIRCUIT 11427
MANAGED ACTION 11424
INTERACTIONS OF PARTIES 11425
TRAINING SET OF BOND MANAGEMENT ACTIVITIES 11426
INTERNET OF THINGS, SET OF ENVIRONMENTAL CONDITION SENSORS, SET OF SOCIAL NSETWORK ANALYTIC SERVICES, SET OF ALGORITHMS FOR QUERYING NETWORK DOMAINS

FIG. 114

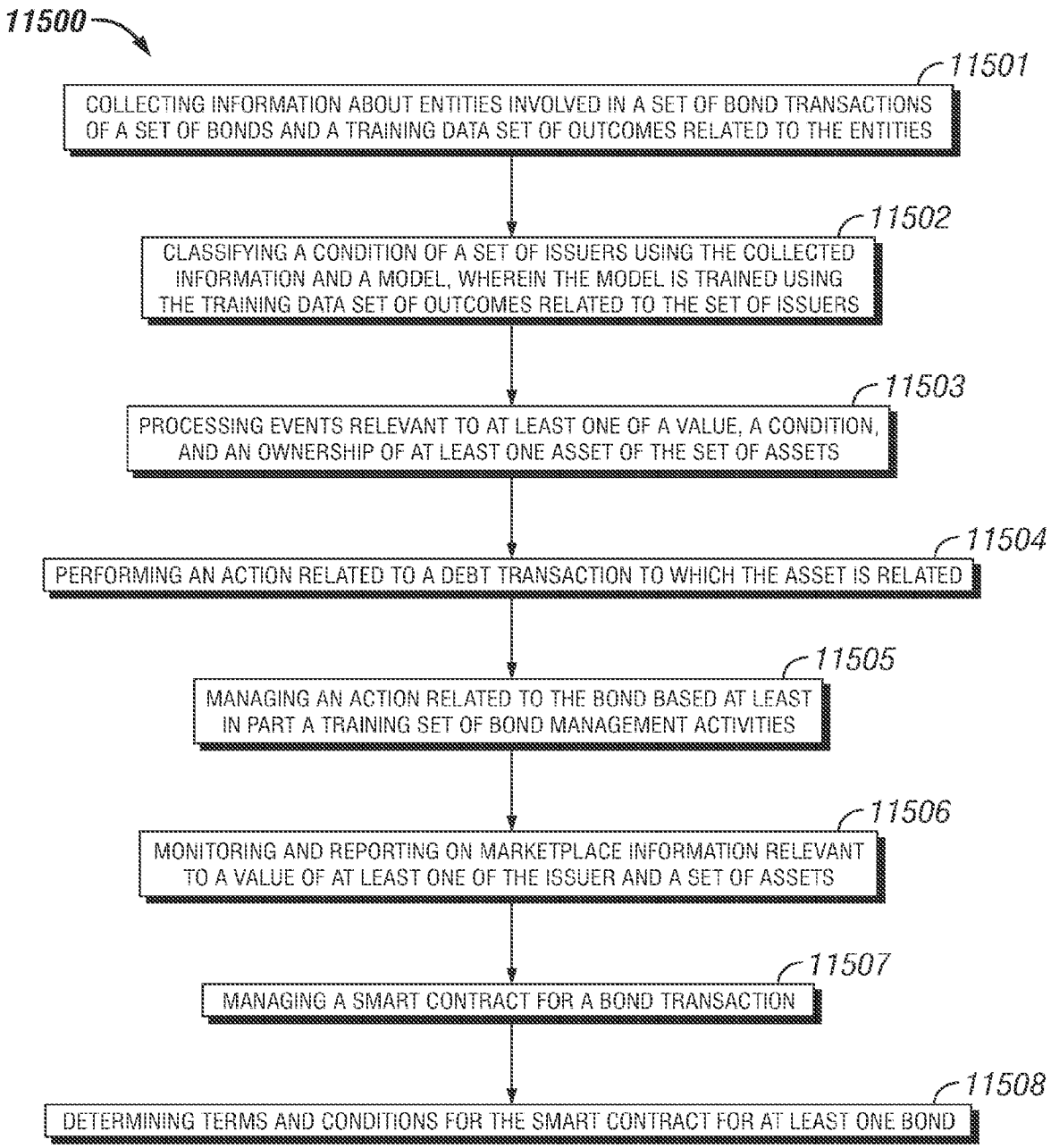

11500
11501
COLLECTING INFORMATION ABOUT ENTITIES INVOLVED IN A SET OF BOND TRANSACTIONS OF A SET OF BONDS AND A TRAINING DATA SET OF OUTCOMES RELATED TO THE ENTITIES
11502
CLASSIFYING A CONDITION OF A SET OF ISSUERS USING THE COLLECTED INFORMATION AND A MODEL, WHEREIN THE MODEL IS TRAINED USING THE TRAINING DATA SET OF OUTCOMES RELATED TO THE SET OF ISSUERS
11503
PROCESSING EVENTS RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION, AND AN OWNERSHIP OF AT LEAST ONE ASSET OF THE SET OF ASSETS
11504
PERFORMING AN ACTION RELATED TO A DEBT TRANSACTION TO WHICH THE ASSET IS RELATED
11505
MANAGING AN ACTION RELATED TO THE BOND BASED AT LEAST IN PART A TRAINING SET OF BOND MANAGEMENT ACTIVITIES
11506
MONITORING AND REPORTING ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF AT LEAST ONE OF THE ISSUER AND A SET OF ASSETS
11507
MANAGING A SMART CONTRACT FOR A BOND TRANSACTION
11508
DETERMINING TERMS AND CONDITIONS FOR THE SMART CONTRACT FOR AT LEAST ONE BOND

FIG. 115

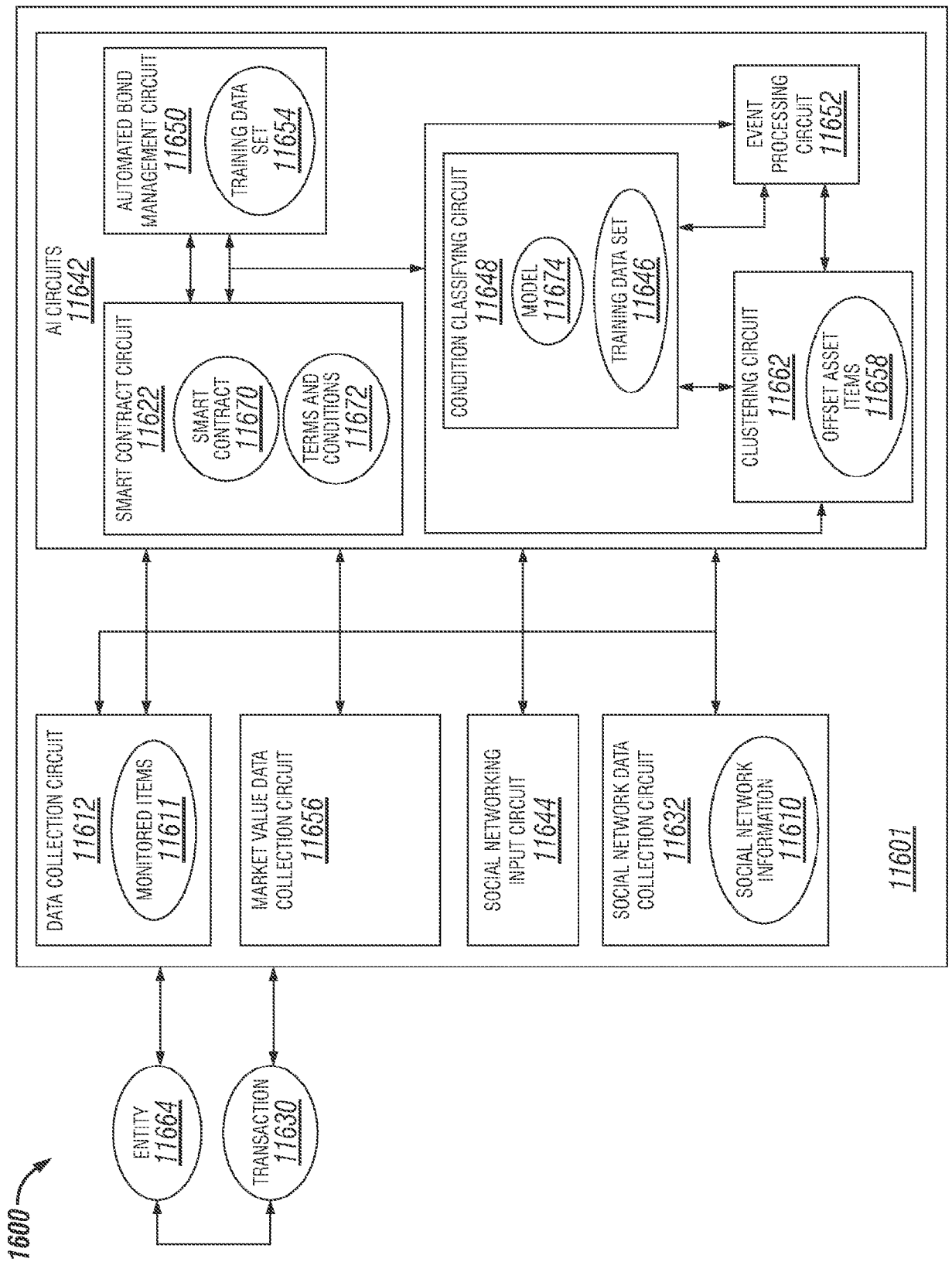

11600
ENTITY 11664
TRANSACTION 11630
11601
DATA COLLECTION CIRCUIT 11612
MONITORED ITEMS 11611
MARKET VALUE DATA COLLECTION CIRCUIT 11656
SOCIAL NETWORKING INPUT CIRCUIT 11644
SOCIAL NETWORK DATA COLLECTION CIRCUIT 11632
SOCIAL NETWORK INFORMATION 11610
AI CIRCUITS 11642
AUTOMATED BOND MANAGEMENT CIRCUIT 11650
TRAINING DATA SET 11654
SMART CONTRACT CIRCUIT 11622
SMART CONTRACT 11670
TERMS AND CONDITIONS 11672
CONDITION CLASSIFYING CIRCUIT 11648
MODEL 11674
TRAINING DATA SET 11646
CLUSTERING CIRCUIT 11662
OFFSET ASSET ITEMS 11658
EVENT PROCESSING CIRCUIT 11652

FIG. 116

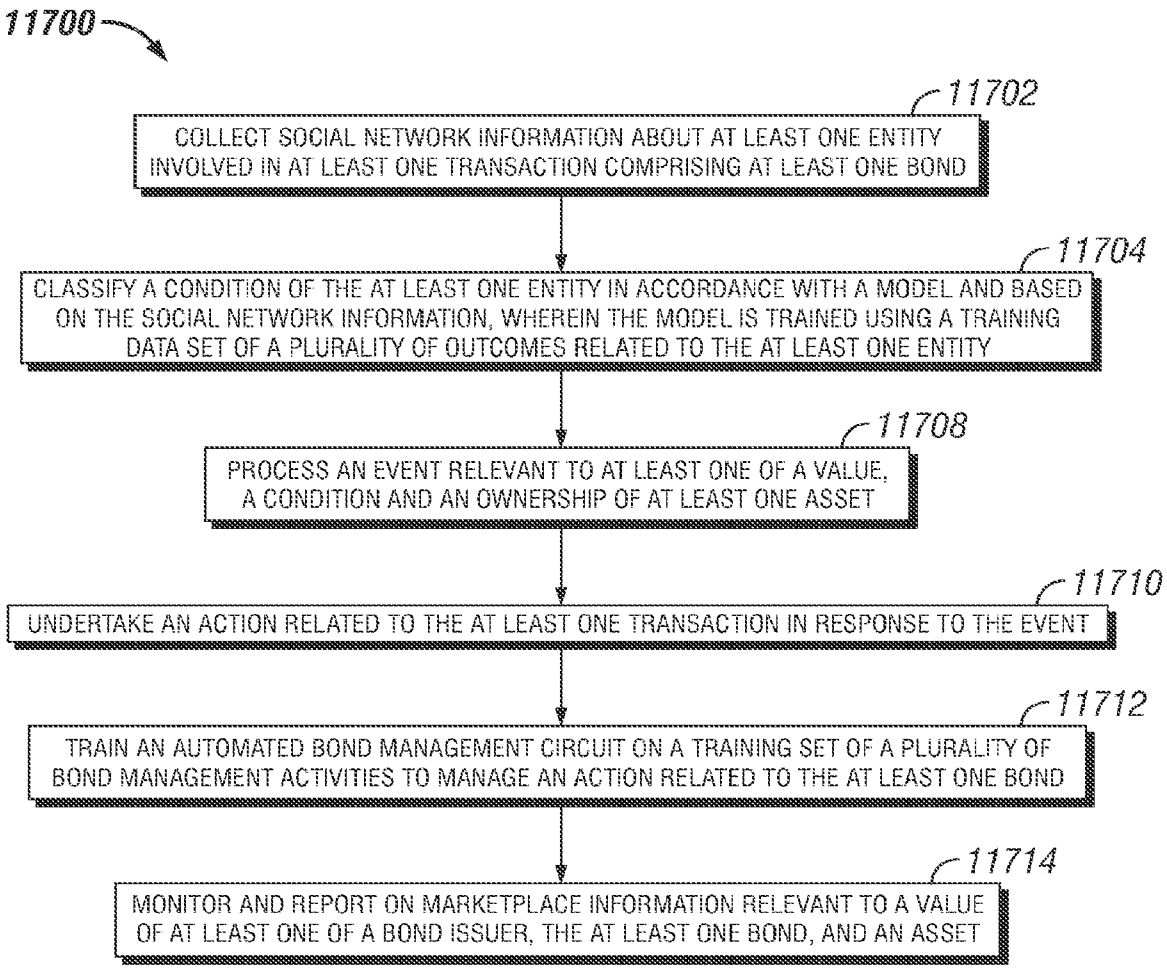

11700
11702
COLLECT SOCIAL NETWORK INFORMATION ABOUT AT LEAST ONE ENTITY INVOLVED IN AT LEAST ONE TRANSACTION COMPRISING AT LEAST ONE BOND
11704
CLASSIFY A CONDITION OF THE AT LEAST ONE ENTITY IN ACCORDANCE WITH A MODEL AND BASED ON THE SOCIAL NETWORK INFORMATION, WHEREIN THE MODEL IS TRAINED USING A TRAINING DATA SET OF A PLURALITY OF OUTCOMES RELATED TO THE AT LEAST ONE ENTITY
11708
PROCESS AN EVENT RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION AND AN OWNERSHIP OF AT LEAST ONE ASSET
11710
UNDERTAKE AN ACTION RELATED TO THE AT LEAST ONE TRANSACTION IN RESPONSE TO THE EVENT
11712
TRAIN AN AUTOMATED BOND MANAGEMENT CIRCUIT ON A TRAINING SET OF A PLURALITY OF BOND MANAGEMENT ACTIVITIES TO MANAGE AN ACTION RELATED TO THE AT LEAST ONE BOND
11714
MONITOR AND REPORT ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF AT LEAST ONE OF A BOND ISSUER, THE AT LEAST ONE BOND, AND AN ASSET

FIG. 117

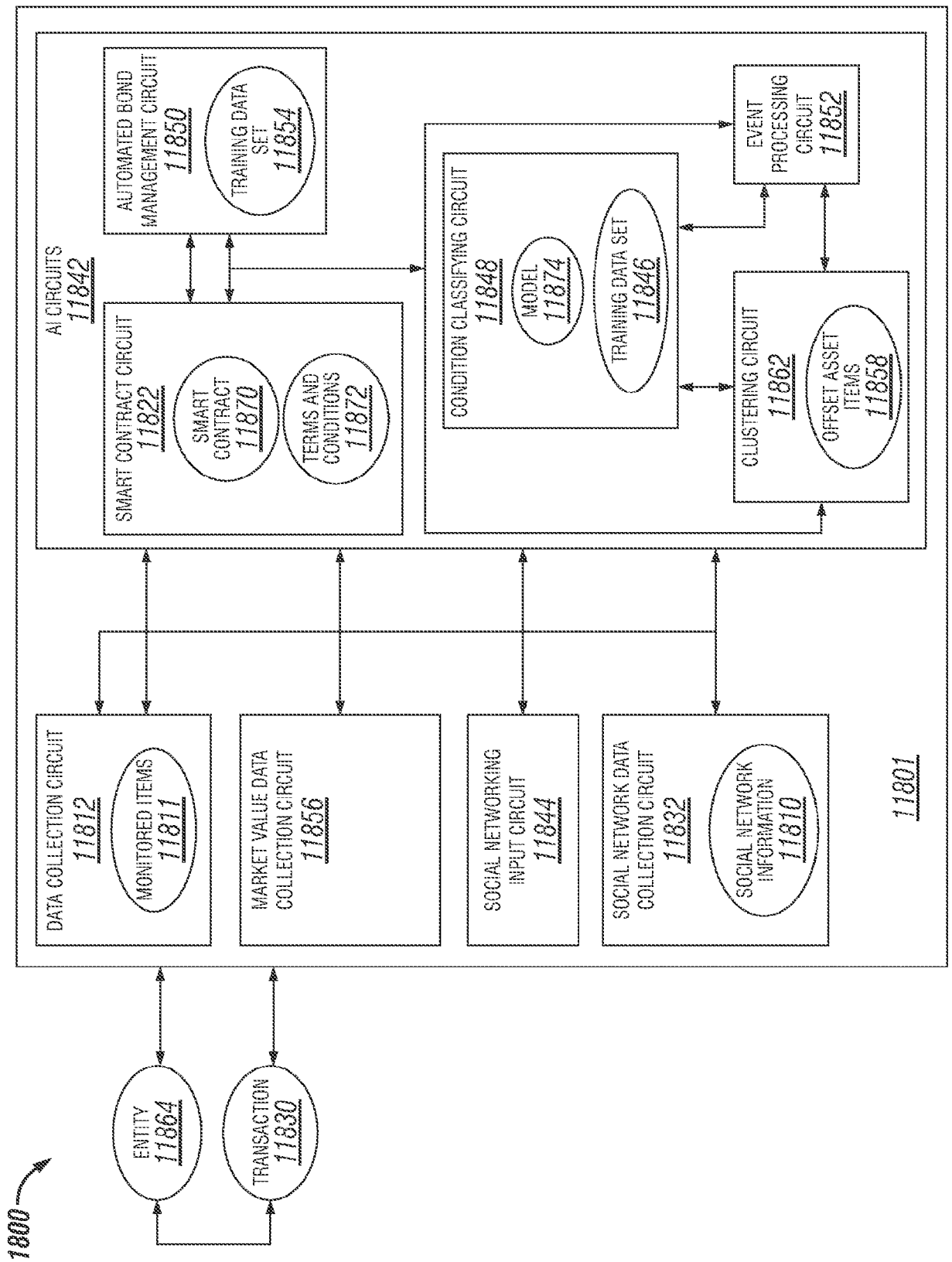

11800
ENTITY 11864
TRANSACTION 11830
11801
DATA COLLECTION CIRCUIT 11812
MONITORED ITEMS 11811
MARKET VALUE DATA COLLECTION CIRCUIT 11856
SOCIAL NETWORKING INPUT CIRCUIT 11844
SOCIAL NETWORK DATA COLLECTION CIRCUIT 11832
SOCIAL NETWORK INFORMATION 11810
AI CIRCUITS 11842
AUTOMATED BOND MANAGEMENT CIRCUIT 11850
TRAINING DATA SET 11854
SMART CONTRACT CIRCUIT 11822
SMART CONTRACT 11870
TERMS AND CONDITIONS 11872
CONDITION CLASSIFYING CIRCUIT 11848
MODEL 11874
TRAINING DATA SET 11846
CLUSTERING CIRCUIT 11862
OFFSET ASSET ITEMS 11858
EVENT PROCESSING CIRCUIT 11852

FIG. 118

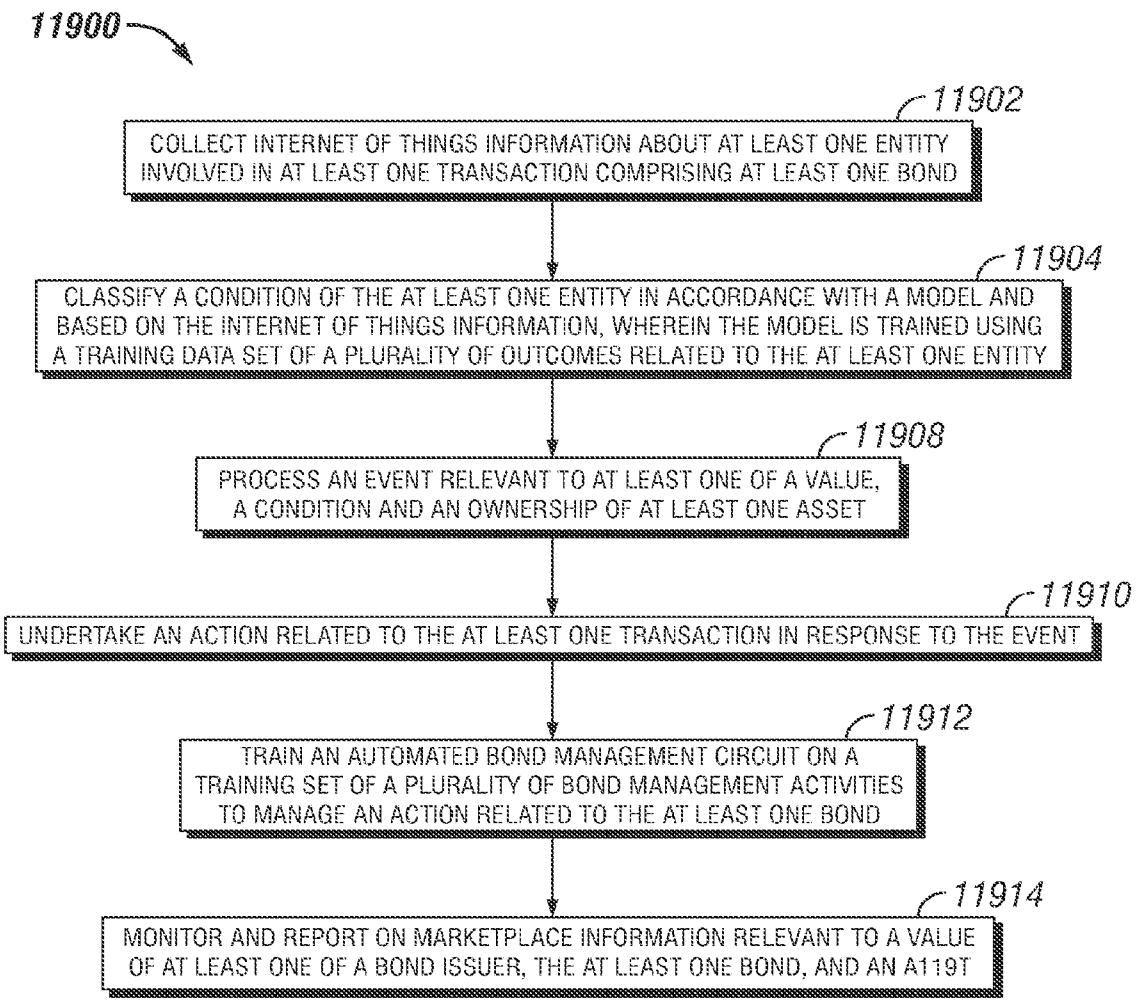

11900
11902
COLLECT INTERNET OF THINGS INFORMATION ABOUT AT LEAST ONE ENTITY INVOLVED IN AT LEAST ONE TRANSACTION COMPRISING AT LEAST ONE BOND
11904
CLASSIFY A CONDITION OF THE AT LEAST ONE ENTITY IN ACCORDANCE WITH A MODEL AND BASED ON THE INTERNET OF THINGS INFORMATION, WHEREIN THE MODEL IS TRAINED USING A TRAINING DATA SET OF A PLURALITY OF OUTCOMES RELATED TO THE AT LEAST ONE ENTITY
11908
PROCESS AN EVENT RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION AND AN OWNERSHIP OF AT LEAST ONE ASSET
11910
UNDERTAKE AN ACTION RELATED TO THE AT LEAST ONE TRANSACTION IN RESPONSE TO THE EVENT
11912
TRAIN AN AUTOMATED BOND MANAGEMENT CIRCUIT ON A TRAINING SET OF A PLURALITY OF BOND MANAGEMENT ACTIVITIES TO MANAGE AN ACTION RELATED TO THE AT LEAST ONE BOND
11914
MONITOR AND REPORT ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF AT LEAST ONE OF A BOND ISSUER, THE AT LEAST ONE BOND, AND AN A119T

FIG. 119

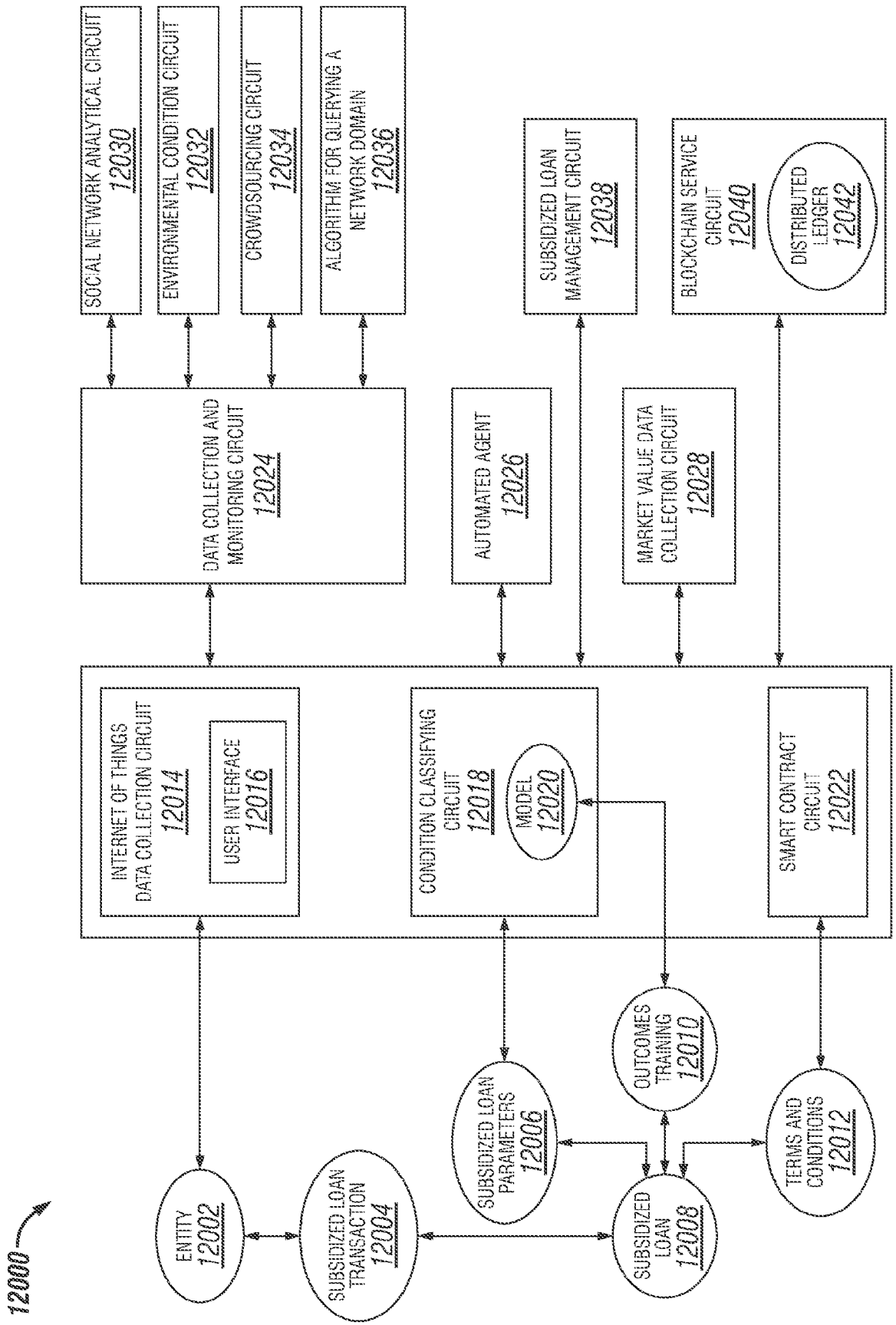

12000
ENTITY 12002
SUBSIDIZED LOAN TRANSACTION 12004
SUBSIDIZED LOAN PARAMETERS 12006
SUBSIDIZED LOAN 12008
OUTCOMES TRAINING 12010
TERMS AND CONDITIONS 12012
INTERNET OF THINGS DATA COLLECTION CIRCUIT 12014
USER INTERFACE 12016
CONDITION CLASSIFYING CIRCUIT 12018
MODEL 12020
SMART CONTRACT CIRCUIT 12022
DATA COLLECTION AND MONITORING CIRCUIT 12024
AUTOMATED AGENT 12026
MARKET VALUE DATA COLLECTION CIRCUIT 12028
SUBSIDIZED LOAN MANAGEMENT CIRCUIT 12038
BLOCKCHAIN SERVICE CIRCUIT 12040
DISTRIBUTED LEDGER 12042
SOCIAL NETWORK ANALYTICAL CIRCUIT 12030
ENVIRONMENTAL CONDITION CIRCUIT 12032
CROWDSOURCING CIRCUIT 12034
ALGORITHM FOR QUERYING A NETWORK DOMAIN 12036

FIG. 120

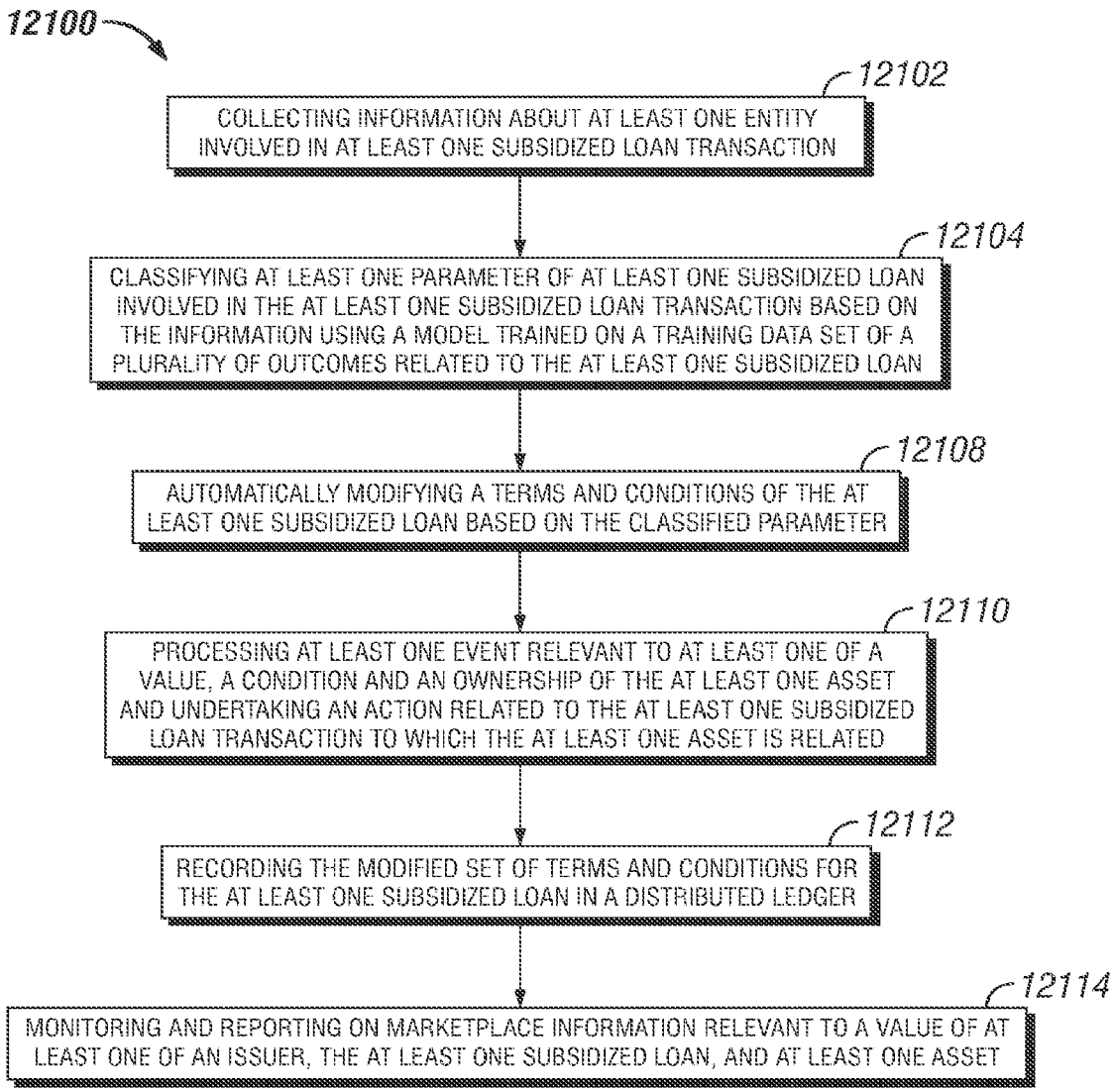

12100
12102
COLLECTING INFORMATION ABOUT AT LEAST ONE ENTITY INVOLVED IN AT LEAST ONE SUBSIDIZED LOAN TRANSACTION
12104
CLASSIFYING AT LEAST ONE PARAMETER OF AT LEAST ONE SUBSIDIZED LOAN INVOLVED IN THE AT LEAST ONE SUBSIDIZED LOAN TRANSACTION BASED ON THE INFORMATION USING A MODEL TRAINED ON A TRAINING DATA SET OF A PLURALITY OF OUTCOMES RELATED TO THE AT LEAST ONE SUBSIDIZED LOAN
12108
AUTOMATICALLY MODIFYING A TERMS AND CONDITIONS OF THE AT LEAST ONE SUBSIDIZED LOAN BASED ON THE CLASSIFIED PARAMETER
12110
PROCESSING AT LEAST ONE EVENT RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION AND AN OWNERSHIP OF THE AT LEAST ONE ASSET AND UNDERTAKING AN ACTION RELATED TO THE AT LEAST ONE SUBSIDIZED LOAN TRANSACTION TO WHICH THE AT LEAST ONE ASSET IS RELATED
12112
RECORDING THE MODIFIED SET OF TERMS AND CONDITIONS FOR THE AT LEAST ONE SUBSIDIZED LOAN IN A DISTRIBUTED LEDGER
12114
MONITORING AND REPORTING ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF AT LEAST ONE OF AN ISSUER, THE AT LEAST ONE SUBSIDIZED LOAN, AND AT LEAST ONE ASSET

FIG. 121

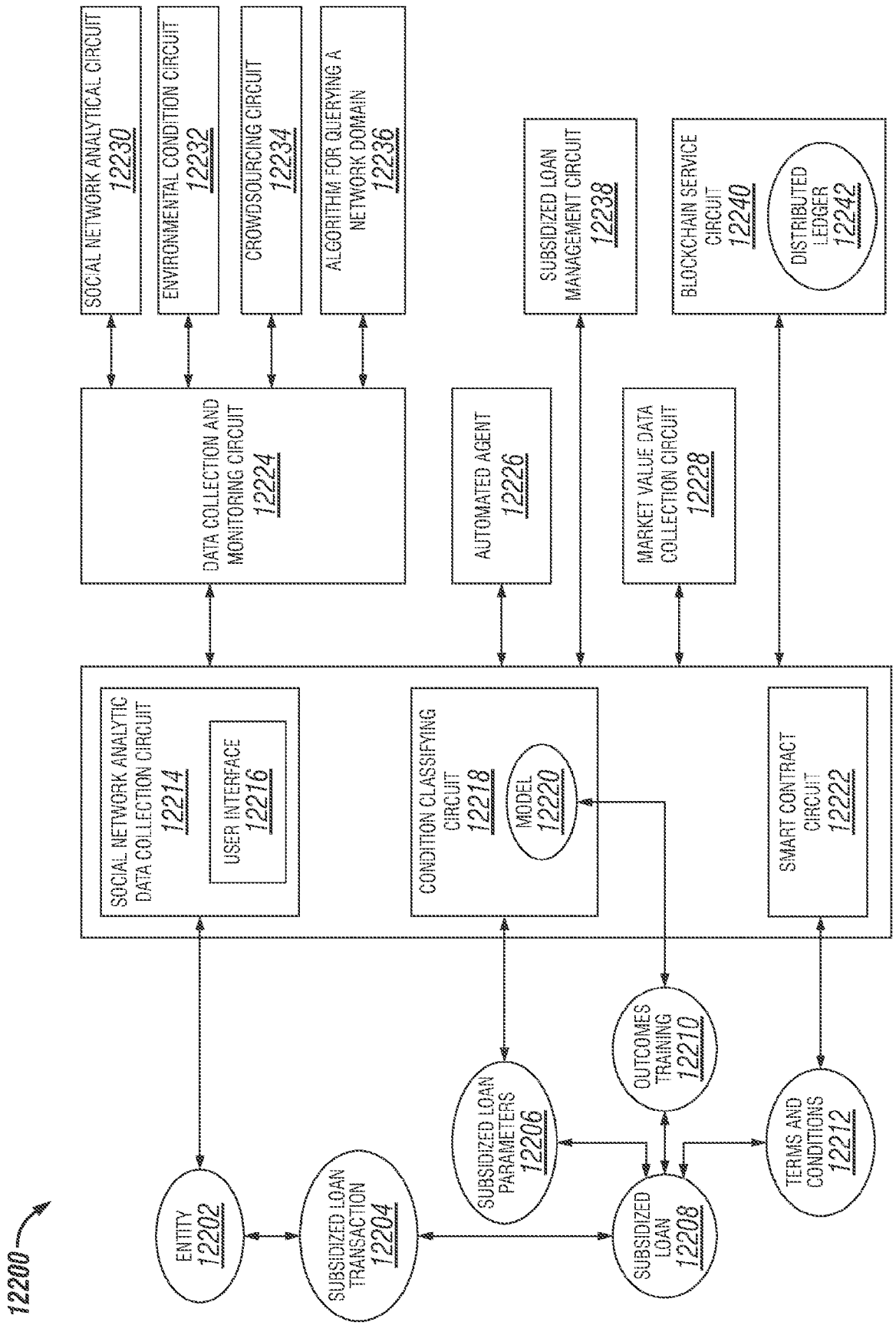

12200
ENTITY 12202
SUBSIDIZED LOAN TRANSACTION 12204
SUBSIDIZED LOAN PARAMETERS 12206
SUBSIDIZED LOAN 12208
OUTCOMES TRAINING 12210
TERMS AND CONDITIONS 12212
SOCIAL NETWORK ANALYTIC DATA COLLECTION CIRCUIT 12214
USER INTERFACE 12216
CONDITION CLASSIFYING CIRCUIT 12218
MODEL 12220
SMART CONTRACT CIRCUIT 12222
DATA COLLECTION AND MONITORING CIRCUIT 12224
AUTOMATED AGENT 12226
MARKET VALUE DATA COLLECTION CIRCUIT 12228
SOCIAL NETWORK ANALYTICAL CIRCUIT 12230
ENVIRONMENTAL CONDITION CIRCUIT 12232
CROWDSOURCING CIRCUIT 12234
ALGORITHM FOR QUERYING A NETWORK DOMAIN 12236
SUBSIDIZED LOAN MANAGEMENT CIRCUIT 12238
BLOCKCHAIN SERVICE CIRCUIT 12240
DISTRIBUTED LEDGER 12242

FIG. 122

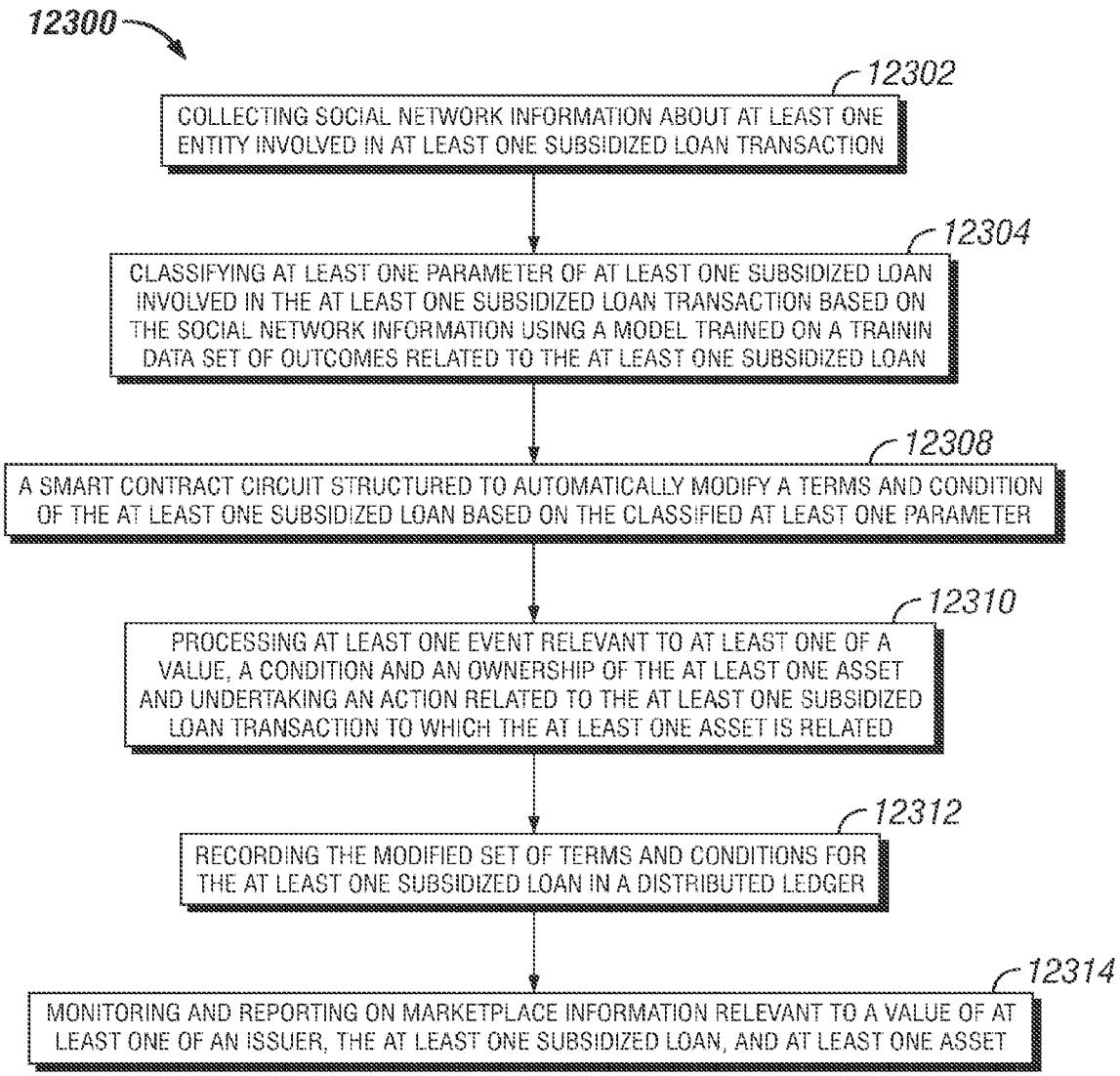

12300
12302
COLLECTING SOCIAL NETWORK INFORMATION ABOUT AT LEAST ONE ENTITY INVOLVED IN AT LEAST ONE SUBSIDIZED LOAN TRANSACTION
12304
CLASSIFYING AT LEAST ONE PARAMETER OF AT LEAST ONE SUBSIDIZED LOAN INVOLVED IN THE AT LEAST ONE SUBSIDIZED LOAN TRANSACTION BASED ON THE SOCIAL NETWORK INFORMATION USING A MODEL TRAINED ON A TRAININ DATA SET OF OUTCOMES RELATED TO THE AT LEAST ONE SUBSIDIZED LOAN
12308
A SMART CONTRACT CIRCUIT STRUCTURED TO AUTOMATICALLY MODIFY A TERMS AND CONDITION OF THE AT LEAST ONE SUBSIDIZED LOAN BASED ON THE CLASSIFIED AT LEAST ONE PARAMETER
12310
PROCESSING AT LEAST ONE EVENT RELEVANT TO AT LEAST ONE OF A VALUE, A CONDITION AND AN OWNERSHIP OF THE AT LEAST ONE ASSET AND UNDERTAKING AN ACTION RELATED TO THE AT LEAST ONE SUBSIDIZED LOAN TRANSACTION TO WHICH THE AT LEAST ONE ASSET IS RELATED
12312
RECORDING THE MODIFIED SET OF TERMS AND CONDITIONS FOR THE AT LEAST ONE SUBSIDIZED LOAN IN A DISTRIBUTED LEDGER
12314
MONITORING AND REPORTING ON MARKETPLACE INFORMATION RELEVANT TO A VALUE OF AT LEAST ONE OF AN ISSUER, THE AT LEAST ONE SUBSIDIZED LOAN, AND AT LEAST ONE ASSET

FIG. 123

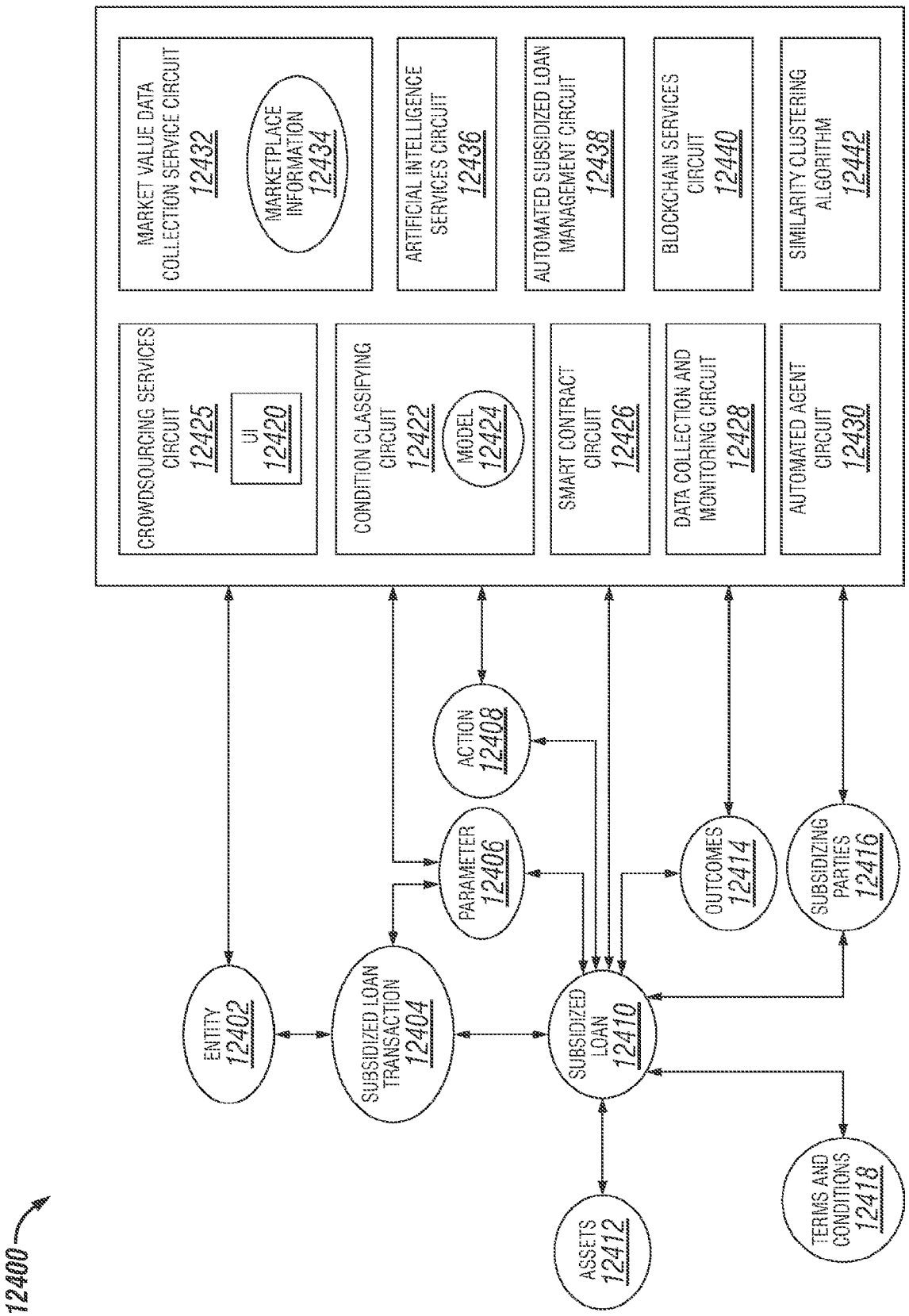

12400
MARKET VALUE DATA COLLECTION SERVICE CIRCUIT 12432
MARKETPLACE INFORMATION 12434
ARTIFICIAL INTELLIGENCE SERVICES CIRCUIT 12436
AUTOMATED SUBSIDIZED LOAN MANAGEMENT CIRCUIT 12438
BLOCKCHAIN SERVICES CIRCUIT 12440
SIMILARITY CLUSTERING ALGORITHM 12442
CROWDSOURCING SERVICES CIRCUIT 12425
UI 12420
CONDITION CLASSIFYING CIRCUIT 12422
MODEL 12424
SMART CONTRACT CIRCUIT 12426
DATA COLLECTION AND MONITORING CIRCUIT 12428
AUTOMATED AGENT CIRCUIT 12430
ENTITY 12402
SUBSIDIZED LOAN TRANSACTION 12404
ACTION 12408
PARAMETER 12406
OUTCOMES 12414
SUBSIDIZING PARTIES 12416
SUBSIDIZED LOAN 12410
ASSETS 12412
TERMS AND CONDITIONS 12418

FIG. 124

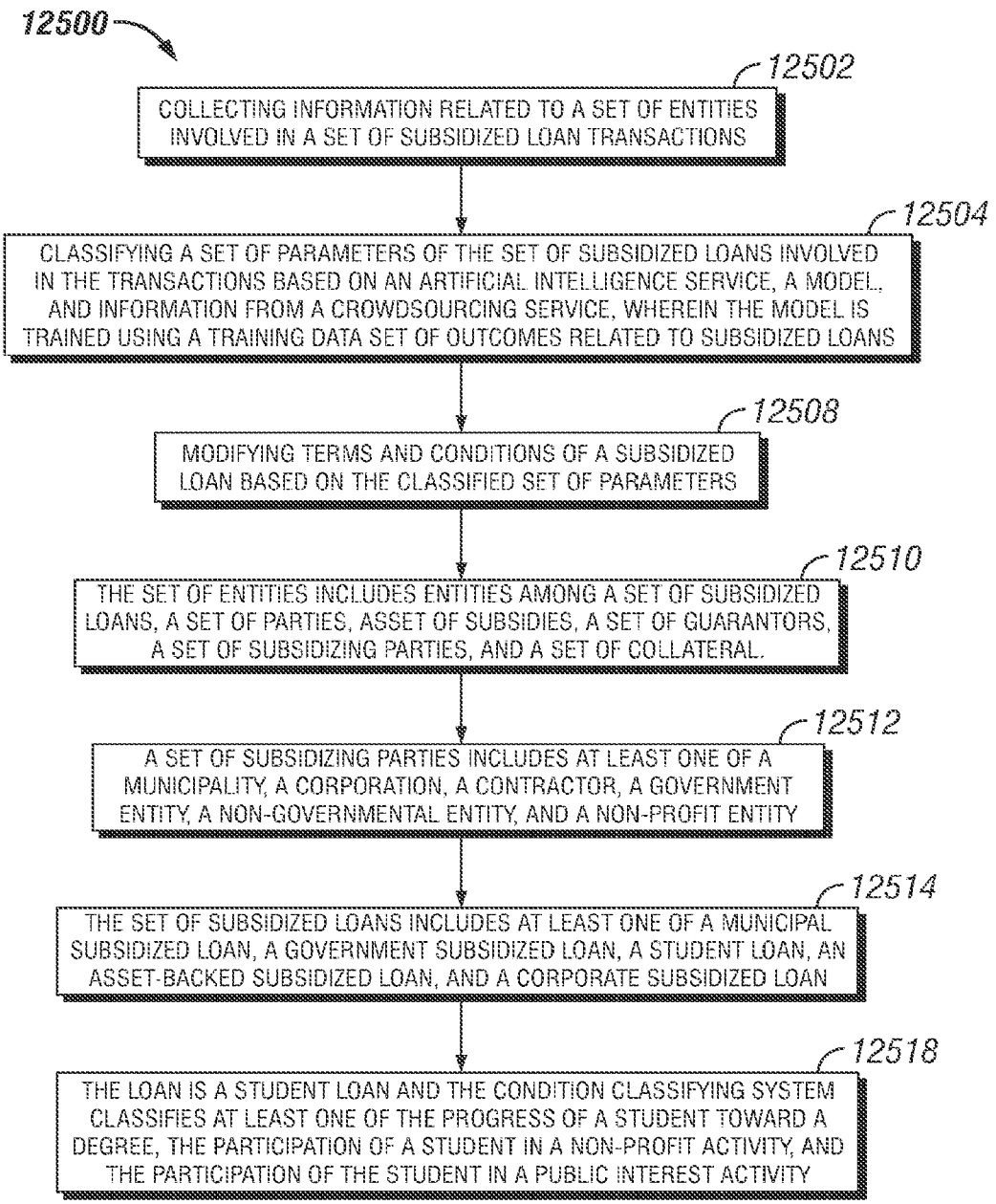

12500
12502
COLLECTING INFORMATION RELATED TO A SET OF ENTITIES INVOLVED IN A SET OF SUBSIDIZED LOAN TRANSACTIONS
12504
CLASSIFYING A SET OF PARAMETERS OF THE SET OF SUBSIDIZED LOANS INVOLVED IN THE TRANSACTIONS BASED ON AN ARTIFICIAL INTELLIGENCE SERVICE, A MODEL, AND INFORMATION FROM A CROWDSOURCING SERVICE, WHEREIN THE MODEL IS TRAINED USING A TRAINING DATA SET OF OUTCOMES RELATED TO SUBSIDIZED LOANS
12508
MODIFYING TERMS AND CONDITIONS OF A SUBSIDIZED LOAN BASED ON THE CLASSIFIED SET OF PARAMETERS
12510
THE SET OF ENTITIES INCLUDES ENTITIES AMONG A SET OF SUBSIDIZED LOANS, A SET OF PARTIES, ASSET OF SUBSIDIES, A SET OF GUARANTORS, A SET OF SUBSIDIZING PARTIES, AND A SET OF COLLATERAL.
12512
A SET OF SUBSIDIZING PARTIES INCLUDES AT LEAST ONE OF A MUNICIPALITY, A CORPORATION, A CONTRACTOR, A GOVERNMENT ENTITY, A NON-GOVERNMENTAL ENTITY, AND A NON-PROFIT ENTITY
12514
THE SET OF SUBSIDIZED LOANS INCLUDES AT LEAST ONE OF A MUNICIPAL SUBSIDIZED LOAN, A GOVERNMENT SUBSIDIZED LOAN, A STUDENT LOAN, AN ASSET-BACKED SUBSIDIZED LOAN, AND A CORPORATE SUBSIDIZED LOAN
12518
THE LOAN IS A STUDENT LOAN AND THE CONDITION CLASSIFYING SYSTEM CLASSIFIES AT LEAST ONE OF THE PROGRESS OF A STUDENT TOWARD A DEGREE, THE PARTICIPATION OF A STUDENT IN A NON-PROFIT ACTIVITY, AND THE PARTICIPATION OF THE STUDENT IN A PUBLIC INTEREST ACTIVITY

FIG. 125

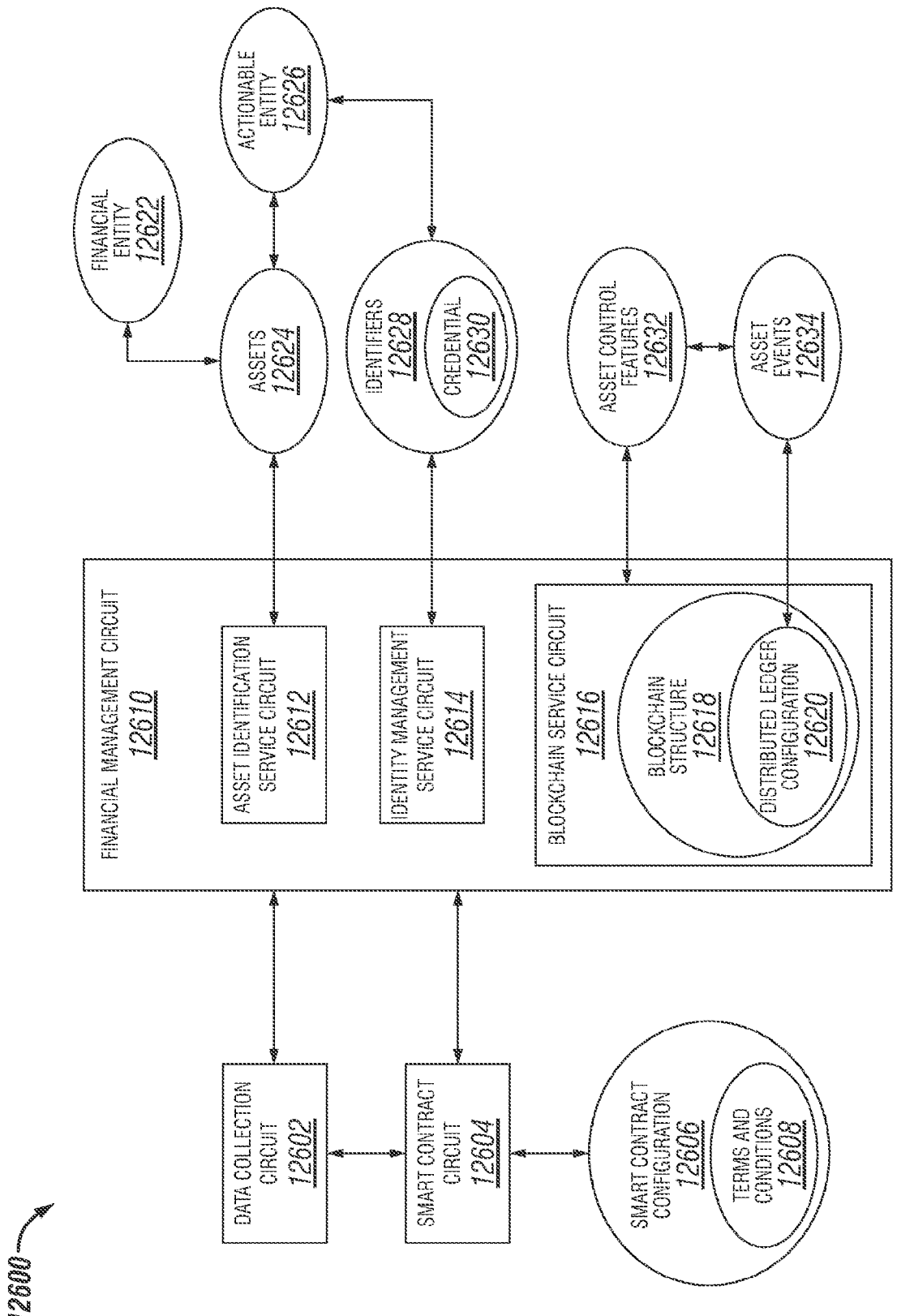

12600
FINANCIAL MANAGEMENT CIRCUIT
12610
DATA COLLECTION CIRCUIT
12602
SMART CONTRACT CIRCUIT
12604
SMART CONTRACT CONFIGURATION
12606
TERMS AND CONDITIONS
12608
ASSET IDENTIFICATION SERVICE CIRCUIT
12612
IDENTITY MANAGEMENT SERVICE CIRCUIT
12614
BLOCKCHAIN SERVICE CIRCUIT
12616
BLOCKCHAIN STRUCTURE
12618
DISTRIBUTED LEDGER CONFIGURATION
12620
ASSETS
12624
IDENTIFIERS
12628
CREDENTIAL
12630
ASSET CONTROL FEATURES
12632
ASSET EVENTS
12634
FINANCIAL ENTITY
12622
ACTIONABLE ENTITY
12626

FIG. 126

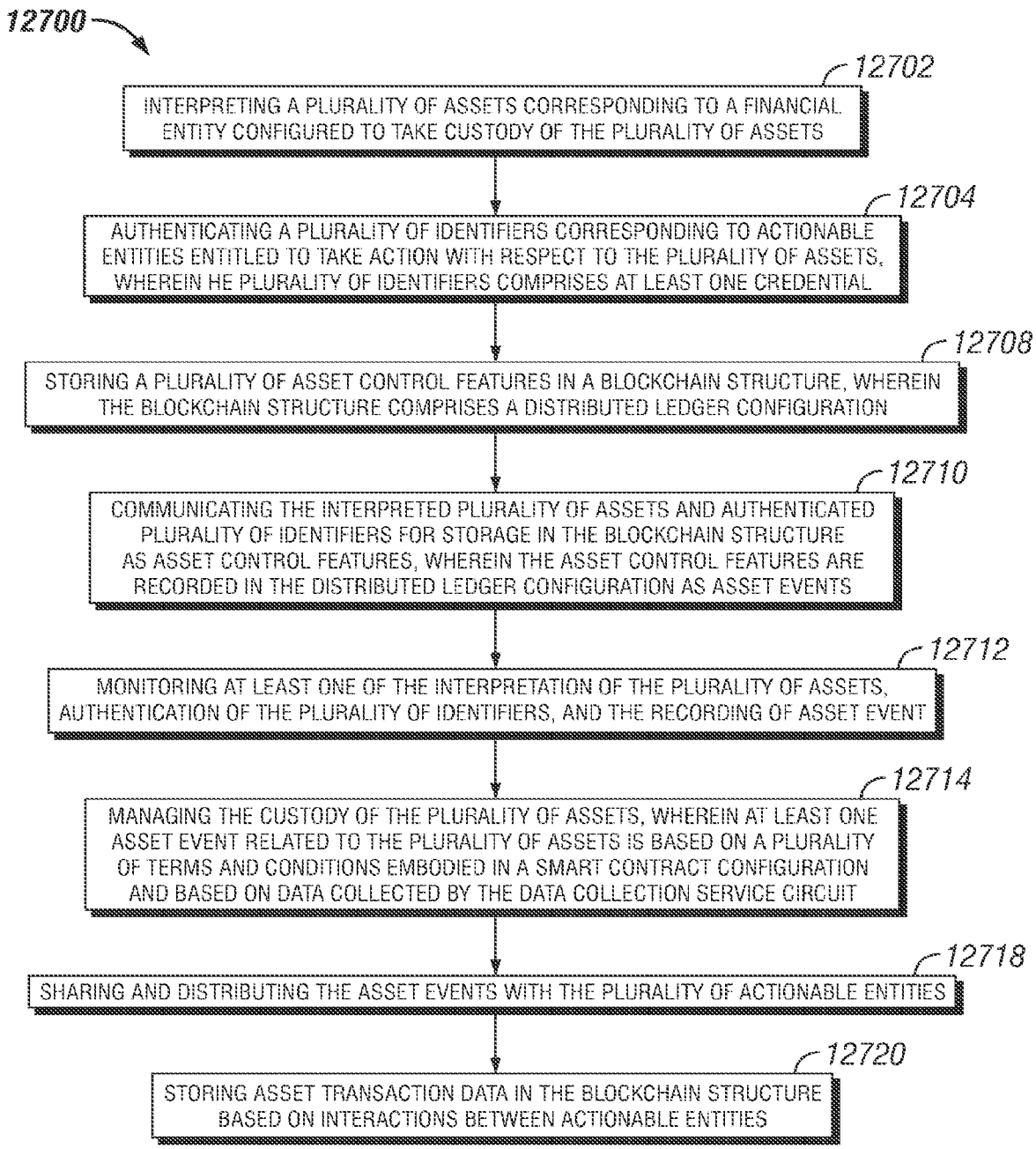

12700
12702
INTERPRETING A PLURALITY OF ASSETS CORRESPONDING TO A FINANCIAL ENTITY CONFIGURED TO TAKE CUSTODY OF THE PLURALITY OF ASSETS
12704
AUTHENTICATING A PLURALITY OF IDENTIFIERS CORRESPONDING TO ACTIONABLE ENTITIES ENTITLED TO TAKE ACTION WITH RESPECT TO THE PLURALITY OF ASSETS, WHEREIN HE PLURALITY OF IDENTIFIERS COMPRISES AT LEAST ONE CREDENTIAL
12708
STORING A PLURALITY OF ASSET CONTROL FEATURES IN A BLOCKCHAIN STRUCTURE, WHEREIN THE BLOCKCHAIN STRUCTURE COMPRISES A DISTRIBUTED LEDGER CONFIGURATION
12710
COMMUNICATING THE INTERPRETED PLURALITY OF ASSETS AND AUTHENTICATED PLURALITY OF IDENTIFIERS FOR STORAGE IN THE BLOCKCHAIN STRUCTURE AS ASSET CONTROL FEATURES, WHEREIN THE ASSET CONTROL FEATURES ARE RECORDED IN THE DISTRIBUTED LEDGER CONFIGURATION AS ASSET EVENTS
12712
MONITORING AT LEAST ONE OF THE INTERPRETATION OF THE PLURALITY OF ASSETS, AUTHENTICATION OF THE PLURALITY OF IDENTIFIERS, AND THE RECORDING OF ASSET EVENT
12714
MANAGING THE CUSTODY OF THE PLURALITY OF ASSETS, WHEREIN AT LEAST ONE ASSET EVENT RELATED TO THE PLURALITY OF ASSETS IS BASED ON A PLURALITY OF TERMS AND CONDITIONS EMBODIED IN A SMART CONTRACT CONFIGURATION AND BASED ON DATA COLLECTED BY THE DATA COLLECTION SERVICE CIRCUIT
12718
SHARING AND DISTRIBUTING THE ASSET EVENTS WITH THE PLURALITY OF ACTIONABLE ENTITIES
12720
STORING ASSET TRANSACTION DATA IN THE BLOCKCHAIN STRUCTURE BASED ON INTERACTIONS BETWEEN ACTIONABLE ENTITIES

FIG. 127

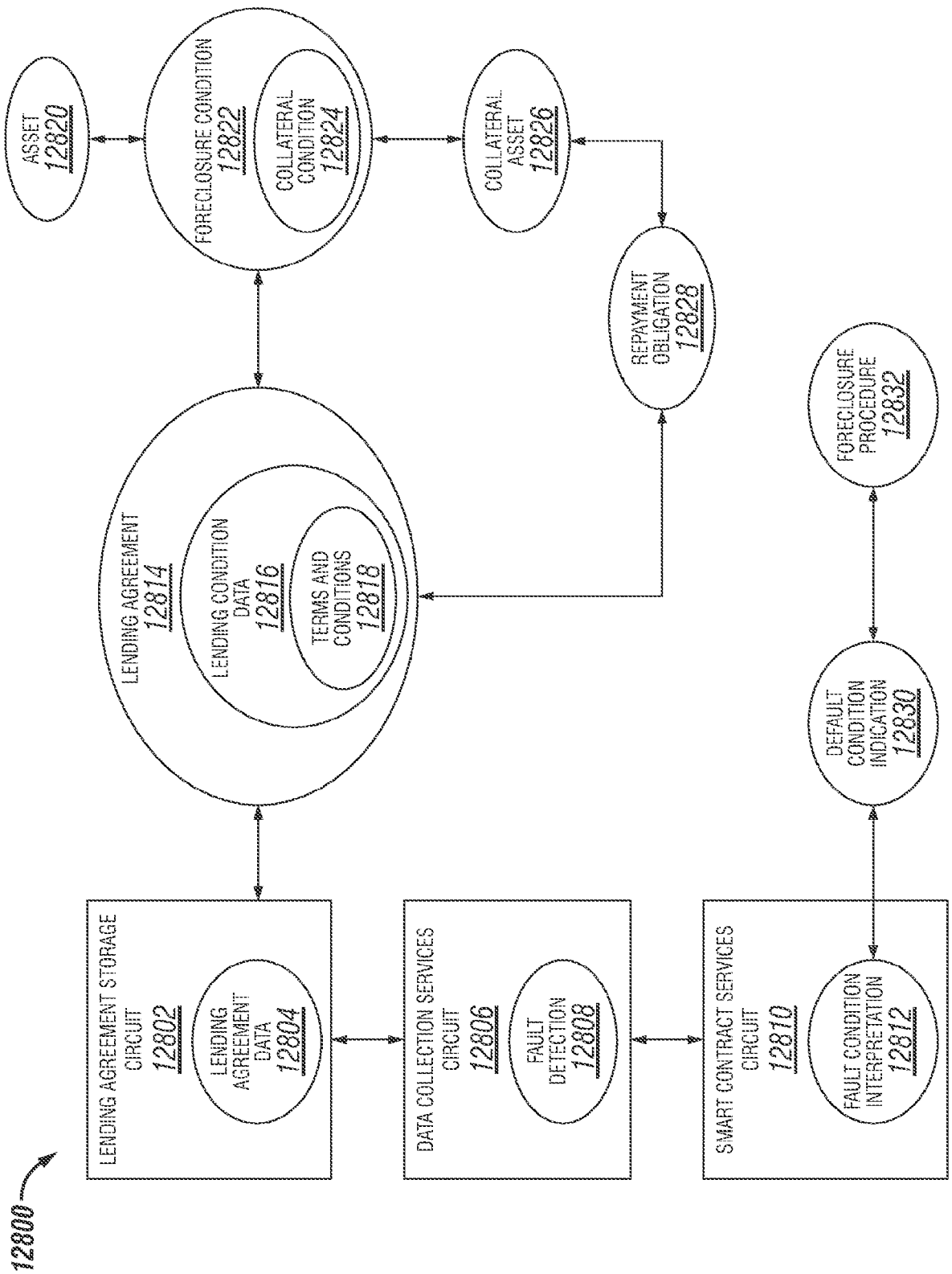

12800
LENDING AGREEMENT STORAGE CIRCUIT 12802
LENDING AGREEMENT DATA 12804
DATA COLLECTION SERVICES CIRCUIT 12806
FAULT DETECTION 12808
SMART CONTRACT SERVICES CIRCUIT 12810
FAULT CONDITION INTERPRETATION 12812
LENDING AGREEMENT 12814
LENDING CONDITION DATA 12816
TERMS AND CONDITIONS 12818
ASSET 12820
FORECLOSURE CONDITION 12822
COLLATERAL CONDITION 12824
COLLATERAL ASSET 12826
REPAYMENT OBLIGATION 12828
DEFAULT CONDITION INDICATION 12830
FORECLOSURE PROCEDURE 12832

FIG. 128

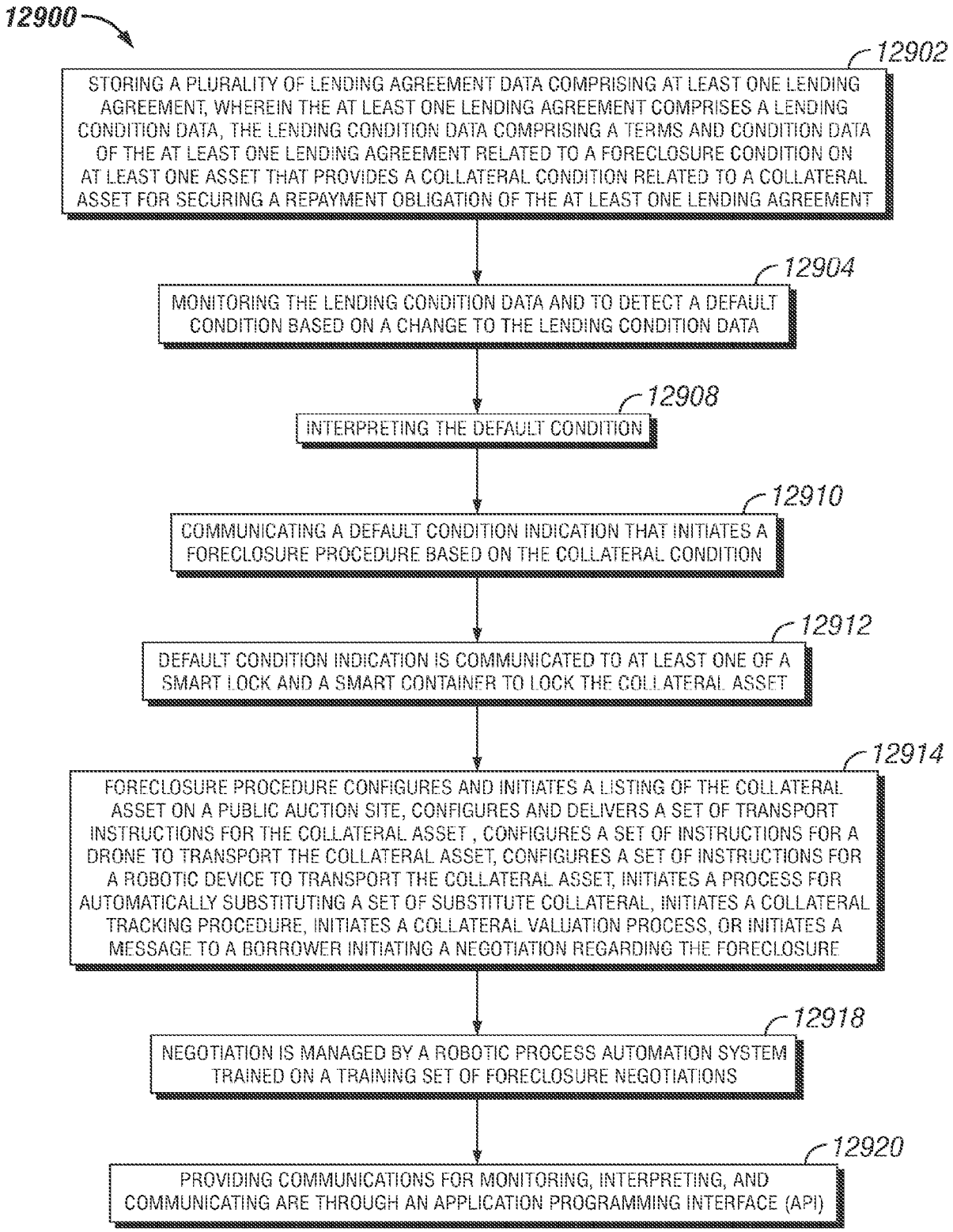

12900
12902
STORING A PLURALITY OF LENDING AGREEMENT DATA COMPRISING AT LEAST ONE LENDING AGREEMENT, WHEREIN THE AT LEAST ONE LENDING AGREEMENT COMPRISES A LENDING CONDITION DATA, THE LENDING CONDITION DATA COMPRISING A TERMS AND CONDITION DATA OF THE AT LEAST ONE LENDING AGREEMENT RELATED TO A FORECLOSURE CONDITION ON AT LEAST ONE ASSET THAT PROVIDES A COLLATERAL CONDITION RELATED TO A COLLATERAL ASSET FOR SECURING A REPAYMENT OBLIGATION OF THE AT LEAST ONE LENDING AGREEMENT
12904
MONITORING THE LENDING CONDITION DATA AND TO DETECT A DEFAULT CONDITION BASED ON A CHANGE TO THE LENDING CONDITION DATA
12908
INTERPRETING THE DEFAULT CONDITION
12910
COMMUNICATING A DEFAULT CONDITION INDICATION THAT INITIATES A FORECLOSURE PROCEDURE BASED ON THE COLLATERAL CONDITION
12912
DEFAULT CONDITION INDICATION IS COMMUNICATED TO AT LEAST ONE OF A SMART LOCK AND A SMART CONTAINER TO LOCK THE COLLATERAL ASSET
12914
FORECLOSURE PROCEDURE CONFIGURES AND INITIATES A LISTING OF THE COLLATERAL ASSET ON A PUBLIC AUCTION SITE, CONFIGURES AND DELIVERS A SET OF TRANSPORT INSTRUCTIONS FOR THE COLLATERAL ASSET , CONFIGURES A SET OF INSTRUCTIONS FOR A DRONE TO TRANSPORT THE COLLATERAL ASSET, CONFIGURES A SET OF INSTRUCTIONS FOR A ROBOTIC DEVICE TO TRANSPORT THE COLLATERAL ASSET, INITIATES A PROCESS FOR AUTOMATICALLY SUBSTITUTING A SET OF SUBSTITUTE COLLATERAL, INITIATES A COLLATERAL TRACKING PROCEDURE, INITIATES A COLLATERAL VALUATION PROCESS, OR INITIATES A MESSAGE TO A BORROWER INITIATING A NEGOTIATION REGARDING THE FORECLOSURE
12918
NEGOTIATION IS MANAGED BY A ROBOTIC PROCESS AUTOMATION SYSTEM TRAINED ON A TRAINING SET OF FORECLOSURE NEGOTIATIONS
12920
PROVIDING COMMUNICATIONS FOR MONITORING, INTERPRETING, AND COMMUNICATING ARE THROUGH AN APPLICATION PROGRAMMING INTERFACE (API)

FIG. 129

FIG. 130

FACILITY DATA RECORD

IDENTIFIER: [TKTK]
TYPE: [TKTK]
PARTICIPANTS: [TKTK]
METADATA: [CREATION DATE], [EDIT DATE(S)], [ETC.]

FIG. 131

PERSON RECORD

IDENTIFIER: [TKTK]
NAME: [TKTK]
FACILITIES: [TKTK]
TITLE: [TKTK]
CONTACTS: [TKTK]
METADATA: [JOIN DATE], [ACTION DATE(S)], [ETC.]

FIG. 132

FIG. 133

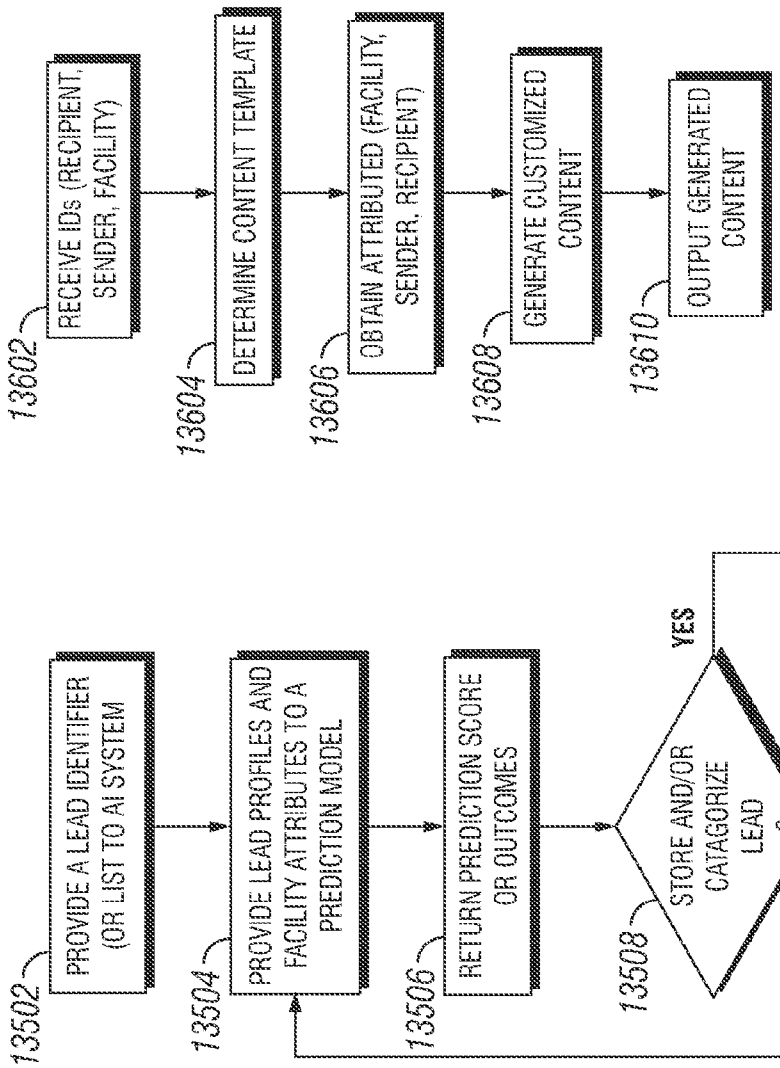


FIG. 136

FIG. 135

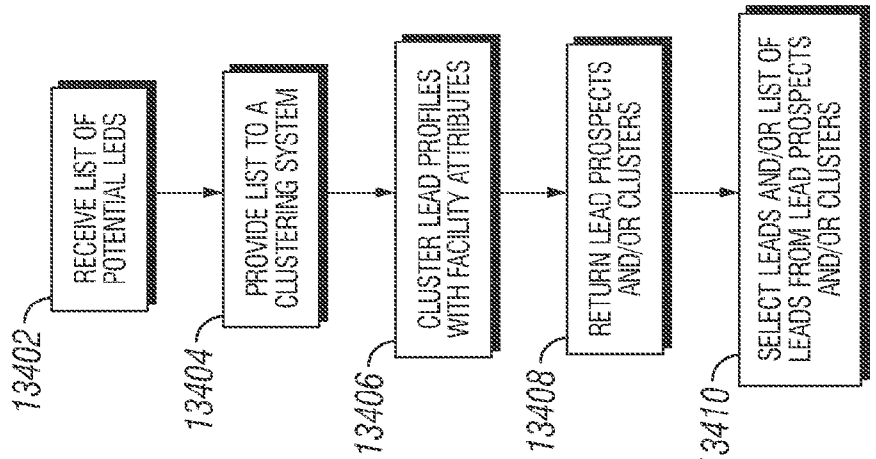


FIG. 134

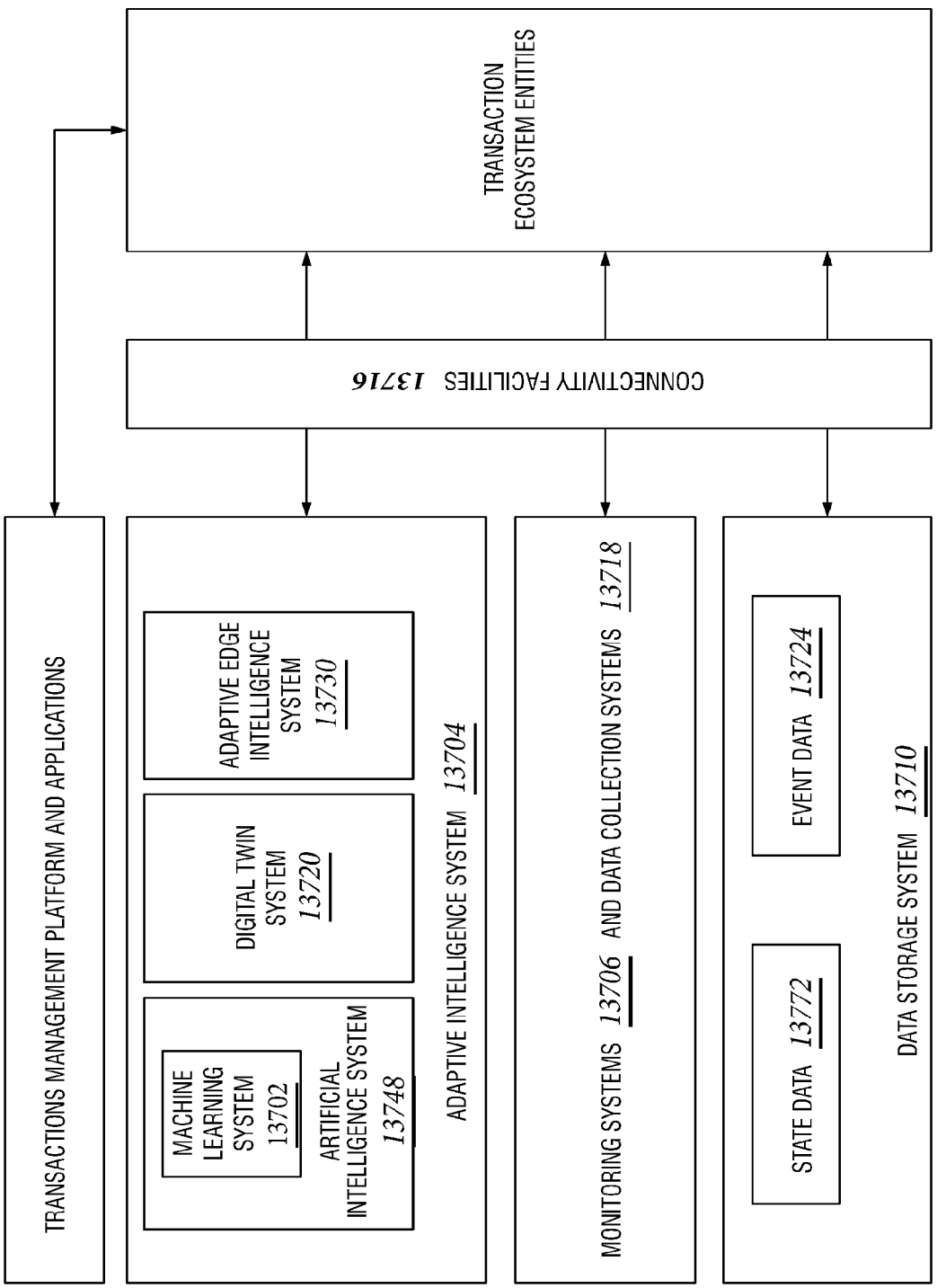

TRANSACTION ECOSYSTEM ENTITIES
CONNECTIVITY FACILITIES 13716
TRANSACTIONS MANAGEMENT PLATFORM AND APPLICATIONS
ADAPTIVE INTELLIGENCE SYSTEM 13704
ADAPTIVE EDGE INTELLIGENCE SYSTEM 13730
DIGITAL TWIN SYSTEM 13720
ARTIFICIAL INTELLIGENCE SYSTEM 13748
MACHINE LEARNING SYSTEM 13702
MONITORING SYSTEMS 13706 AND DATA COLLECTION SYSTEMS 13718
DATA STORAGE SYSTEM 13710
EVENT DATA 13724
STATE DATA 13772

FIG. 137

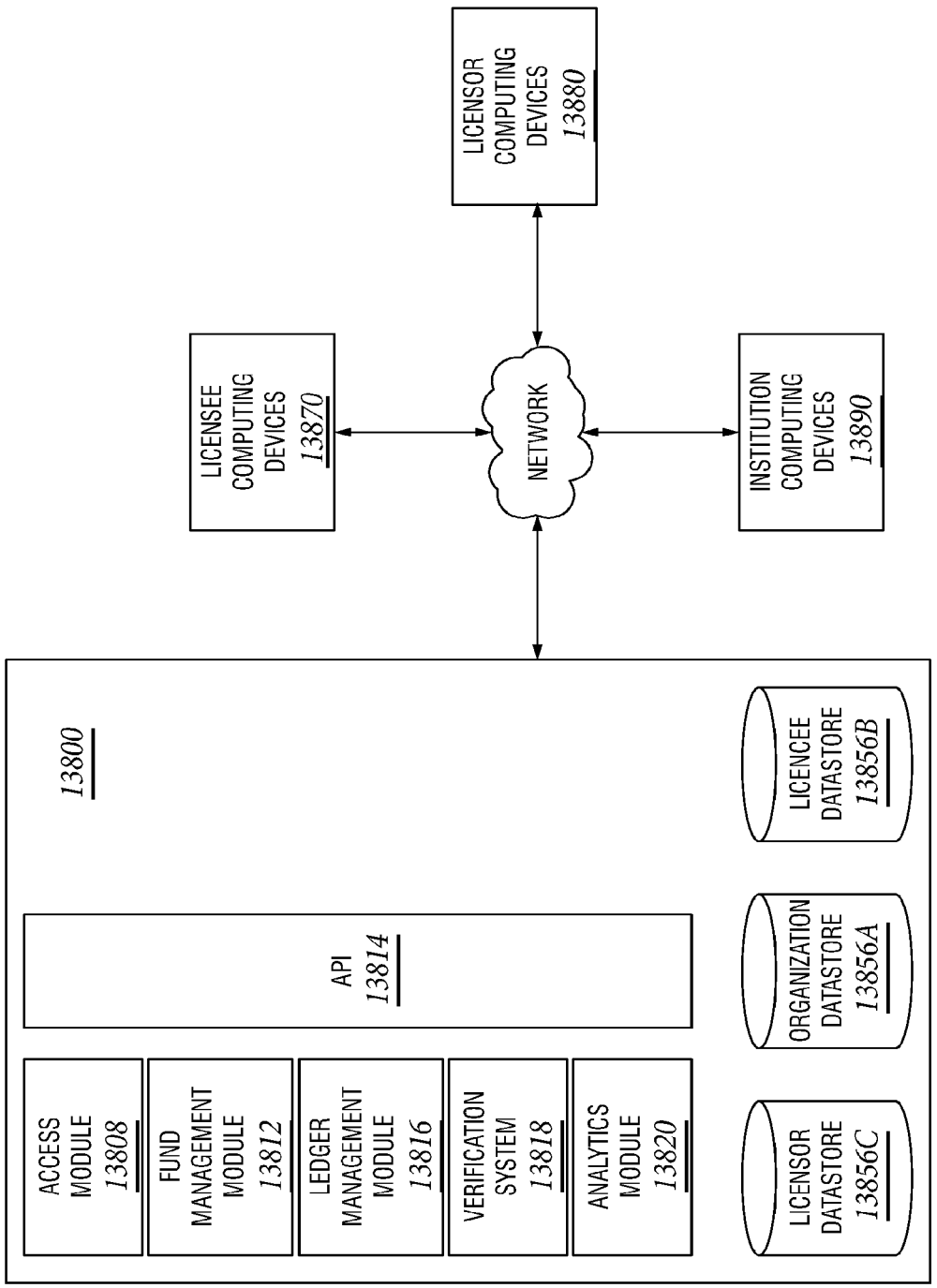

LICENSOR COMPUTING DEVICES 13880
LICENSEE COMPUTING DEVICES 13870
NETWORK
INSTITUTION COMPUTING DEVICES 13890
13800
ACCESS MODULE 13808
FUND MANAGEMENT MODULE 13812
LEDGER MANAGEMENT MODULE 13816
VERIFICATION SYSTEM 13818
ANALYTICS MODULE 13820
API 13814
LICENSOR DATASTORE 13856C
ORGANIZATION DATASTORE 13856A
LICENCEE DATASTORE 13856B

FIG. 138

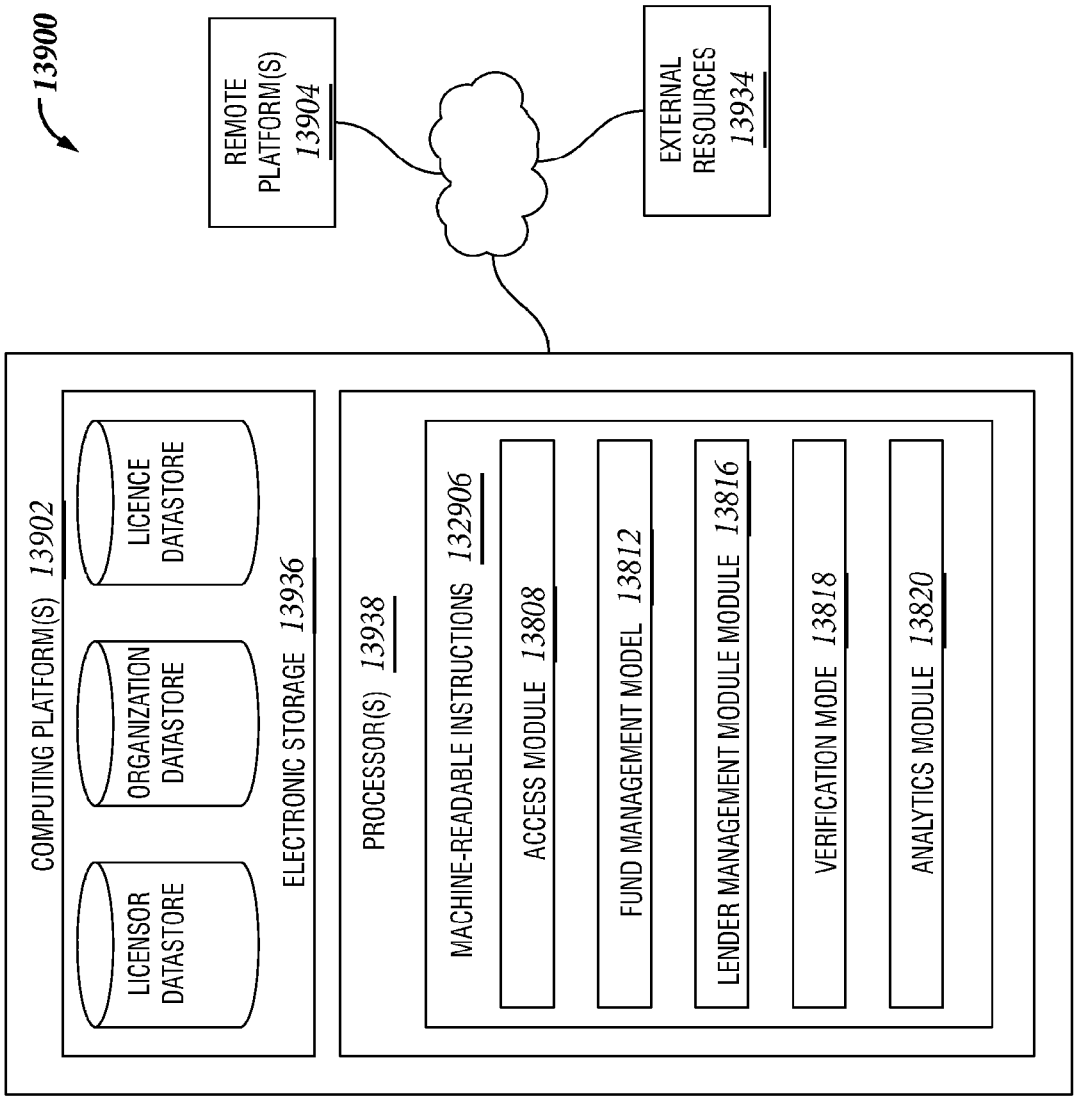

13900
REMOTE PLATFORM(S) 13904
EXTERNAL RESOURCES 13934
COMPUTING PLATFORM(S) 13902
ELECTRONIC STORAGE 13936
LICENSOR DATASTORE
ORGANIZATION DATASTORE
LICENCE DATASTORE
PROCESSOR(S) 13938
MACHINE-READABLE INSTRUCTIONS 132906
ACCESS MODULE 13808
FUND MANAGEMENT MODEL 13812
LENDER MANAGEMENT MODULE MODULE 13816
VERIFICATION MODE 13818
ANALYTICS MODULE 13820

FIG. 139

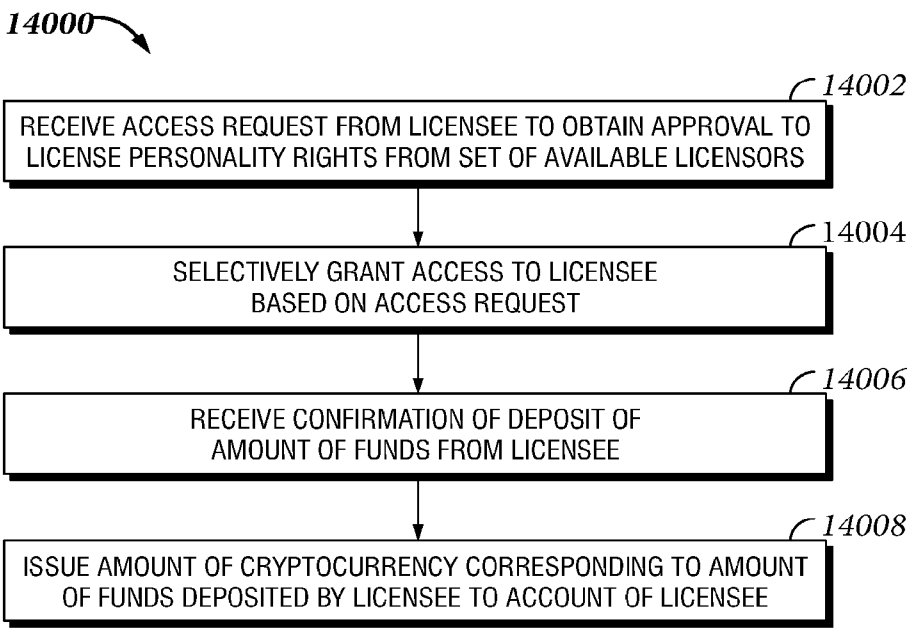

14000
14002
RECEIVE ACCESS REQUEST FROM LICENSEE TO OBTAIN APPROVAL TO LICENSE PERSONALITY RIGHTS FROM SET OF AVAILABLE LICENSORS
14004
SELECTIVELY GRANT ACCESS TO LICENSEE BASED ON ACCESS REQUEST
14006
RECEIVE CONFIRMATION OF DEPOSIT OF AMOUNT OF FUNDS FROM LICENSEE
14008
ISSUE AMOUNT OF CRYPTOCURRENCY CORRESPONDING TO AMOUNT OF FUNDS DEPOSITED BY LICENSEE TO ACCOUNT OF LICENSEE

FIG. 140

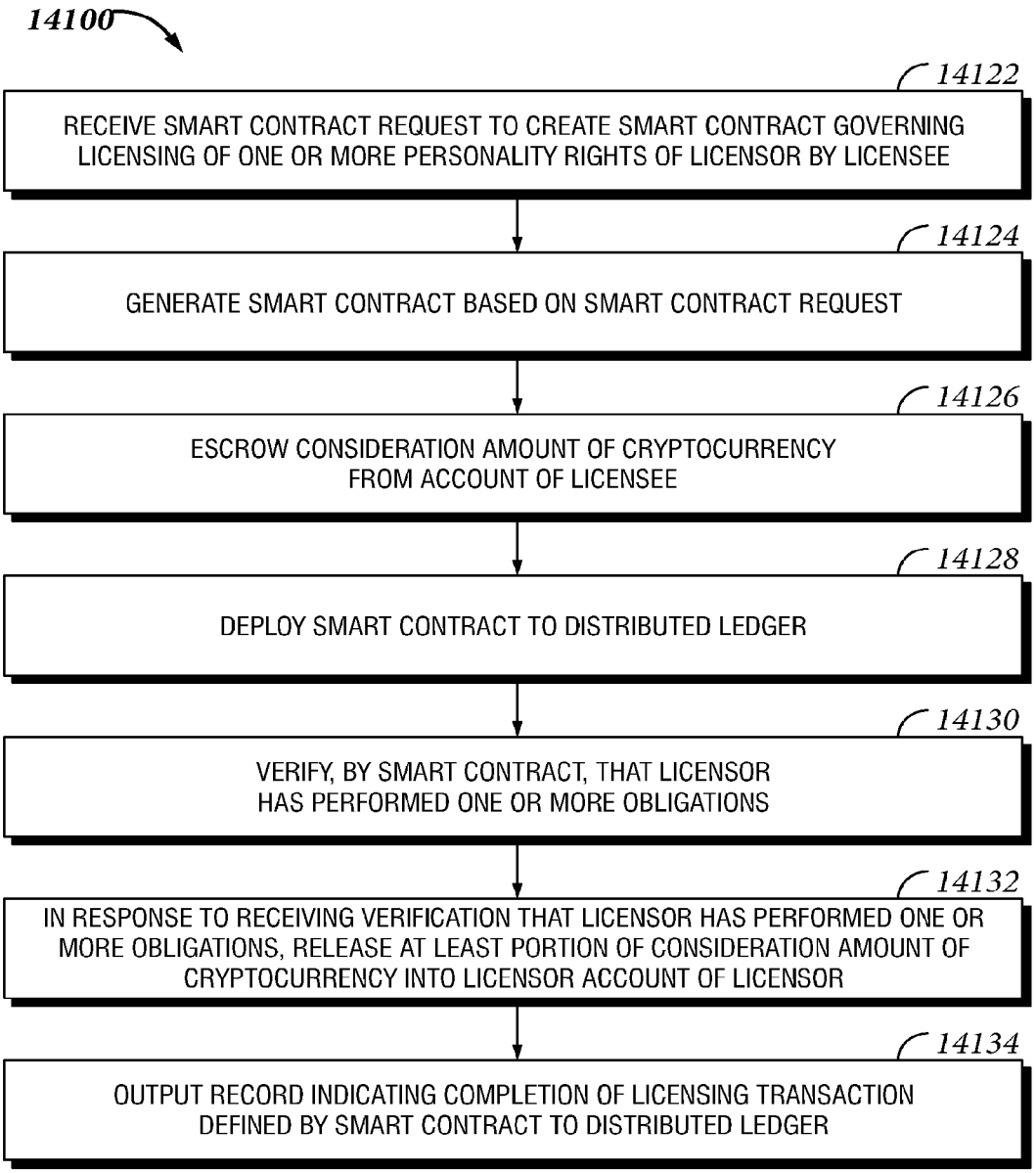

14100
14122
RECEIVE SMART CONTRACT REQUEST TO CREATE SMART CONTRACT GOVERNING LICENSING OF ONE OR MORE PERSONALITY RIGHTS OF LICENSOR BY LICENSEE
14124
GENERATE SMART CONTRACT BASED ON SMART CONTRACT REQUEST
14126
ESCROW CONSIDERATION AMOUNT OF CRYPTOCURRENCY FROM ACCOUNT OF LICENSEE
14128
DEPLOY SMART CONTRACT TO DISTRIBUTED LEDGER
14130
VERIFY, BY SMART CONTRACT, THAT LICENSOR HAS PERFORMED ONE OR MORE OBLIGATIONS
14132
IN RESPONSE TO RECEIVING VERIFICATION THAT LICENSOR HAS PERFORMED ONE OR MORE OBLIGATIONS, RELEASE AT LEAST PORTION OF CONSIDERATION AMOUNT OF CRYPTOCURRENCY INTO LICENSOR ACCOUNT OF LICENSOR
14134
OUTPUT RECORD INDICATING COMPLETION OF LICENSING TRANSACTION DEFINED BY SMART CONTRACT TO DISTRIBUTED LEDGER

FIG. 141

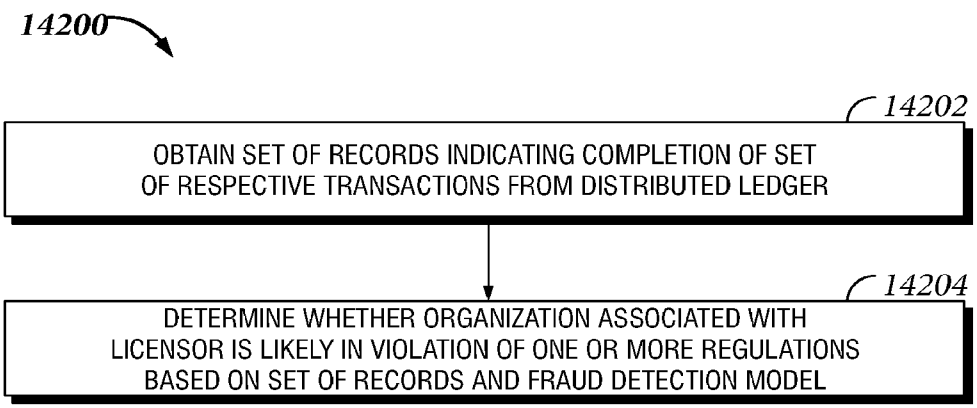

14200
14202
OBTAIN SET OF RECORDS INDICATING COMPLETION OF SET OF RESPECTIVE TRANSACTIONS FROM DISTRIBUTED LEDGER
14204
DETERMINE WHETHER ORGANIZATION ASSOCIATED WITH LICENSOR IS LIKELY IN VIOLATION OF ONE OR MORE REGULATIONS BASED ON SET OF RECORDS AND FRAUD DETECTION MODEL

FIG. 142

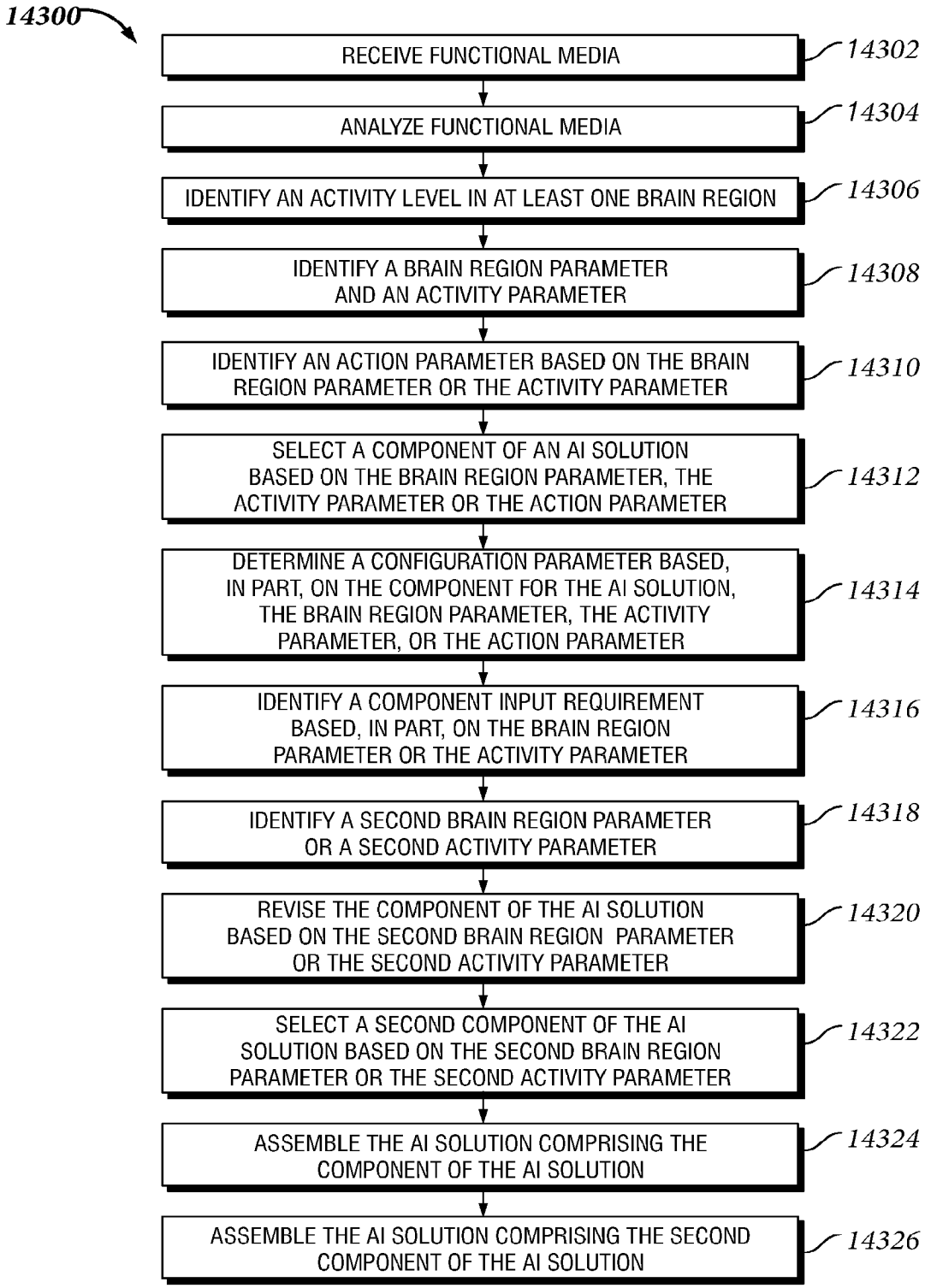

14300
RECEIVE FUNCTIONAL MEDIA
14302
ANALYZE FUNCTIONAL MEDIA
14304
IDENTIFY AN ACTIVITY LEVEL IN AT LEAST ONE BRAIN REGION
14306
IDENTIFY A BRAIN REGION PARAMETER AND AN ACTIVITY PARAMETER
14308
IDENTIFY AN ACTION PARAMETER BASED ON THE BRAIN REGION PARAMETER OR THE ACTIVITY PARAMETER
14310
SELECT A COMPONENT OF AN AI SOLUTION BASED ON THE BRAIN REGION PARAMETER, THE ACTIVITY PARAMETER OR THE ACTION PARAMETER
14312
DETERMINE A CONFIGURATION PARAMETER BASED, IN PART, ON THE COMPONENT FOR THE AI SOLUTION, THE BRAIN REGION PARAMETER, THE ACTIVITY PARAMETER, OR THE ACTION PARAMETER
14314
IDENTIFY A COMPONENT INPUT REQUIREMENT BASED, IN PART, ON THE BRAIN REGION PARAMETER OR THE ACTIVITY PARAMETER
14316
IDENTIFY A SECOND BRAIN REGION PARAMETER OR A SECOND ACTIVITY PARAMETER
14318
REVISE THE COMPONENT OF THE AI SOLUTION BASED ON THE SECOND BRAIN REGION PARAMETER OR THE SECOND ACTIVITY PARAMETER
14320
SELECT A SECOND COMPONENT OF THE AI SOLUTION BASED ON THE SECOND BRAIN REGION PARAMETER OR THE SECOND ACTIVITY PARAMETER
14322
ASSEMBLE THE AI SOLUTION COMPRISING THE COMPONENT OF THE AI SOLUTION
14324
ASSEMBLE THE AI SOLUTION COMPRISING THE SECOND COMPONENT OF THE AI SOLUTION
14326

FIG. 143

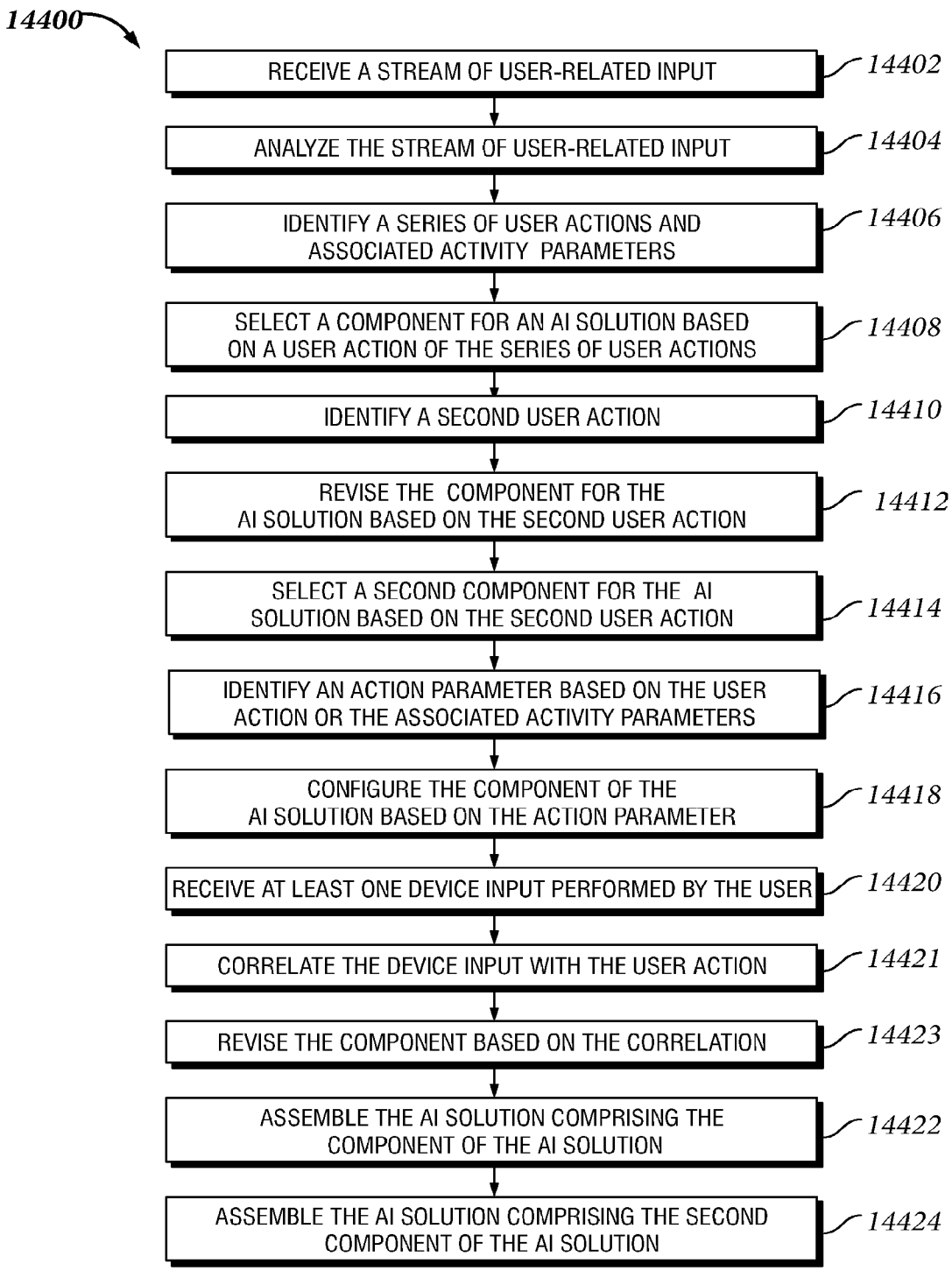

14400
RECEIVE A STREAM OF USER-RELATED INPUT
14402
ANALYZE THE STREAM OF USER-RELATED INPUT
14404
IDENTIFY A SERIES OF USER ACTIONS AND ASSOCIATED ACTIVITY PARAMETERS
14406
SELECT A COMPONENT FOR AN AI SOLUTION BASED ON A USER ACTION OF THE SERIES OF USER ACTIONS
14408
IDENTIFY A SECOND USER ACTION
14410
REVISE THE COMPONENT FOR THE AI SOLUTION BASED ON THE SECOND USER ACTION
14412
SELECT A SECOND COMPONENT FOR THE AI SOLUTION BASED ON THE SECOND USER ACTION
14414
IDENTIFY AN ACTION PARAMETER BASED ON THE USER ACTION OR THE ASSOCIATED ACTIVITY PARAMETERS
14416
CONFIGURE THE COMPONENT OF THE AI SOLUTION BASED ON THE ACTION PARAMETER
14418
RECEIVE AT LEAST ONE DEVICE INPUT PERFORMED BY THE USER
14420
CORRELATE THE DEVICE INPUT WITH THE USER ACTION
14421
REVISE THE COMPONENT BASED ON THE CORRELATION
14423
ASSEMBLE THE AI SOLUTION COMPRISING THE COMPONENT OF THE AI SOLUTION
14422
ASSEMBLE THE AI SOLUTION COMPRISING THE SECOND COMPONENT OF THE AI SOLUTION
14424

FIG. 144

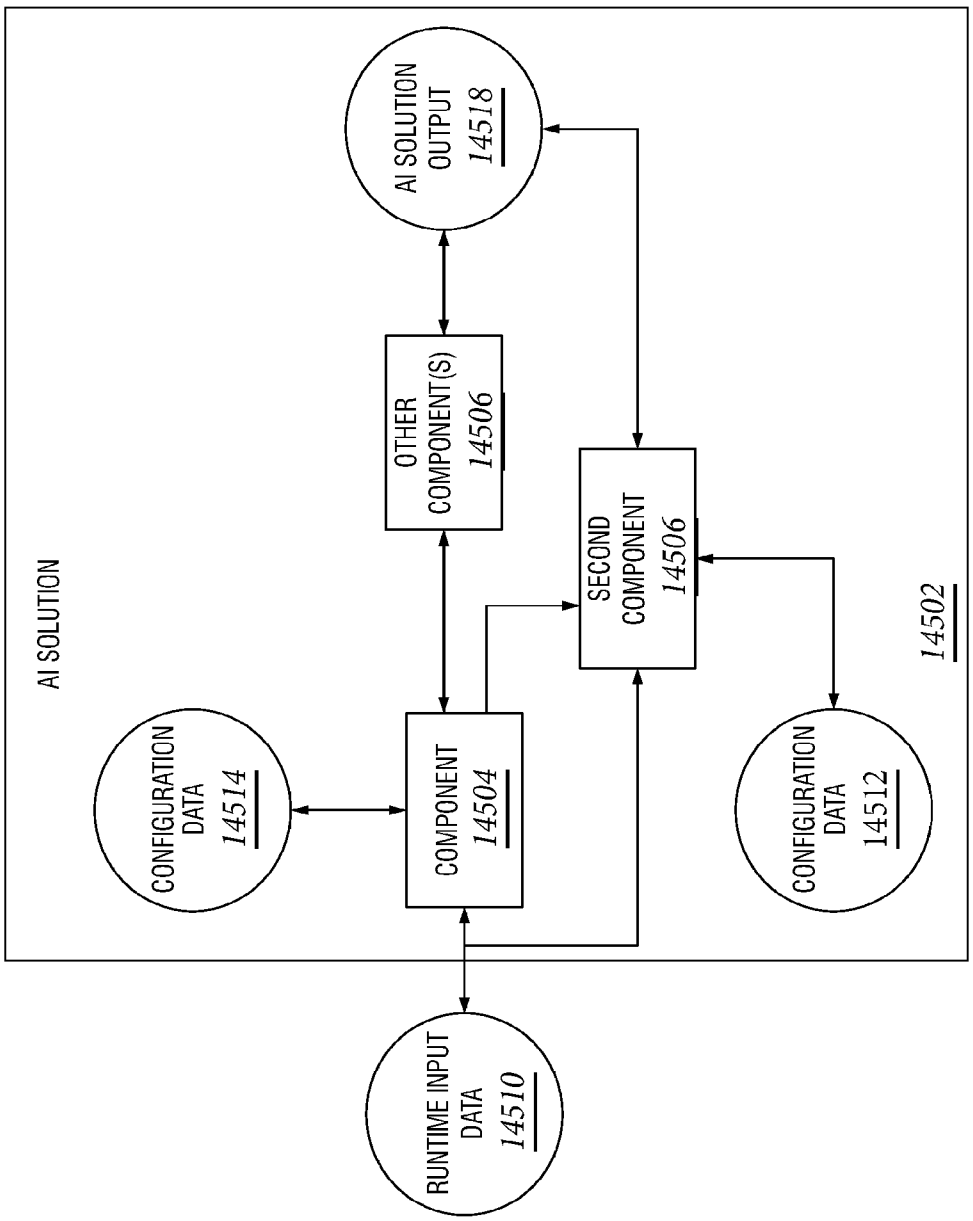

AI SOLUTION
AI SOLUTION OUTPUT 14518
OTHER COMPONENT(S) 14506
SECOND COMPONENT 14506
CONFIGURATION DATA 14514
COMPONENT 14504
CONFIGURATION DATA 14512
RUNTIME INPUT DATA 14510
14502

FIG. 145

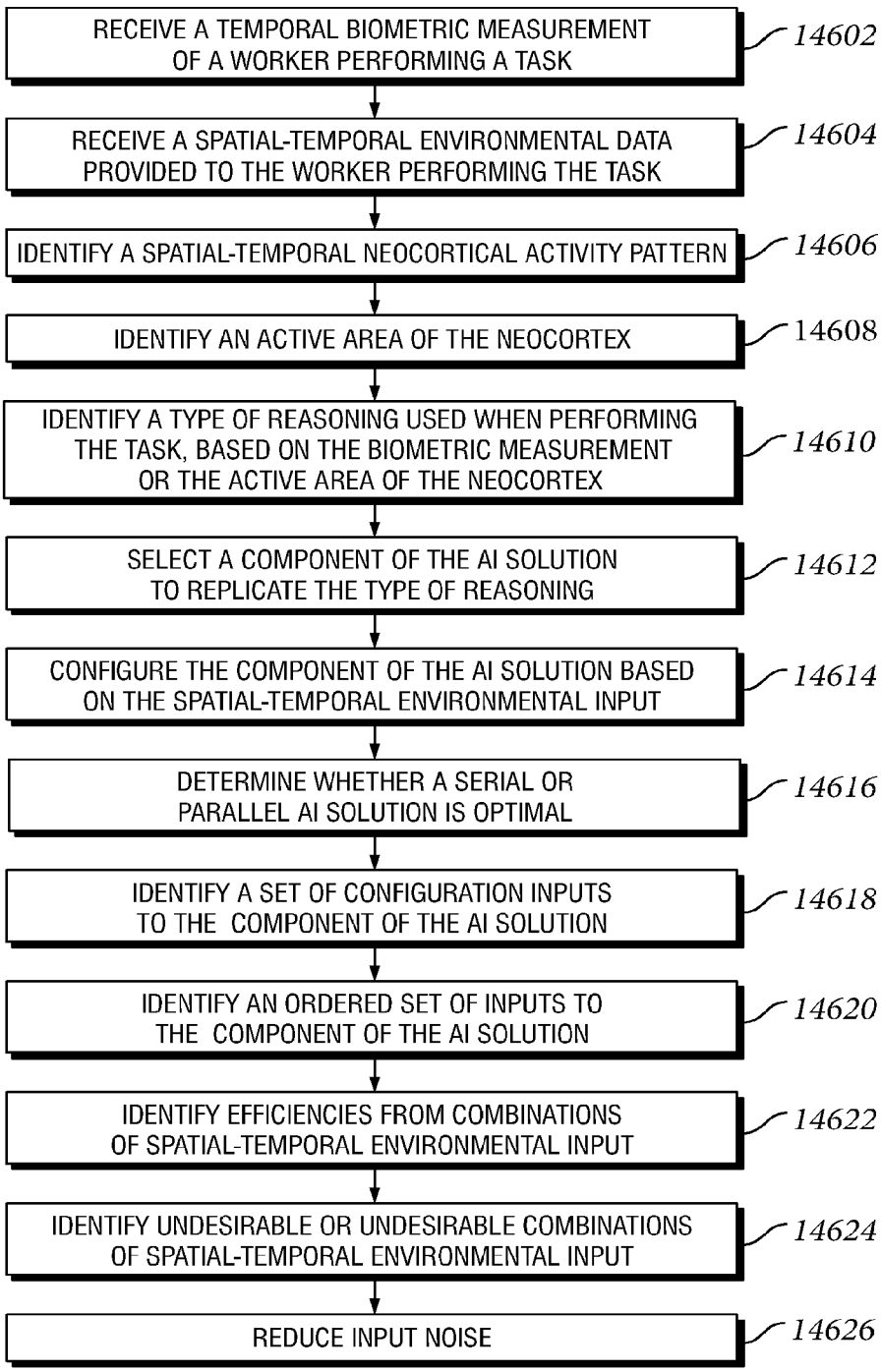

RECEIVE A TEMPORAL BIOMETRIC MEASUREMENT OF A WORKER PERFORMING A TASK
14602
RECEIVE A SPATIAL-TEMPORAL ENVIRONMENTAL DATA PROVIDED TO THE WORKER PERFORMING THE TASK
14604
IDENTIFY A SPATIAL-TEMPORAL NEOCORTICAL ACTIVITY PATTERN
14606
IDENTIFY AN ACTIVE AREA OF THE NEOCORTEX
14608
IDENTIFY A TYPE OF REASONING USED WHEN PERFORMING THE TASK, BASED ON THE BIOMETRIC MEASUREMENT OR THE ACTIVE AREA OF THE NEOCORTEX
14610
SELECT A COMPONENT OF THE AI SOLUTION TO REPLICATE THE TYPE OF REASONING
14612
CONFIGURE THE COMPONENT OF THE AI SOLUTION BASED ON THE SPATIAL-TEMPORAL ENVIRONMENTAL INPUT
14614
DETERMINE WHETHER A SERIAL OR PARALLEL AI SOLUTION IS OPTIMAL
14616
IDENTIFY A SET OF CONFIGURATION INPUTS TO THE COMPONENT OF THE AI SOLUTION
14618
IDENTIFY AN ORDERED SET OF INPUTS TO THE COMPONENT OF THE AI SOLUTION
14620
IDENTIFY EFFICIENCIES FROM COMBINATIONS OF SPATIAL-TEMPORAL ENVIRONMENTAL INPUT
14622
IDENTIFY UNDESIRABLE OR UNDESIRABLE COMBINATIONS OF SPATIAL-TEMPORAL ENVIRONMENTAL INPUT
14624
REDUCE INPUT NOISE
14626

FIG. 146

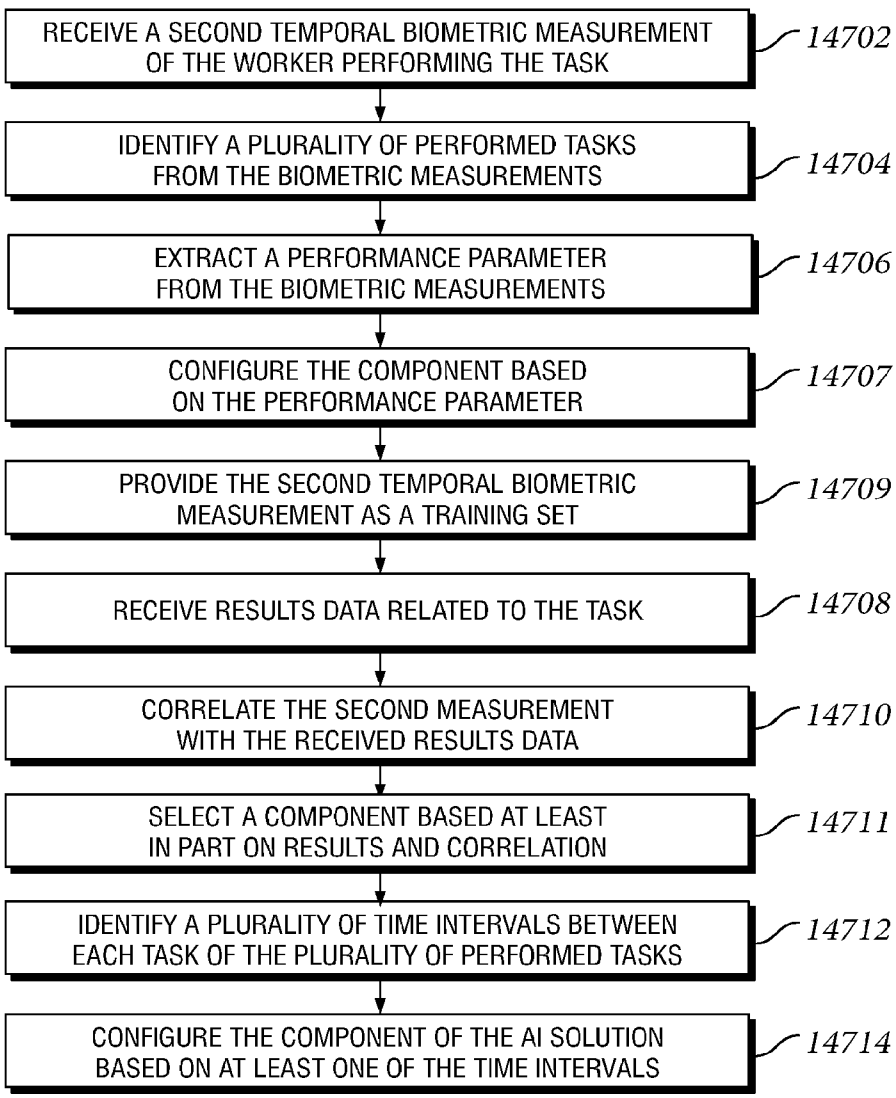

RECEIVE A SECOND TEMPORAL BIOMETRIC MEASUREMENT OF THE WORKER PERFORMING THE TASK
14702
IDENTIFY A PLURALITY OF PERFORMED TASKS FROM THE BIOMETRIC MEASUREMENTS
14704
EXTRACT A PERFORMANCE PARAMETER FROM THE BIOMETRIC MEASUREMENTS
14706
CONFIGURE THE COMPONENT BASED ON THE PERFORMANCE PARAMETER
14707
PROVIDE THE SECOND TEMPORAL BIOMETRIC MEASUREMENT AS A TRAINING SET
14709
RECEIVE RESULTS DATA RELATED TO THE TASK
14708
CORRELATE THE SECOND MEASUREMENT WITH THE RECEIVED RESULTS DATA
14710
SELECT A COMPONENT BASED AT LEAST IN PART ON RESULTS AND CORRELATION
14711
IDENTIFY A PLURALITY OF TIME INTERVALS BETWEEN EACH TASK OF THE PLURALITY OF PERFORMED TASKS
14712
CONFIGURE THE COMPONENT OF THE AI SOLUTION BASED ON AT LEAST ONE OF THE TIME INTERVALS
14714

FIG. 147

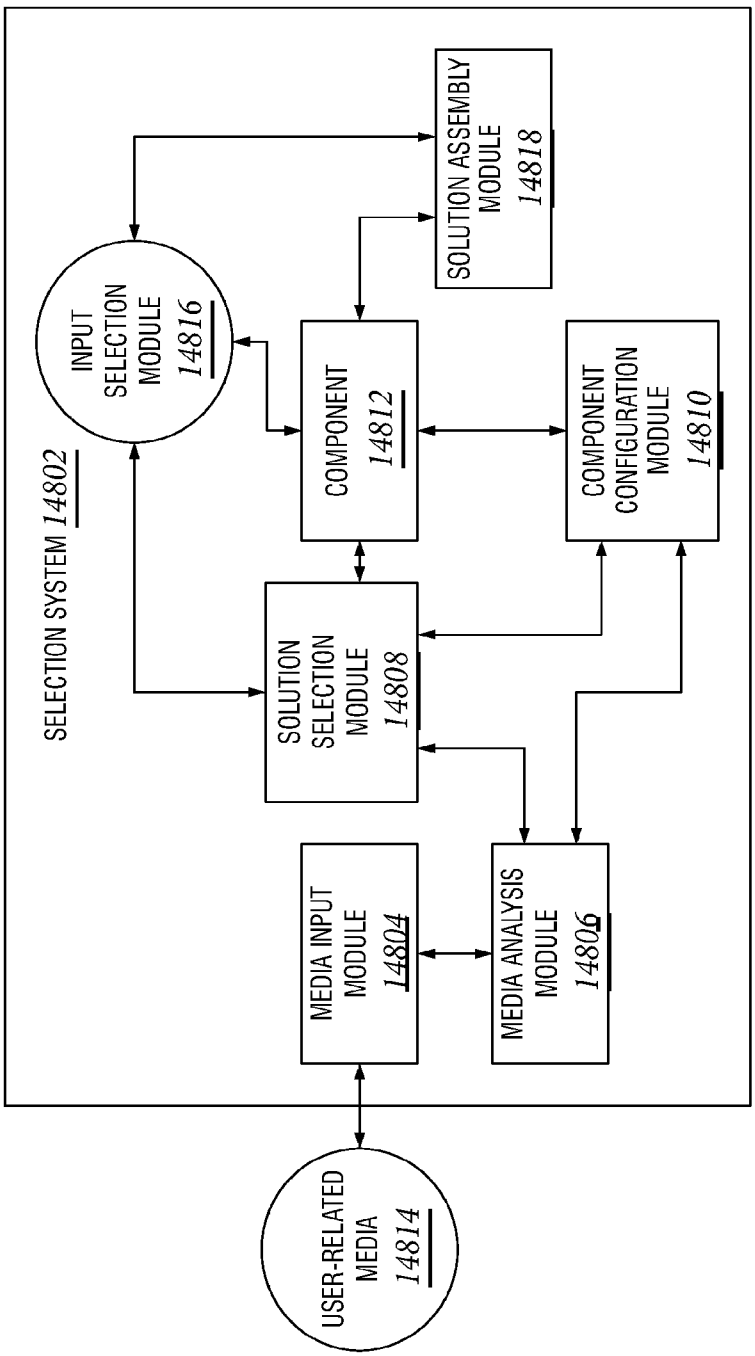

SELECTION SYSTEM 14802
INPUT SELECTION MODULE 14816
SOLUTION ASSEMBLY MODULE 14818
COMPONENT 14812
COMPONENT CONFIGURATION MODULE 14810
SOLUTION SELECTION MODULE 14808
MEDIA INPUT MODULE 14804
MEDIA ANALYSIS MODULE 14806
USER-RELATED MEDIA 14814

FIG. 148

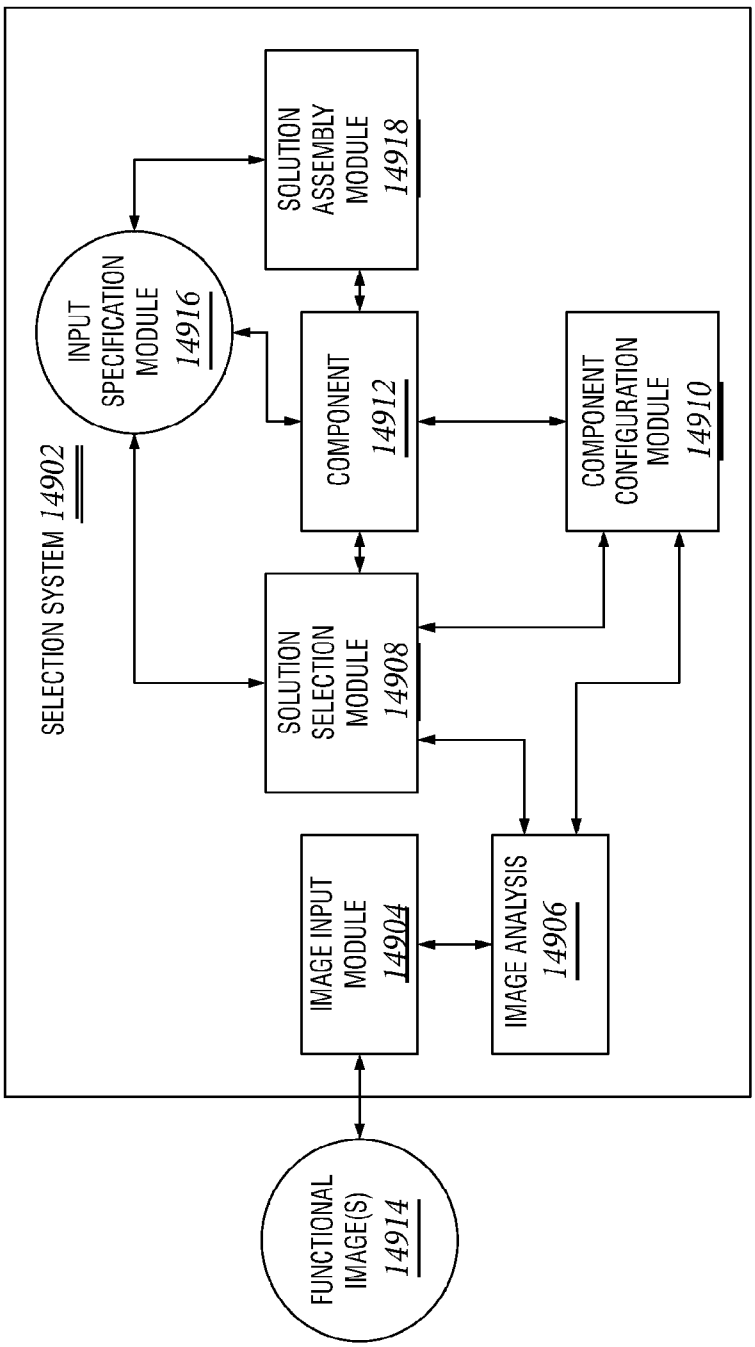

SELECTION SYSTEM 14902
INPUT SPECIFICATION MODULE 14916
SOLUTION ASSEMBLY MODULE 14918
COMPONENT 14912
COMPONENT CONFIGURATION MODULE 14910
SOLUTION SELECTION MODULE 14908
IMAGE INPUT MODULE 14904
IMAGE ANALYSIS 14906
FUNCTIONAL IMAGE(S) 14914

FIG. 149

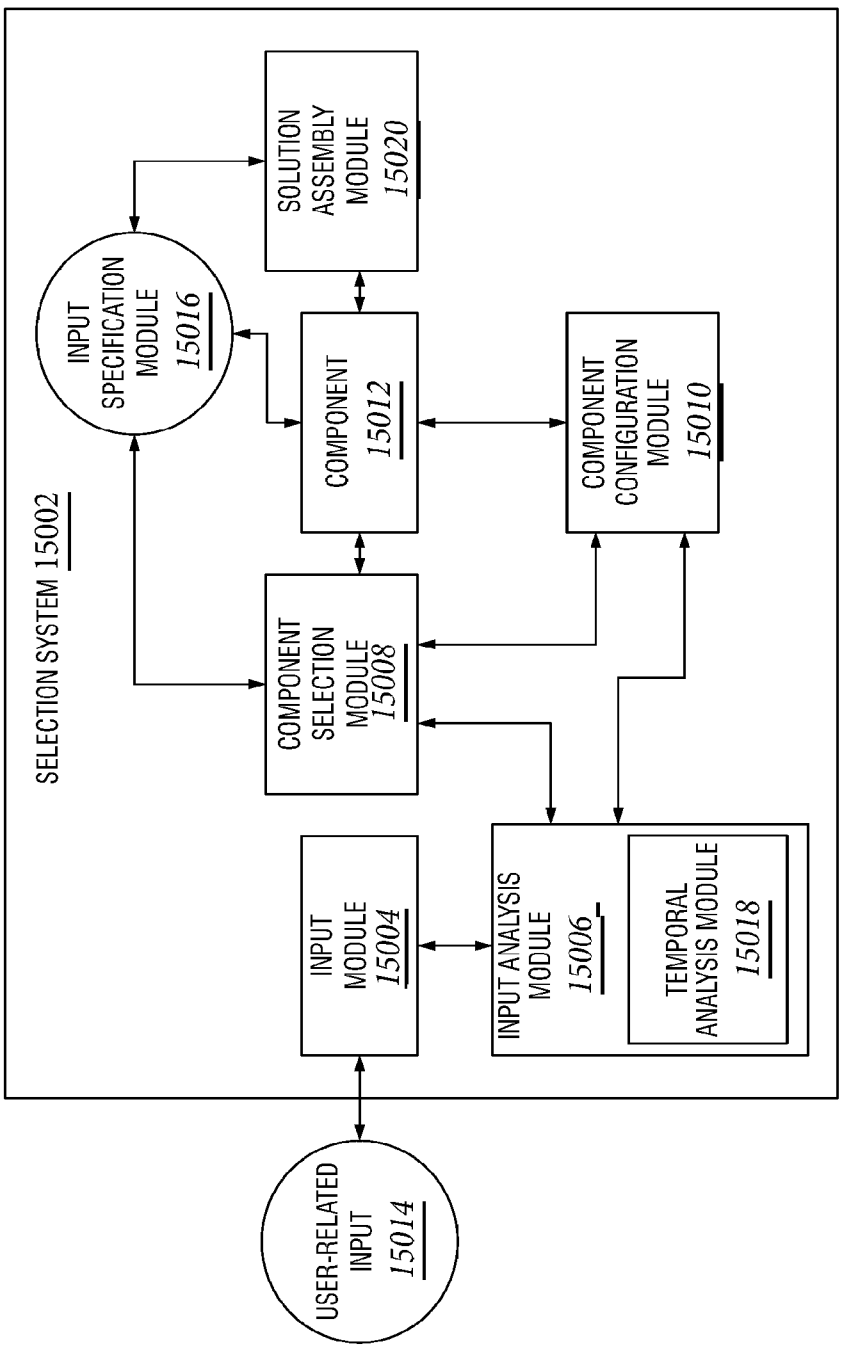

SELECTION SYSTEM 15002
INPUT SPECIFICATION MODULE 15016
SOLUTION ASSEMBLY MODULE 15020
COMPONENT 15012
COMPONENT CONFIGURATION MODULE 15010
COMPONENT SELECTION MODULE 15008
INPUT MODULE 15004
INPUT ANALYSIS MODULE 15006
TEMPORAL ANALYSIS MODULE 15018
USER-RELATED INPUT 15014

FIG. 150

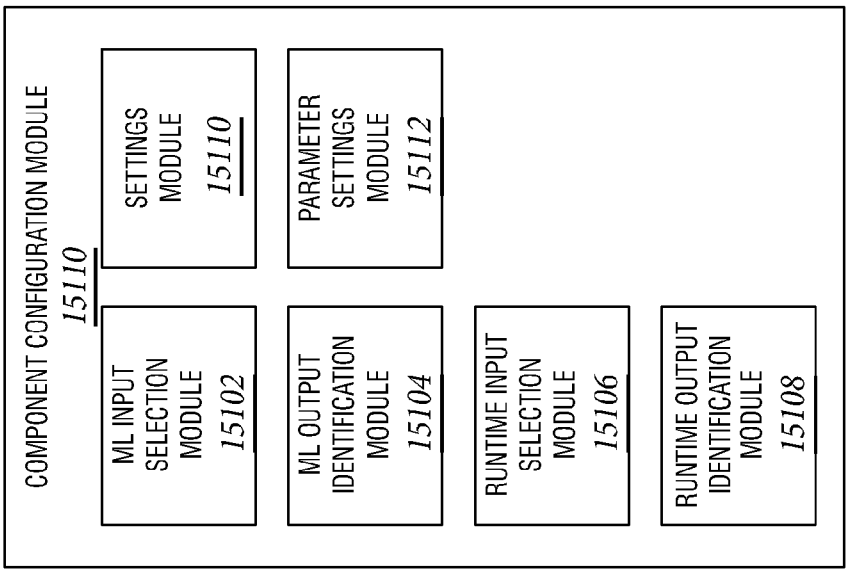

COMPONENT CONFIGURATION MODULE
15110
ML INPUT SELECTION MODULE
15102
SETTINGS MODULE
15110
ML OUTPUT IDENTIFICATION MODULE
15104
PARAMETER SETTINGS MODULE
15112
RUNTIME INPUT SELECTION MODULE
15106
RUNTIME OUTPUT IDENTIFICATION MODULE
15108

FIG. 151

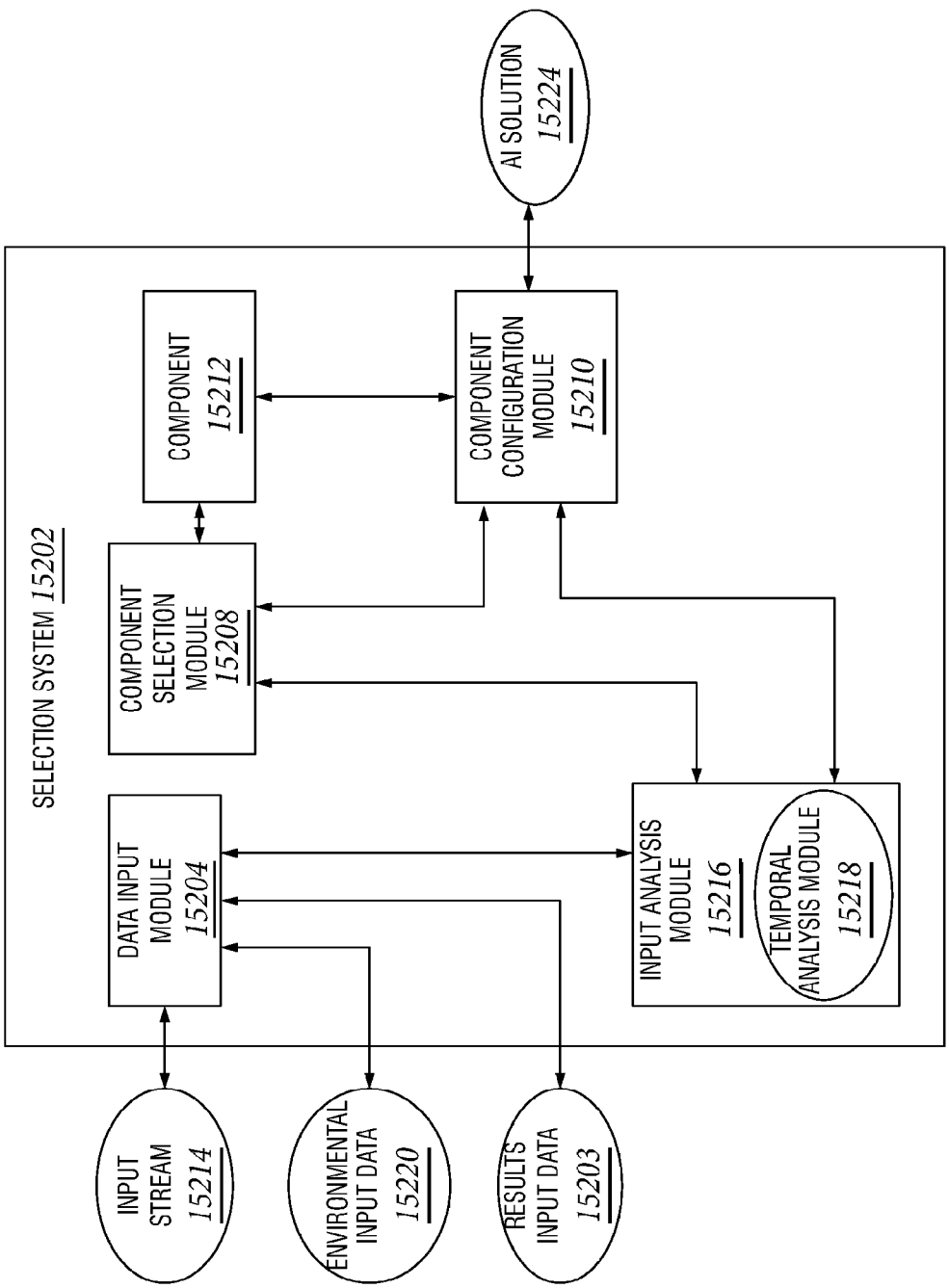

AI SOLUTION
15224
SELECTION SYSTEM 15202
COMPONENT
15212
COMPONENT
CONFIGURATION
MODULE
15210
COMPONENT
SELECTION
MODULE
15208
DATA INPUT
MODULE
15204
INPUT ANALYSIS
MODULE
15216
TEMPORAL
ANALYSIS MODULE
15218
INPUT
STREAM
15214
ENVIRONMENTAL
INPUT DATA
15220
RESULTS
INPUT DATA
15203

FIG. 152

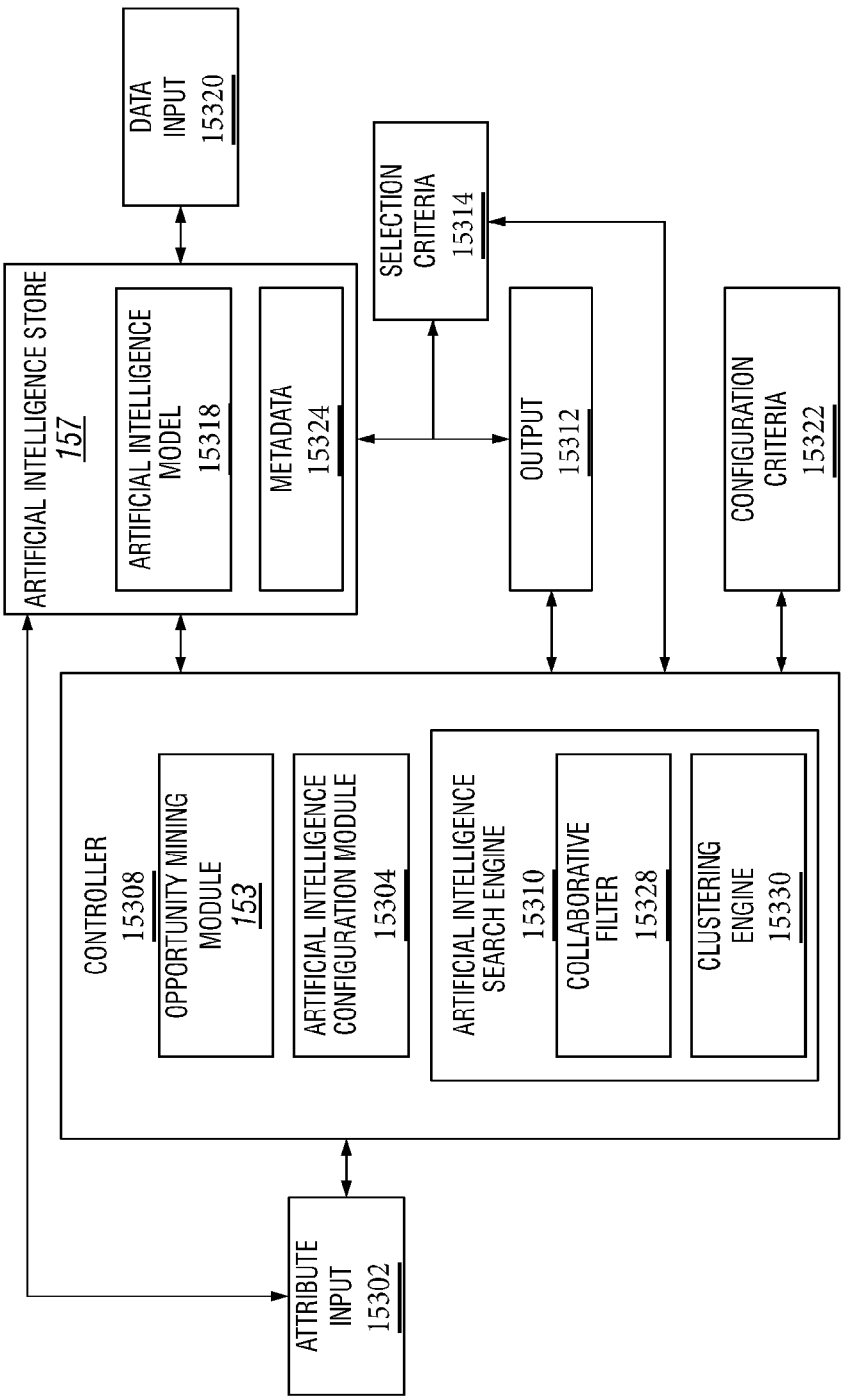

DATA INPUT 15320
SELECTION CRITERIA 15314
ARTIFICIAL INTELLIGENCE STORE 157
ARTIFICIAL INTELLIGENCE MODEL 15318
METADATA 15324
OUTPUT 15312
CONFIGURATION CRITERIA 15322
CONTROLLER 15308
OPPORTUNITY MINING MODULE 153
ARTIFICIAL INTELLIGENCE CONFIGURATION MODULE 15304
ARTIFICIAL INTELLIGENCE SEARCH ENGINE 15310
COLLABORATIVE FILTER 15328
CLUSTERING ENGINE 15330
ATTRIBUTE INPUT 15302

FIG. 153

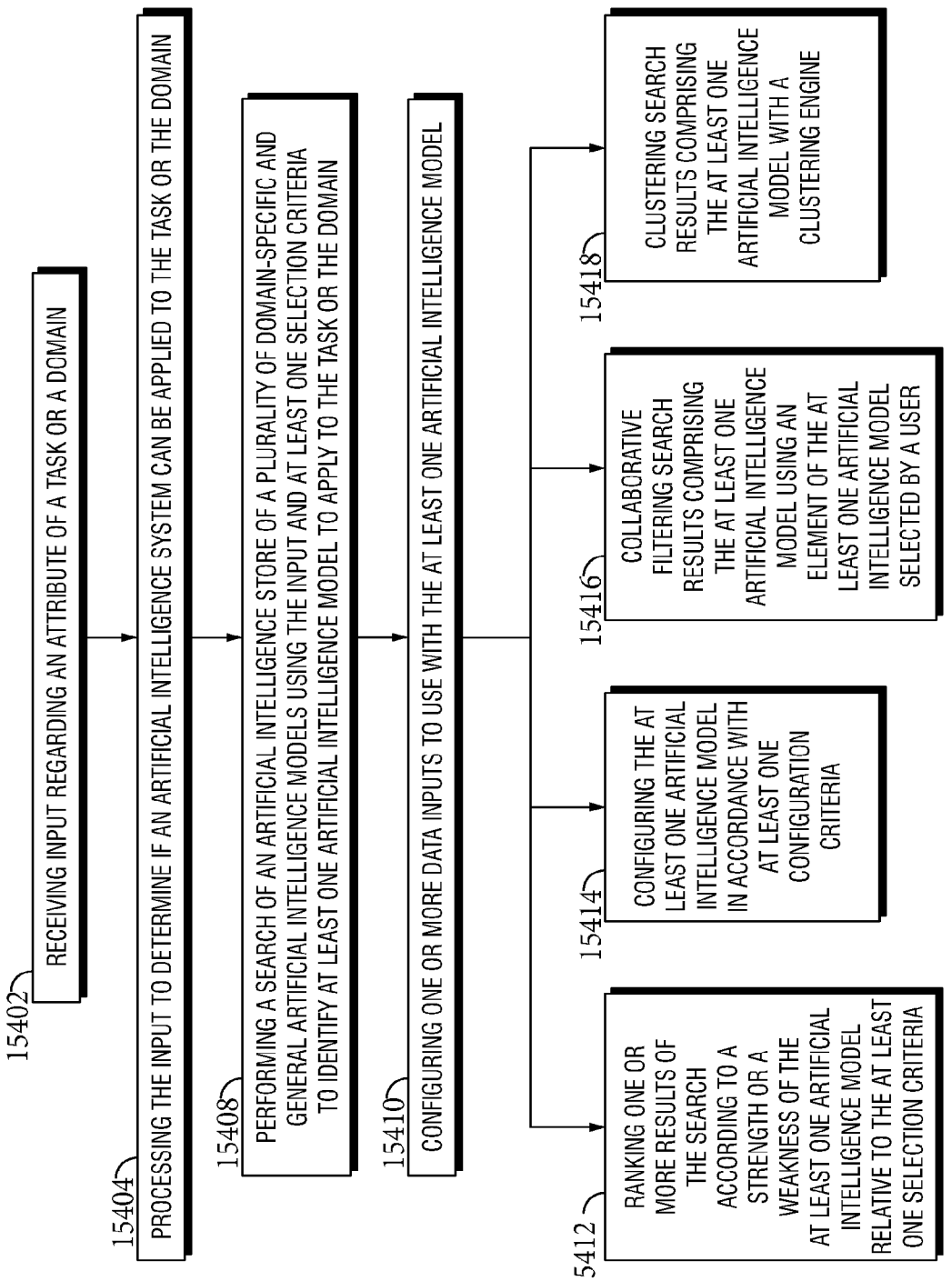

15402
RECEIVING INPUT REGARDING AN ATTRIBUTE OF A TASK OR A DOMAIN
15404
PROCESSING THE INPUT TO DETERMINE IF AN ARTIFICIAL INTELLIGENCE SYSTEM CAN BE APPLIED TO THE TASK OR THE DOMAIN
15408
PERFORMING A SEARCH OF AN ARTIFICIAL INTELLIGENCE STORE OF A PLURALITY OF DOMAIN-SPECIFIC AND GENERAL ARTIFICIAL INTELLIGENCE MODELS USING THE INPUT AND AT LEAST ONE SELECTION CRITERIA TO IDENTIFY AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL TO APPLY TO THE TASK OR THE DOMAIN
15410
CONFIGURING ONE OR MORE DATA INPUTS TO USE WITH THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL
15412
RANKING ONE OR MORE RESULTS OF THE SEARCH ACCORDING TO A STRENGTH OR A WEAKNESS OF THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL RELATIVE TO THE AT LEAST ONE SELECTION CRITERIA
15414
CONFIGURING THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL IN ACCORDANCE WITH AT LEAST ONE CONFIGURATION CRITERIA
15416
COLLABORATIVE FILTERING SEARCH RESULTS COMPRISING THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL USING AN ELEMENT OF THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL SELECTED BY A USER
15418
CLUSTERING SEARCH RESULTS COMPRISING THE AT LEAST ONE ARTIFICIAL INTELLIGENCE MODEL WITH A CLUSTERING ENGINE

FIG. 154

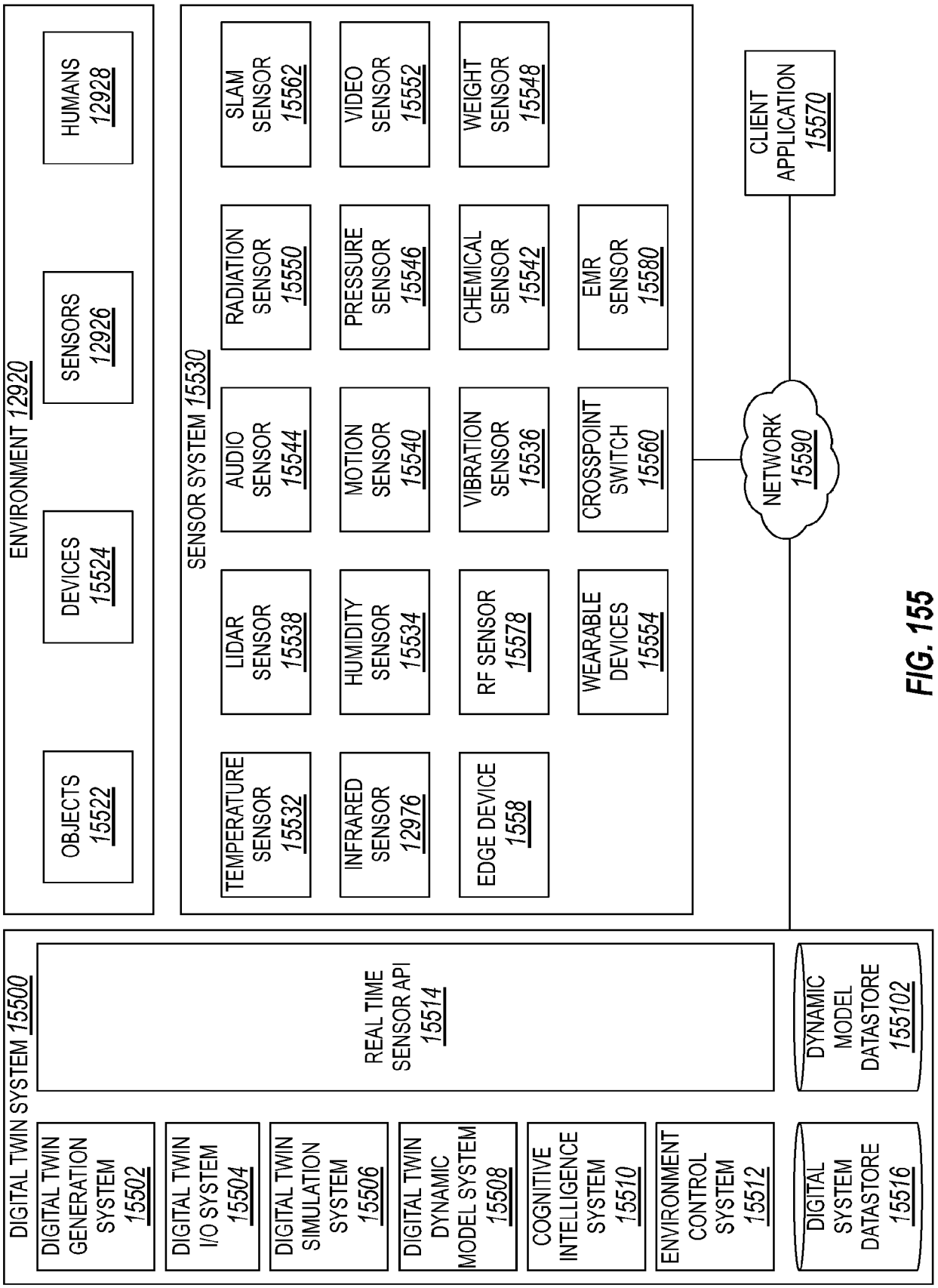

DIGITAL TWIN SYSTEM 15500
DIGITAL TWIN GENERATION SYSTEM 15502
DIGITAL TWIN I/O SYSTEM 15504
DIGITAL TWIN SIMULATION SYSTEM 15506
DIGITAL TWIN DYNAMIC MODEL SYSTEM 15508
COGNITIVE INTELLIGENCE SYSTEM 15510
ENVIRONMENT CONTROL SYSTEM 15512
DIGITAL SYSTEM DATASTORE 15516
REAL TIME SENSOR API 15514
DYNAMIC MODEL DATASTORE 155102
ENVIRONMENT 12920
OBJECTS 15522
DEVICES 15524
SENSORS 12926
HUMANS 12928
SENSOR SYSTEM 15530
TEMPERATURE SENSOR 15532
LIDAR SENSOR 15538
AUDIO SENSOR 15544
RADIATION SENSOR 15550
SLAM SENSOR 15562
INFRARED SENSOR 12976
HUMIDITY SENSOR 15534
MOTION SENSOR 15540
PRESSURE SENSOR 15546
VIDEO SENSOR 15552
EDGE DEVICE 1558
RF SENSOR 15578
VIBRATION SENSOR 15536
CHEMICAL SENSOR 15542
WEIGHT SENSOR 15548
WEARABLE DEVICES 15554
CROSSPOINT SWITCH 15560
EMR SENSOR 15580
NETWORK 15590
CLIENT APPLICATION 15570

FIG. 155

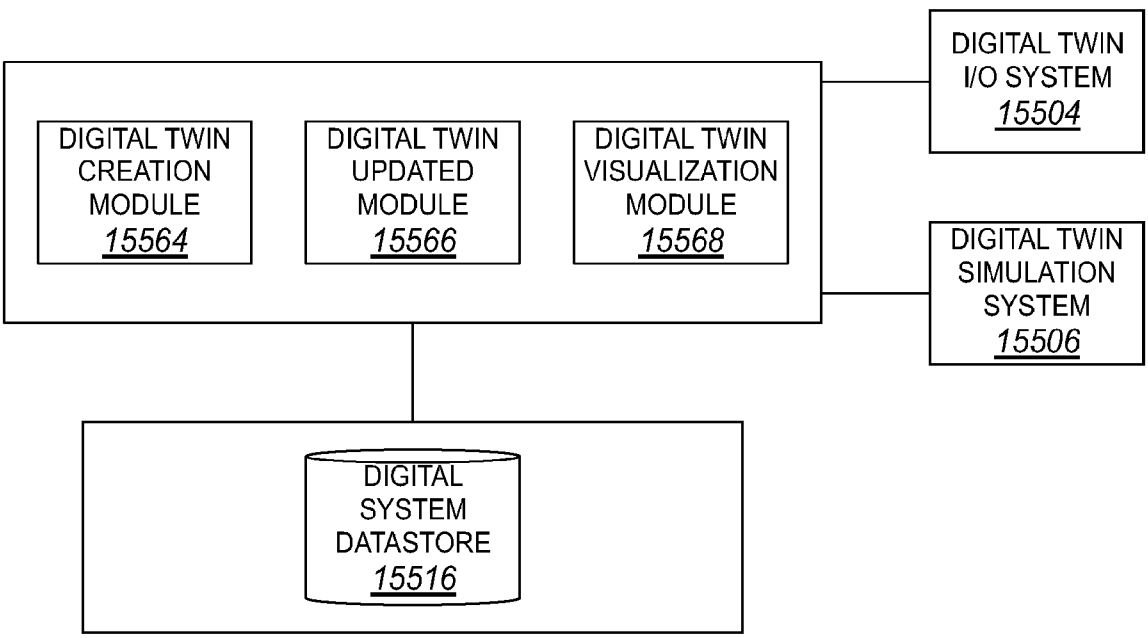

DIGITAL TWIN CREATION MODULE
15564
DIGITAL TWIN UPDATED MODULE
15566
DIGITAL TWIN VISUALIZATION MODULE
15568
DIGITAL TWIN I/O SYSTEM
15504
DIGITAL TWIN SIMULATION SYSTEM
15506
DIGITAL SYSTEM DATASTORE
15516

FIG. 156

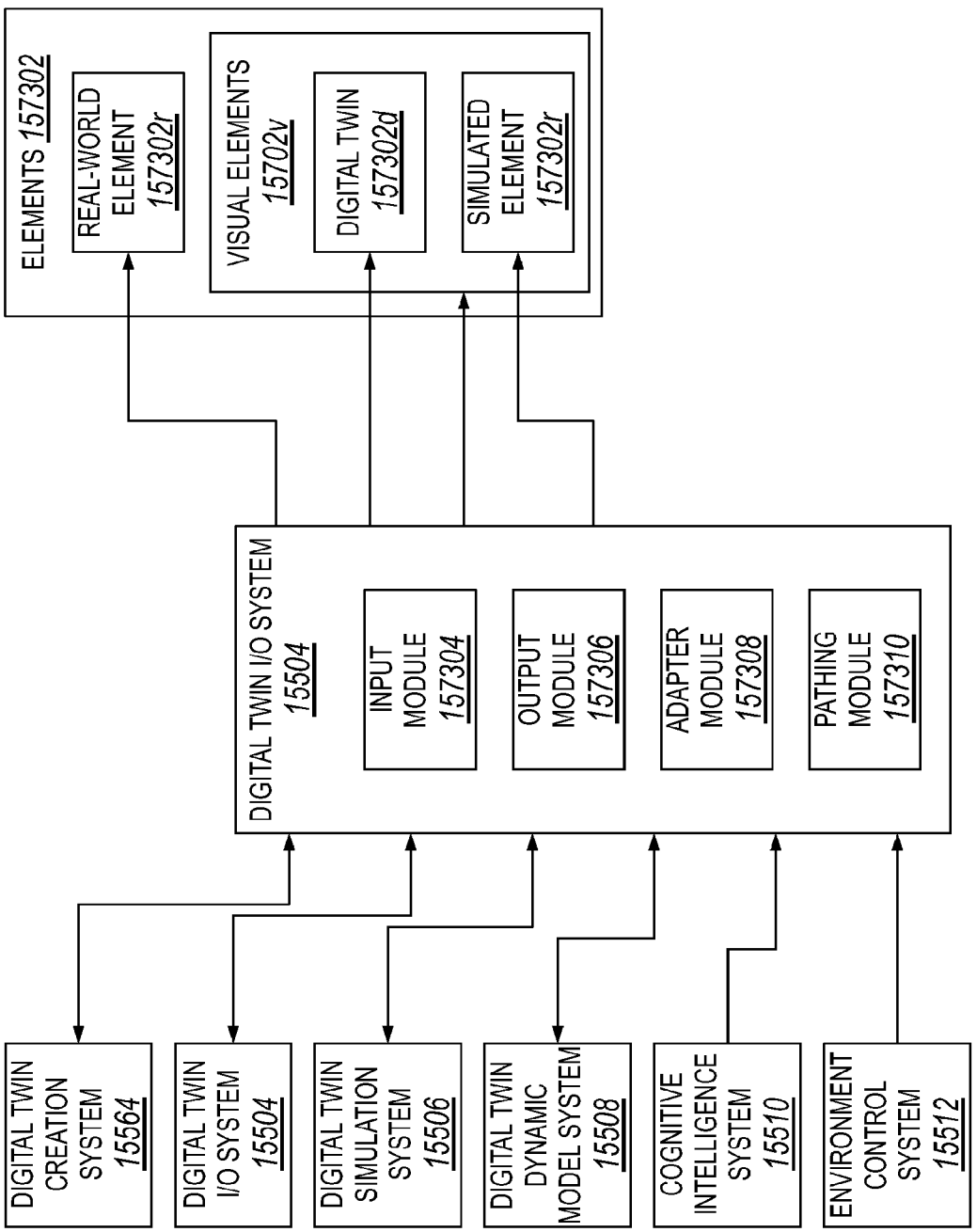

ELEMENTS 157302
REAL-WORLD ELEMENT 157302r
VISUAL ELEMENTS 15702v
DIGITAL TWIN 157302d
SIMULATED ELEMENT 157302r
DIGITAL TWIN I/O SYSTEM 15504
INPUT MODULE 157304
OUTPUT MODULE 157306
ADAPTER MODULE 157308
PATHING MODULE 157310
DIGITAL TWIN CREATION SYSTEM 15564
DIGITAL TWIN I/O SYSTEM 15504
DIGITAL TWIN SIMULATION SYSTEM 15506
DIGITAL TWIN DYNAMIC MODEL SYSTEM 15508
COGNITIVE INTELLIGENCE SYSTEM 15510
ENVIRONMENT CONTROL SYSTEM 15512

FIG. 157

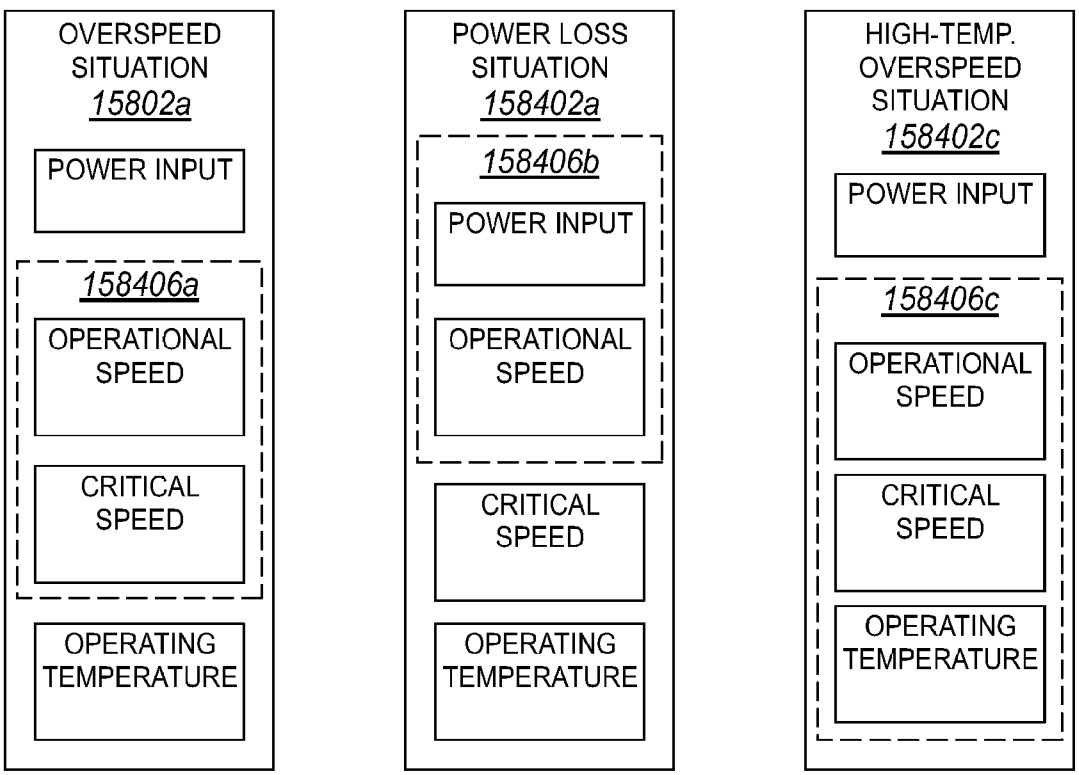

OVERSPEED SITUATION
15802a
POWER INPUT
158406a
OPERATIONAL SPEED
CRITICAL SPEED
OPERATING TEMPERATURE
POWER LOSS SITUATION
158402a
158406b
POWER INPUT
OPERATIONAL SPEED
CRITICAL SPEED
OPERATING TEMPERATURE
HIGH-TEMP. OVERSPEED SITUATION
158402c
POWER INPUT
158406c
OPERATIONAL SPEED
CRITICAL SPEED
OPERATING TEMPERATURE

FIG. 158

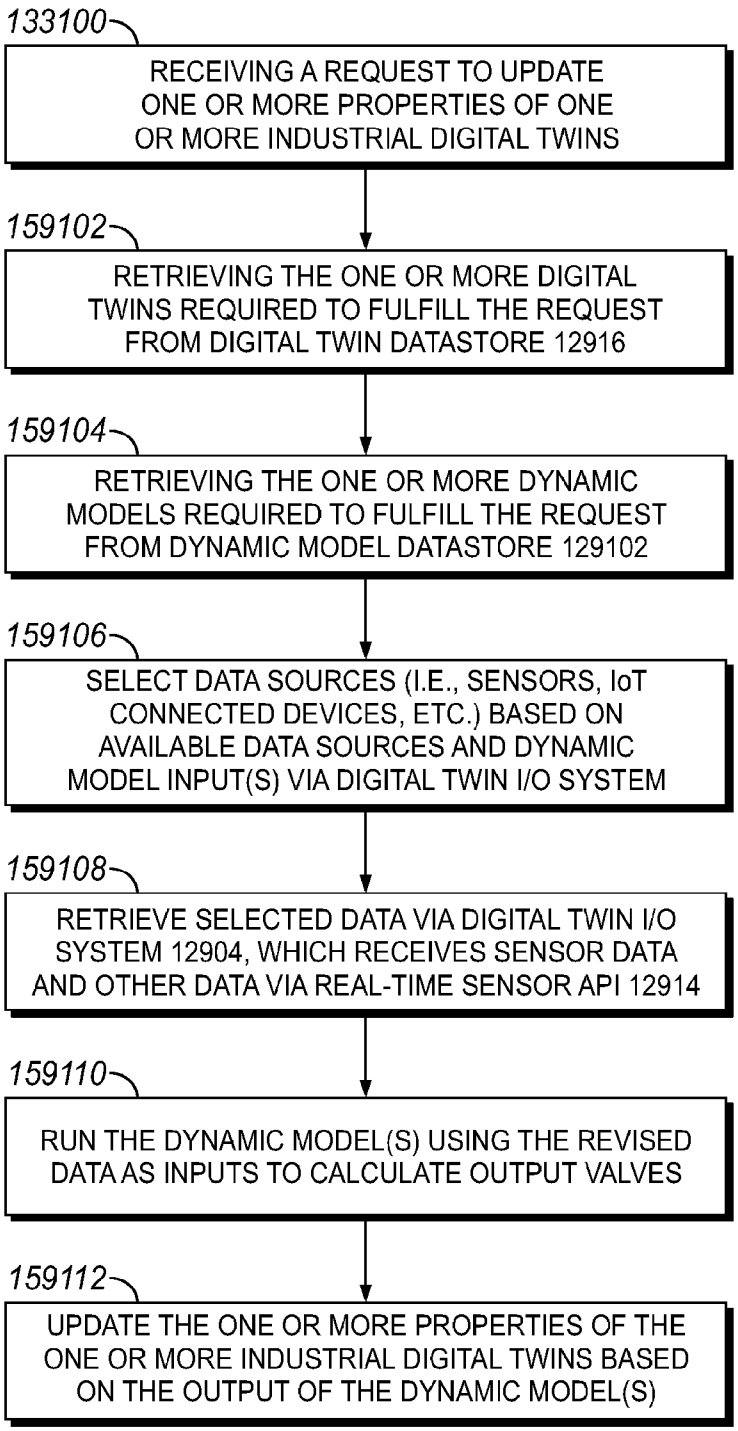

133100
RECEIVING A REQUEST TO UPDATE ONE OR MORE PROPERTIES OF ONE OR MORE INDUSTRIAL DIGITAL TWINS
159102
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 12916
159104
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 129102
159106
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM
159108
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 12904, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 12914
159110
RUN THE DYNAMIC MODEL(S) USING THE REVISED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
159112
UPDATE THE ONE OR MORE PROPERTIES OF THE ONE OR MORE INDUSTRIAL DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 159

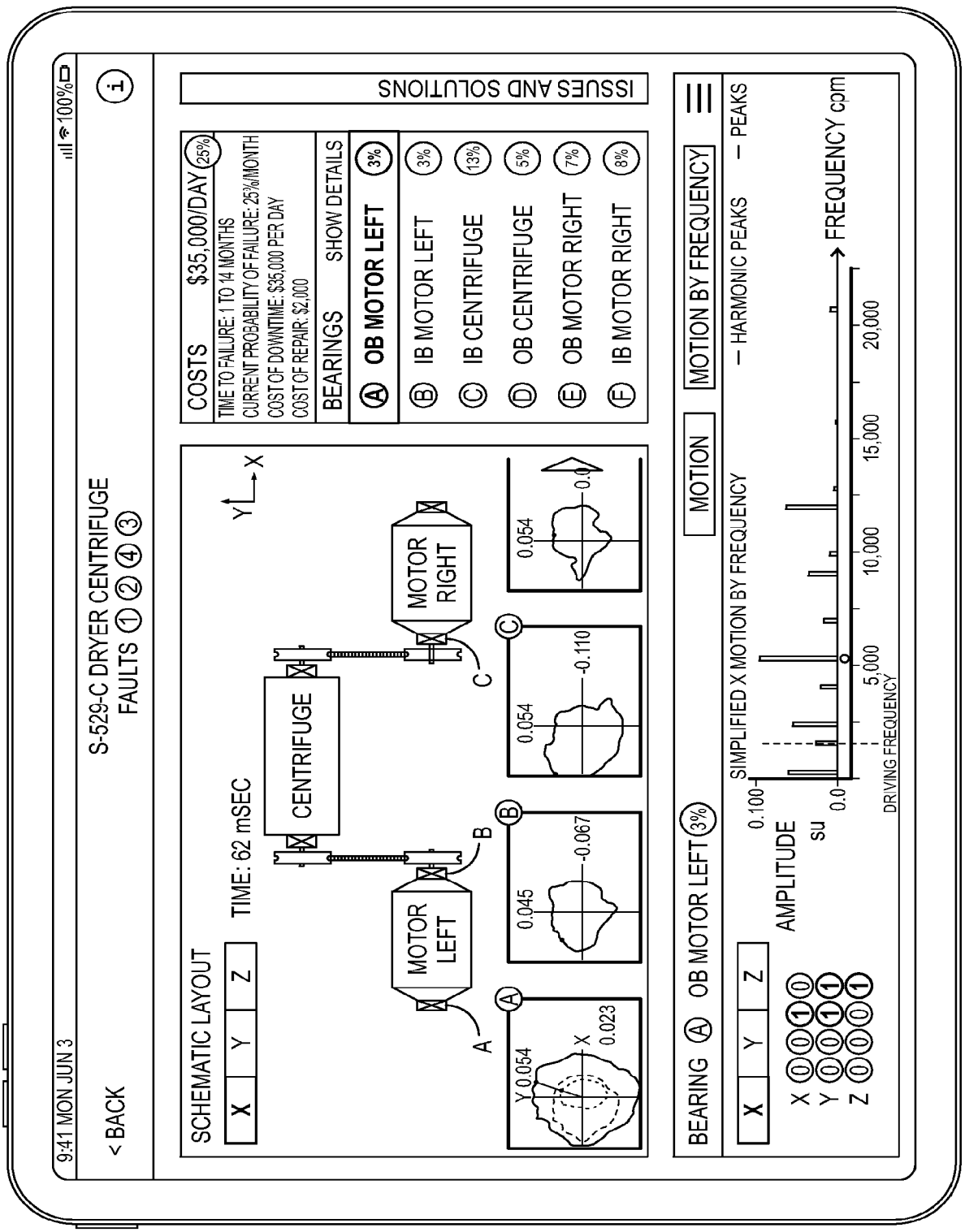

9:41 MON JUN 3
100%
< BACK
S-529-C DRYER CENTRIFUGE
FAULTS ① ② ④ ③
SCHEMATIC LAYOUT
X Y Z
TIME: 62 mSEC
CENTRIFUGE
MOTOR LEFT
MOTOR RIGHT
A
B
C
0.045
-0.067
0.054
-0.110
0.054
0.023
ISSUES AND SOLUTIONS
COSTS $35,000/DAY (25%)
TIME TO FAILURE: 1 TO 14 MONTHS
CURRENT PROBABILITY OF FAILURE: 25%/MONTH
COST OF DOWNTIME: $35,000 PER DAY
COST OF REPAIR: $2,000
BEARINGS SHOW DETAILS
Ⓐ OB MOTOR LEFT 3%
Ⓑ IB MOTOR LEFT 3%
Ⓒ IB CENTRIFUGE 13%
Ⓓ OB CENTRIFUGE 5%
Ⓔ OB MOTOR RIGHT 7%
Ⓕ IB MOTOR RIGHT 8%
BEARING Ⓐ OB MOTOR LEFT 3%
MOTION
MOTION BY FREQUENCY
SIMPLIFIED X MOTION BY FREQUENCY
HARMONIC PEAKS
PEAKS
AMPLITUDE
su
0.100
0.0
5,000
10,000
15,000
20,000
FREQUENCY cpm
DRIVING FREQUENCY

FIG. 160

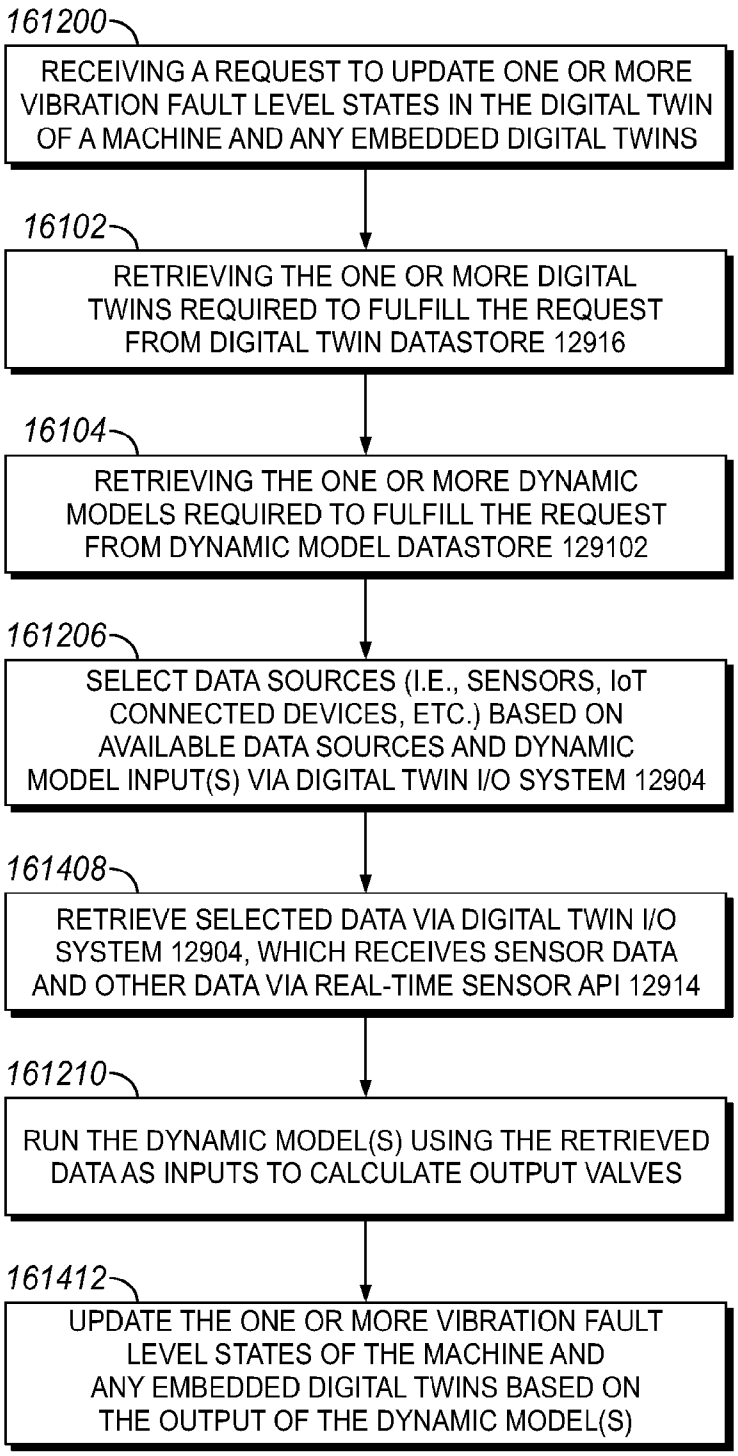

161200
RECEIVING A REQUEST TO UPDATE ONE OR MORE VIBRATION FAULT LEVEL STATES IN THE DIGITAL TWIN OF A MACHINE AND ANY EMBEDDED DIGITAL TWINS
16102
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 12916
16104
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 129102
161206
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM 12904
161408
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 12904, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 12914
161210
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
161412
UPDATE THE ONE OR MORE VIBRATION FAULT LEVEL STATES OF THE MACHINE AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 161

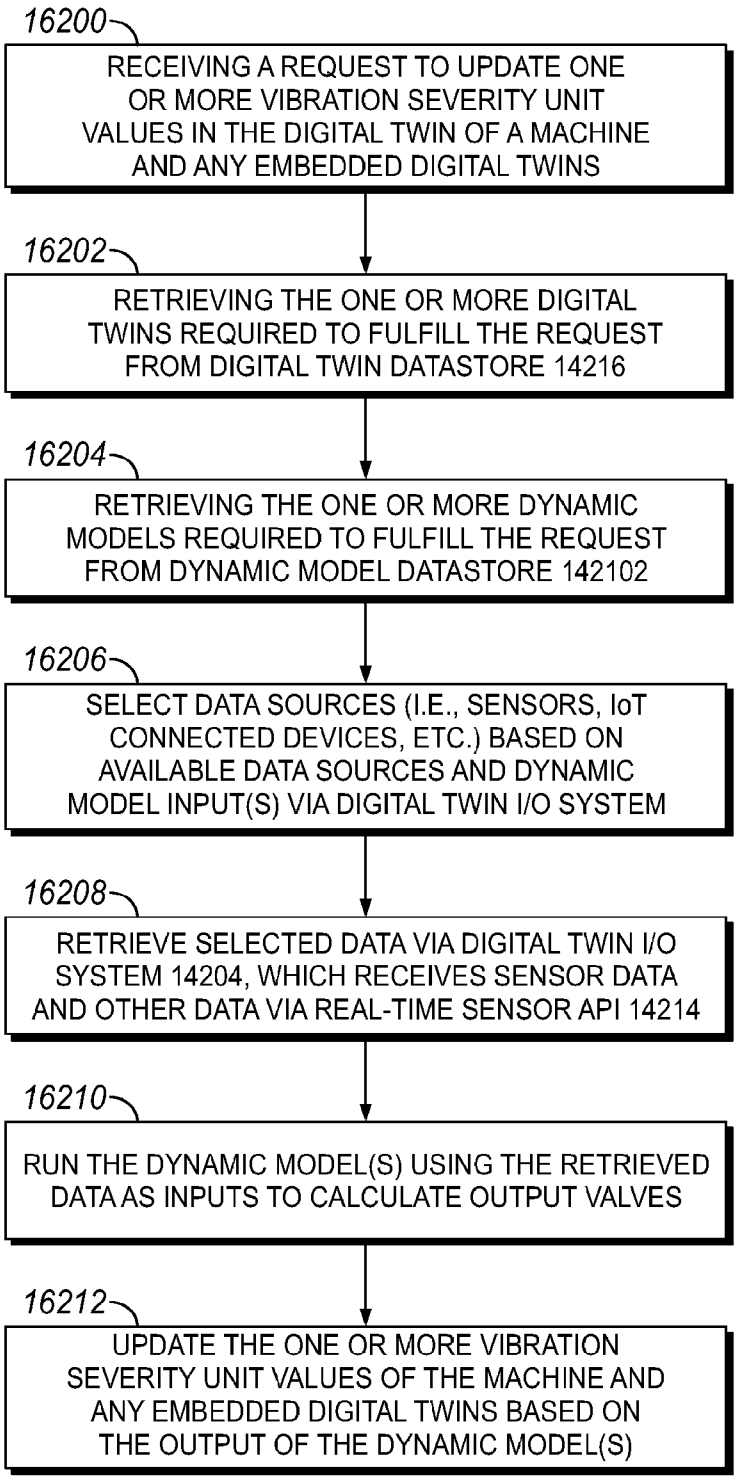

16200
RECEIVING A REQUEST TO UPDATE ONE OR MORE VIBRATION SEVERITY UNIT VALUES IN THE DIGITAL TWIN OF A MACHINE AND ANY EMBEDDED DIGITAL TWINS
16202
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 14216
16204
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 142102
16206
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM
16208
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 14204, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 14214
16210
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
16212
UPDATE THE ONE OR MORE VIBRATION SEVERITY UNIT VALUES OF THE MACHINE AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 162

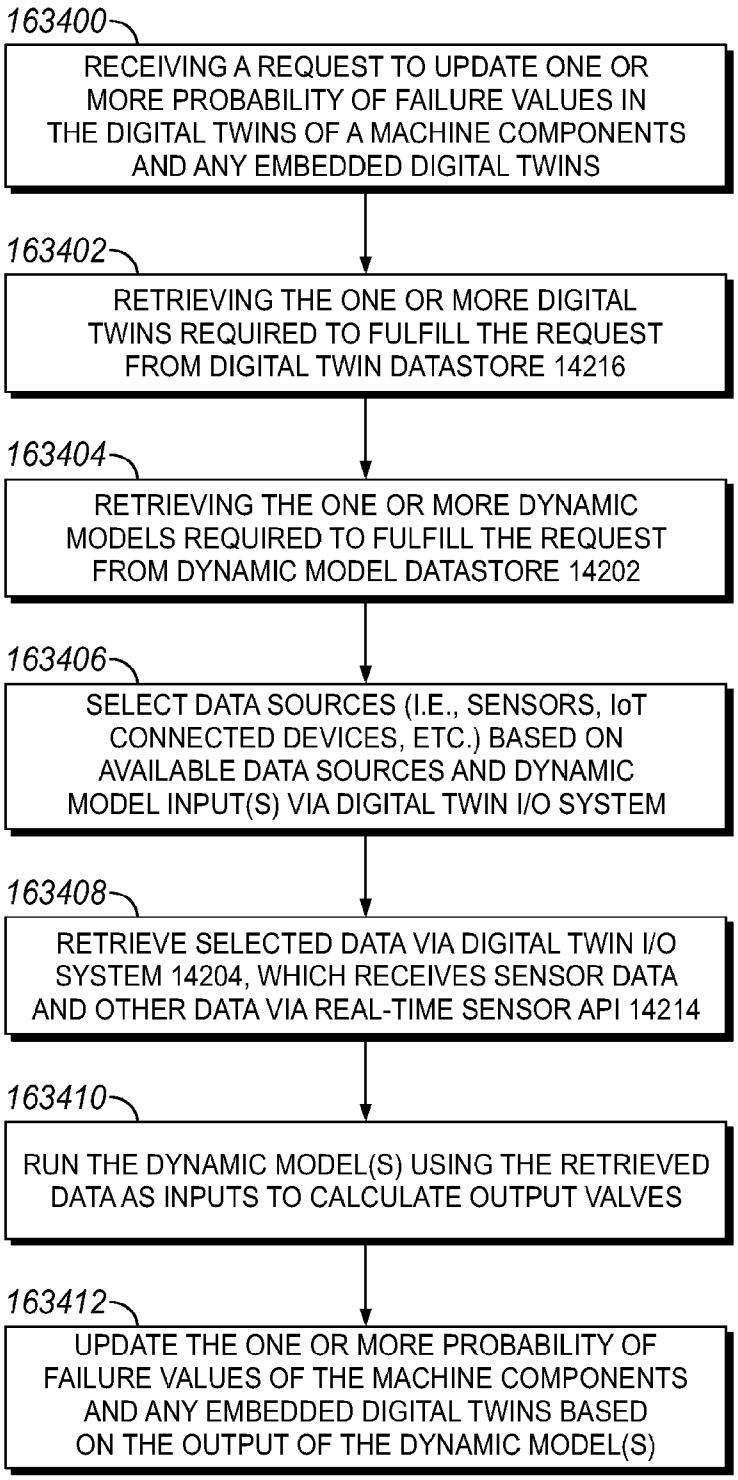

163400
RECEIVING A REQUEST TO UPDATE ONE OR MORE PROBABILITY OF FAILURE VALUES IN THE DIGITAL TWINS OF A MACHINE COMPONENTS AND ANY EMBEDDED DIGITAL TWINS
163402
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 14216
163404
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 14202
163406
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM
163408
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 14204, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 14214
163410
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
163412
UPDATE THE ONE OR MORE PROBABILITY OF FAILURE VALUES OF THE MACHINE COMPONENTS AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 163

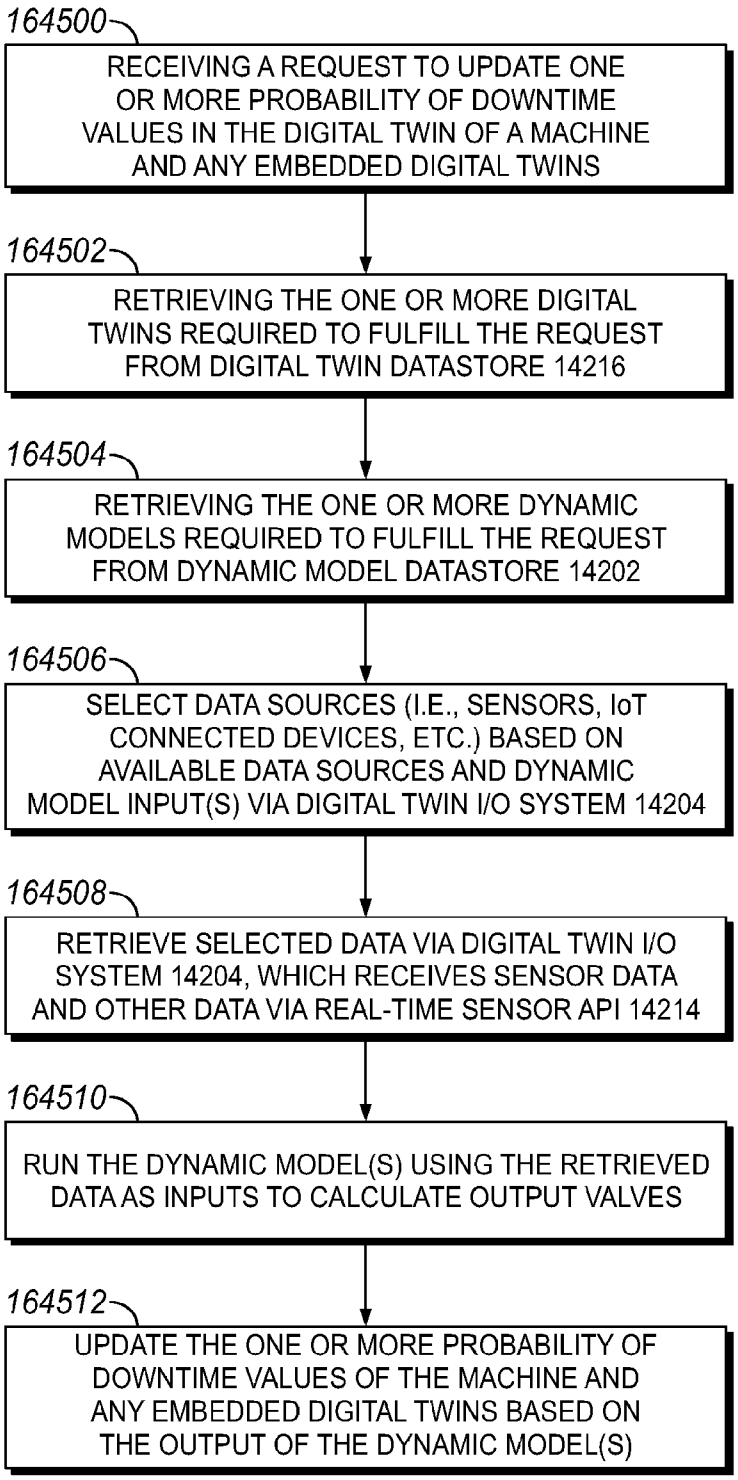

164500
RECEIVING A REQUEST TO UPDATE ONE OR MORE PROBABILITY OF DOWNTIME VALUES IN THE DIGITAL TWIN OF A MACHINE AND ANY EMBEDDED DIGITAL TWINS
164502
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 14216
164504
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 14202
164506
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM 14204
164508
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 14204, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 14214
164510
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
164512
UPDATE THE ONE OR MORE PROBABILITY OF DOWNTIME VALUES OF THE MACHINE AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 164

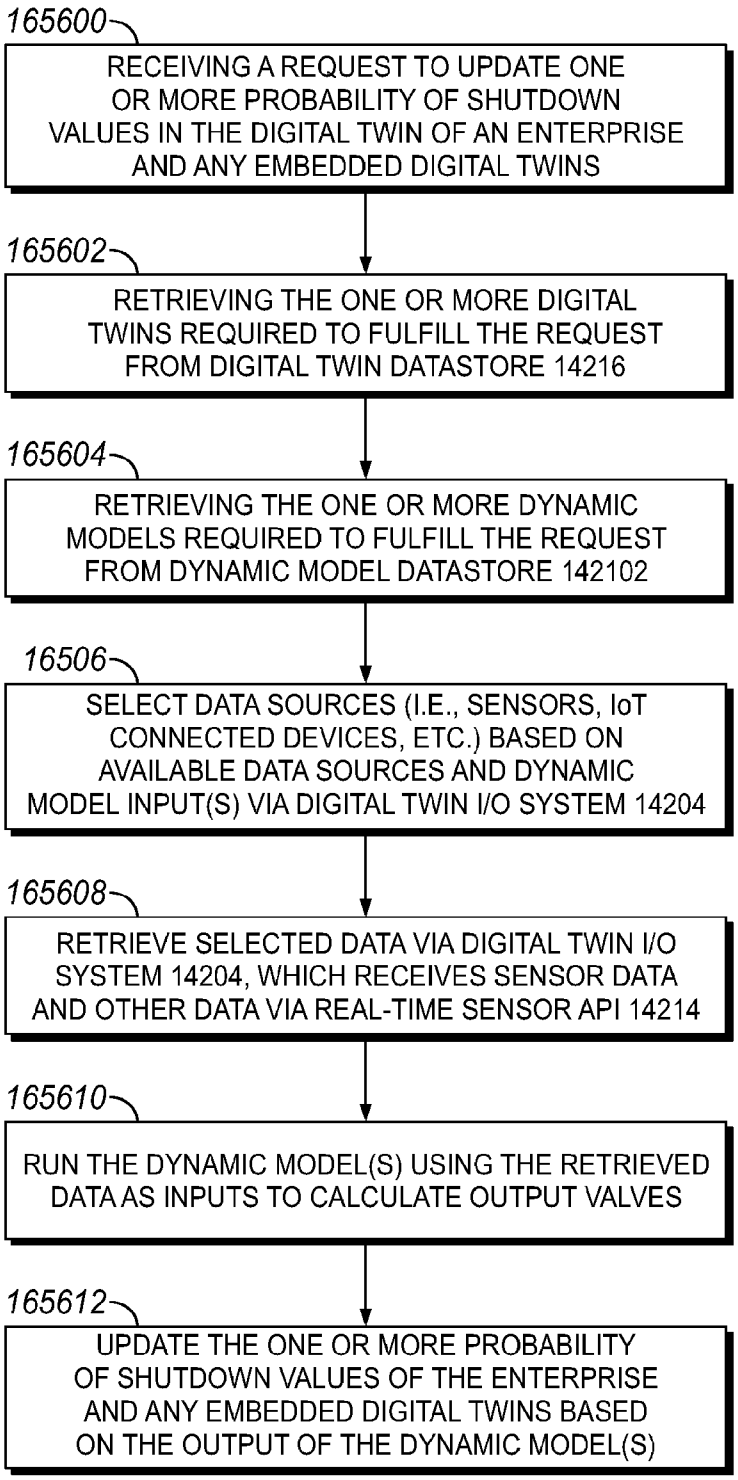

165600
RECEIVING A REQUEST TO UPDATE ONE OR MORE PROBABILITY OF SHUTDOWN VALUES IN THE DIGITAL TWIN OF AN ENTERPRISE AND ANY EMBEDDED DIGITAL TWINS
165602
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 14216
165604
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 142102
16506
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM 14204
165608
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 14204, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 14214
165610
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
165612
UPDATE THE ONE OR MORE PROBABILITY OF SHUTDOWN VALUES OF THE ENTERPRISE AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 165

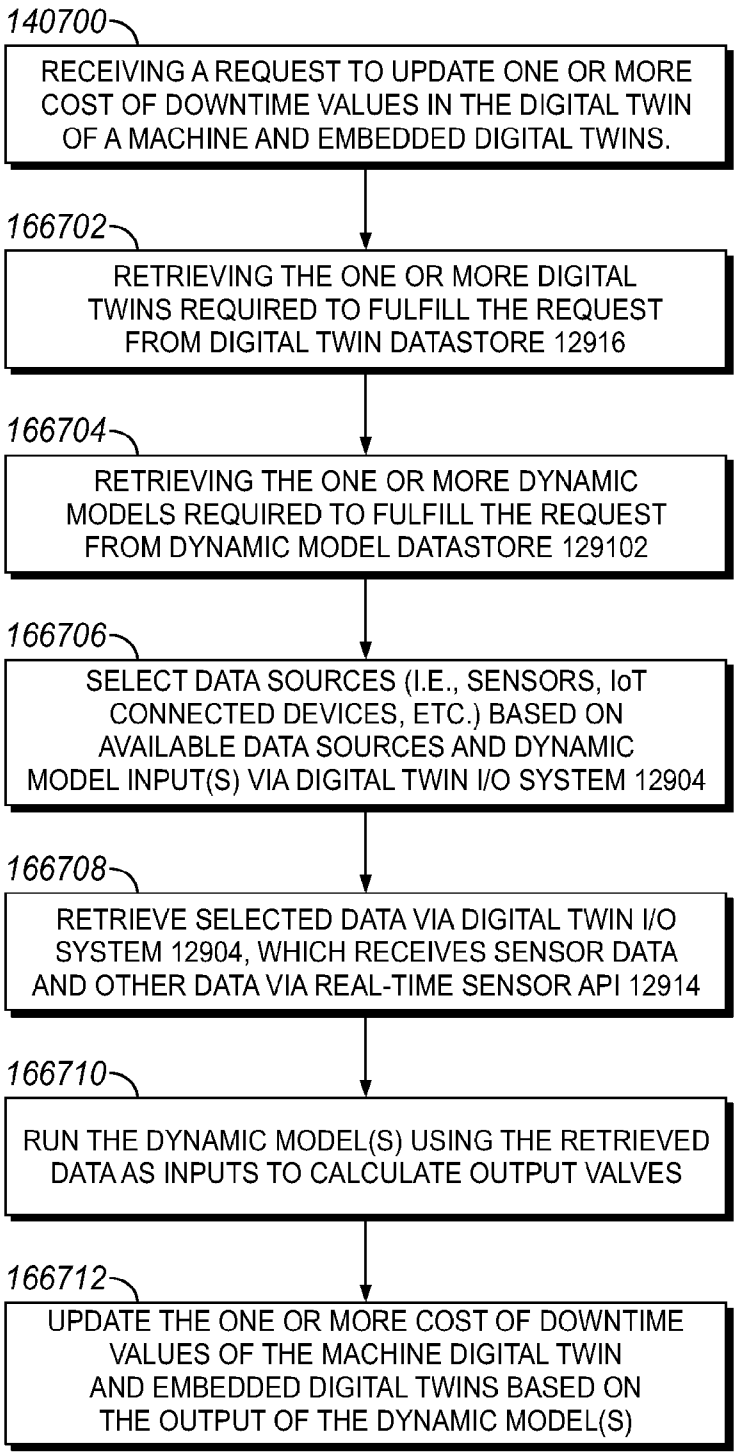

140700
RECEIVING A REQUEST TO UPDATE ONE OR MORE COST OF DOWNTIME VALUES IN THE DIGITAL TWIN OF A MACHINE AND EMBEDDED DIGITAL TWINS.
166702
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 12916
166704
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 129102
166706
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM 12904
166708
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 12904, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 12914
166710
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
166712
UPDATE THE ONE OR MORE COST OF DOWNTIME VALUES OF THE MACHINE DIGITAL TWIN AND EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 166

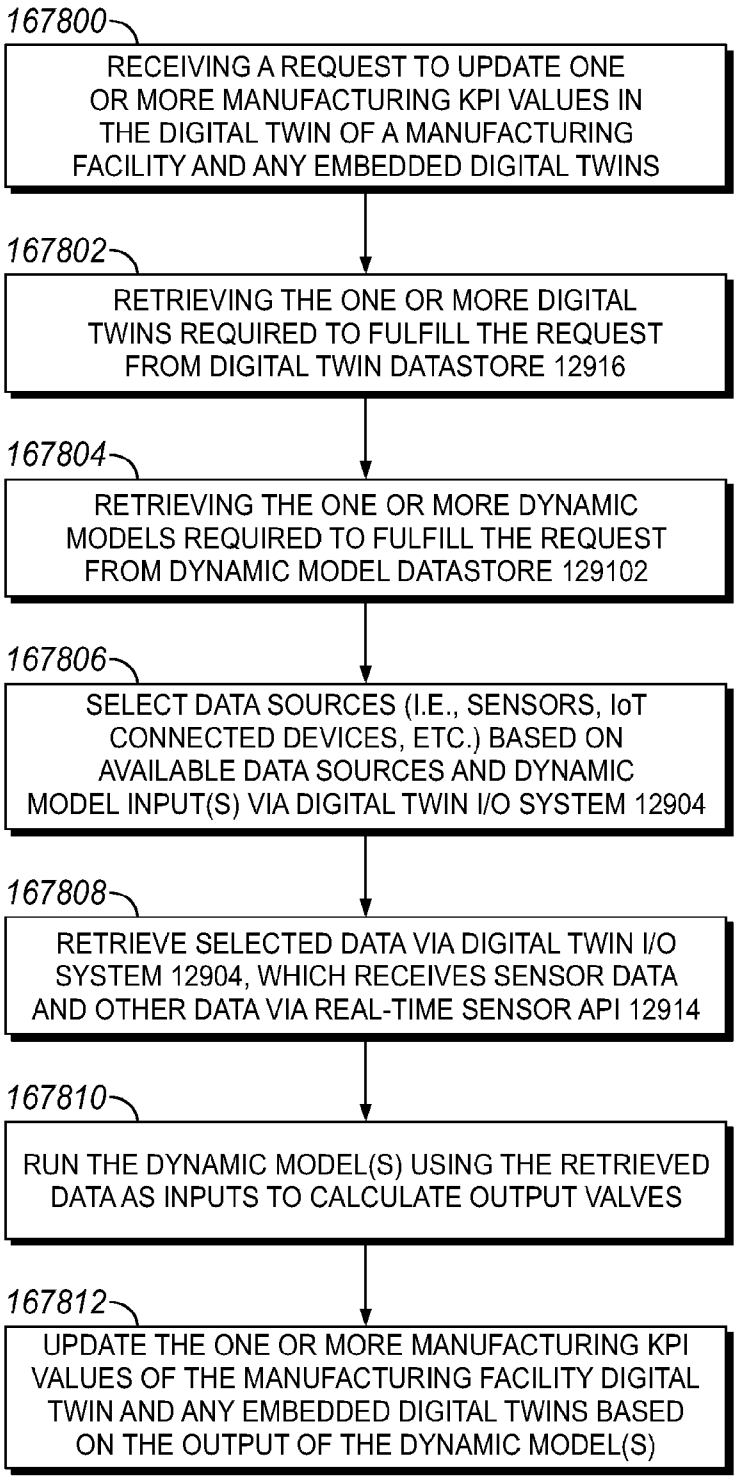

167800
RECEIVING A REQUEST TO UPDATE ONE OR MORE MANUFACTURING KPI VALUES IN THE DIGITAL TWIN OF A MANUFACTURING FACILITY AND ANY EMBEDDED DIGITAL TWINS
167802
RETRIEVING THE ONE OR MORE DIGITAL TWINS REQUIRED TO FULFILL THE REQUEST FROM DIGITAL TWIN DATASTORE 12916
167804
RETRIEVING THE ONE OR MORE DYNAMIC MODELS REQUIRED TO FULFILL THE REQUEST FROM DYNAMIC MODEL DATASTORE 129102
167806
SELECT DATA SOURCES (I.E., SENSORS, IoT CONNECTED DEVICES, ETC.) BASED ON AVAILABLE DATA SOURCES AND DYNAMIC MODEL INPUT(S) VIA DIGITAL TWIN I/O SYSTEM 12904
167808
RETRIEVE SELECTED DATA VIA DIGITAL TWIN I/O SYSTEM 12904, WHICH RECEIVES SENSOR DATA AND OTHER DATA VIA REAL-TIME SENSOR API 12914
167810
RUN THE DYNAMIC MODEL(S) USING THE RETRIEVED DATA AS INPUTS TO CALCULATE OUTPUT VALVES
167812
UPDATE THE ONE OR MORE MANUFACTURING KPI VALUES OF THE MANUFACTURING FACILITY DIGITAL TWIN AND ANY EMBEDDED DIGITAL TWINS BASED ON THE OUTPUT OF THE DYNAMIC MODEL(S)

FIG. 167

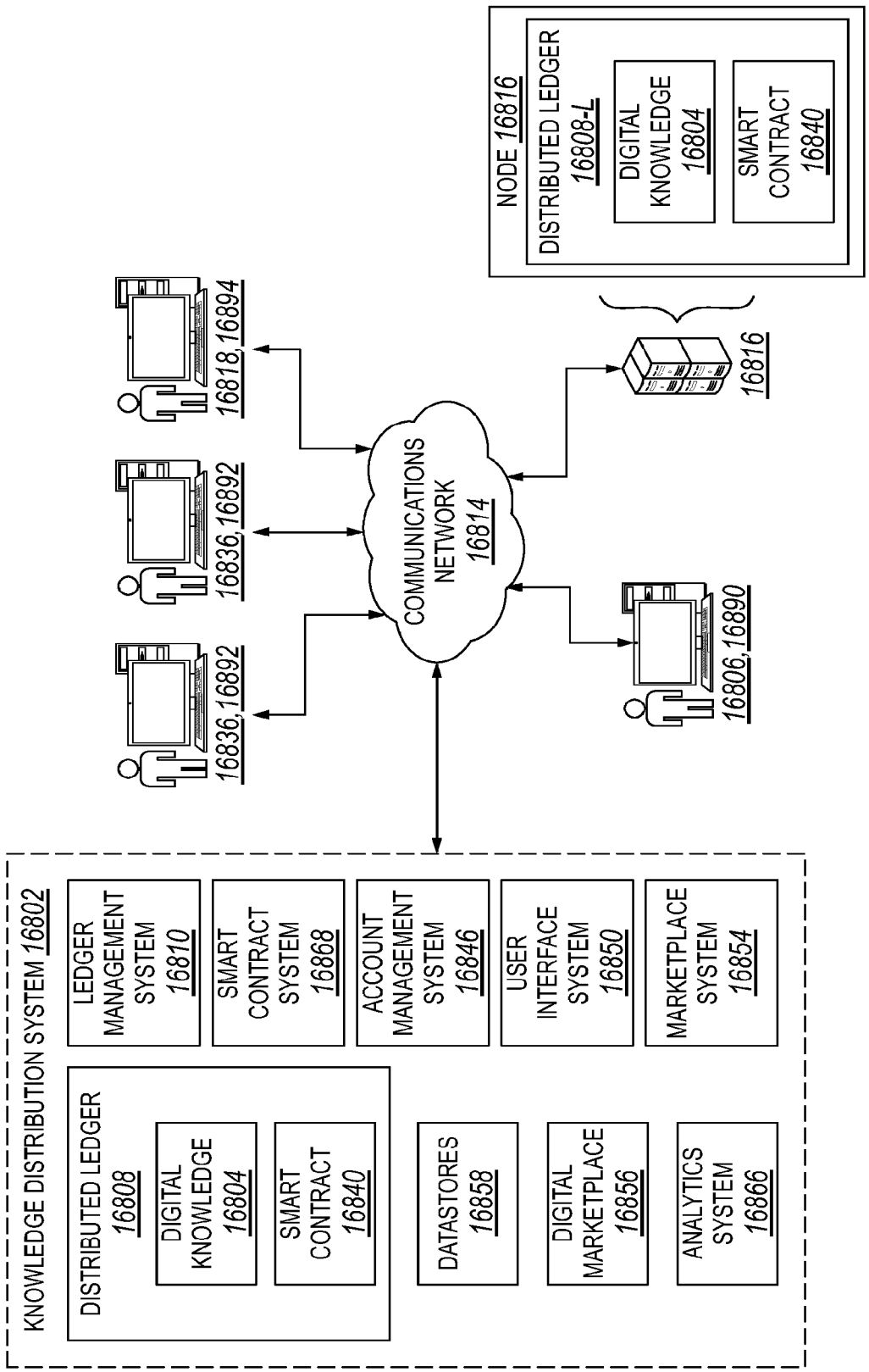

KNOWLEDGE DISTRIBUTION SYSTEM 16802
LEDGER MANAGEMENT SYSTEM 16810
SMART CONTRACT SYSTEM 16868
ACCOUNT MANAGEMENT SYSTEM 16846
USER INTERFACE SYSTEM 16850
MARKETPLACE SYSTEM 16854
DISTRIBUTED LEDGER 16808
DIGITAL KNOWLEDGE 16804
SMART CONTRACT 16840
DATASTORES 16858
DIGITAL MARKETPLACE 16856
ANALYTICS SYSTEM 16866
COMMUNICATIONS NETWORK 16814
16836,16892
16836,16892
16818,16894
16806,16890
16816
NODE 16816
DISTRIBUTED LEDGER 16808-L
DIGITAL KNOWLEDGE 16804
SMART CONTRACT 16840

FIG. 168

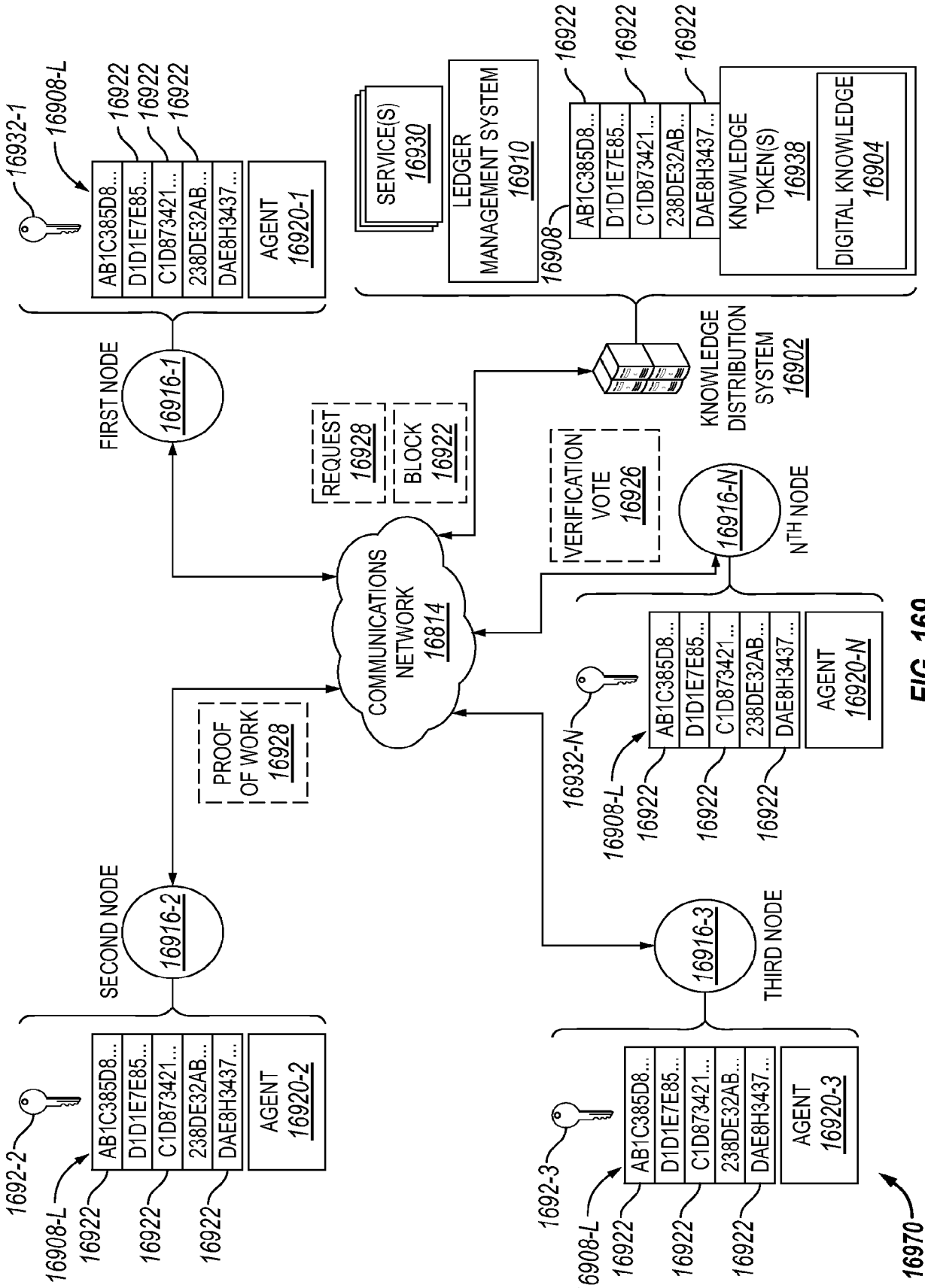

16932-1
16908-L
16922
16922
16922
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
AGENT 16920-1
FIRST NODE 16916-1
SERVICE(S) 16930
LEDGER MANAGEMENT SYSTEM 16910
16908
16922
16922
16922
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
KNOWLEDGE TOKEN(S) 16938
DIGITAL KNOWLEDGE 16904
KNOWLEDGE DISTRIBUTION SYSTEM 16902
REQUEST 16928
BLOCK 16922
VERIFICATION VOTE 16926
COMMUNICATIONS NETWORK 16814
PROOF OF WORK 16928
16916-N
N^TH NODE
16932-N
16908-L
16922
16922
16922
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
AGENT 16920-N
SECOND NODE 16916-2
THIRD NODE 16916-3
1692-2
16908-L
16922
16922
16922
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
AGENT 16920-2
1692-3
16908-L
16922
16922
16922
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
AGENT 16920-3
16970

FIG. 169

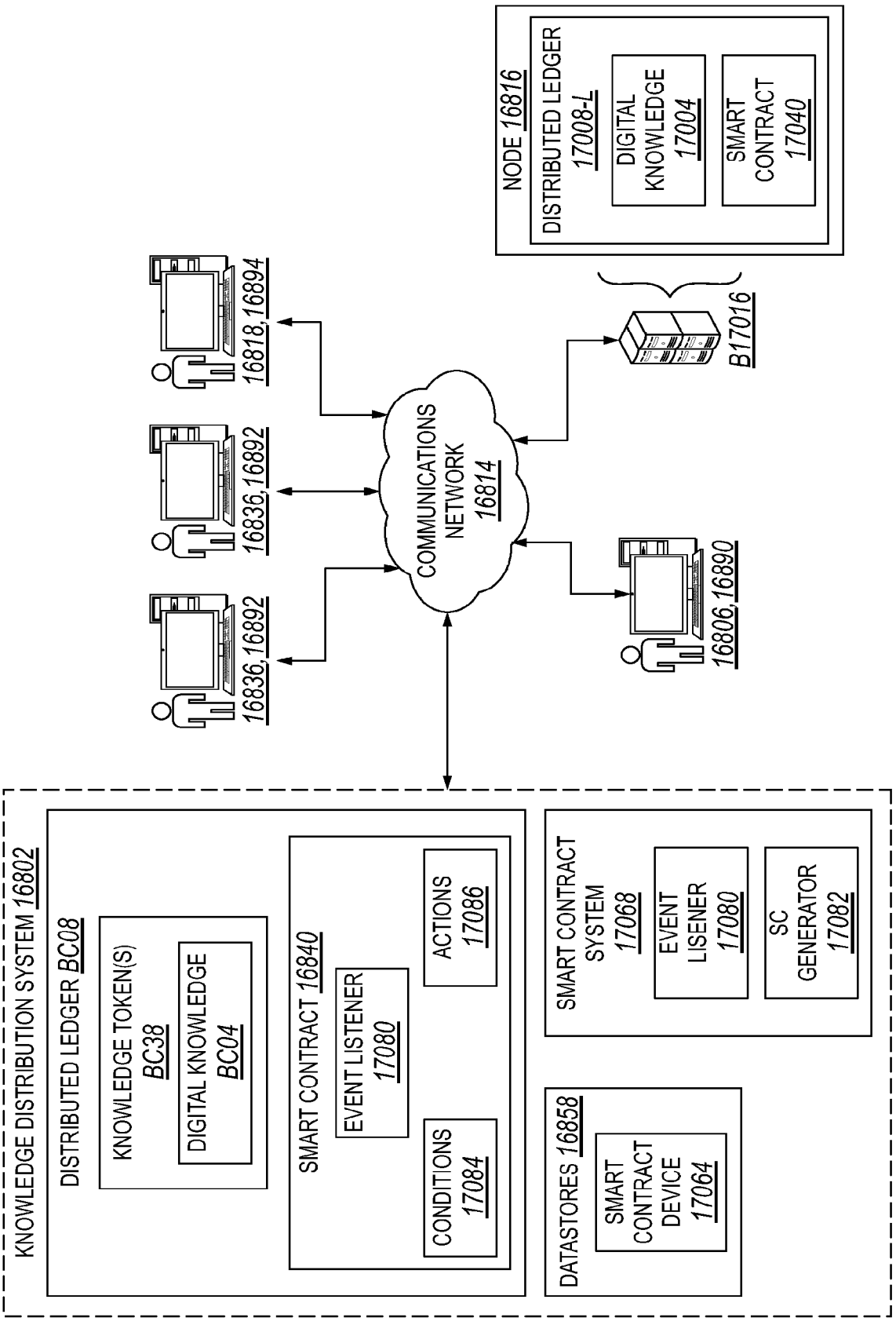

KNOWLEDGE DISTRIBUTION SYSTEM 16802
DISTRIBUTED LEDGER BC08
KNOWLEDGE TOKEN(S) BC38
DIGITAL KNOWLEDGE BC04
SMART CONTRACT 16840
EVENT LISTENER 17080
CONDITIONS 17084
ACTIONS 17086
SMART CONTRACT SYSTEM 17068
EVENT LISENER 17080
SC GENERATOR 17082
DATASTORES 16858
SMART CONTRACT DEVICE 17064
COMMUNICATIONS NETWORK 16814
16836,16892
16836,16892
16818,16894
16806,16890
B17016
NODE 16816
DISTRIBUTED LEDGER 17008-L
DIGITAL KNOWLEDGE 17004
SMART CONTRACT 17040

FIG. 170

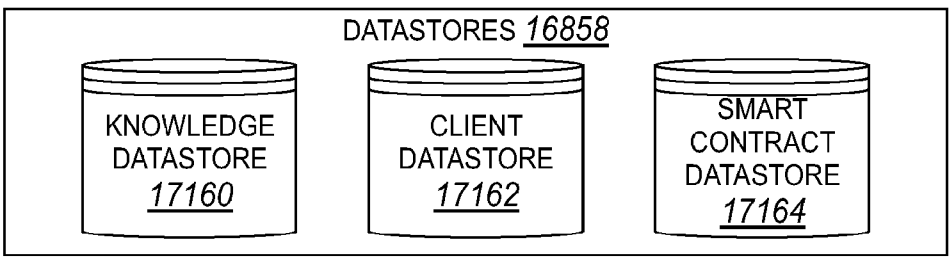

DATASTORES 16858
KNOWLEDGE DATASTORE 17160
CLIENT DATASTORE 17162
SMART CONTRACT DATASTORE 17164

FIG. 171

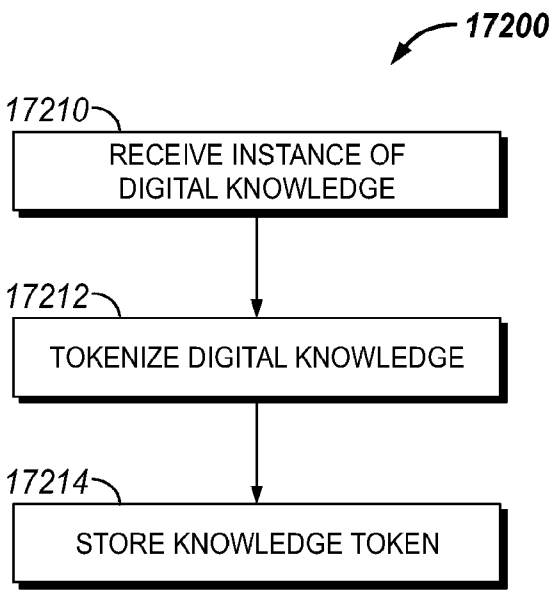

17200
17210
RECEIVE INSTANCE OF DIGITAL KNOWLEDGE
17212
TOKENIZE DIGITAL KNOWLEDGE
17214
STORE KNOWLEDGE TOKEN

FIG. 172

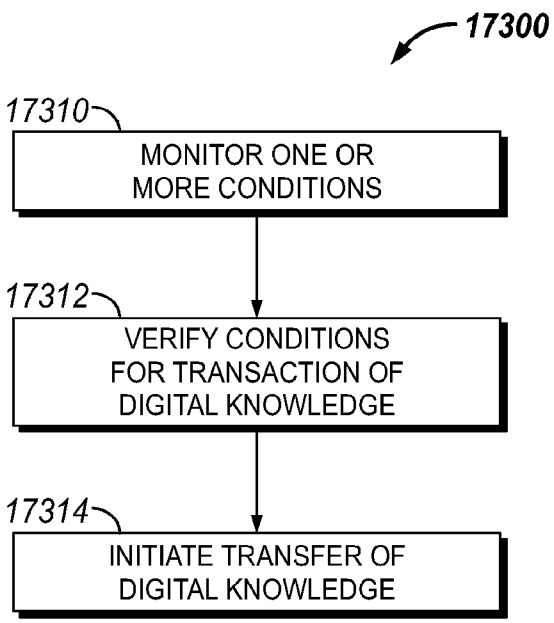

17300
17310
MONITOR ONE OR MORE CONDITIONS
17312
VERIFY CONDITIONS FOR TRANSACTION OF DIGITAL KNOWLEDGE
17314
INITIATE TRANSFER OF DIGITAL KNOWLEDGE

FIG. 173

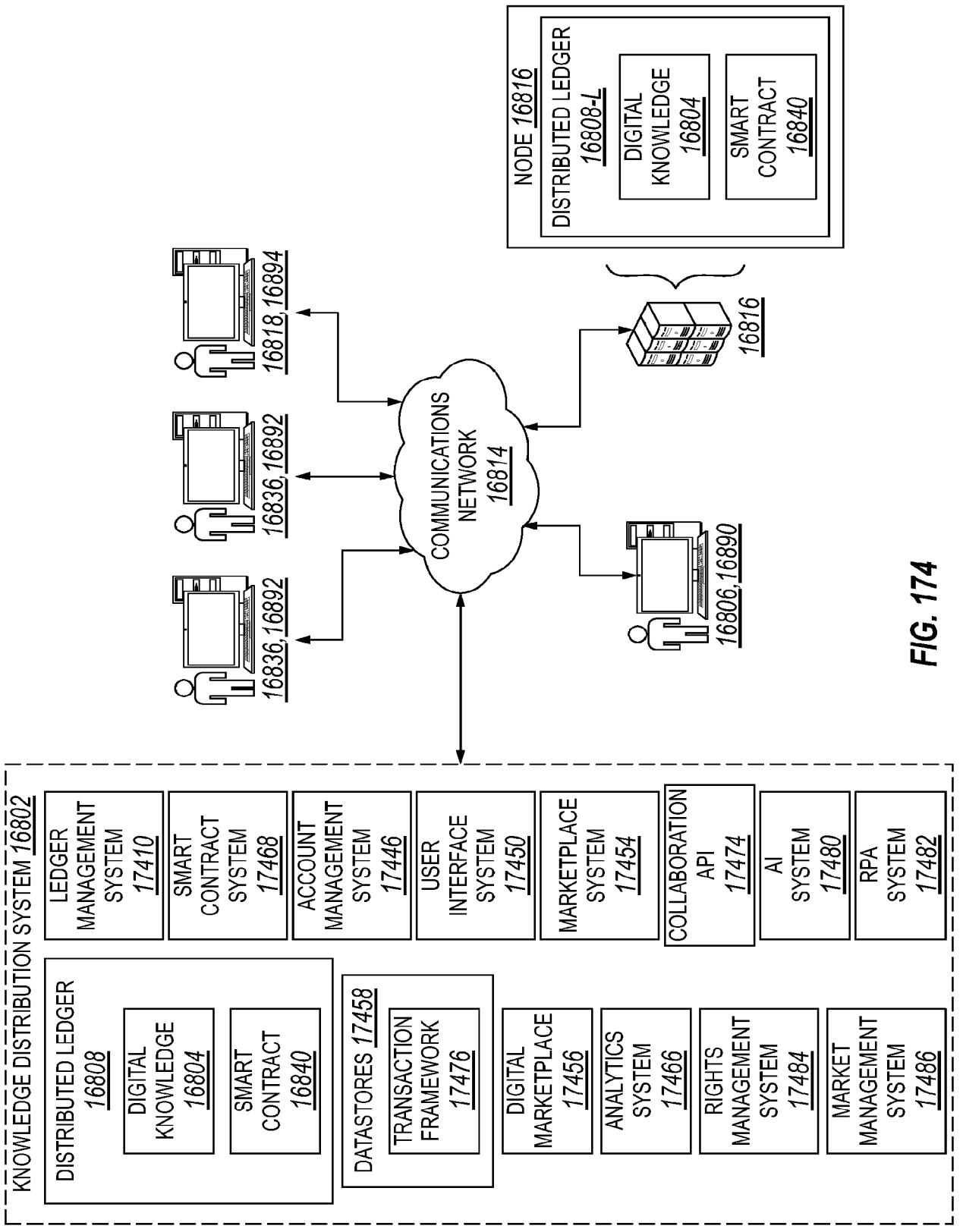

KNOWLEDGE DISTRIBUTION SYSTEM 16802
DISTRIBUTED LEDGER 16808
DIGITAL KNOWLEDGE 16804
SMART CONTRACT 16840
LEDGER MANAGEMENT SYSTEM 17410
SMART CONTRACT SYSTEM 17468
ACCOUNT MANAGEMENT SYSTEM 17446
USER INTERFACE SYSTEM 17450
MARKETPLACE SYSTEM 17454
COLLABORATION API 17474
AI SYSTEM 17480
RPA SYSTEM 17482
DATASTORES 17458
TRANSACTION FRAMEWORK 17476
DIGITAL MARKETPLACE 17456
ANALYTICS SYSTEM 17466
RIGHTS MANAGEMENT SYSTEM 17484
MARKET MANAGEMENT SYSTEM 17486
COMMUNICATIONS NETWORK 16814
16836,16892
16836,16892
16818,16894
16806,16890
16816
NODE 16816
DISTRIBUTED LEDGER 16808-L
DIGITAL KNOWLEDGE 16804
SMART CONTRACT 16840

FIG. 174

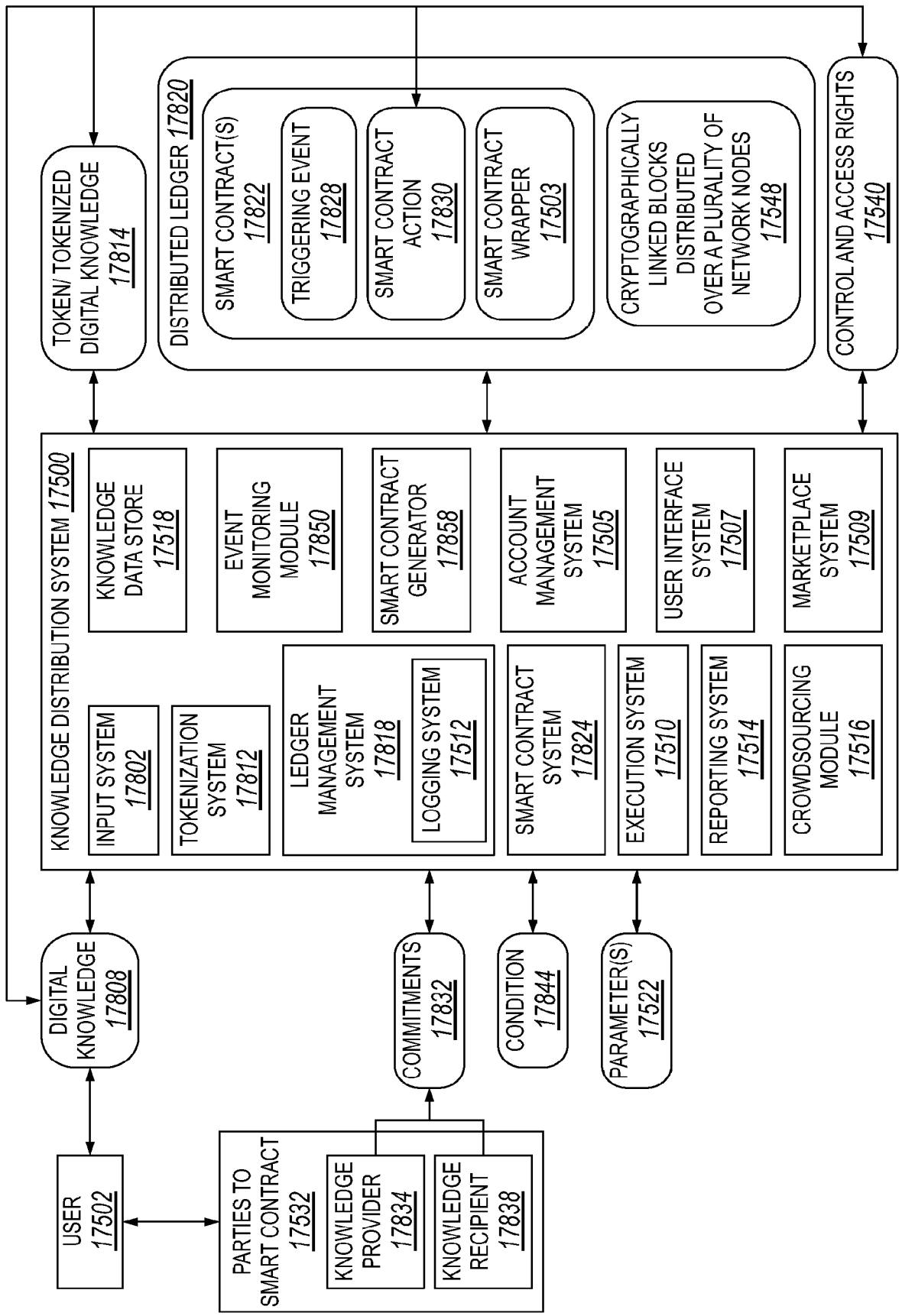

TOKEN/ TOKENIZED DIGITAL KNOWLEDGE 17814
DISTRIBUTED LEDGER 17820
SMART CONTRACT(S) 17822
TRIGGERING EVENT 17828
SMART CONTRACT ACTION 17830
SMART CONTRACT WRAPPER 17503
CRYPTOGRAPHICALLY LINKED BLOCKS DISTRIBUTED OVER A PLURALITY OF NETWORK NODES 17548
CONTROL AND ACCESS RIGHTS 17540
KNOWLEDGE DISTRIBUTION SYSTEM 17500
KNOWLEDGE DATA STORE 17518
EVENT MONITORING MODULE 17850
SMART CONTRACT GENERATOR 17858
ACCOUNT MANAGEMENT SYSTEM 17505
USER INTERFACE SYSTEM 17507
MARKETPLACE SYSTEM 17509
INPUT SYSTEM 17802
TOKENIZATION SYSTEM 17812
LEDGER MANAGEMENT SYSTEM 17818
LOGGING SYSTEM 17512
SMART CONTRACT SYSTEM 17824
EXECUTION SYSTEM 17510
REPORTING SYSTEM 17514
CROWDSOURCING MODULE 17516
DIGITAL KNOWLEDGE 17808
COMMITMENTS 17832
CONDITION 17844
PARAMETER(S) 17522
USER 17502
PARTIES TO SMART CONTRACT 17532
KNOWLEDGE PROVIDER 17834
KNOWLEDGE RECIPIENT 17838

FIG. 175

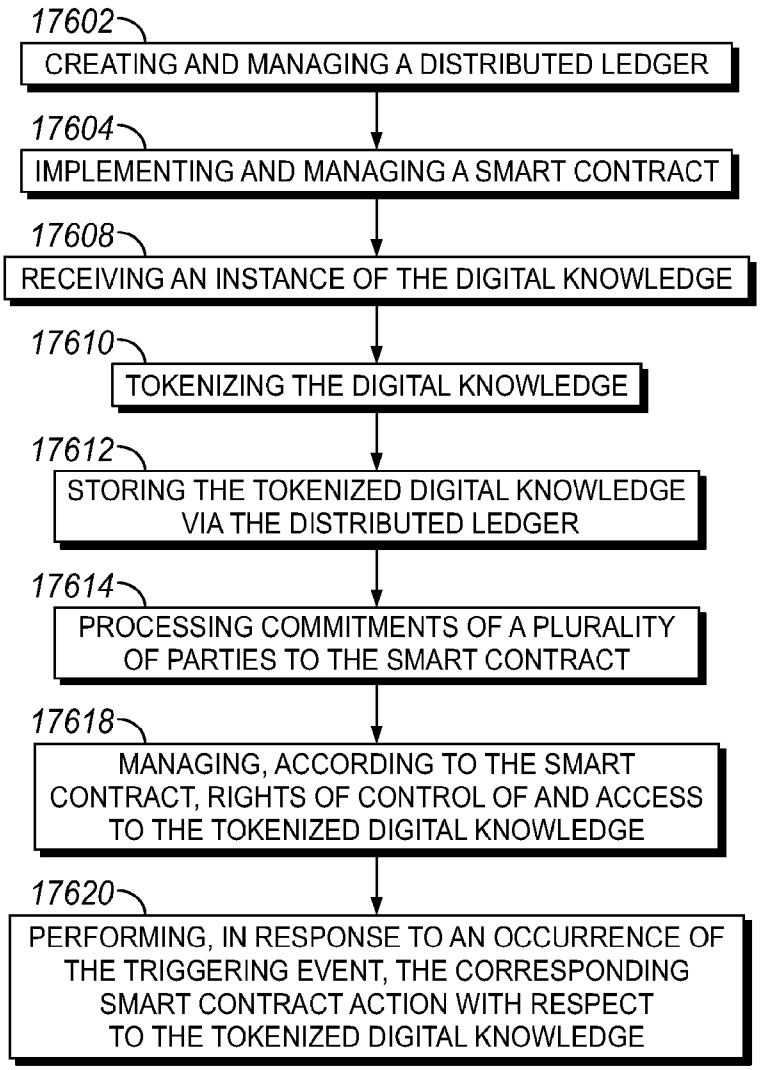

17602
CREATING AND MANAGING A DISTRIBUTED LEDGER
17604
IMPLEMENTING AND MANAGING A SMART CONTRACT
17608
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
17610
TOKENIZING THE DIGITAL KNOWLEDGE
17612
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
17614
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
17618
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
17620
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE

FIG. 176

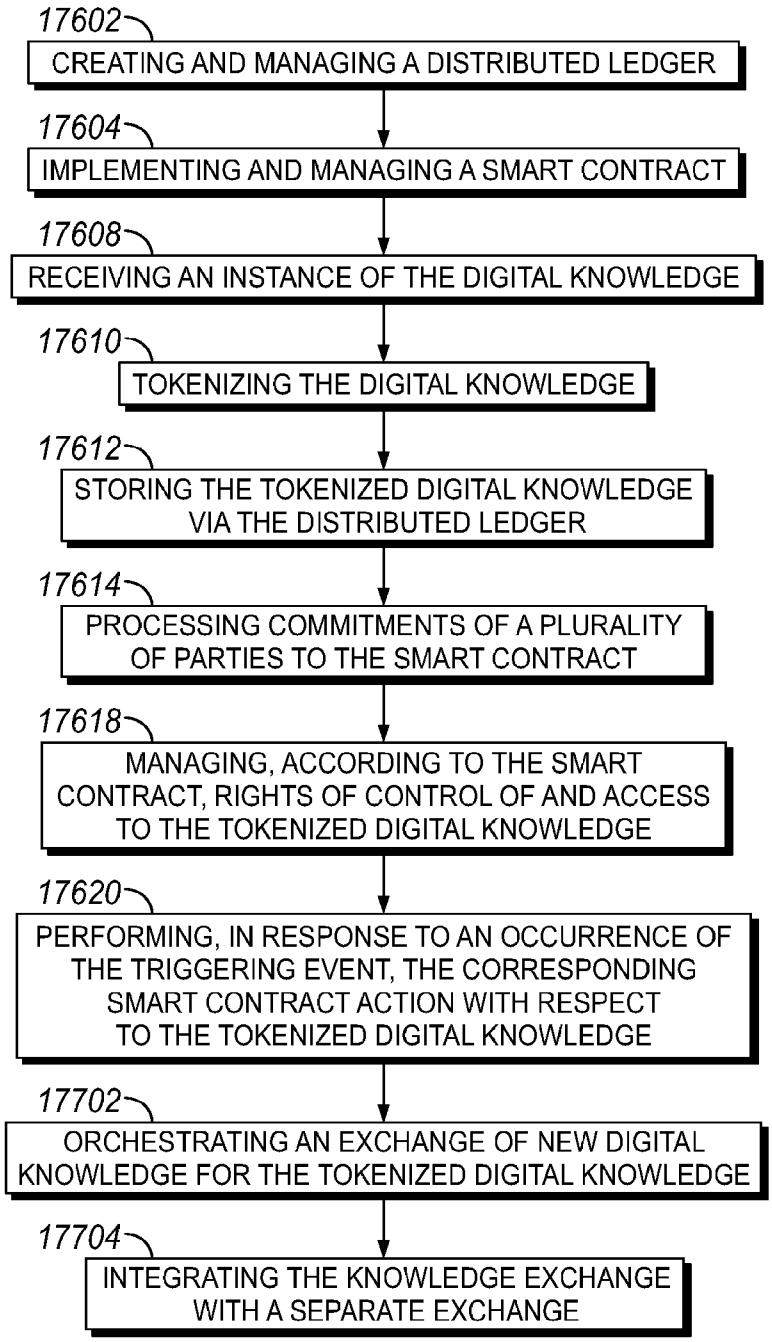

17602
CREATING AND MANAGING A DISTRIBUTED LEDGER
17604
IMPLEMENTING AND MANAGING A SMART CONTRACT
17608
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
17610
TOKENIZING THE DIGITAL KNOWLEDGE
17612
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
17614
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
17618
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
17620
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
17702
ORCHESTRATING AN EXCHANGE OF NEW DIGITAL KNOWLEDGE FOR THE TOKENIZED DIGITAL KNOWLEDGE
17704
INTEGRATING THE KNOWLEDGE EXCHANGE WITH A SEPARATE EXCHANGE

FIG. 177

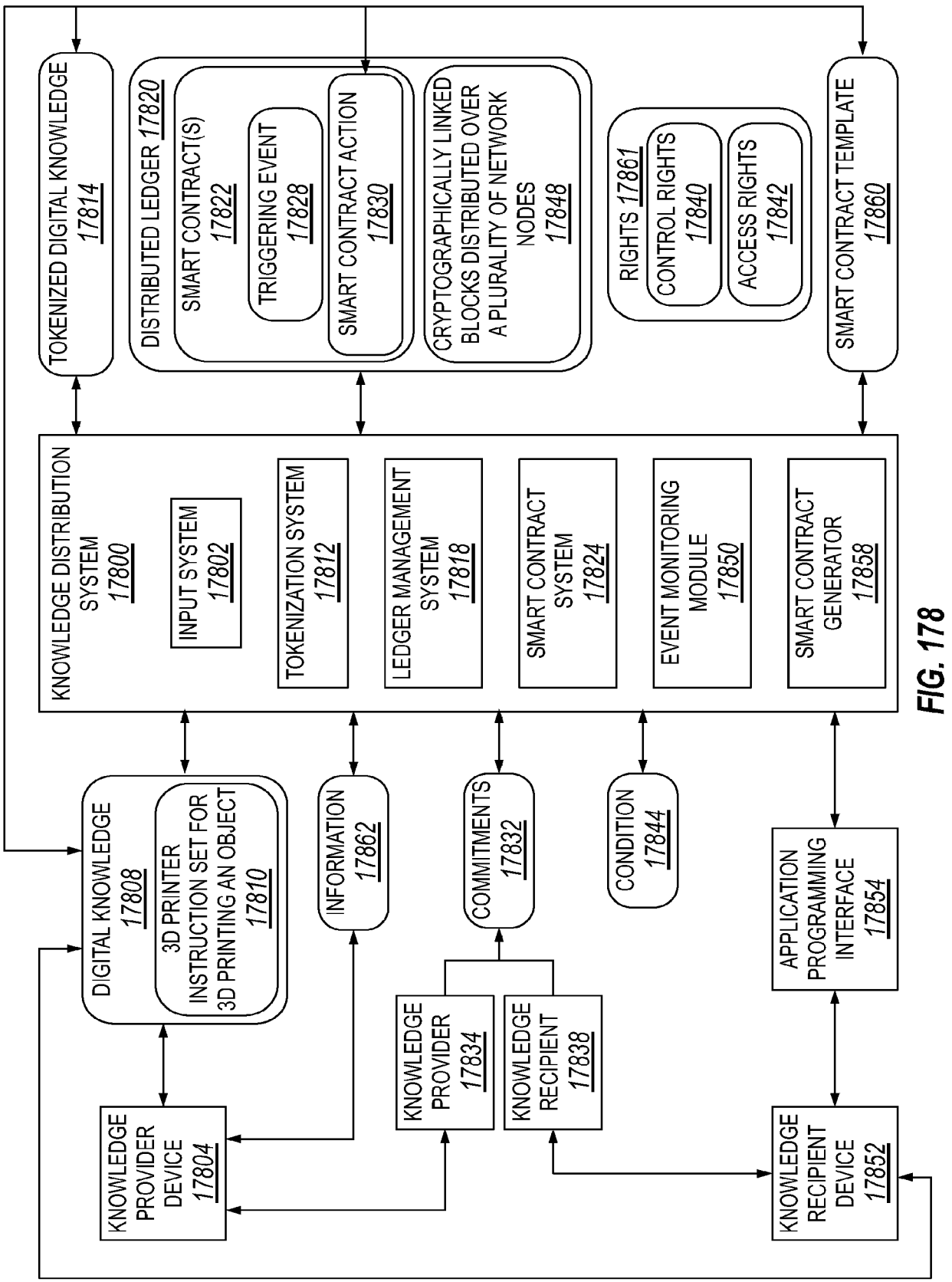

TOKENIZED DIGITAL KNOWLEDGE 17814
DISTRIBUTED LEDGER 17820
SMART CONTRACT(S) 17822
TRIGGERING EVENT 17828
SMART CONTRACT ACTION 17830
CRYPTOGRAPHICALLY LINKED BLOCKS DISTRIBUTED OVER A PLURALITY OF NETWORK NODES 17848
RIGHTS 17861
CONTROL RIGHTS 17840
ACCESS RIGHTS 17842
SMART CONTRACT TEMPLATE 17860
KNOWLEDGE DISTRIBUTION SYSTEM 17800
INPUT SYSTEM 17802
TOKENIZATION SYSTEM 17812
LEDGER MANAGEMENT SYSTEM 17818
SMART CONTRACT SYSTEM 17824
EVENT MONITORING MODULE 17850
SMART CONTRACT GENERATOR 17858
DIGITAL KNOWLEDGE 17808
3D PRINTER INSTRUCTION SET FOR 3D PRINTING AN OBJECT 17810
INFORMATION 17862
COMMITMENTS 17832
CONDITION 17844
APPLICATION PROGRAMMING INTERFACE 17854
KNOWLEDGE PROVIDER 17834
KNOWLEDGE RECIPIENT 17838
KNOWLEDGE PROVIDER DEVICE 17804
KNOWLEDGE RECIPIENT DEVICE 17852

FIG. 178

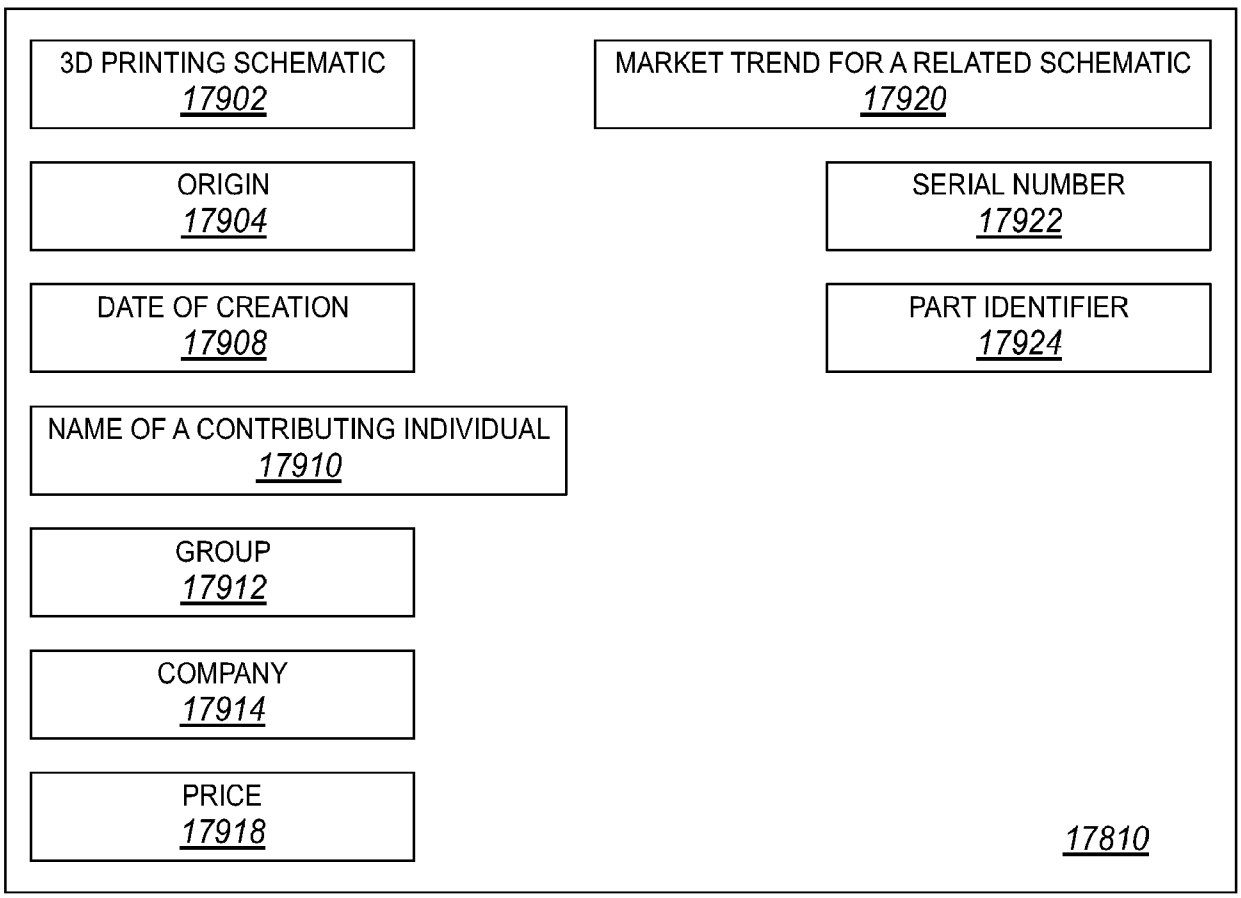

3D PRINTING SCHEMATIC
17902
MARKET TREND FOR A RELATED SCHEMATIC
17920
ORIGIN
17904
SERIAL NUMBER
17922
DATE OF CREATION
17908
PART IDENTIFIER
17924
NAME OF A CONTRIBUTING INDIVIDUAL
17910
GROUP
17912
COMPANY
17914
PRICE
17918
17810

FIG. 179

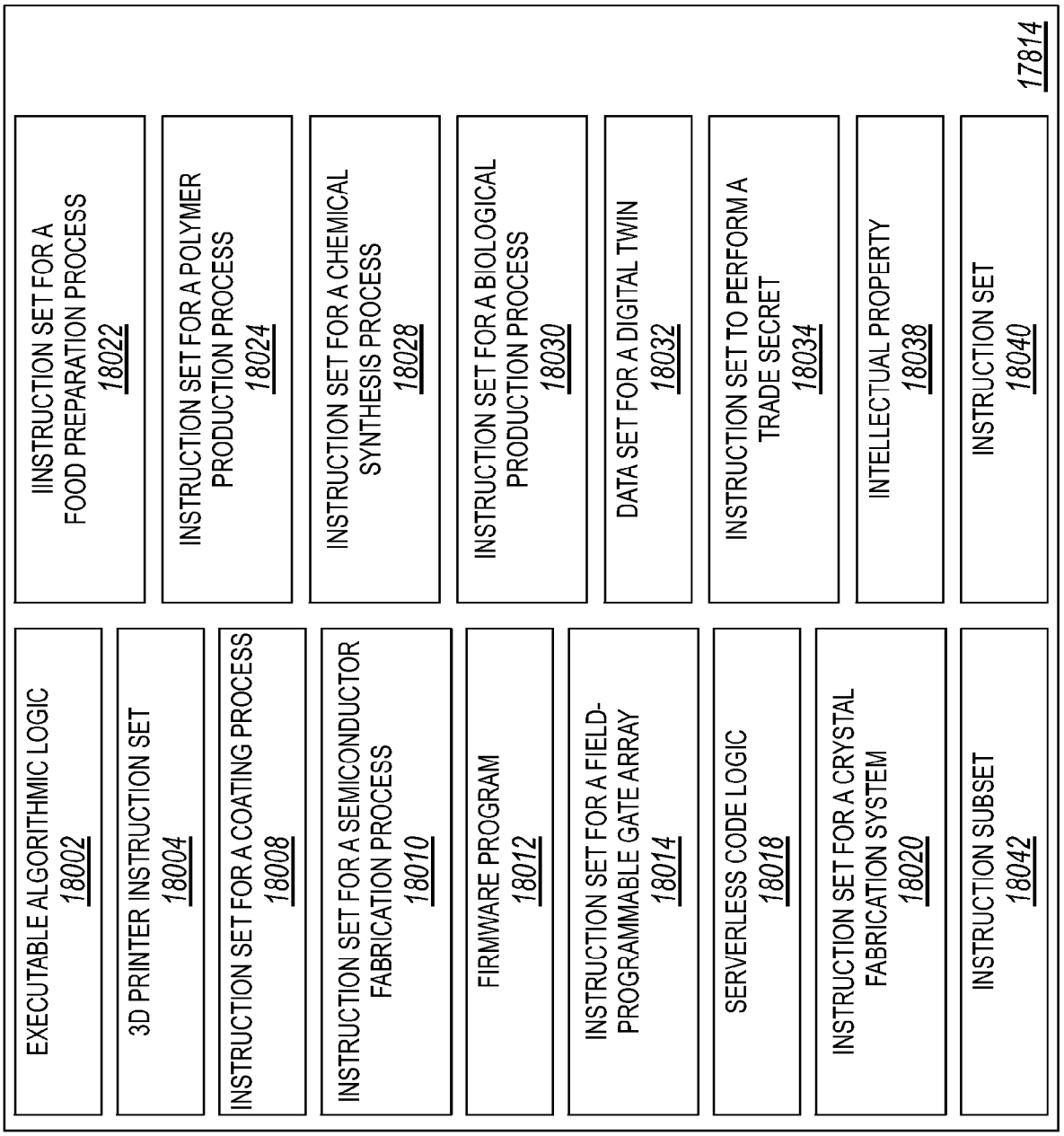

EXECUTABLE ALGORITHMIC LOGIC
18002
3D PRINTER INSTRUCTION SET
18004
INSTRUCTION SET FOR A COATING PROCESS
18008
INSTRUCTION SET FOR A SEMICONDUCTOR FABRICATION PROCESS
18010
FIRMWARE PROGRAM
18012
INSTRUCTION SET FOR A FIELD-PROGRAMMABLE GATE ARRAY
18014
SERVERLESS CODE LOGIC
18018
INSTRUCTION SET FOR A CRYSTAL FABRICATION SYSTEM
18020
INSTRUCTION SUBSET
18042
IINSTRUCTION SET FOR A FOOD PREPARATION PROCESS
18022
INSTRUCTION SET FOR A POLYMER PRODUCTION PROCESS
18024
INSTRUCTION SET FOR A CHEMICAL SYNTHESIS PROCESS
18028
INSTRUCTION SET FOR A BIOLOGICAL PRODUCTION PROCESS
18030
DATA SET FOR A DIGITAL TWIN
18032
INSTRUCTION SET TO PERFORM A TRADE SECRET
18034
INTELLECTUAL PROPERTY
18038
INSTRUCTION SET
18040
17814

FIG. 180

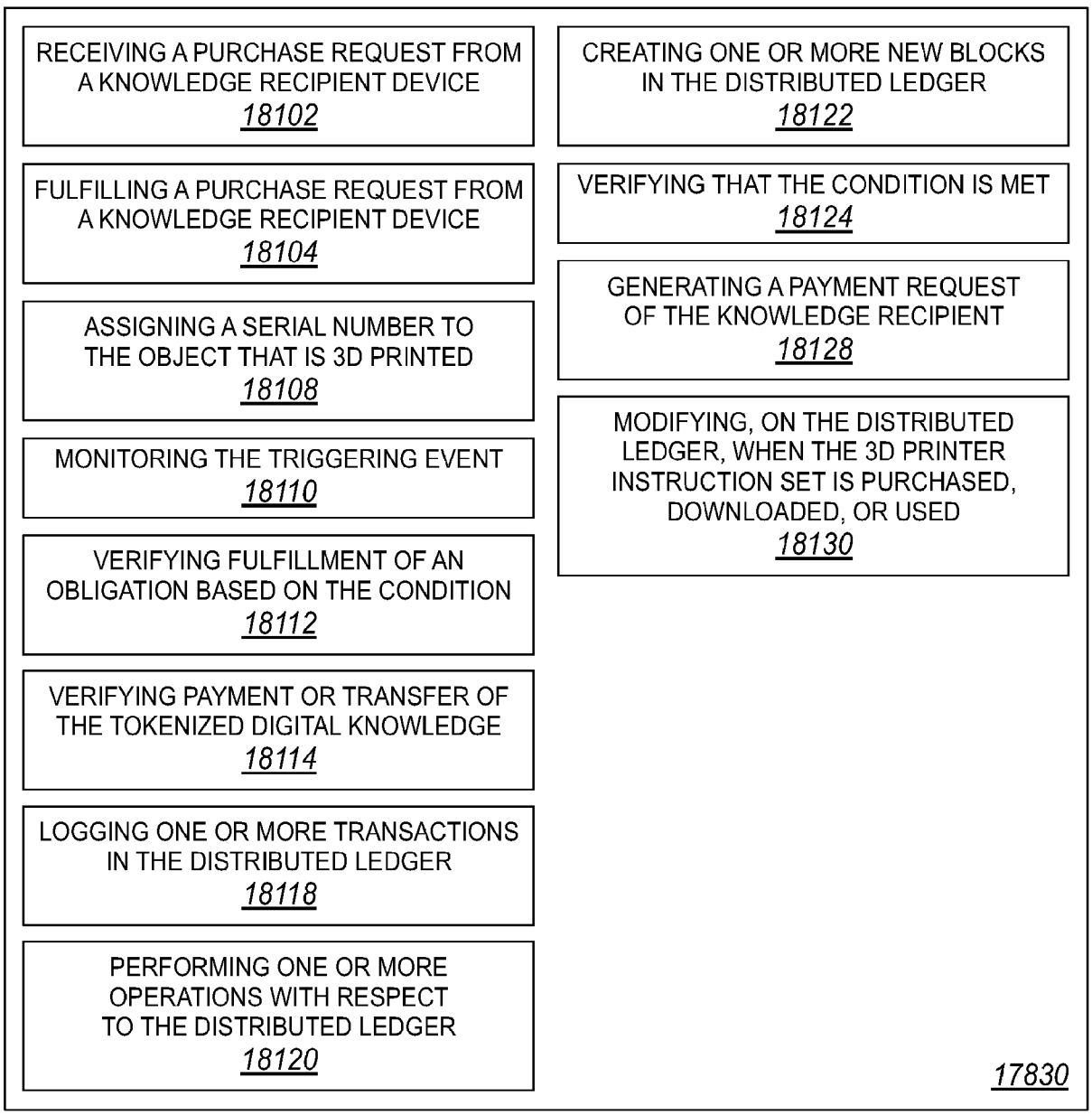

RECEIVING A PURCHASE REQUEST FROM A KNOWLEDGE RECIPIENT DEVICE
18102
FULFILLING A PURCHASE REQUEST FROM A KNOWLEDGE RECIPIENT DEVICE
18104
ASSIGNING A SERIAL NUMBER TO THE OBJECT THAT IS 3D PRINTED
18108
MONITORING THE TRIGGERING EVENT
18110
VERIFYING FULFILLMENT OF AN OBLIGATION BASED ON THE CONDITION
18112
VERIFYING PAYMENT OR TRANSFER OF THE TOKENIZED DIGITAL KNOWLEDGE
18114
LOGGING ONE OR MORE TRANSACTIONS IN THE DISTRIBUTED LEDGER
18118
PERFORMING ONE OR MORE OPERATIONS WITH RESPECT TO THE DISTRIBUTED LEDGER
18120
CREATING ONE OR MORE NEW BLOCKS IN THE DISTRIBUTED LEDGER
18122
VERIFYING THAT THE CONDITION IS MET
18124
GENERATING A PAYMENT REQUEST OF THE KNOWLEDGE RECIPIENT
18128
MODIFYING, ON THE DISTRIBUTED LEDGER, WHEN THE 3D PRINTER INSTRUCTION SET IS PURCHASED, DOWNLOADED, OR USED
18130
17830

FIG. 181

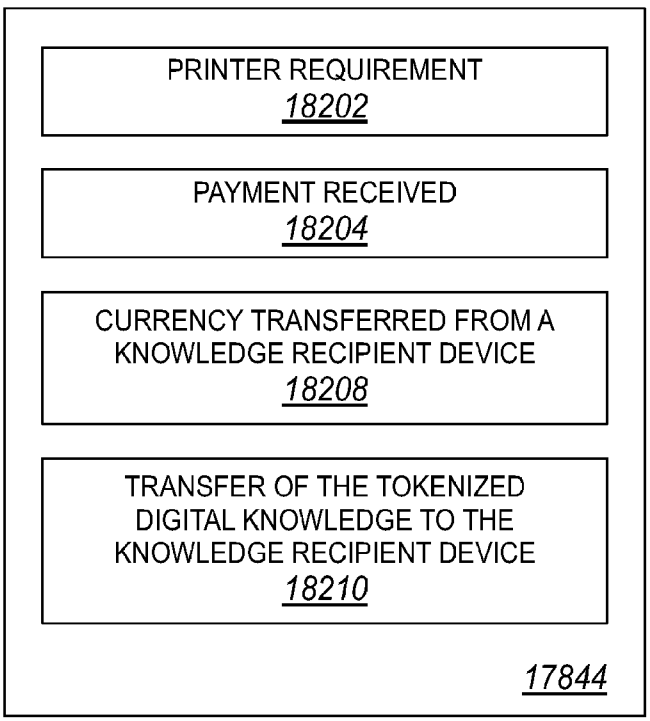

PRINTER REQUIREMENT
18202
PAYMENT RECEIVED
18204
CURRENCY TRANSFERRED FROM A KNOWLEDGE RECIPIENT DEVICE
18208
TRANSFER OF THE TOKENIZED DIGITAL KNOWLEDGE TO THE KNOWLEDGE RECIPIENT DEVICE
18210
17844

FIG. 182

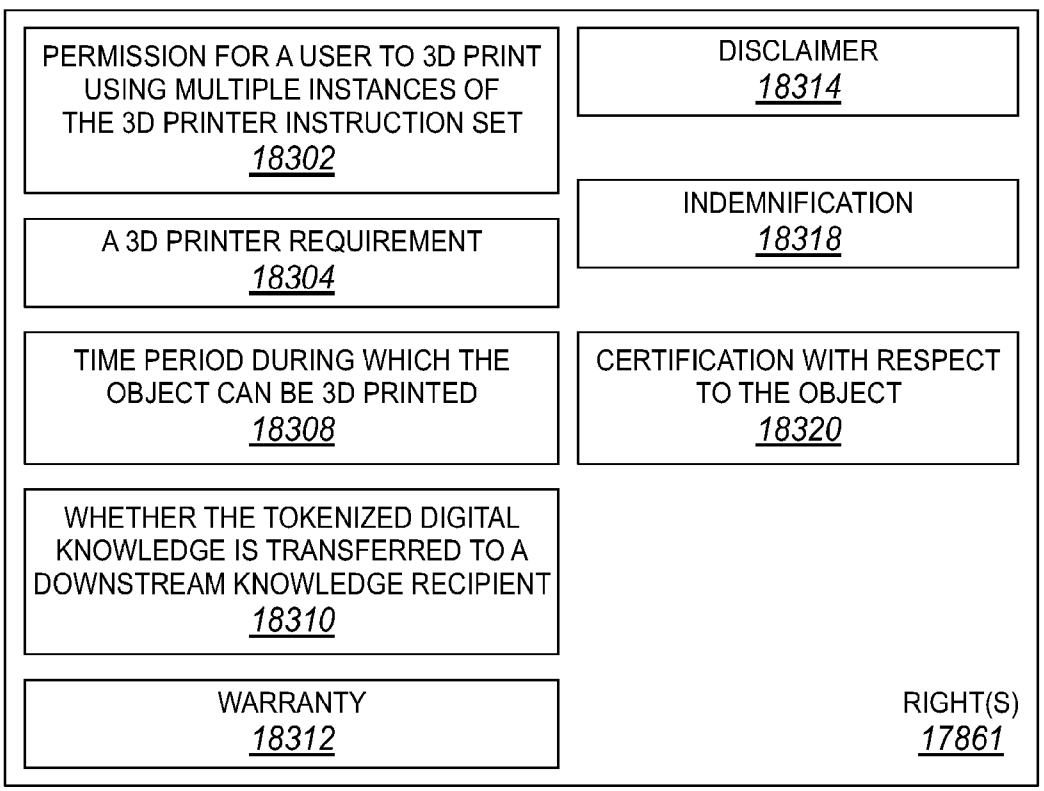

PERMISSION FOR A USER TO 3D PRINT USING MULTIPLE INSTANCES OF THE 3D PRINTER INSTRUCTION SET
18302
A 3D PRINTER REQUIREMENT
18304
TIME PERIOD DURING WHICH THE OBJECT CAN BE 3D PRINTED
18308
WHETHER THE TOKENIZED DIGITAL KNOWLEDGE IS TRANSFERRED TO A DOWNSTREAM KNOWLEDGE RECIPIENT
18310
WARRANTY
18312
DISCLAIMER
18314
INDEMNIFICATION
18318
CERTIFICATION WITH RESPECT TO THE OBJECT
18320
RIGHT(S)
17861

FIG. 183

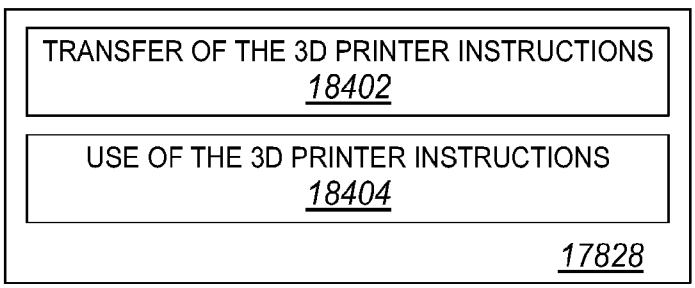

TRANSFER OF THE 3D PRINTER INSTRUCTIONS
18402
USE OF THE 3D PRINTER INSTRUCTIONS
18404
17828

FIG. 184

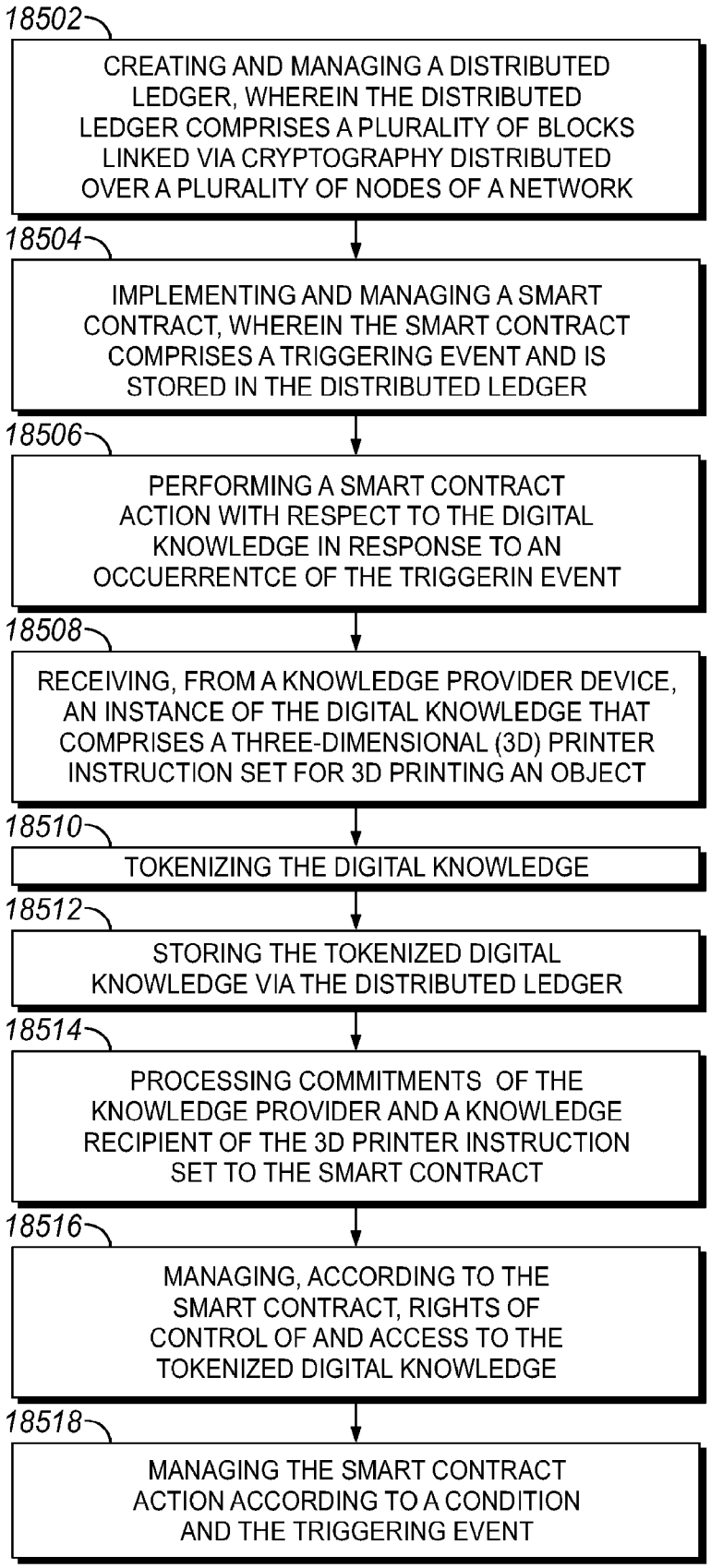

18502
CREATING AND MANAGING A DISTRIBUTED LEDGER, WHEREIN THE DISTRIBUTED LEDGER COMPRISES A PLURALITY OF BLOCKS LINKED VIA CRYPTOGRAPHY DISTRIBUTED OVER A PLURALITY OF NODES OF A NETWORK
18504
IMPLEMENTING AND MANAGING A SMART CONTRACT, WHEREIN THE SMART CONTRACT COMPRISES A TRIGGERING EVENT AND IS STORED IN THE DISTRIBUTED LEDGER
18506
PERFORMING A SMART CONTRACT ACTION WITH RESPECT TO THE DIGITAL KNOWLEDGE IN RESPONSE TO AN OCCUERRENTCE OF THE TRIGGERIN EVENT
18508
RECEIVING, FROM A KNOWLEDGE PROVIDER DEVICE, AN INSTANCE OF THE DIGITAL KNOWLEDGE THAT COMPRISES A THREE-DIMENSIONAL (3D) PRINTER INSTRUCTION SET FOR 3D PRINTING AN OBJECT
18510
TOKENIZING THE DIGITAL KNOWLEDGE
18512
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
18514
PROCESSING COMMITMENTS OF THE KNOWLEDGE PROVIDER AND A KNOWLEDGE RECIPIENT OF THE 3D PRINTER INSTRUCTION SET TO THE SMART CONTRACT
18516
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
18518
MANAGING THE SMART CONTRACT ACTION ACCORDING TO A CONDITION AND THE TRIGGERING EVENT

FIG. 185

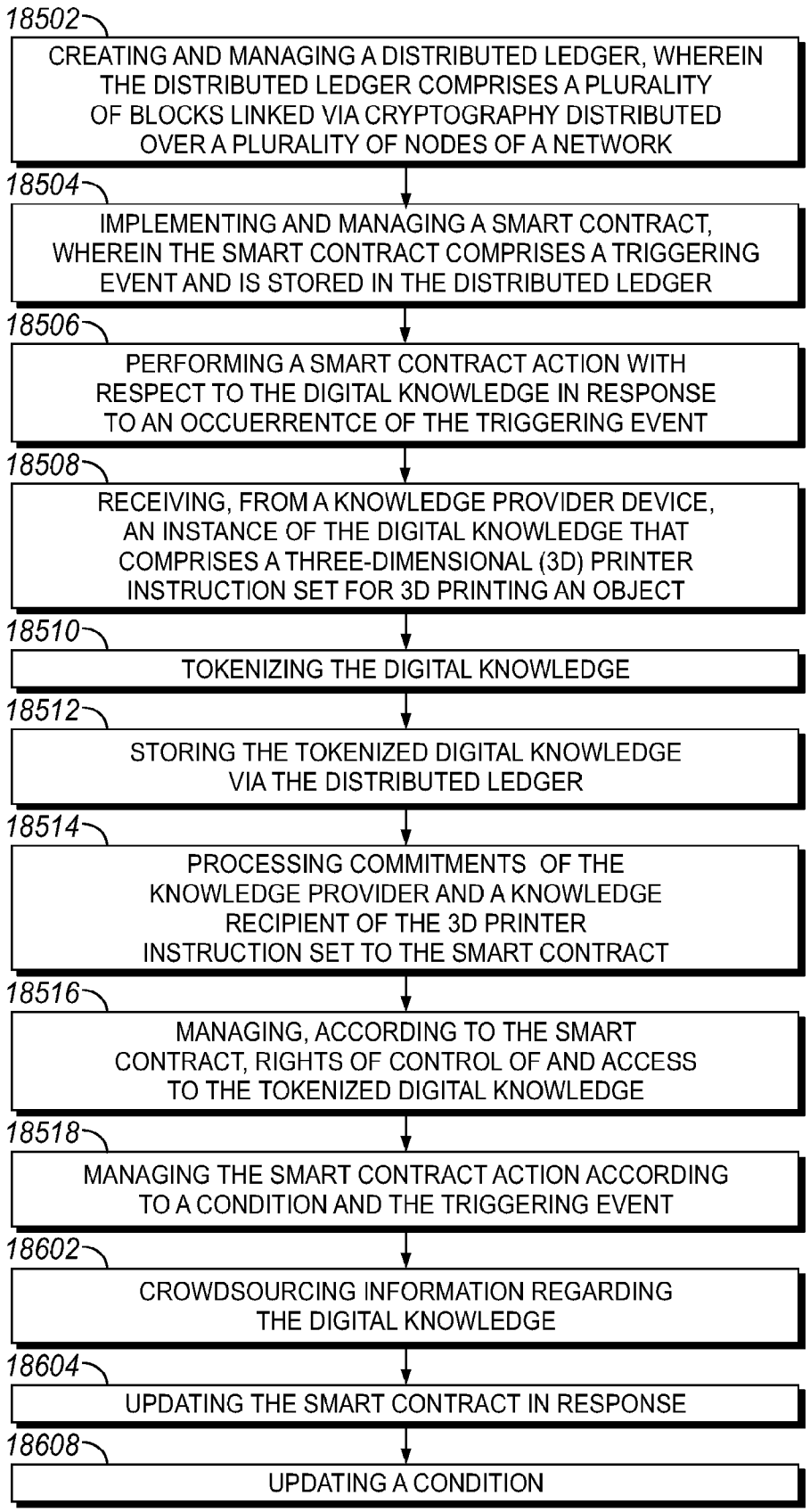

18502
CREATING AND MANAGING A DISTRIBUTED LEDGER, WHEREIN THE DISTRIBUTED LEDGER COMPRISES A PLURALITY OF BLOCKS LINKED VIA CRYPTOGRAPHY DISTRIBUTED OVER A PLURALITY OF NODES OF A NETWORK
18504
IMPLEMENTING AND MANAGING A SMART CONTRACT, WHEREIN THE SMART CONTRACT COMPRISES A TRIGGERING EVENT AND IS STORED IN THE DISTRIBUTED LEDGER
18506
PERFORMING A SMART CONTRACT ACTION WITH RESPECT TO THE DIGITAL KNOWLEDGE IN RESPONSE TO AN OCCUERRENTCE OF THE TRIGGERING EVENT
18508
RECEIVING, FROM A KNOWLEDGE PROVIDER DEVICE, AN INSTANCE OF THE DIGITAL KNOWLEDGE THAT COMPRISES A THREE-DIMENSIONAL (3D) PRINTER INSTRUCTION SET FOR 3D PRINTING AN OBJECT
18510
TOKENIZING THE DIGITAL KNOWLEDGE
18512
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
18514
PROCESSING COMMITMENTS OF THE KNOWLEDGE PROVIDER AND A KNOWLEDGE RECIPIENT OF THE 3D PRINTER INSTRUCTION SET TO THE SMART CONTRACT
18516
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
18518
MANAGING THE SMART CONTRACT ACTION ACCORDING TO A CONDITION AND THE TRIGGERING EVENT
18602
CROWDSOURCING INFORMATION REGARDING THE DIGITAL KNOWLEDGE
18604
UPDATING THE SMART CONTRACT IN RESPONSE
18608
UPDATING A CONDITION

FIG. 186

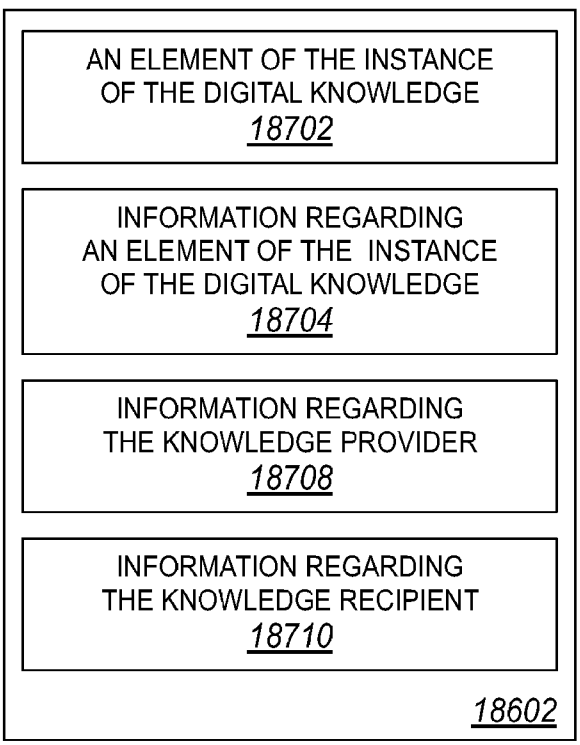

AN ELEMENT OF THE INSTANCE OF THE DIGITAL KNOWLEDGE
18702
INFORMATION REGARDING AN ELEMENT OF THE INSTANCE OF THE DIGITAL KNOWLEDGE
18704
INFORMATION REGARDING THE KNOWLEDGE PROVIDER
18708
INFORMATION REGARDING THE KNOWLEDGE RECIPIENT
18710
18602

FIG. 187

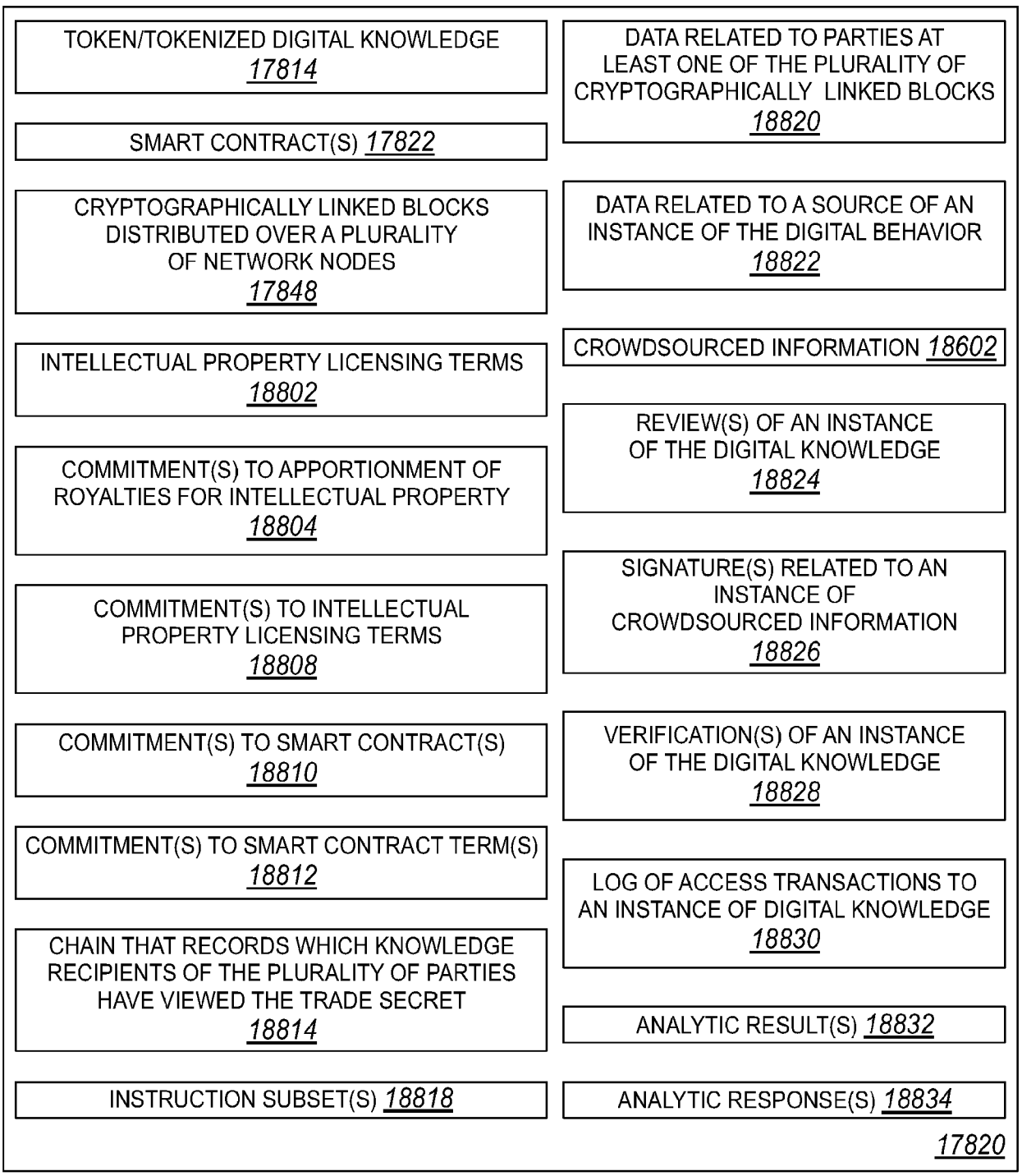

TOKEN/TOKENIZED DIGITAL KNOWLEDGE 17814
SMART CONTRACT(S) 17822
CRYPTOGRAPHICALLY LINKED BLOCKS DISTRIBUTED OVER A PLURALITY OF NETWORK NODES 17848
INTELLECTUAL PROPERTY LICENSING TERMS 18802
COMMITMENT(S) TO APPORTIONMENT OF ROYALTIES FOR INTELLECTUAL PROPERTY 18804
COMMITMENT(S) TO INTELLECTUAL PROPERTY LICENSING TERMS 18808
COMMITMENT(S) TO SMART CONTRACT(S) 18810
COMMITMENT(S) TO SMART CONTRACT TERM(S) 18812
CHAIN THAT RECORDS WHICH KNOWLEDGE RECIPIENTS OF THE PLURALITY OF PARTIES HAVE VIEWED THE TRADE SECRET 18814
INSTRUCTION SUBSET(S) 18818
DATA RELATED TO PARTIES AT LEAST ONE OF THE PLURALITY OF CRYPTOGRAPHICALLY LINKED BLOCKS 18820
DATA RELATED TO A SOURCE OF AN INSTANCE OF THE DIGITAL BEHAVIOR 18822
CROWDSOURCED INFORMATION 18602
REVIEW(S) OF AN INSTANCE OF THE DIGITAL KNOWLEDGE 18824
SIGNATURE(S) RELATED TO AN INSTANCE OF CROWDSOURCED INFORMATION 18826
VERIFICATION(S) OF AN INSTANCE OF THE DIGITAL KNOWLEDGE 18828
LOG OF ACCESS TRANSACTIONS TO AN INSTANCE OF DIGITAL KNOWLEDGE 18830
ANALYTIC RESULT(S) 18832
ANALYTIC RESPONSE(S) 18834
17820

FIG. 188

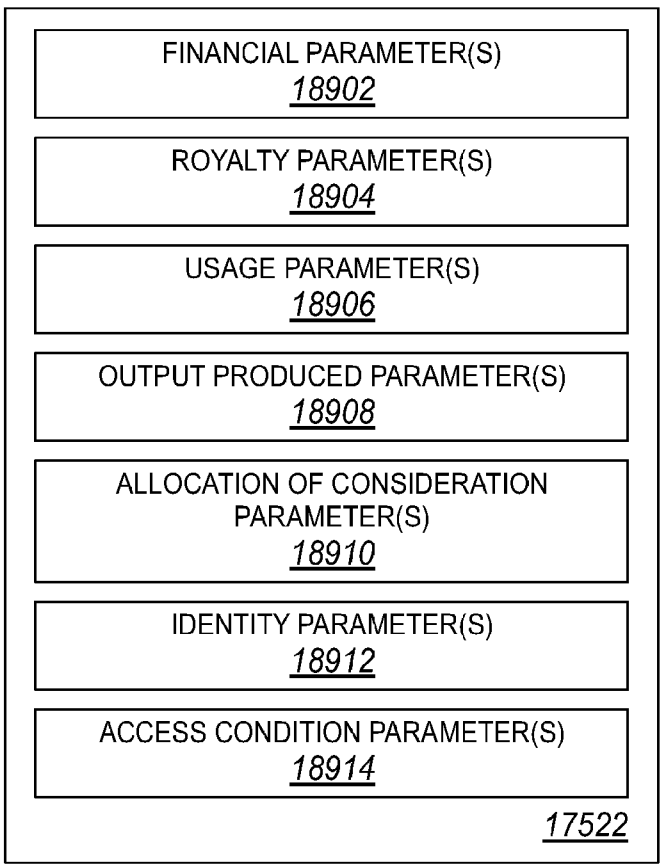

FINANCIAL PARAMETER(S)
18902
ROYALTY PARAMETER(S)
18904
USAGE PARAMETER(S)
18906
OUTPUT PRODUCED PARAMETER(S)
18908
ALLOCATION OF CONSIDERATION PARAMETER(S)
18910
IDENTITY PARAMETER(S)
18912
ACCESS CONDITION PARAMETER(S)
18914
17522

FIG. 189

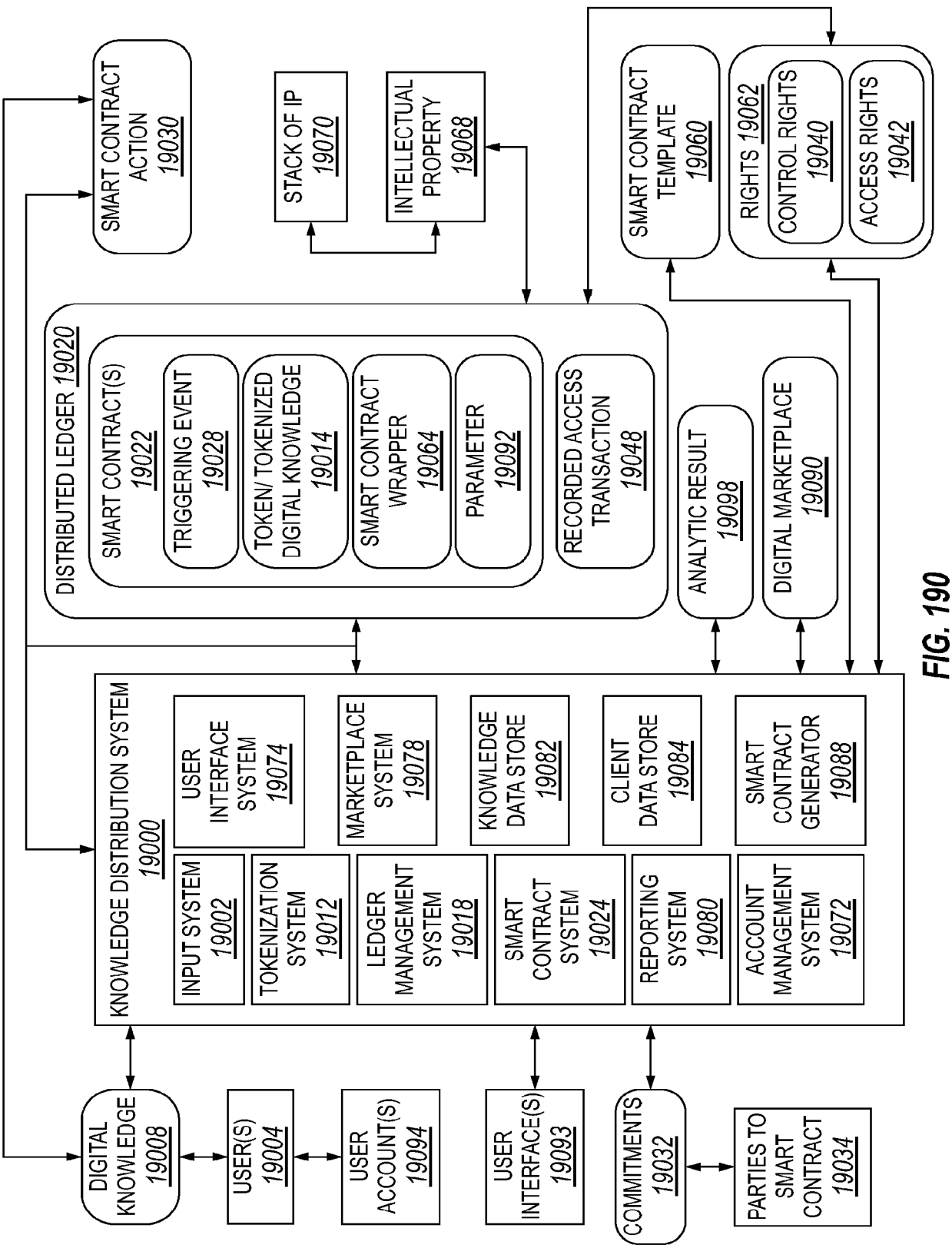

SMART CONTRACT ACTION 19030
STACK OF IP 19070
INTELLECTUAL PROPERTY 19068
SMART CONTRACT TEMPLATE 19060
RIGHTS 19062
CONTROL RIGHTS 19040
ACCESS RIGHTS 19042
DISTRIBUTED LEDGER 19020
SMART CONTRACT(S) 19022
TRIGGERING EVENT 19028
TOKEN/ TOKENIZED DIGITAL KNOWLEDGE 19014
SMART CONTRACT WRAPPER 19064
PARAMETER 19092
RECORDED ACCESS TRANSACTION 19048
ANALYTIC RESULT 19098
DIGITAL MARKETPLACE 19090
KNOWLEDGE DISTRIBUTION SYSTEM 19000
USER INTERFACE SYSTEM 19074
MARKETPLACE SYSTEM 19078
KNOWLEDGE DATA STORE 19082
CLIENT DATA STORE 19084
SMART CONTRACT GENERATOR 19088
INPUT SYSTEM 19002
TOKENIZATION SYSTEM 19012
LEDGER MANAGEMENT SYSTEM 19018
SMART CONTRACT SYSTEM 19024
REPORTING SYSTEM 19080
ACCOUNT MANAGEMENT SYSTEM 19072
DIGITAL KNOWLEDGE 19008
USER(S) 19004
USER ACCOUNT(S) 19094
USER INTERFACE(S) 19093
COMMITMENTS 19032
PARTIES TO SMART CONTRACT 19034

FIG. 190

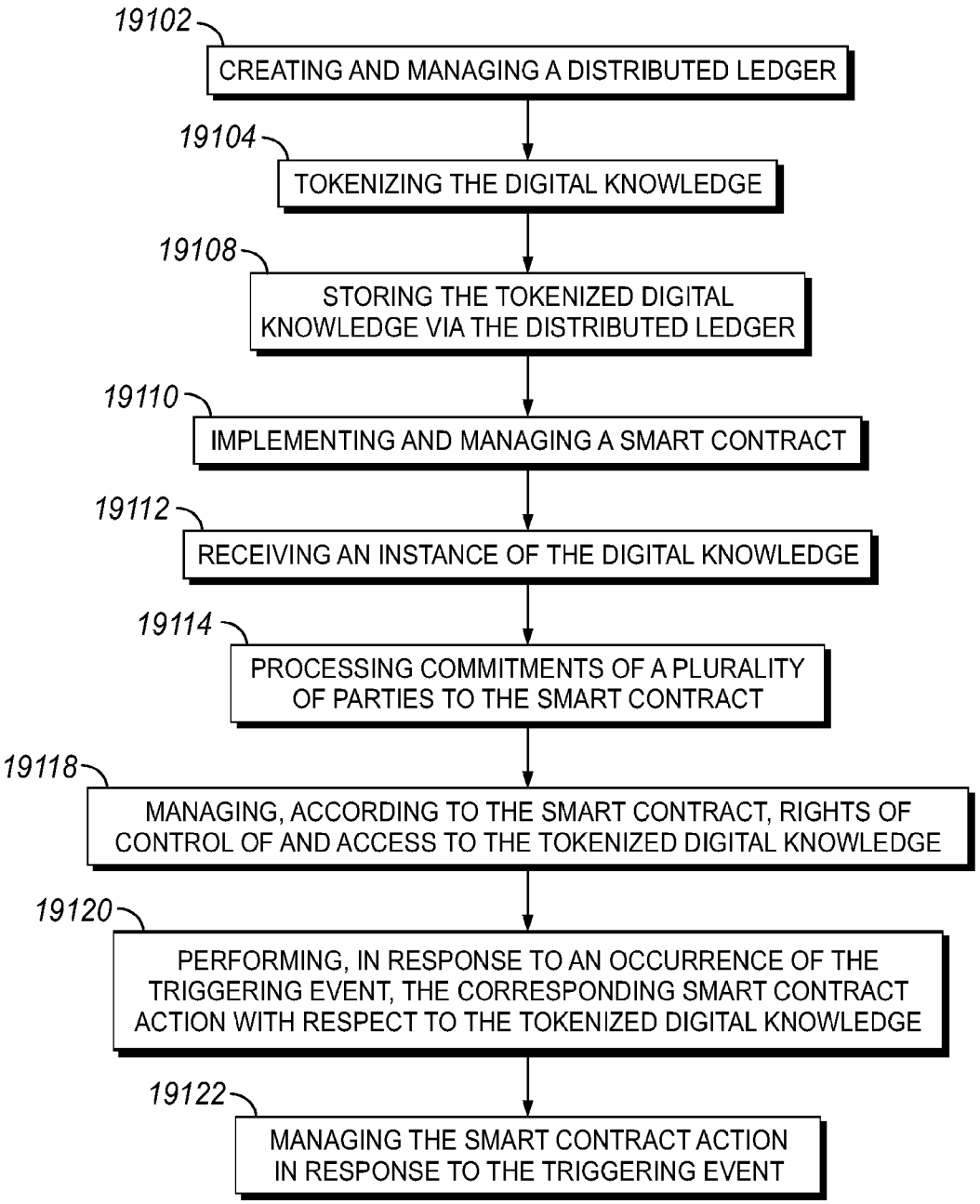

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT

FIG. 191

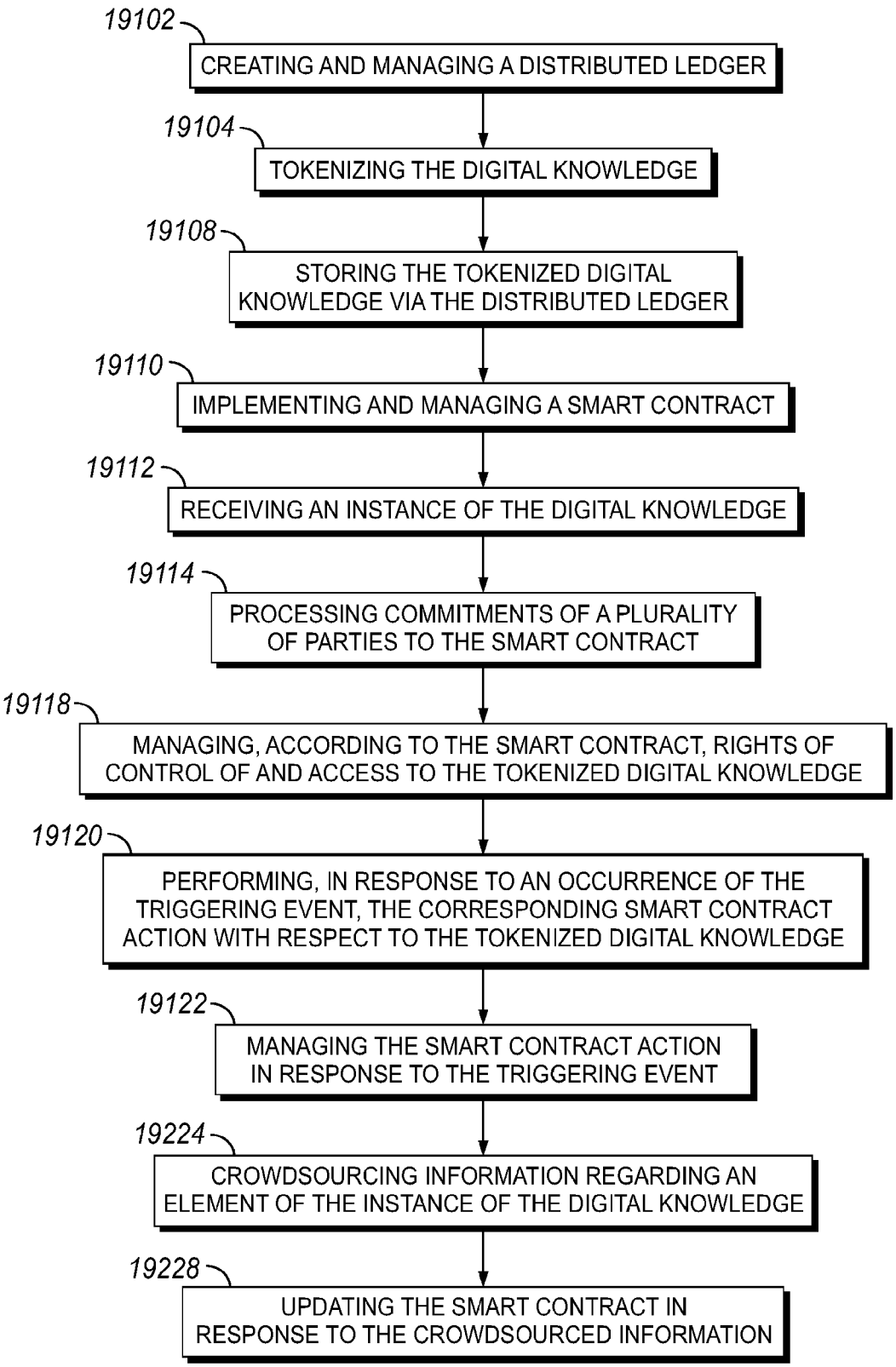

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT
19224
CROWDSOURCING INFORMATION REGARDING AN ELEMENT OF THE INSTANCE OF THE DIGITAL KNOWLEDGE
19228
UPDATING THE SMART CONTRACT IN RESPONSE TO THE CROWDSOURCED INFORMATION

FIG. 192

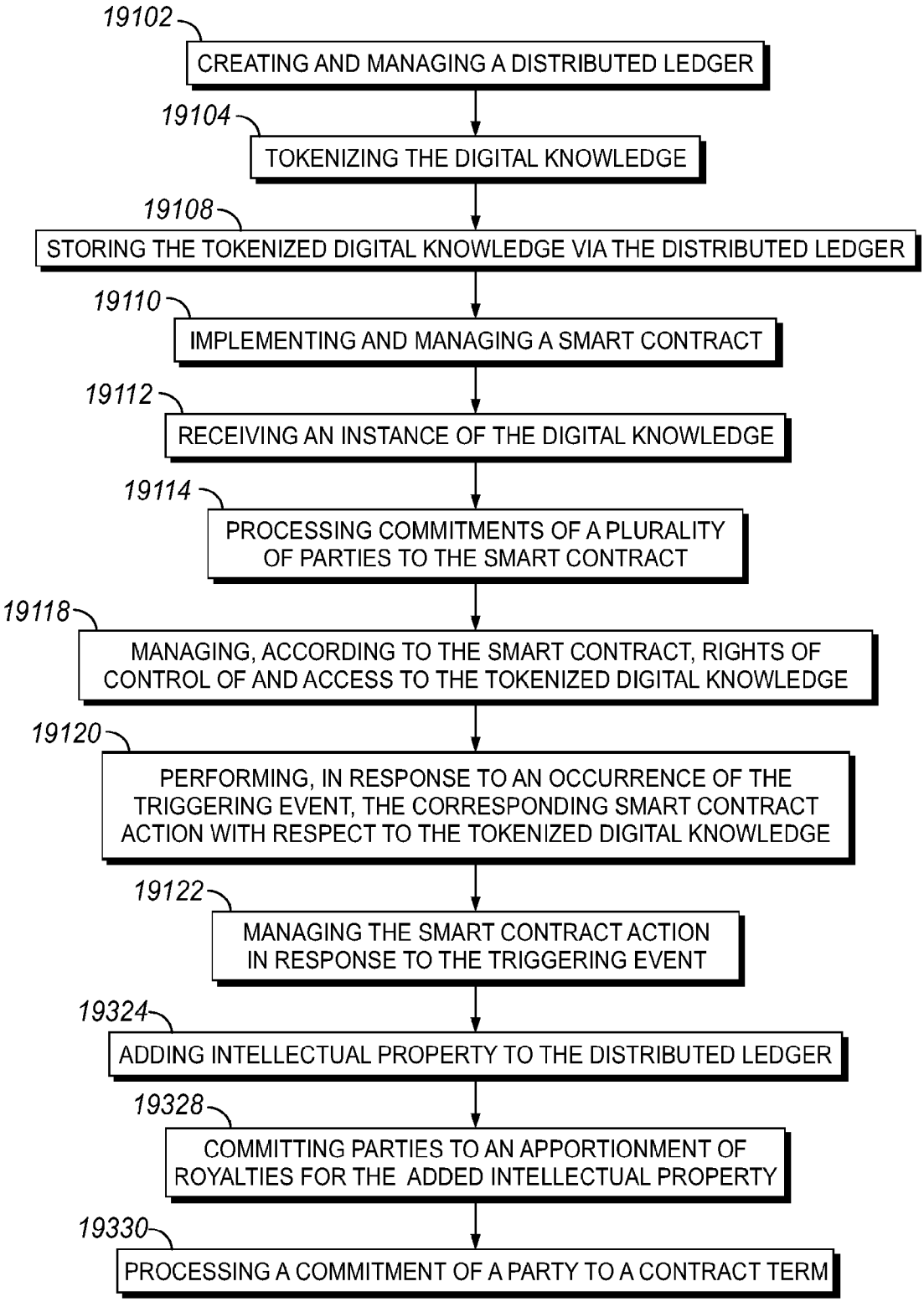

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT
19324
ADDING INTELLECTUAL PROPERTY TO THE DISTRIBUTED LEDGER
19328
COMMITTING PARTIES TO AN APPORTIONMENT OF ROYALTIES FOR THE ADDED INTELLECTUAL PROPERTY
19330
PROCESSING A COMMITMENT OF A PARTY TO A CONTRACT TERM

FIG. 193

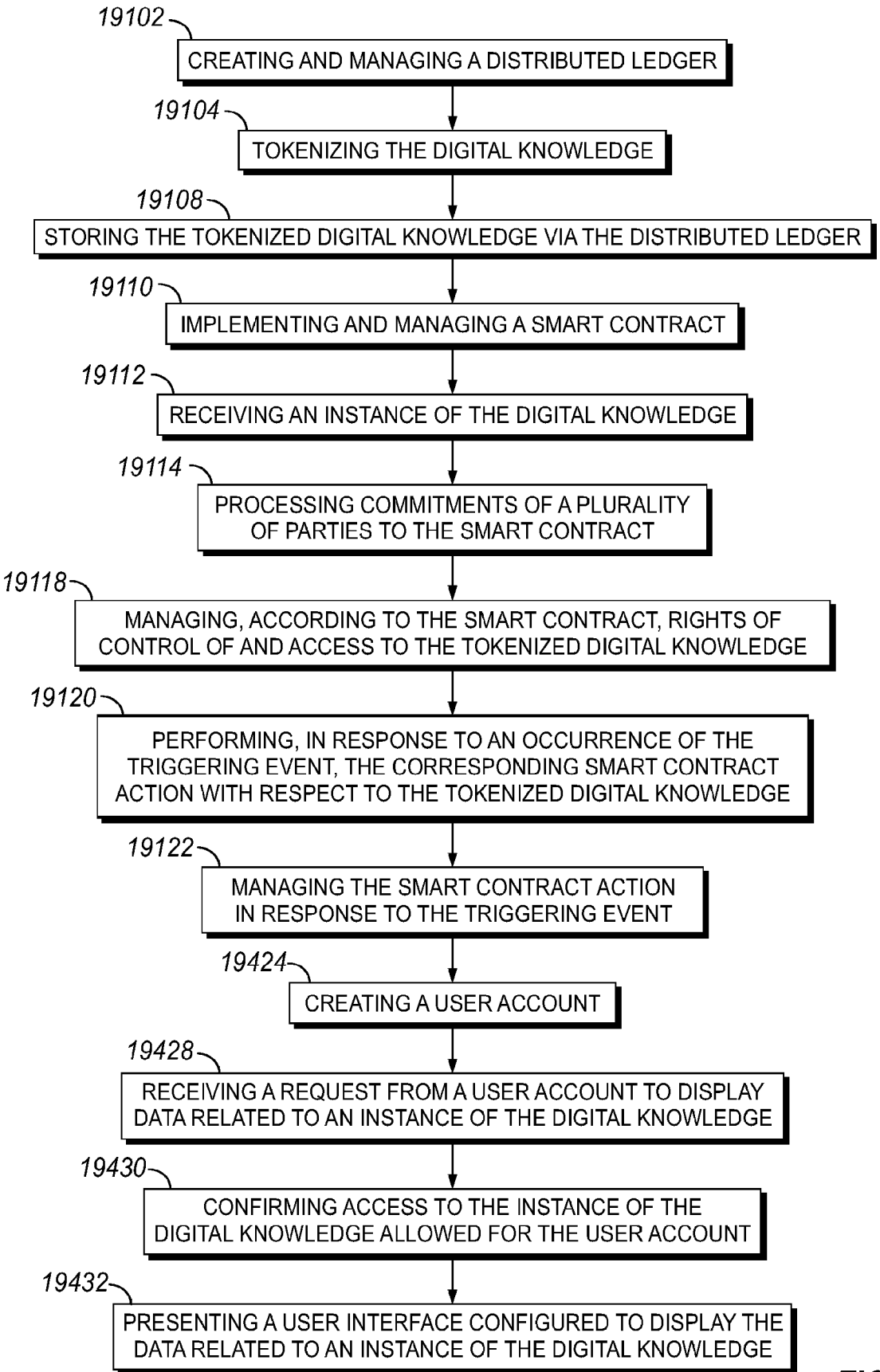

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT
19424
CREATING A USER ACCOUNT
19428
RECEIVING A REQUEST FROM A USER ACCOUNT TO DISPLAY DATA RELATED TO AN INSTANCE OF THE DIGITAL KNOWLEDGE
19430
CONFIRMING ACCESS TO THE INSTANCE OF THE DIGITAL KNOWLEDGE ALLOWED FOR THE USER ACCOUNT
19432
PRESENTING A USER INTERFACE CONFIGURED TO DISPLAY THE DATA RELATED TO AN INSTANCE OF THE DIGITAL KNOWLEDGE

FIG. 194

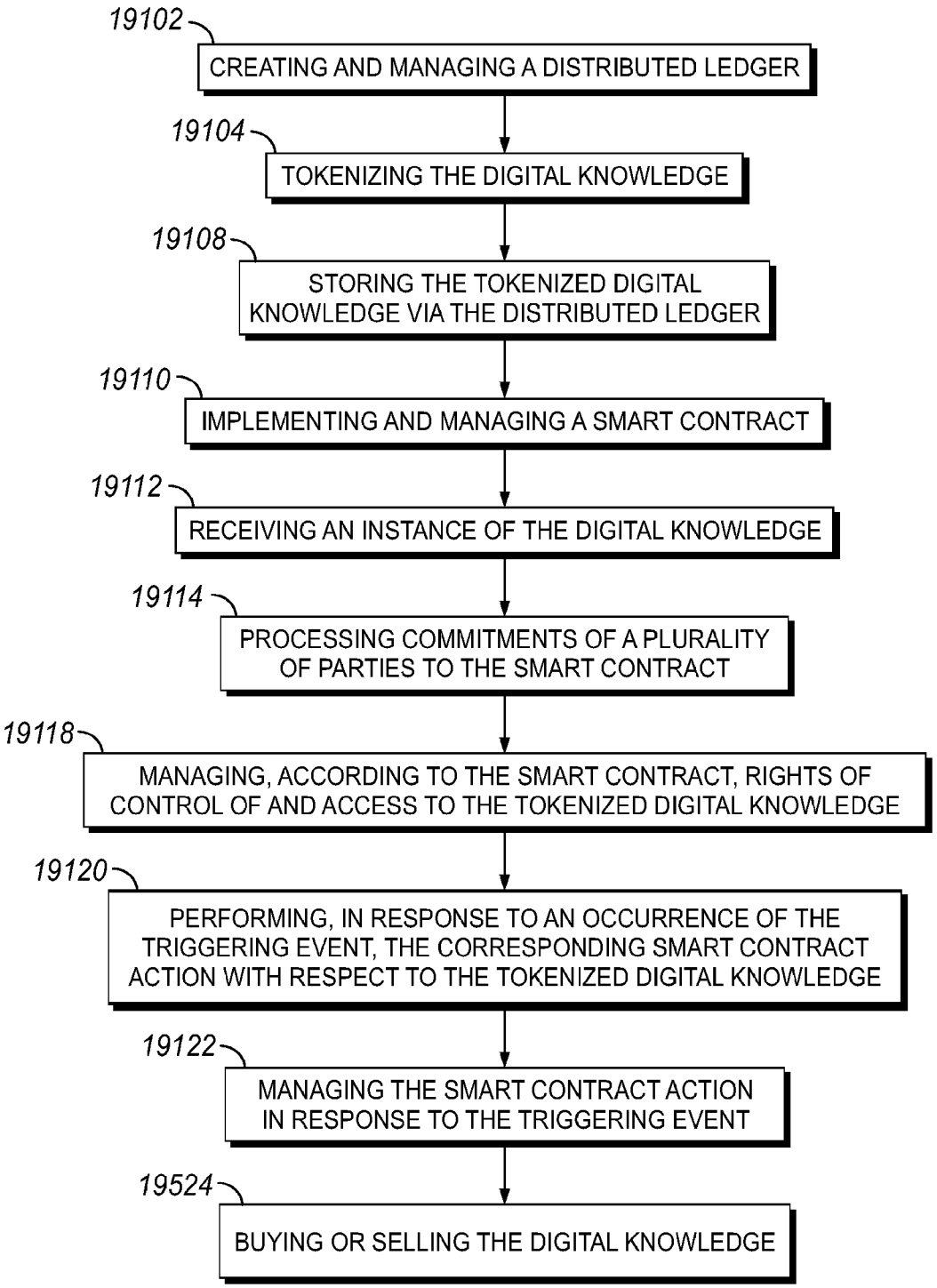

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT
19524
BUYING OR SELLING THE DIGITAL KNOWLEDGE

FIG. 195

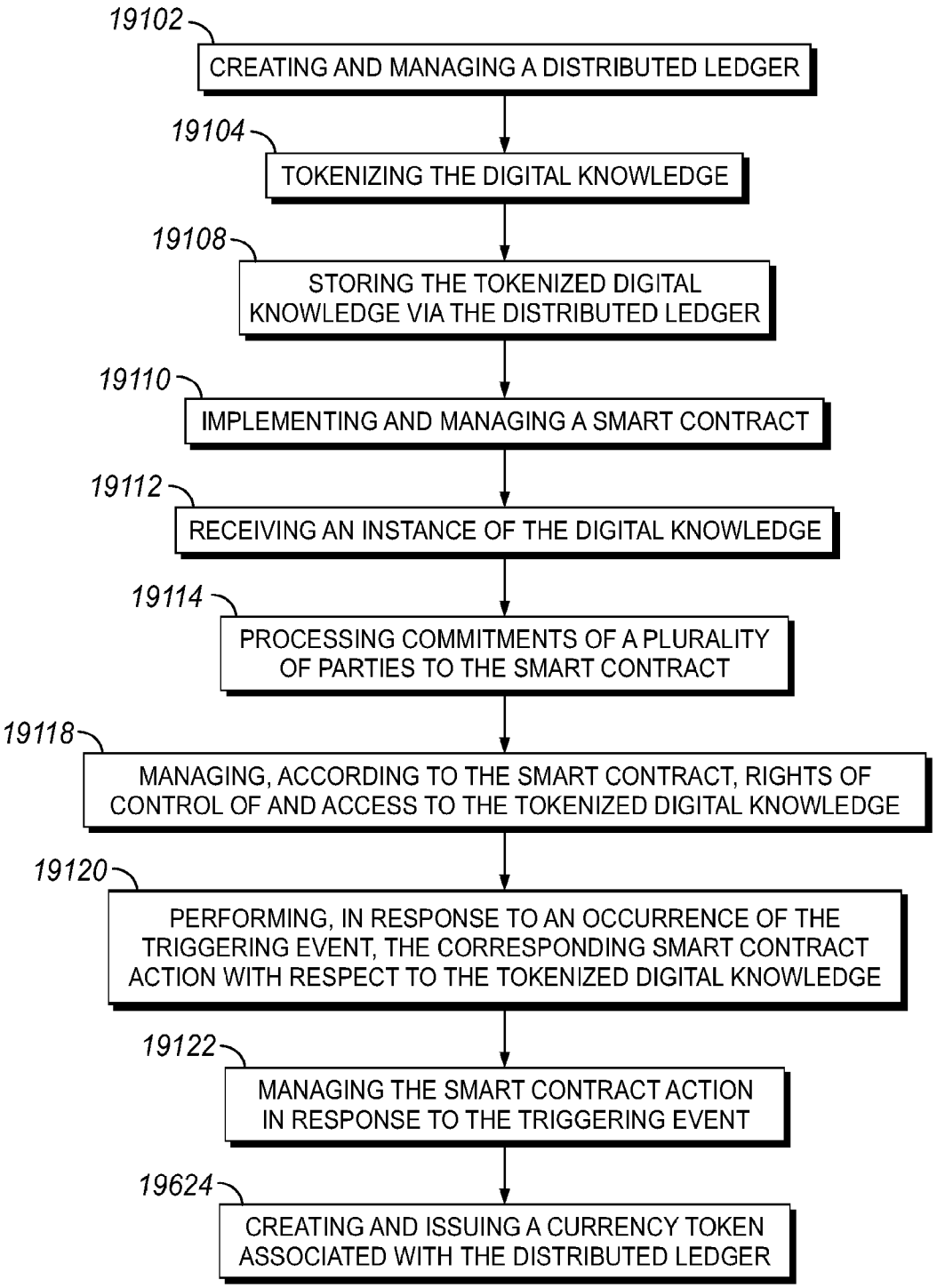

19102
CREATING AND MANAGING A DISTRIBUTED LEDGER
19104
TOKENIZING THE DIGITAL KNOWLEDGE
19108
STORING THE TOKENIZED DIGITAL KNOWLEDGE VIA THE DISTRIBUTED LEDGER
19110
IMPLEMENTING AND MANAGING A SMART CONTRACT
19112
RECEIVING AN INSTANCE OF THE DIGITAL KNOWLEDGE
19114
PROCESSING COMMITMENTS OF A PLURALITY OF PARTIES TO THE SMART CONTRACT
19118
MANAGING, ACCORDING TO THE SMART CONTRACT, RIGHTS OF CONTROL OF AND ACCESS TO THE TOKENIZED DIGITAL KNOWLEDGE
19120
PERFORMING, IN RESPONSE TO AN OCCURRENCE OF THE TRIGGERING EVENT, THE CORRESPONDING SMART CONTRACT ACTION WITH RESPECT TO THE TOKENIZED DIGITAL KNOWLEDGE
19122
MANAGING THE SMART CONTRACT ACTION IN RESPONSE TO THE TRIGGERING EVENT
19624
CREATING AND ISSUING A CURRENCY TOKEN ASSOCIATED WITH THE DISTRIBUTED LEDGER

FIG. 196

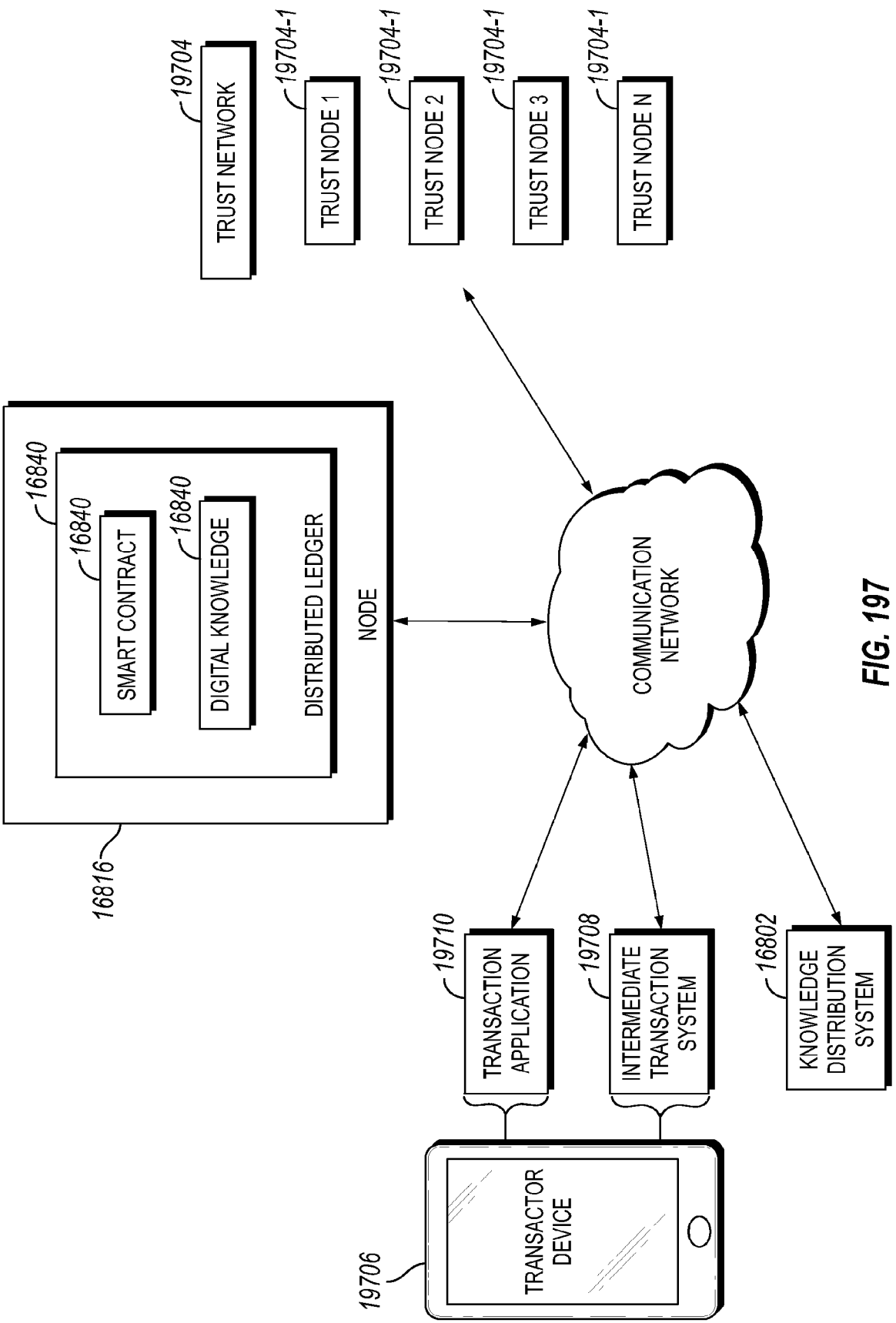

19704
TRUST NETWORK
19704-1
TRUST NODE 1
19704-1
TRUST NODE 2
19704-1
TRUST NODE 3
19704-1
TRUST NODE N
16840
SMART CONTRACT
16840
DIGITAL KNOWLEDGE
DISTRIBUTED LEDGER
NODE
16816
COMMUNICATION NETWORK
19710
TRANSACTION APPLICATION
19708
INTERMEDIATE TRANSACTION SYSTEM
16802
KNOWLEDGE DISTRIBUTION SYSTEM
19706
TRANSACTOR DEVICE

FIG. 197

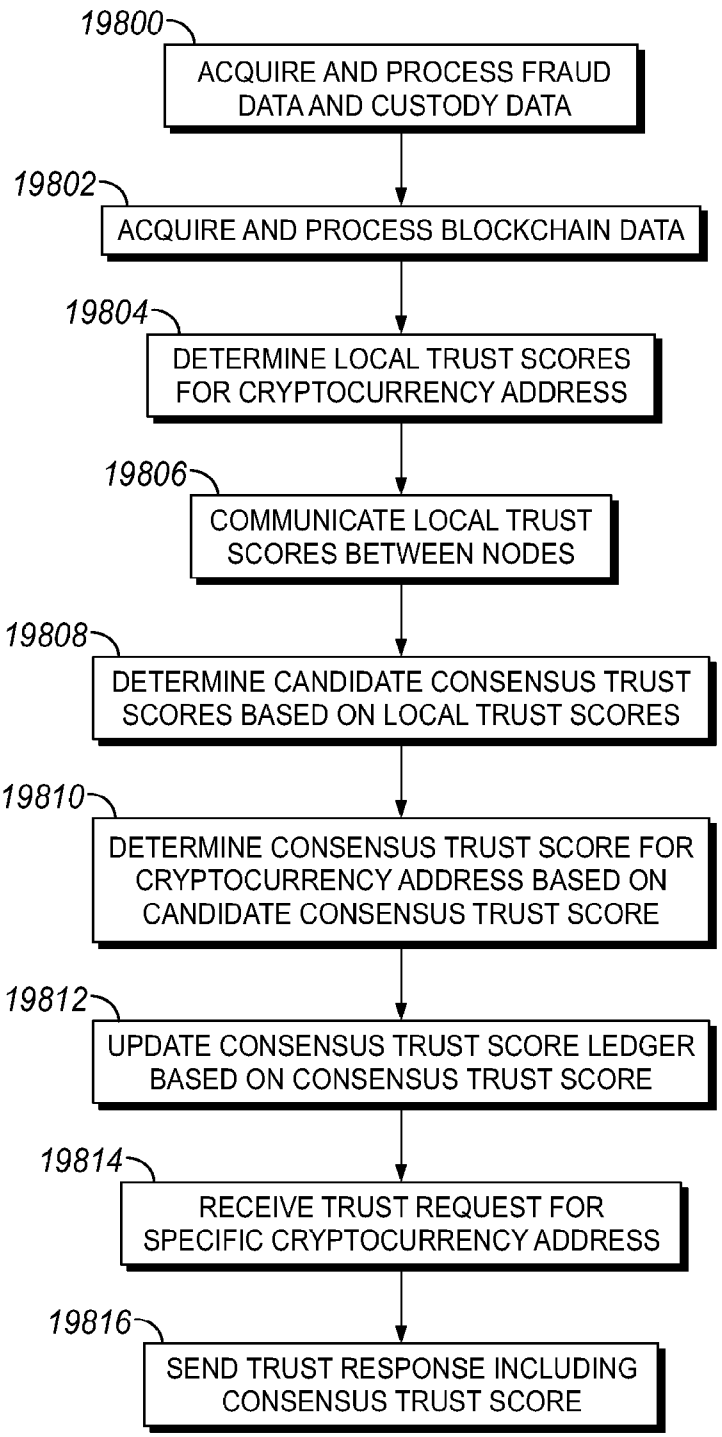

19800
ACQUIRE AND PROCESS FRAUD DATA AND CUSTODY DATA
19802
ACQUIRE AND PROCESS BLOCKCHAIN DATA
19804
DETERMINE LOCAL TRUST SCORES FOR CRYPTOCURRENCY ADDRESS
19806
COMMUNICATE LOCAL TRUST SCORES BETWEEN NODES
19808
DETERMINE CANDIDATE CONSENSUS TRUST SCORES BASED ON LOCAL TRUST SCORES
19810
DETERMINE CONSENSUS TRUST SCORE FOR CRYPTOCURRENCY ADDRESS BASED ON CANDIDATE CONSENSUS TRUST SCORE
19812
UPDATE CONSENSUS TRUST SCORE LEDGER BASED ON CONSENSUS TRUST SCORE
19814
RECEIVE TRUST REQUEST FOR SPECIFIC CRYPTOCURRENCY ADDRESS
19816
SEND TRUST RESPONSE INCLUDING CONSENSUS TRUST SCORE

FIG. 198

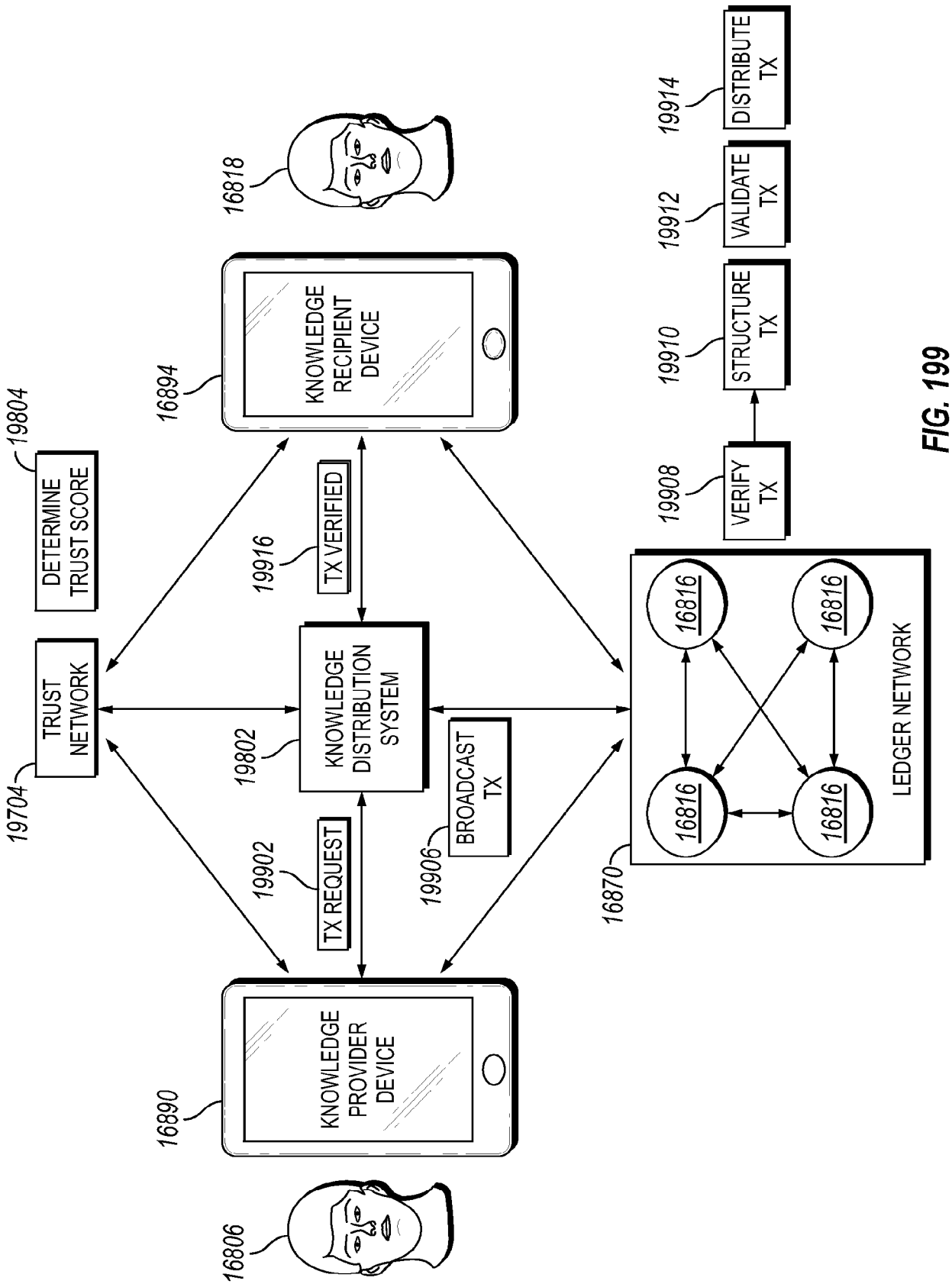

16806
16890
KNOWLEDGE PROVIDER DEVICE
16818
16894
KNOWLEDGE RECIPIENT DEVICE
19804
DETERMINE TRUST SCORE
19704
TRUST NETWORK
19902
TX REQUEST
19916
TX VERIFIED
19802
KNOWLEDGE DISTRIBUTION SYSTEM
19906
BROADCAST TX
16870
16816
16816
16816
16816
LEDGER NETWORK
19908
VERIFY TX
19910
STRUCTURE TX
19912
VALIDATE TX
19914
DISTRIBUTE TX

FIG. 199

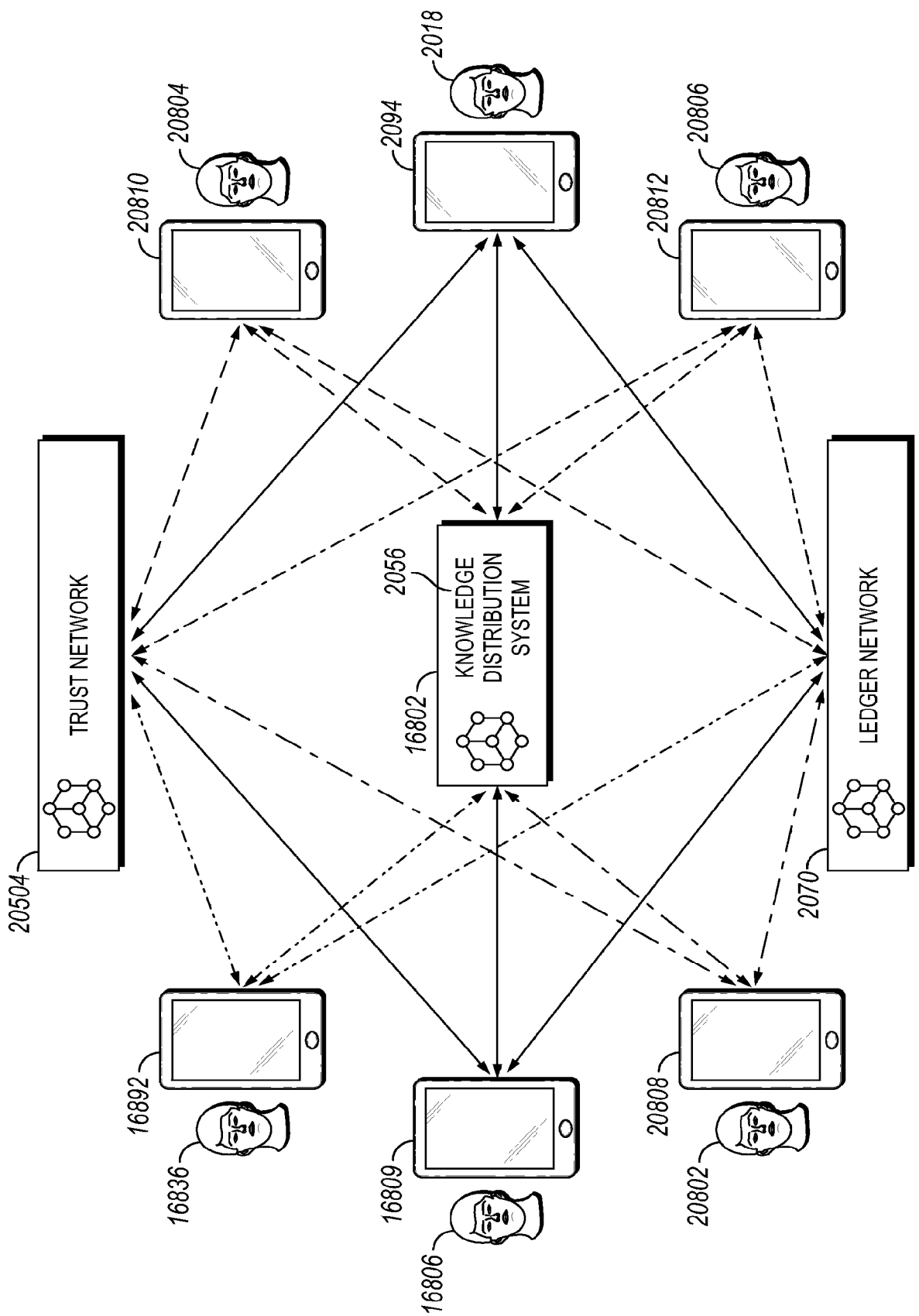

2018
20804
2094
20806
20810
20812
TRUST NETWORK
2056
KNOWLEDGE DISTRIBUTION SYSTEM
16802
LEDGER NETWORK
20504
2070
16892
20808
16836
16809
20802
16806

FIG. 200

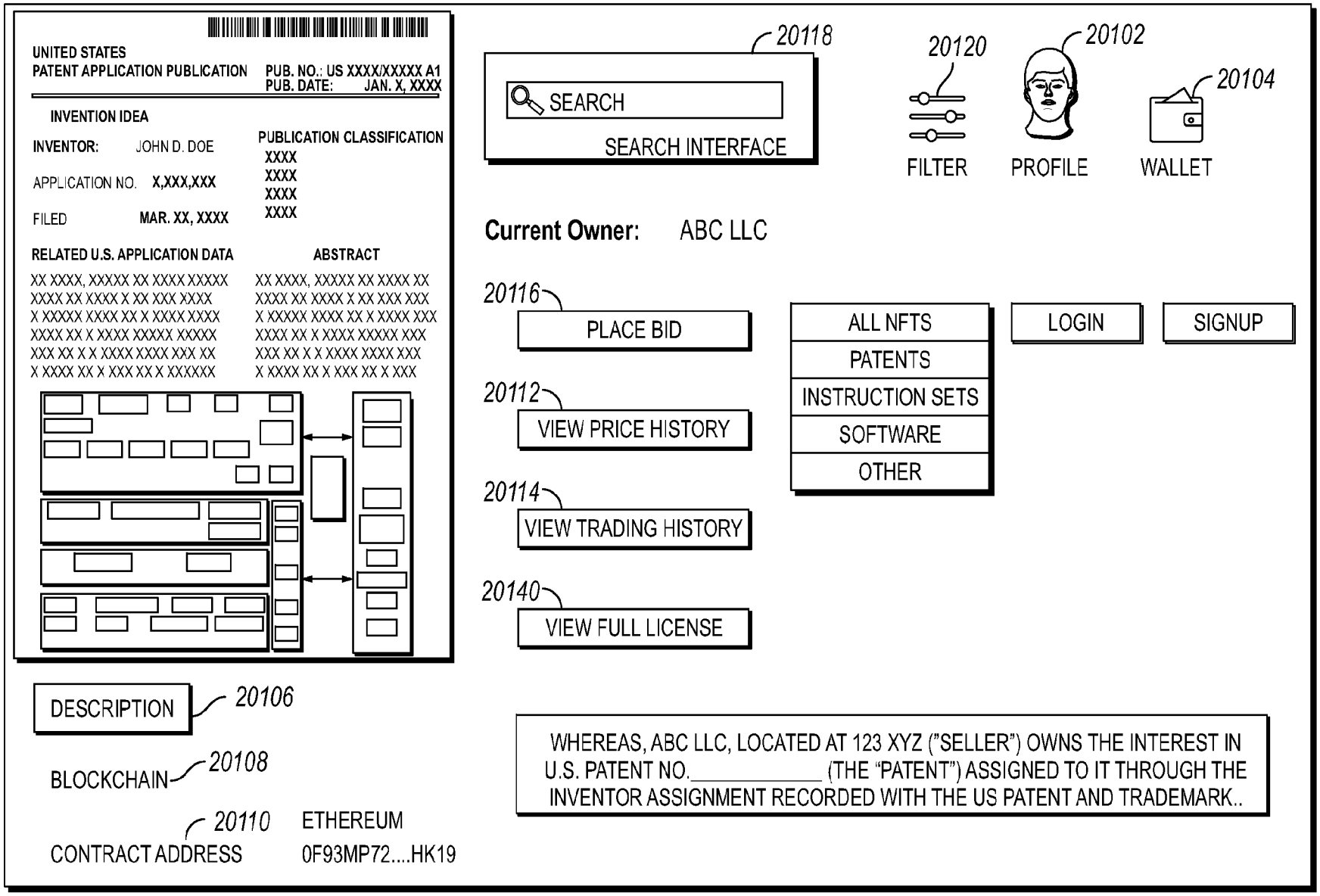

UNITED STATES
PATENT APPLICATION PUBLICATION
PUB. NO.: US XXXX/XXXXX A1
PUB. DATE: JAN. X, XXXX
INVENTION IDEA
INVENTOR: JOHN D. DOE
APPLICATION NO. X,XXX,XXX
FILED MAR. XX, XXXX
PUBLICATION CLASSIFICATION
XXXX
XXXX
XXXX
XXXX
RELATED U.S. APPLICATION DATA
ABSTRACT
DESCRIPTION
20106
BLOCKCHAIN
20108
CONTRACT ADDRESS
20110
ETHEREUM
0F93MP72....HK19
20118
SEARCH
SEARCH INTERFACE
20120
FILTER
20102
PROFILE
20104
WALLET
Current Owner: ABC LLC
20116
PLACE BID
20112
VIEW PRICE HISTORY
20114
VIEW TRADING HISTORY
20140
VIEW FULL LICENSE
ALL NFTS
PATENTS
INSTRUCTION SETS
SOFTWARE
OTHER
LOGIN
SIGNUP
WHEREAS, ABC LLC, LOCATED AT 123 XYZ ("SELLER") OWNS THE INTEREST IN U.S. PATENT NO._____ (THE "PATENT") ASSIGNED TO IT THROUGH THE INVENTOR ASSIGNMENT RECORDED WITH THE US PATENT AND TRADEMARK..

FIG. 201

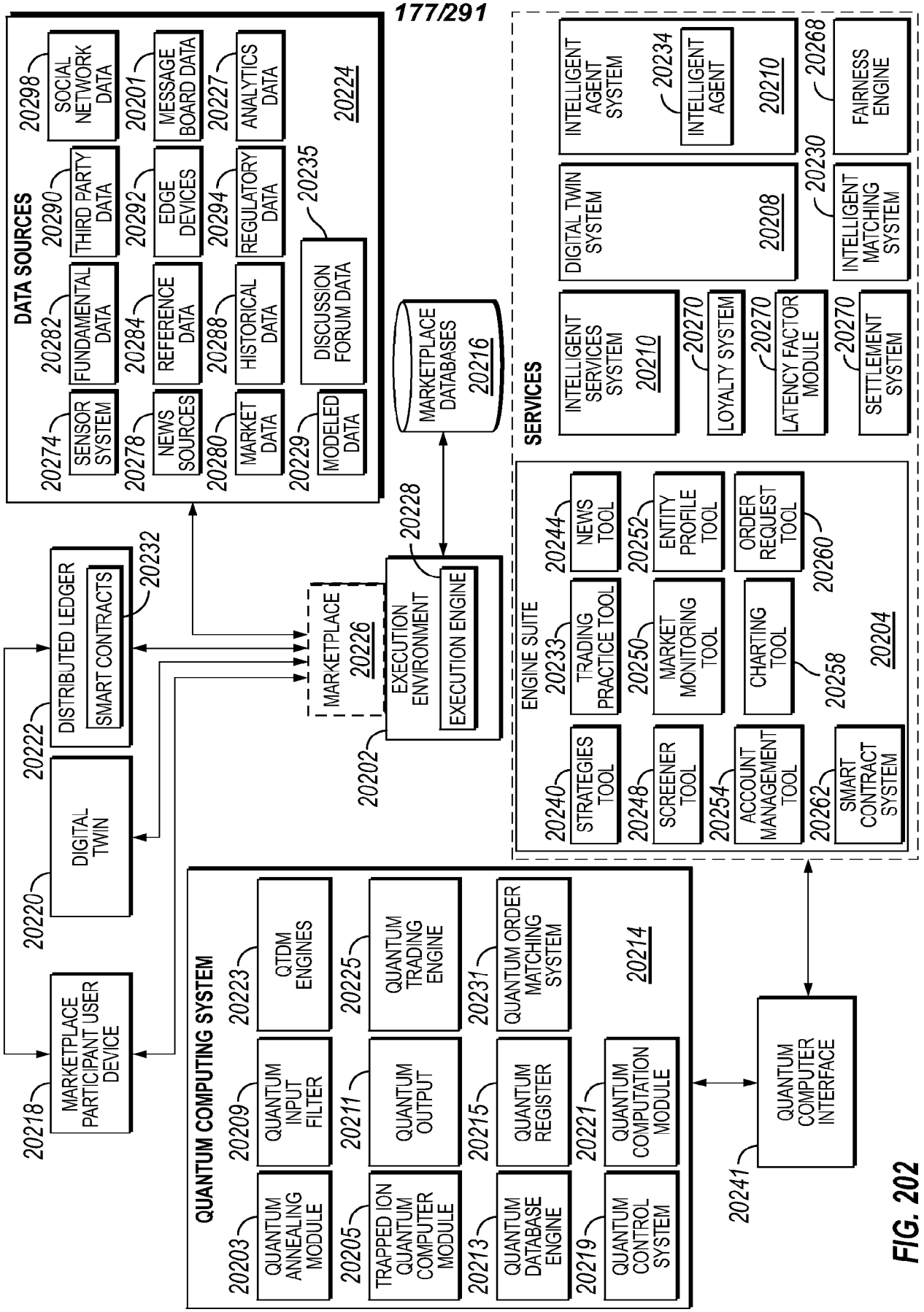

DATA SOURCES
20224
20298 SOCIAL NETWORK DATA
20201 MESSAGE BOARD DATA
20227 ANALYTICS DATA
20290 THIRD PARTY DATA
20292 EDGE DEVICES
20294 REGULATORY DATA
20235
20282 FUNDAMENTAL DATA
20284 REFERENCE DATA
20288 HISTORICAL DATA
DISCUSSION FORUM DATA
20274 SENSOR SYSTEM
20278 NEWS SOURCES
20280 MARKET DATA
20229 MODELED DATA
MARKETPLACE DATABASES 20216
20228
SERVICES
INTELLIGENT SERVICES SYSTEM 20210
20270 LOYALTY SYSTEM
20270 LATENCY FACTOR MODULE
20270 SETTLEMENT SYSTEM
DIGITAL TWIN SYSTEM 20208
INTELLIGENT AGENT SYSTEM
20234 INTELLIGENT AGENT
20210
20230 INTELLIGENT MATCHING SYSTEM
20268 FAIRNESS ENGINE
ENGINE SUITE 20204
20244 NEWS TOOL
20252 ENTITY PROFILE TOOL
ORDER REQUEST TOOL 20260
20233 TRADING PRACTICE TOOL
20250 MARKET MONITORING TOOL
CHARTING TOOL 20258
20240 STRATEGIES TOOL
20248 SCREENER TOOL
20254 ACCOUNT MANAGEMENT TOOL
20262 SMART CONTRACT SYSTEM
MARKETPLACE 20226
EXECUTION ENVIRONMENT
EXECUTION ENGINE
20202
DISTRIBUTED LEDGER
SMART CONTRACTS 20232
20222
DIGITAL TWIN
20220
MARKETPLACE PARTICIPANT USER DEVICE
20218
QUANTUM COMPUTING SYSTEM
20214
20223 QTDM ENGINES
20225 QUANTUM TRADING ENGINE
20231 QUANTUM ORDER MATCHING SYSTEM
20209 QUANTUM INPUT FILTER
20211 QUANTUM OUTPUT
20215 QUANTUM REGISTER
20221 QUANTUM COMPUTATION MODULE
20203 QUANTUM ANNEALING MODULE
20205 TRAPPED ION QUANTUM COMPUTER MODULE
20213 QUANTUM DATABASE ENGINE
20219 QUANTUM CONTROL SYSTEM
20241
QUANTUM COMPUTER INTERFACE

FIG. 202

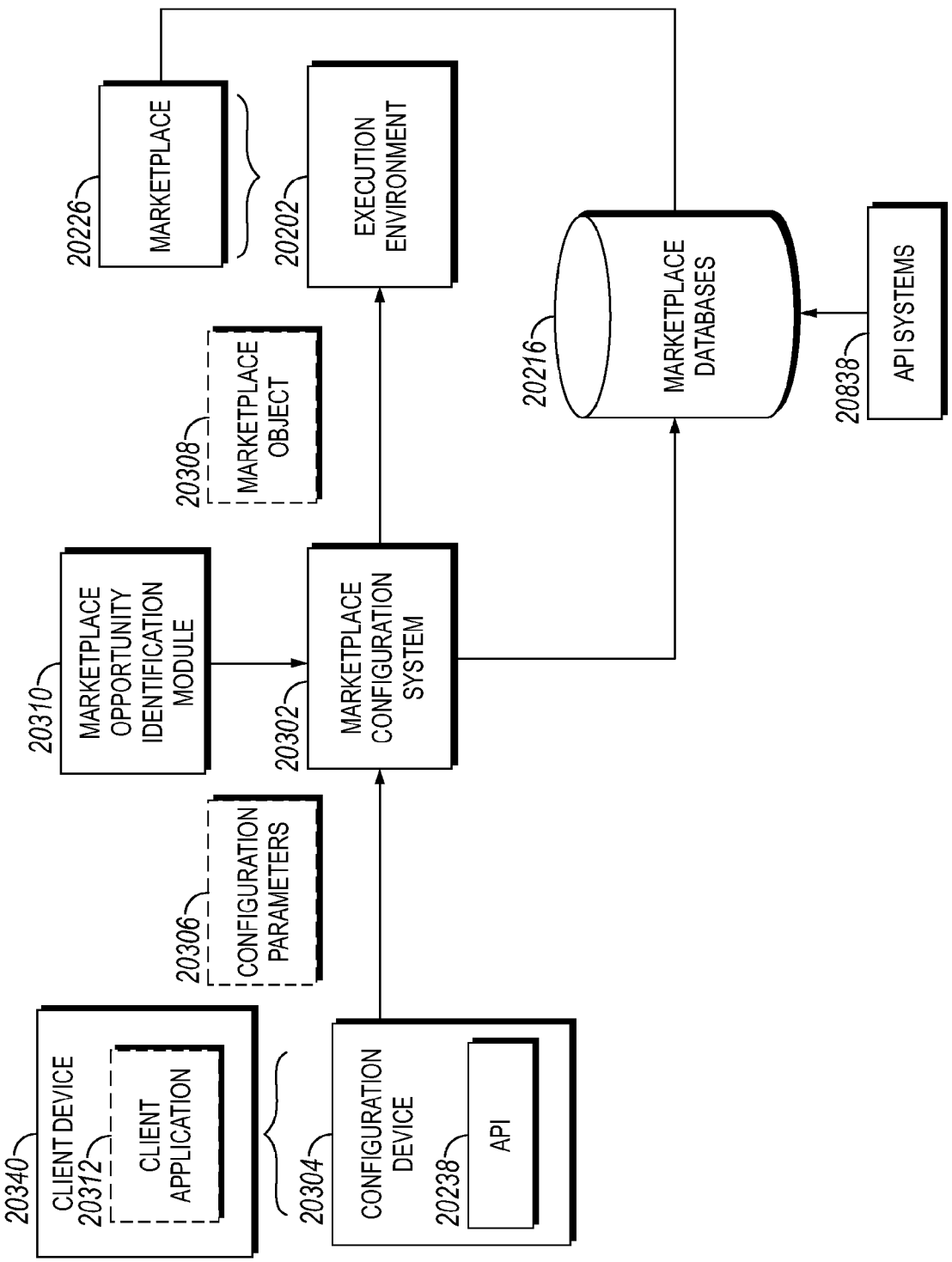

20340
CLIENT DEVICE
20312
CLIENT APPLICATION
20304
CONFIGURATION DEVICE
20238
API
20306
CONFIGURATION PARAMETERS
20310
MARKETPLACE OPPORTUNITY IDENTIFICATION MODULE
20302
MARKETPLACE CONFIGURATION SYSTEM
20308
MARKETPLACE OBJECT
20226
MARKETPLACE
20202
EXECUTION ENVIRONMENT
20216
MARKETPLACE DATABASES
20838
API SYSTEMS

FIG. 203

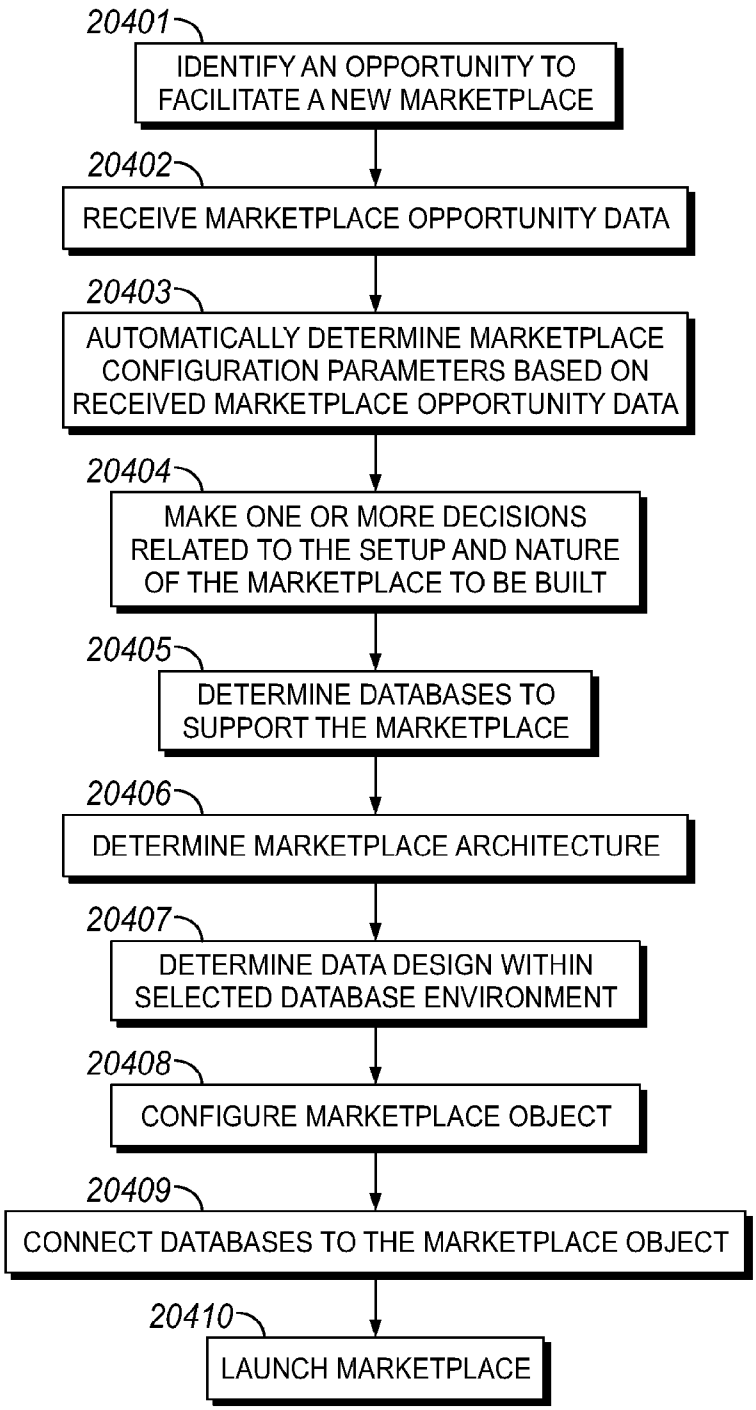

20401
IDENTIFY AN OPPORTUNITY TO FACILITATE A NEW MARKETPLACE
20402
RECEIVE MARKETPLACE OPPORTUNITY DATA
20403
AUTOMATICALLY DETERMINE MARKETPLACE CONFIGURATION PARAMETERS BASED ON RECEIVED MARKETPLACE OPPORTUNITY DATA
20404
MAKE ONE OR MORE DECISIONS RELATED TO THE SETUP AND NATURE OF THE MARKETPLACE TO BE BUILT
20405
DETERMINE DATABASES TO SUPPORT THE MARKETPLACE
20406
DETERMINE MARKETPLACE ARCHITECTURE
20407
DETERMINE DATA DESIGN WITHIN SELECTED DATABASE ENVIRONMENT
20408
CONFIGURE MARKETPLACE OBJECT
20409
CONNECT DATABASES TO THE MARKETPLACE OBJECT
20410
LAUNCH MARKETPLACE

FIG. 204

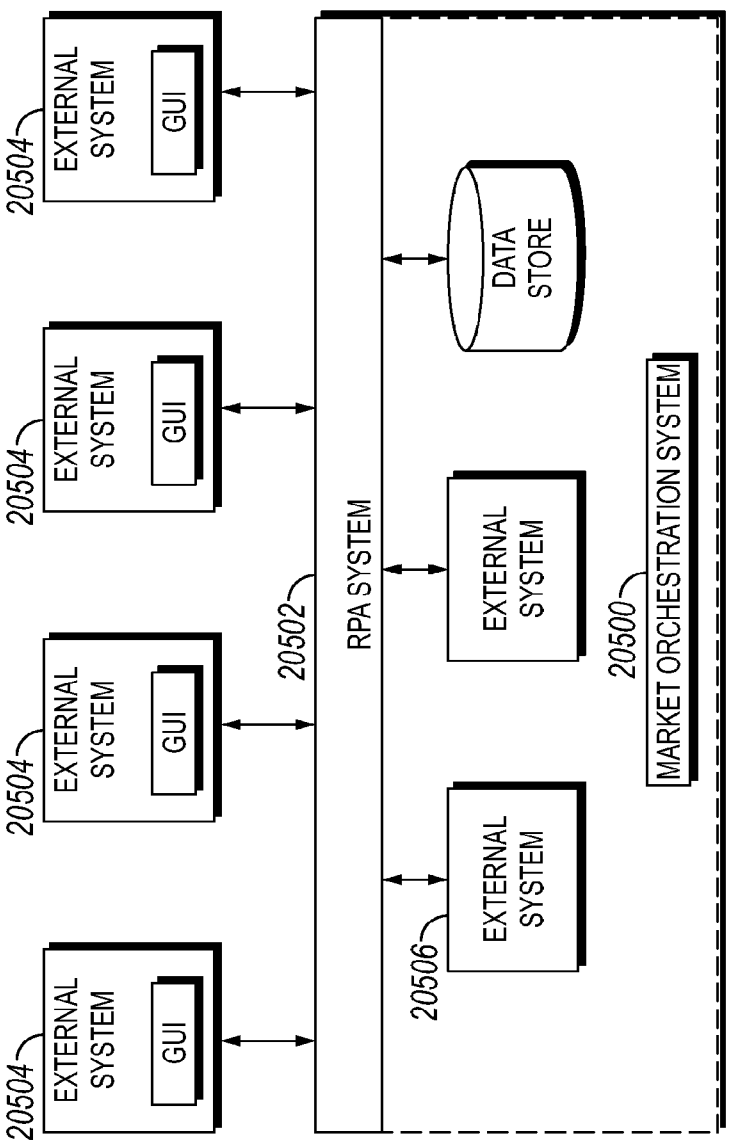

20504
EXTERNAL SYSTEM
GUI
20504
EXTERNAL SYSTEM
GUI
20504
EXTERNAL SYSTEM
GUI
20504
EXTERNAL SYSTEM
GUI
20502
RPA SYSTEM
DATA STORE
EXTERNAL SYSTEM
20506
EXTERNAL SYSTEM
20500
MARKET ORCHESTRATION SYSTEM

FIG. 205

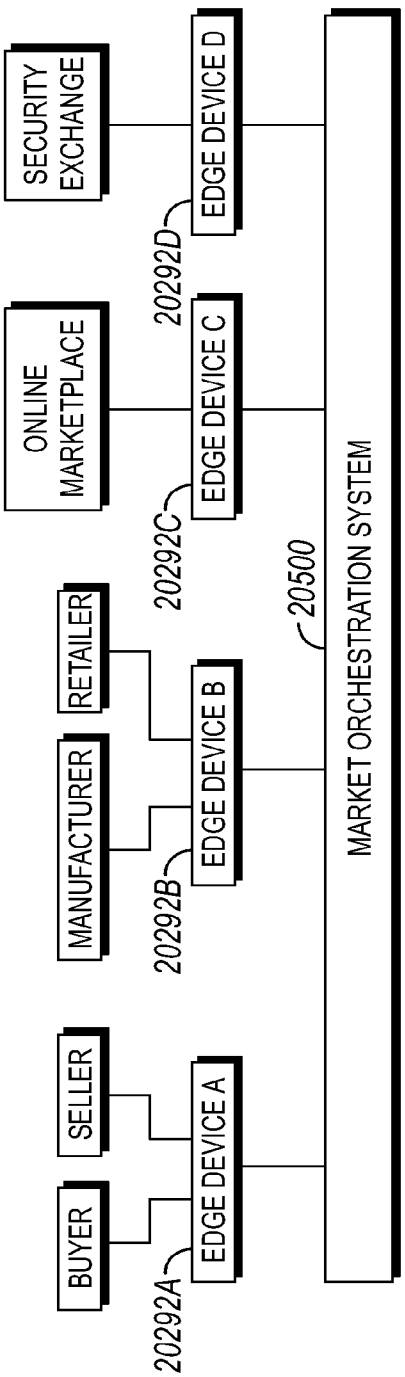

BUYER
SELLER
EDGE DEVICE A
20292A
MANUFACTURER
RETAILER
EDGE DEVICE B
20292B
ONLINE MARKETPLACE
EDGE DEVICE C
20292C
SECURITY EXCHANGE
EDGE DEVICE D
20292D
20500
MARKET ORCHESTRATION SYSTEM

FIG. 206

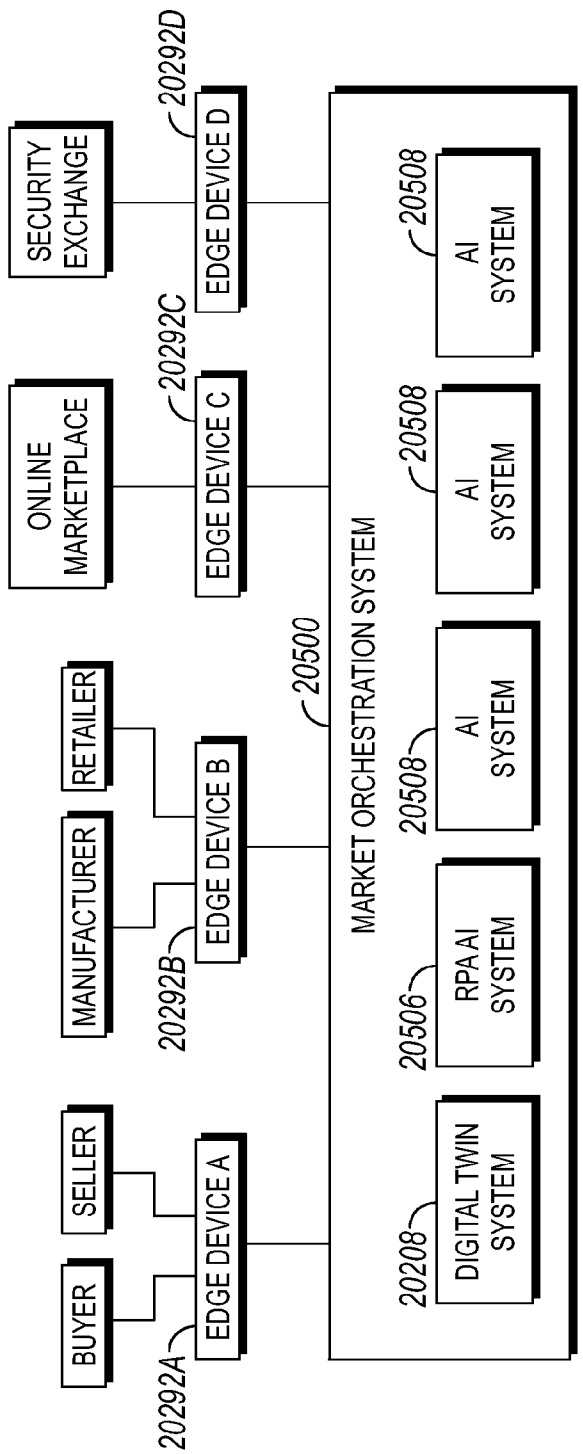

BUYER
SELLER
EDGE DEVICE A
20292A
MANUFACTURER
RETAILER
EDGE DEVICE B
20292B
ONLINE MARKETPLACE
EDGE DEVICE C
20292C
SECURITY EXCHANGE
EDGE DEVICE D
20292D
20500
MARKET ORCHESTRATION SYSTEM
20208
DIGITAL TWIN SYSTEM
20506
RPA AI SYSTEM
20508
AI SYSTEM
20508
AI SYSTEM
20508
AI SYSTEM

FIG. 207

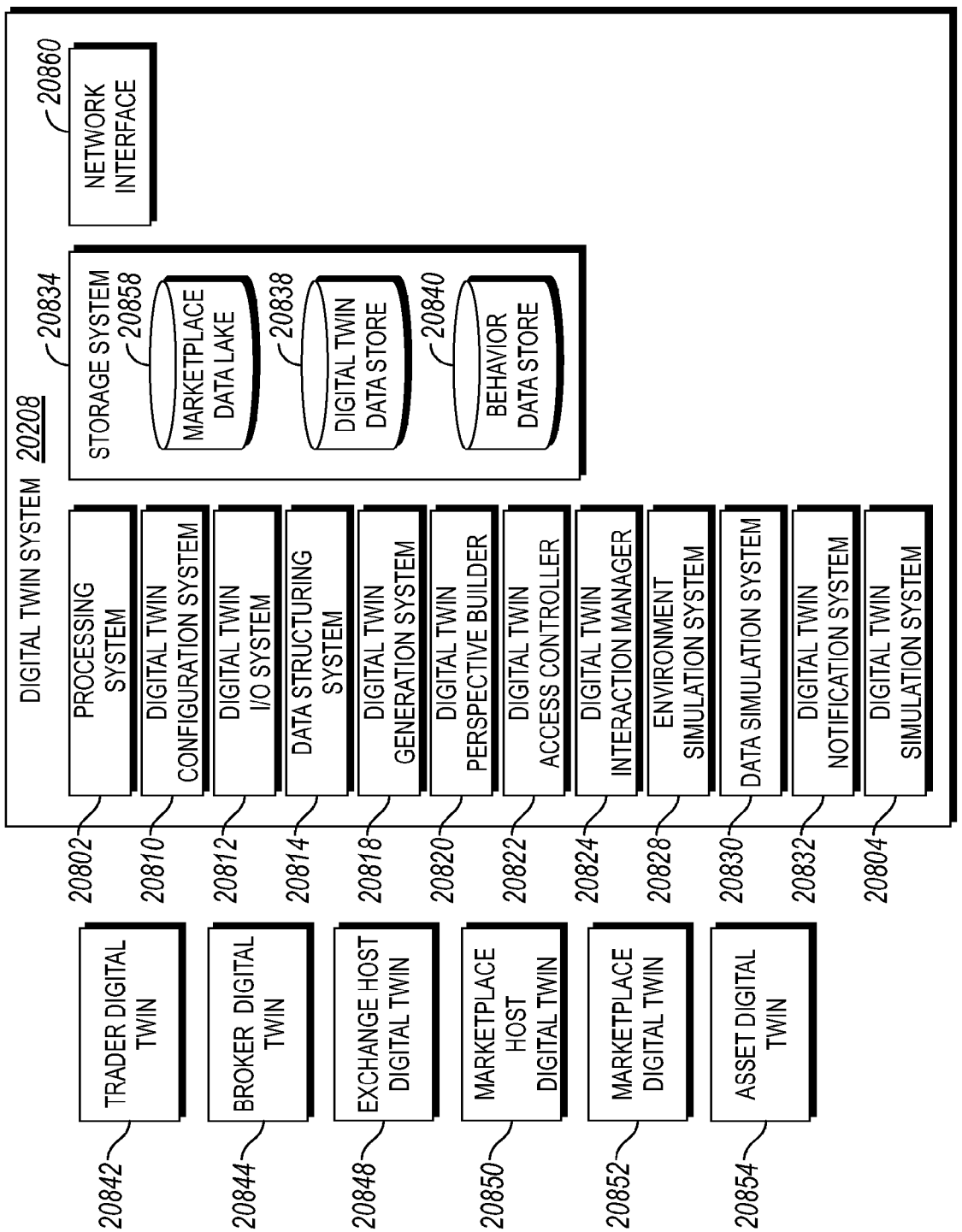

DIGITAL TWIN SYSTEM 20208
PROCESSING SYSTEM
DIGITAL TWIN CONFIGURATION SYSTEM
DIGITAL TWIN I/O SYSTEM
DATA STRUCTURING SYSTEM
DIGITAL TWIN GENERATION SYSTEM
DIGITAL TWIN PERSPECTIVE BUILDER
DIGITAL TWIN ACCESS CONTROLLER
DIGITAL TWIN INTERACTION MANAGER
ENVIRONMENT SIMULATION SYSTEM
DATA SIMULATION SYSTEM
DIGITAL TWIN NOTIFICATION SYSTEM
DIGITAL TWIN SIMULATION SYSTEM
20802
20810
20812
20814
20818
20820
20822
20824
20828
20830
20832
20804
STORAGE SYSTEM 20834
MARKETPLACE DATA LAKE 20858
DIGITAL TWIN DATA STORE 20838
BEHAVIOR DATA STORE 20840
NETWORK INTERFACE 20860
TRADER DIGITAL TWIN
BROKER DIGITAL TWIN
EXCHANGE HOST DIGITAL TWIN
MARKETPLACE HOST DIGITAL TWIN
MARKETPLACE DIGITAL TWIN
ASSET DIGITAL TWIN
20842
20844
20848
20850
20852
20854

FIG. 208

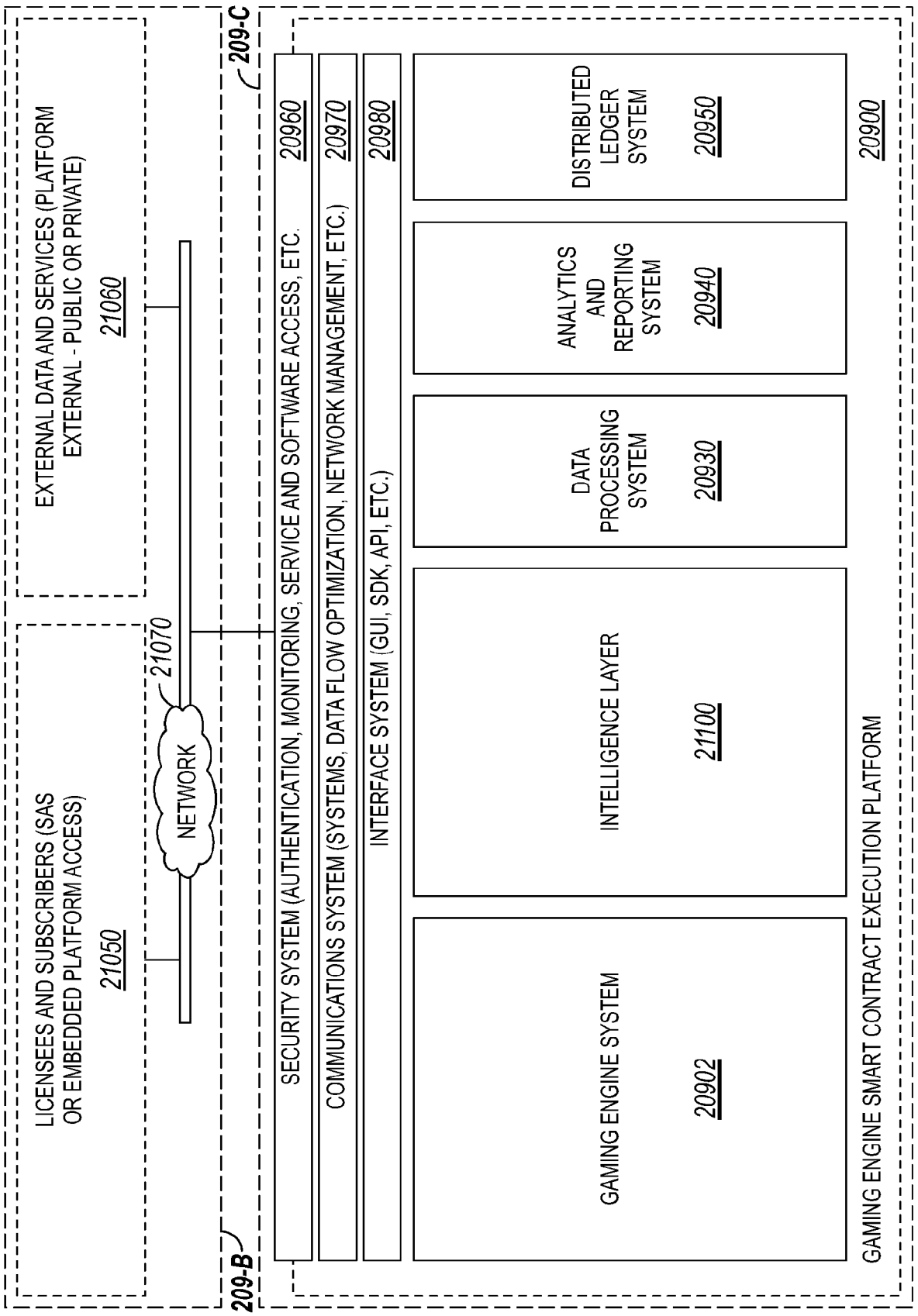

209-C
209-B
EXTERNAL DATA AND SERVICES (PLATFORM
EXTERNAL - PUBLIC OR PRIVATE)
21060
LICENSEES AND SUBSCRIBERS (SAS
OR EMBEDDED PLATFORM ACCESS)
21050
21070
NETWORK
SECURITY SYSTEM (AUTHENTICATION, MONITORING, SERVICE AND SOFTWARE ACCESS, ETC.
20960
COMMUNICATIONS SYSTEM (SYSTEMS, DATA FLOW OPTIMIZATION, NETWORK MANAGEMENT, ETC.)
20970
INTERFACE SYSTEM (GUI, SDK, API, ETC.)
20980
GAMING ENGINE SYSTEM
20902
INTELLIGENCE LAYER
21100
DATA
PROCESSING
SYSTEM
20930
ANALYTICS
AND
REPORTING
SYSTEM
20940
DISTRIBUTED
LEDGER
SYSTEM
20950
GAMING ENGINE SMART CONTRACT EXECUTION PLATFORM
20900

FIG. 209-A

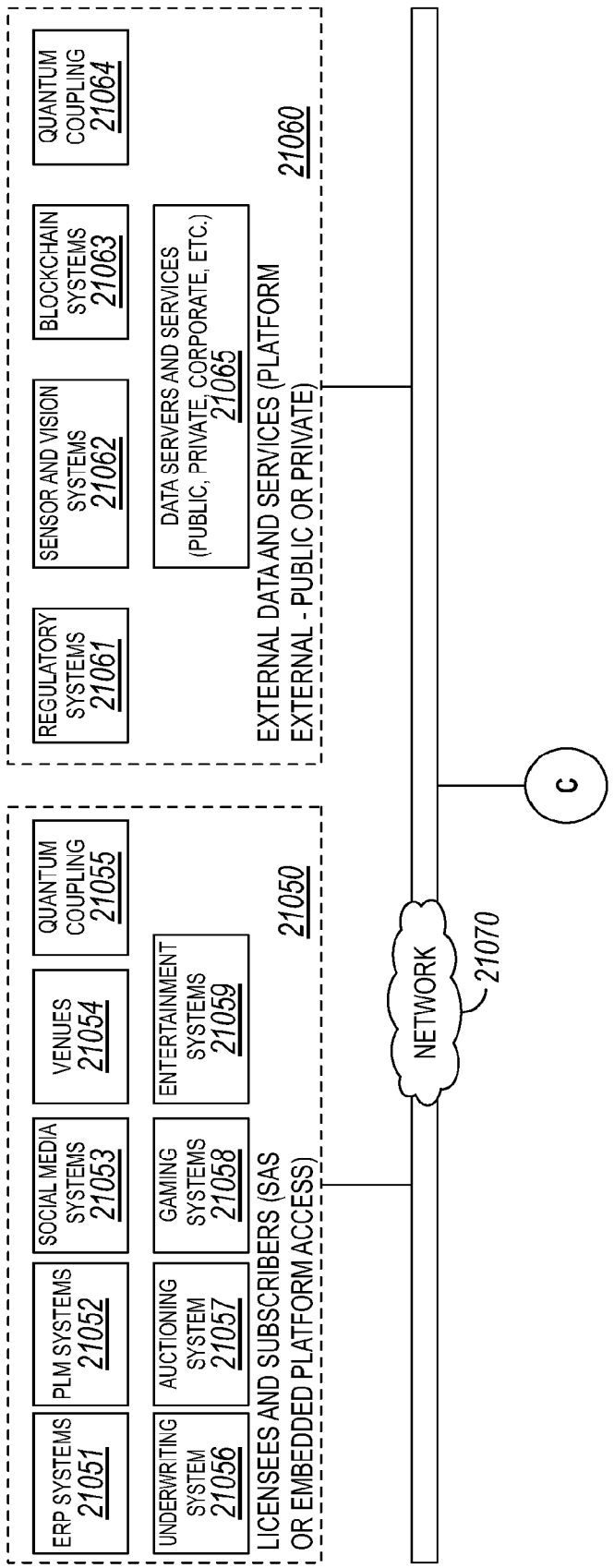

ERP SYSTEMS 21051
PLM SYSTEMS 21052
SOCIAL MEDIA SYSTEMS 21053
VENUES 21054
QUANTUM COUPLING 21055
UNDERWRITING SYSTEM 21056
AUCTIONING SYSTEM 21057
GAMING SYSTEMS 21058
ENTERTAINMENT SYSTEMS 21059
LICENSEES AND SUBSCRIBERS (SAS OR EMBEDDED PLATFORM ACCESS) 21050
REGULATORY SYSTEMS 21061
SENSOR AND VISION SYSTEMS 21062
BLOCKCHAIN SYSTEMS 21063
QUANTUM COUPLING 21064
DATA SERVERS AND SERVICES (PUBLIC, PRIVATE, CORPORATE, ETC.) 21065
EXTERNAL DATA AND SERVICES (PLATFORM EXTERNAL - PUBLIC OR PRIVATE) 21060
NETWORK 21070
C

FIG. 209-B

B
SECURITY SYSTEM (AUTHENTICATION, MONITORING, SERVICE AND SOFTWARE ACCESS, ETC. 20960
COMMUNICATIONS SYSTEM (SYSTEMS, DATA FLOW OPTIMIZATION, NETWORK MANAGEMENT, ETC.) 20970
INTERFACE SYSTEM (GUI, SDK, API, ETC.) 20980
BLOCKCHAIN SMART CONTRACT TRANSACTION SERVICES 20951
BLOCKCHAIN SMART CONTRACT DATA MANAGEMENT SERVICES 20952
OTHER DTL SERVICES 20953
DISTRIBUTED LEDGER SYSTEM 2950
DATABASE SEARCH 20941
MONITORING AND NOTIFICATIONS 20942
MARKETING, ADVERTISING, AND RESEARCH 20943
ANALYTICS AND REPORTING SYSTEM 20940
DATA PROCESSING SERVICE 20931
DATA HANDLING SERVICE 20932
DATA STORES 20933
LIBRARIES 20934
DATA PROCESSING SYSTEM 20930
21124
21122
21128
21126
21132
21130
21136
21134
21138
ARTIFICIAL INTELLIGENCE SERVICE 21120
21114
21112
21116
INTELLIGENCE LAYER CONTROLLER 21110
INTELLIGENCE LAYER 21100
211
21042
21044
21046
21040
21032
21034
21036
21030
21020
21010
210
GAMING ENGINE SYSTEM 20902
GAMING ENGINE SMART CONTRACT EXECUTION PLATFORM 20900

FIG. 209-C

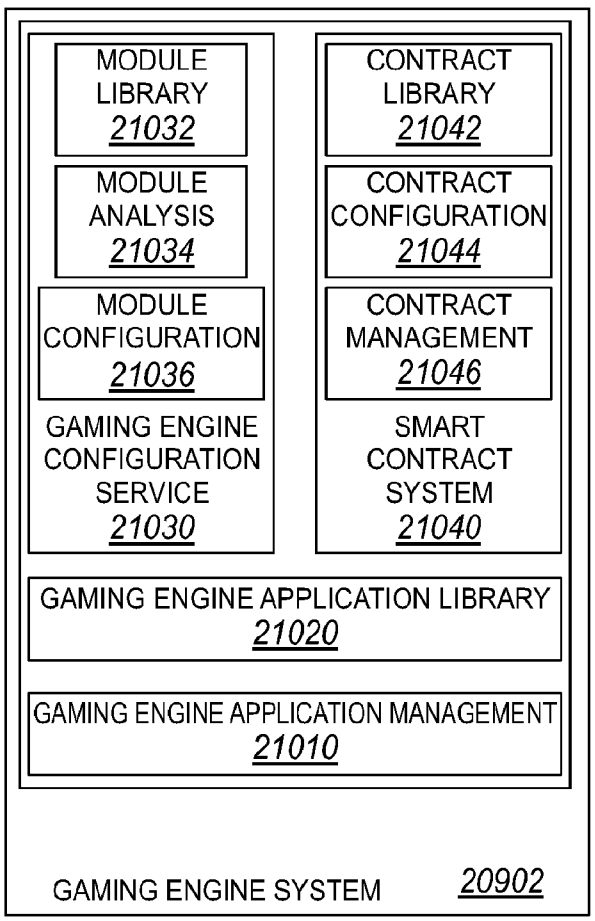


FIG. 210

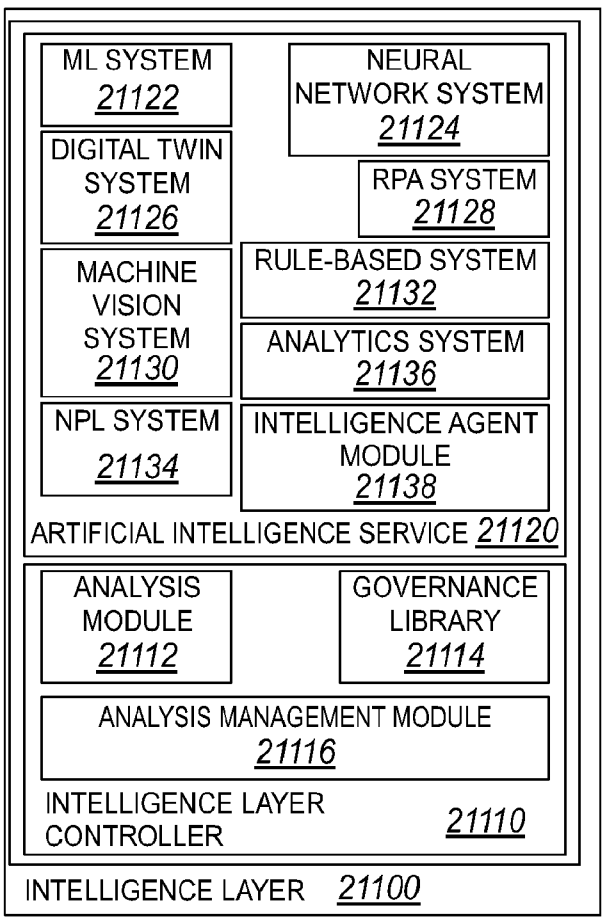


FIG. 211

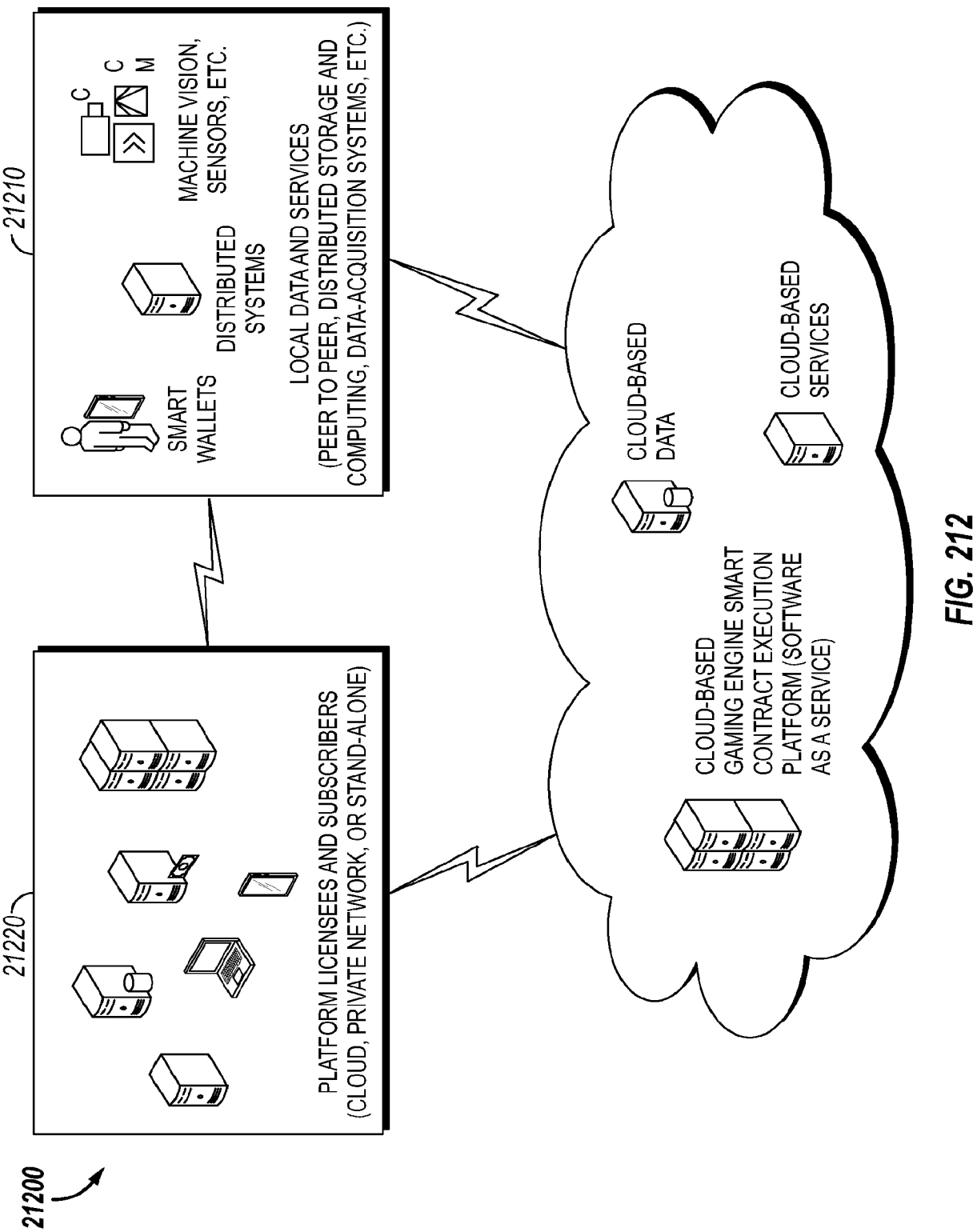

21200
21210
21220
PLATFORM LICENSEES AND SUBSCRIBERS
(CLOUD, PRIVATE NETWORK, OR STAND-ALONE)
LOCAL DATA AND SERVICES
(PEER TO PEER, DISTRIBUTED STORAGE AND
COMPUTING, DATA-ACQUISITION SYSTEMS, ETC.)
SMART
WALLETS
DISTRIBUTED
SYSTEMS
MACHINE VISION,
SENSORS, ETC.
CLOUD-BASED
GAMING ENGINE SMART
CONTRACT EXECUTION
PLATFORM (SOFTWARE
AS A SERVICE)
CLOUD-BASED
DATA
CLOUD-BASED
SERVICES

FIG. 212

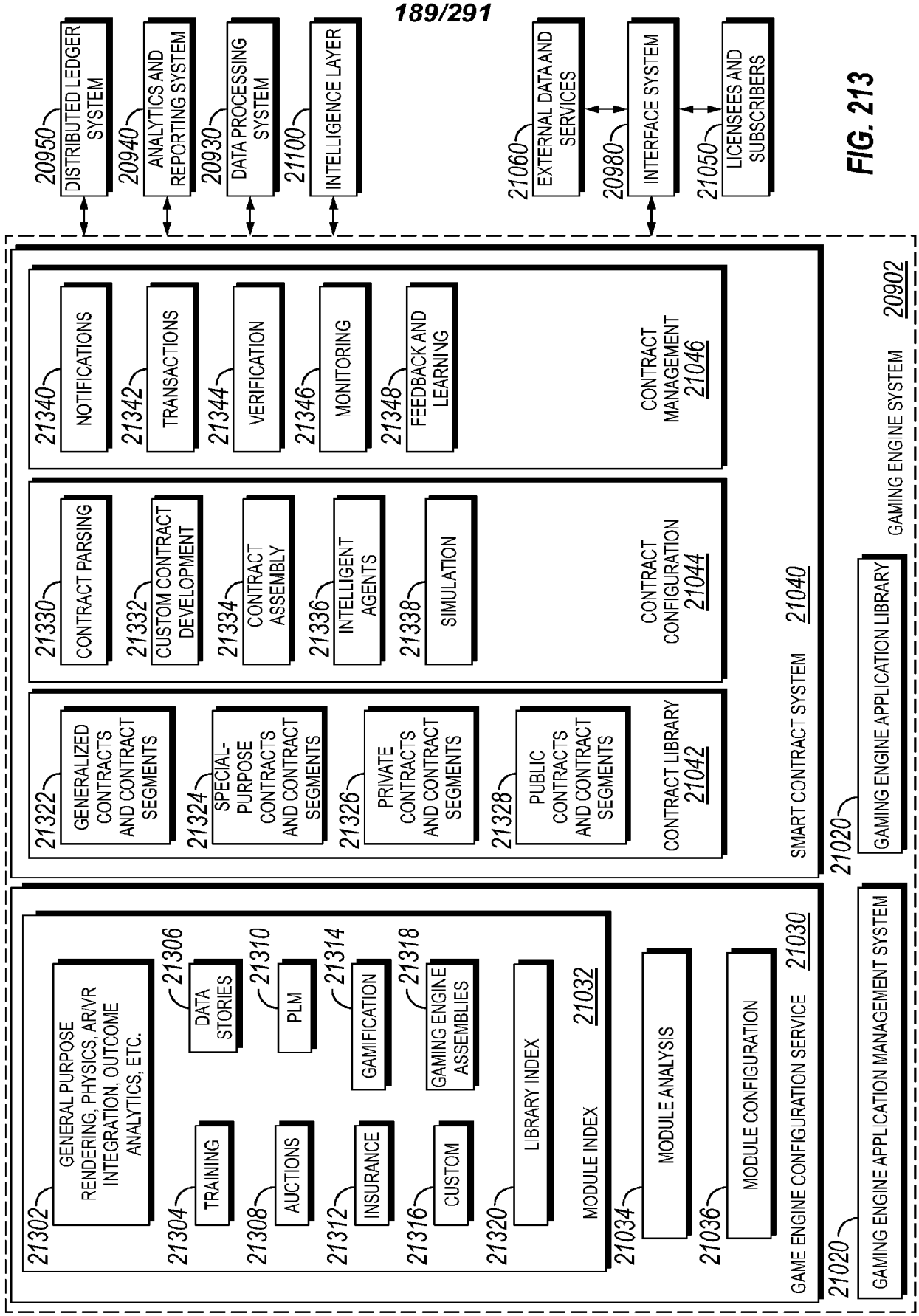

20950 DISTRIBUTED LEDGER SYSTEM
20940 ANALYTICS AND REPORTING SYSTEM
20930 DATA PROCESSING SYSTEM
21100 INTELLIGENCE LAYER
21060 EXTERNAL DATA AND SERVICES
20980 INTERFACE SYSTEM
21050 LICENSEES AND SUBSCRIBERS
GAMING ENGINE SYSTEM 20902
SMART CONTRACT SYSTEM 21040
CONTRACT MANAGEMENT 21046
21340 NOTIFICATIONS
21342 TRANSACTIONS
21344 VERIFICATION
21346 MONITORING
21348 FEEDBACK AND LEARNING
CONTRACT CONFIGURATION 21044
21330 CONTRACT PARSING
21332 CUSTOM CONTRACT DEVELOPMENT
21334 CONTRACT ASSEMBLY
21336 INTELLIGENT AGENTS
21338 SIMULATION
CONTRACT LIBRARY 21042
21322 GENERALIZED CONTRACTS AND CONTRACT SEGMENTS
21324 SPECIAL-PURPOSE CONTRACTS AND CONTRACT SEGMENTS
21326 PRIVATE CONTRACTS AND CONTRACT SEGMENTS
21328 PUBLIC CONTRACTS AND CONTRACT SEGMENTS
21020 GAMING ENGINE APPLICATION LIBRARY
GAME ENGINE CONFIGURATION SERVICE 21030
MODULE INDEX 21032
21302 GENERAL PURPOSE RENDERING, PHYSICS, AR/VR INTEGRATION, OUTCOME ANALYTICS, ETC.
21304 TRAINING
21306 DATA STORIES
21308 AUCTIONS
21310 PLM
21312 INSURANCE
21314 GAMIFICATION
21316 CUSTOM
21318 GAMING ENGINE ASSEMBLIES
21320 LIBRARY INDEX
21034 MODULE ANALYSIS
21036 MODULE CONFIGURATION
21020 GAMING ENGINE APPLICATION MANAGEMENT SYSTEM

FIG. 213

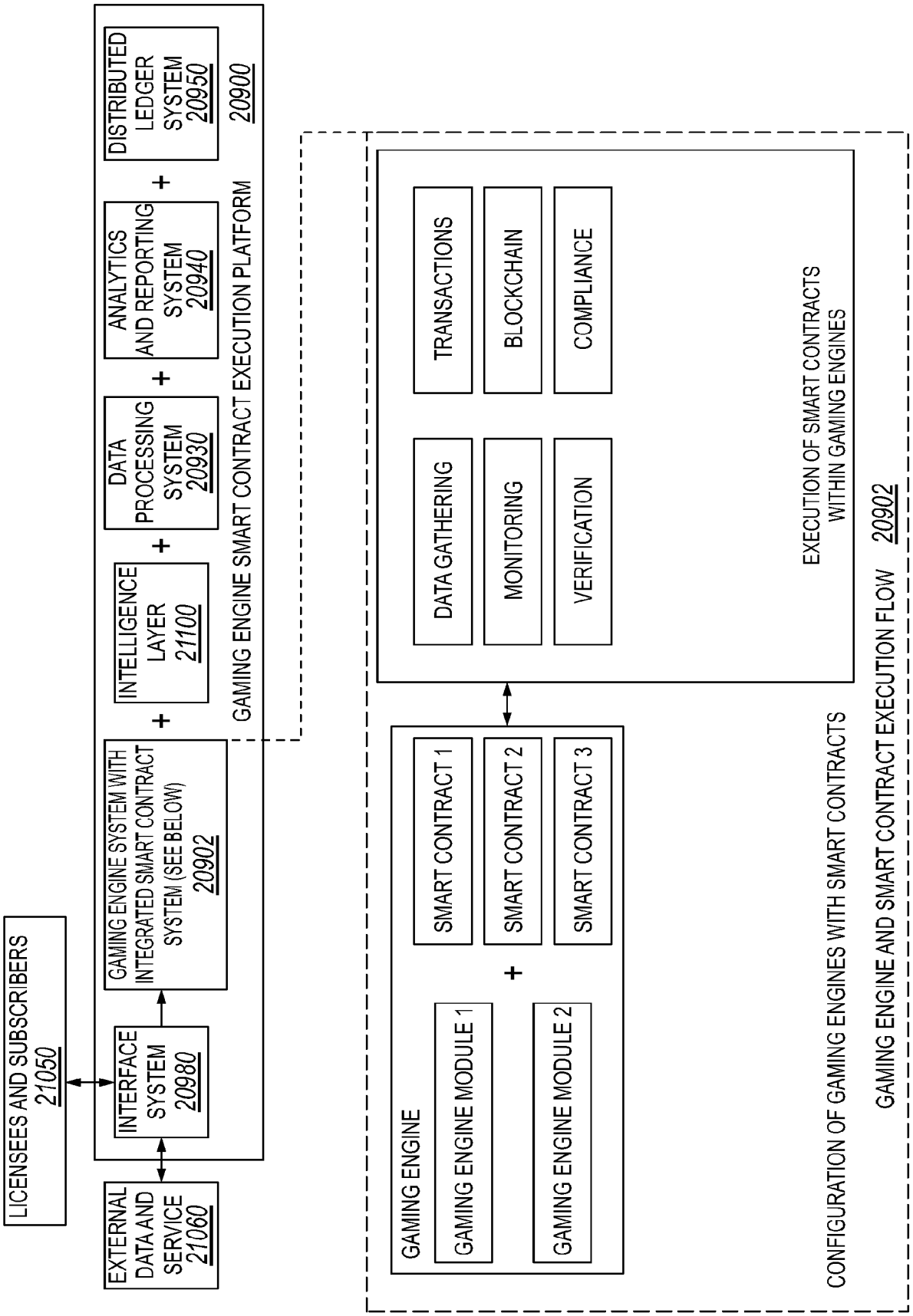

LICENSEES AND SUBSCRIBERS 21050
EXTERNAL DATA AND SERVICE 21060
INTERFACE SYSTEM 20980
GAMING ENGINE SYSTEM WITH INTEGRATED SMART CONTRACT SYSTEM (SEE BELOW) 20902
INTELLIGENCE LAYER 21100
DATA PROCESSING SYSTEM 20930
ANALYTICS AND REPORTING SYSTEM 20940
DISTRIBUTED LEDGER SYSTEM 20950
GAMING ENGINE SMART CONTRACT EXECUTION PLATFORM 20900
GAMING ENGINE
GAMING ENGINE MODULE 1
GAMING ENGINE MODULE 2
SMART CONTRACT 1
SMART CONTRACT 2
SMART CONTRACT 3
DATA GATHERING
MONITORING
VERIFICATION
TRANSACTIONS
BLOCKCHAIN
COMPLIANCE
EXECUTION OF SMART CONTRACTS WITHIN GAMING ENGINES
CONFIGURATION OF GAMING ENGINES WITH SMART CONTRACTS
GAMING ENGINE AND SMART CONTRACT EXECUTION FLOW 20902

FIG. 214

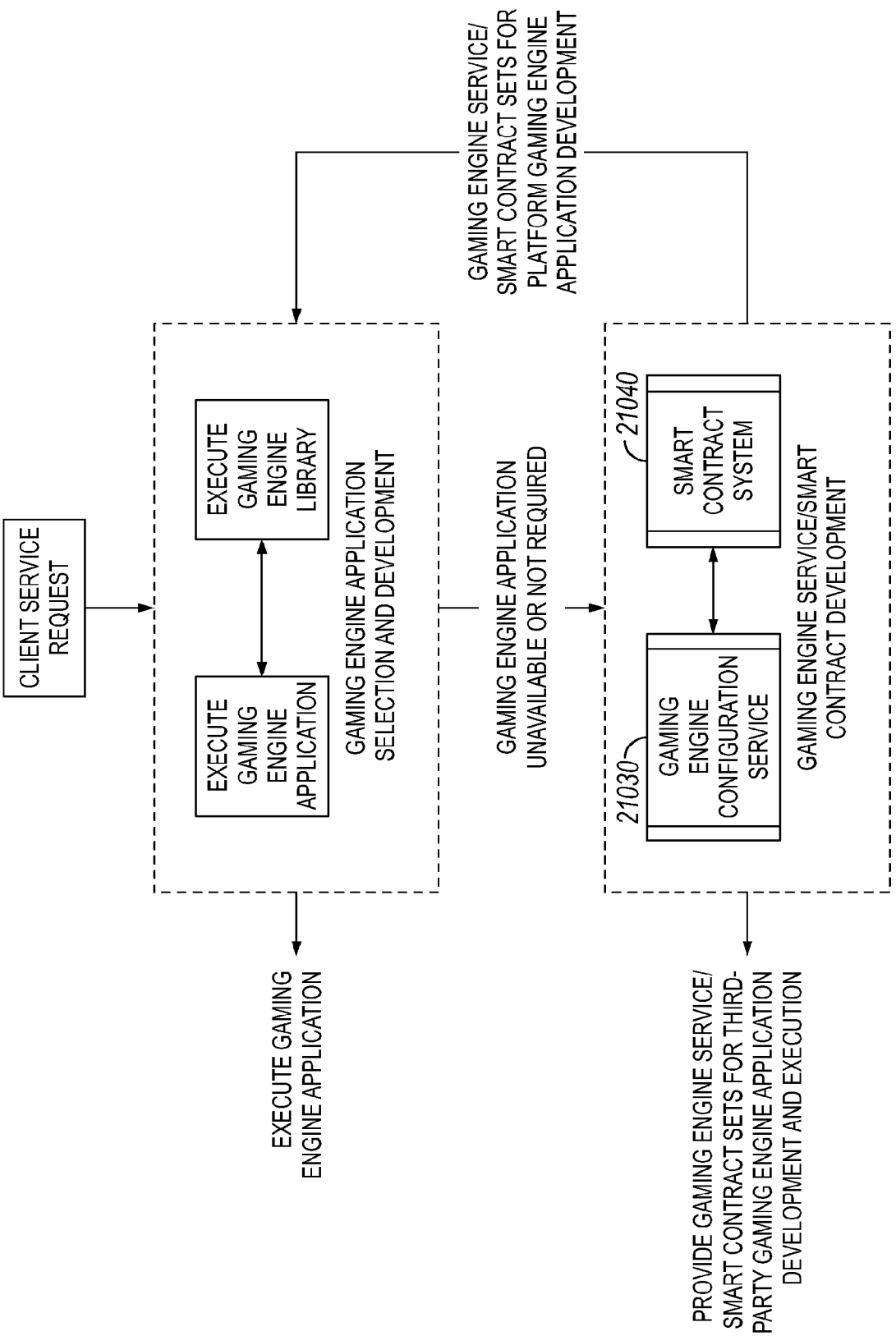

GAMING ENGINE SERVICE/
SMART CONTRACT SETS FOR
PLATFORM GAMING ENGINE
APPLICATION DEVELOPMENT
CLIENT SERVICE
REQUEST
EXECUTE
GAMING
ENGINE
APPLICATION
EXECUTE
GAMING
ENGINE
LIBRARY
GAMING ENGINE APPLICATION
SELECTION AND DEVELOPMENT
GAMING ENGINE APPLICATION
UNAVAILABLE OR NOT REQUIRED
21030
GAMING
ENGINE
CONFIGURATION
SERVICE
21040
SMART
CONTRACT
SYSTEM
GAMING ENGINE SERVICE/SMART
CONTRACT DEVELOPMENT
EXECUTE GAMING
ENGINE APPLICATION
PROVIDE GAMING ENGINE SERVICE/
SMART CONTRACT SETS FOR THIRD-
PARTY GAMING ENGINE APPLICATION
DEVELOPMENT AND EXECUTION

FIG. 215

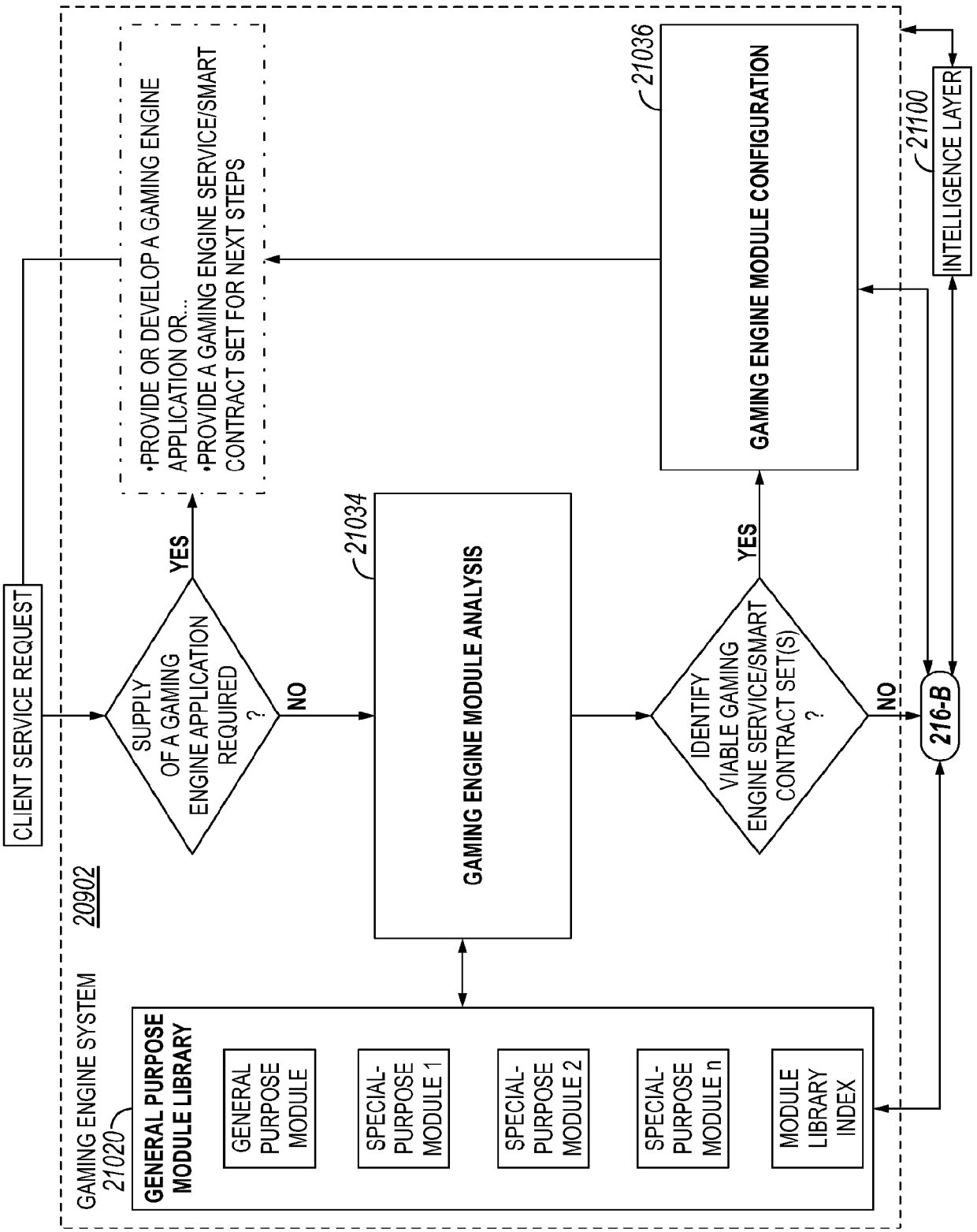

GAMING ENGINE SYSTEM
20902
GENERAL PURPOSE MODULE LIBRARY
21020
GENERAL PURPOSE MODULE
SPECIAL-PURPOSE MODULE 1
SPECIAL-PURPOSE MODULE 2
SPECIAL-PURPOSE MODULE n
MODULE LIBRARY INDEX
CLIENT SERVICE REQUEST
SUPPLY OF A GAMING ENGINE APPLICATION REQUIRED ?
YES
NO
•PROVIDE OR DEVELOP A GAMING ENGINE APPLICATION OR...
•PROVIDE A GAMING ENGINE SERVICE/SMART CONTRACT SET FOR NEXT STEPS
21034
GAMING ENGINE MODULE ANALYSIS
IDENTIFY VIABLE GAMING ENGINE SERVICE/SMART CONTRACT SET(S) ?
YES
NO
21036
GAMING ENGINE MODULE CONFIGURATION
216-B
21100
INTELLIGENCE LAYER

FIG. 216-A

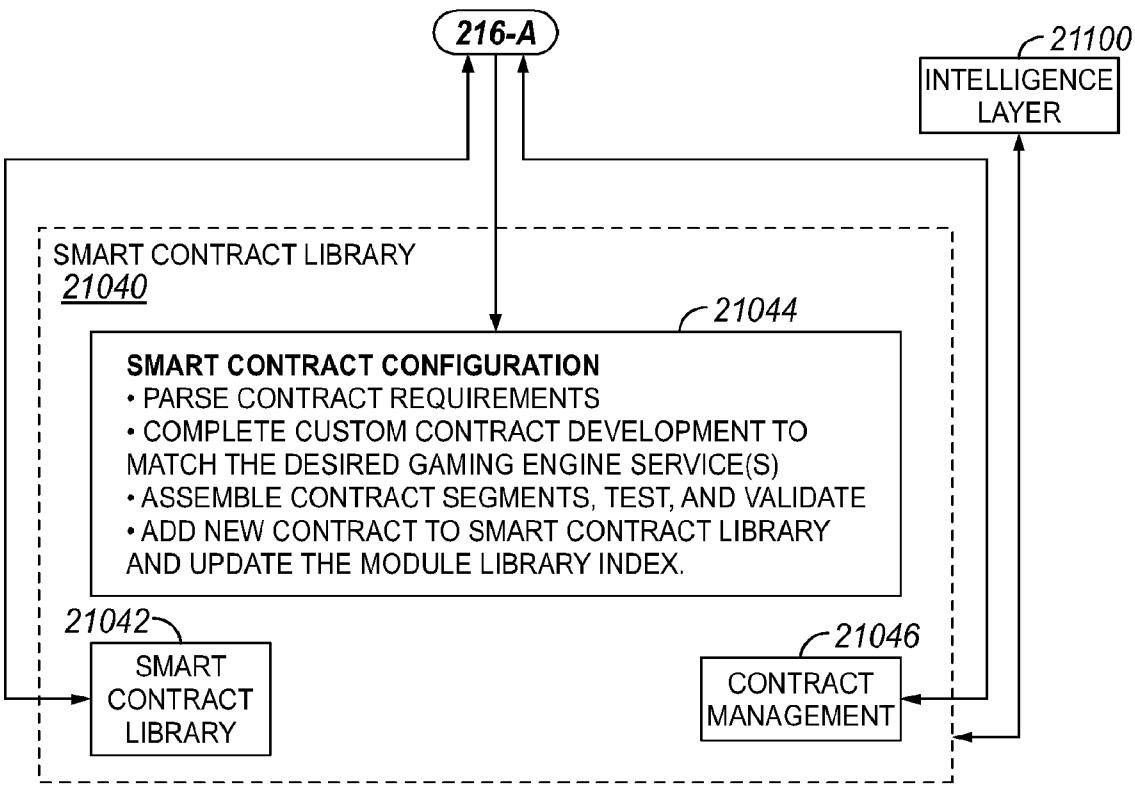

216-A
21100
INTELLIGENCE LAYER
SMART CONTRACT LIBRARY
21040
21044
SMART CONTRACT CONFIGURATION
• PARSE CONTRACT REQUIREMENTS
• COMPLETE CUSTOM CONTRACT DEVELOPMENT TO MATCH THE DESIRED GAMING ENGINE SERVICE(S)
• ASSEMBLE CONTRACT SEGMENTS, TEST, AND VALIDATE
• ADD NEW CONTRACT TO SMART CONTRACT LIBRARY AND UPDATE THE MODULE LIBRARY INDEX.
21042
SMART CONTRACT LIBRARY
21046
CONTRACT MANAGEMENT

FIG. 216-B

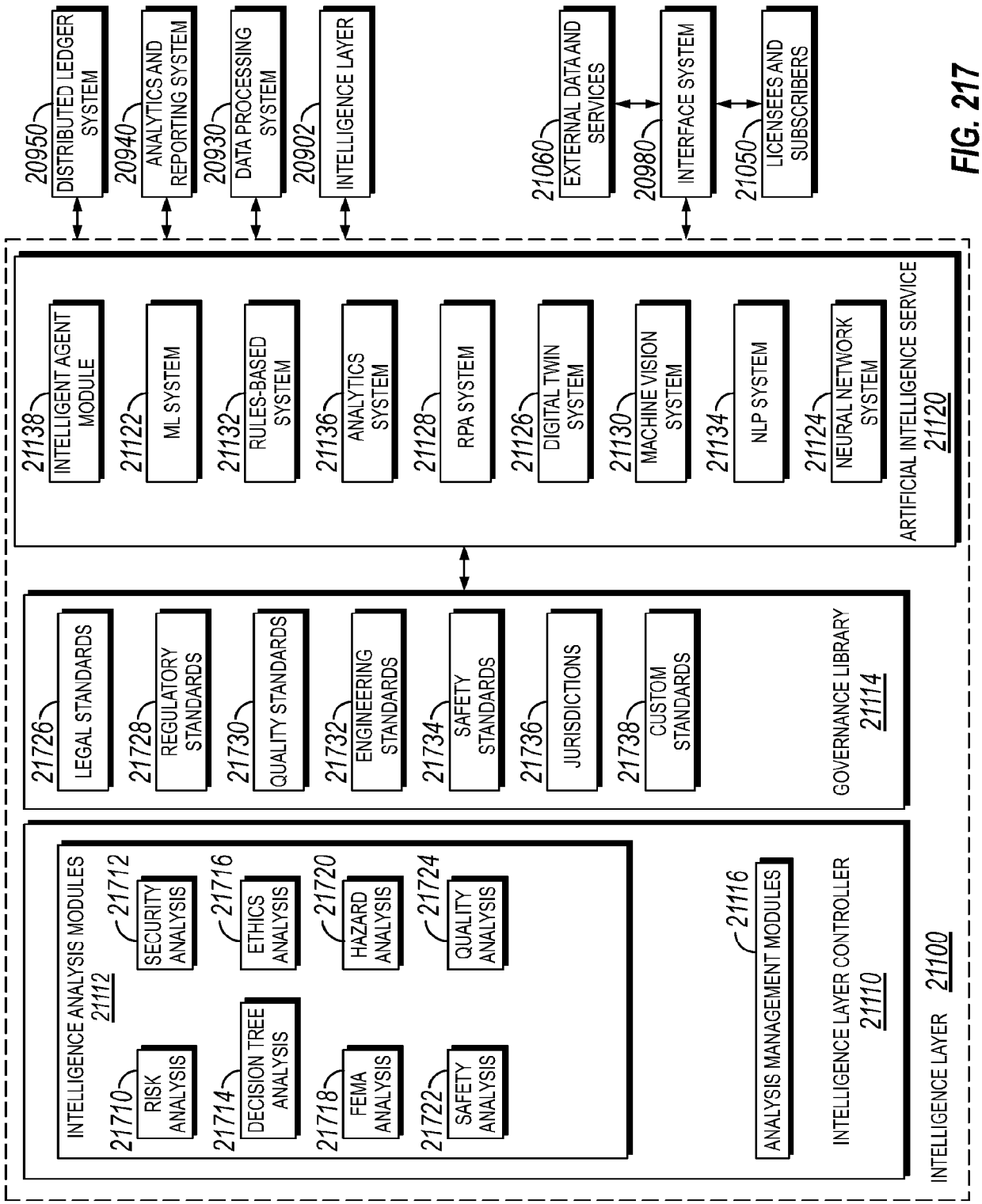

20950 DISTRIBUTED LEDGER SYSTEM
20940 ANALYTICS AND REPORTING SYSTEM
20930 DATA PROCESSING SYSTEM
20902 INTELLIGENCE LAYER
21060 EXTERNAL DATA AND SERVICES
20980 INTERFACE SYSTEM
21050 LICENSEES AND SUBSCRIBERS
21138 INTELLIGENT AGENT MODULE
21122 ML SYSTEM
21132 RULES-BASED SYSTEM
21136 ANALYTICS SYSTEM
21128 RPA SYSTEM
21126 DIGITAL TWIN SYSTEM
21130 MACHINE VISION SYSTEM
21134 NLP SYSTEM
21124 NEURAL NETWORK SYSTEM
ARTIFICIAL INTELLIGENCE SERVICE 21120
21726 LEGAL STANDARDS
21728 REGULATORY STANDARDS
21730 QUALITY STANDARDS
21732 ENGINEERING STANDARDS
21734 SAFETY STANDARDS
21736 JURISDICTIONS
21738 CUSTOM STANDARDS
GOVERNANCE LIBRARY 21114
INTELLIGENCE ANALYSIS MODULES 21112
21710 RISK ANALYSIS
21712 SECURITY ANALYSIS
21714 DECISION TREE ANALYSIS
21716 ETHICS ANALYSIS
21718 FEMA ANALYSIS
21720 HAZARD ANALYSIS
21722 SAFETY ANALYSIS
21724 QUALITY ANALYSIS
21116 ANALYSIS MANAGEMENT MODULES
INTELLIGENCE LAYER CONTROLLER 21110
INTELLIGENCE LAYER 21100

FIG. 217

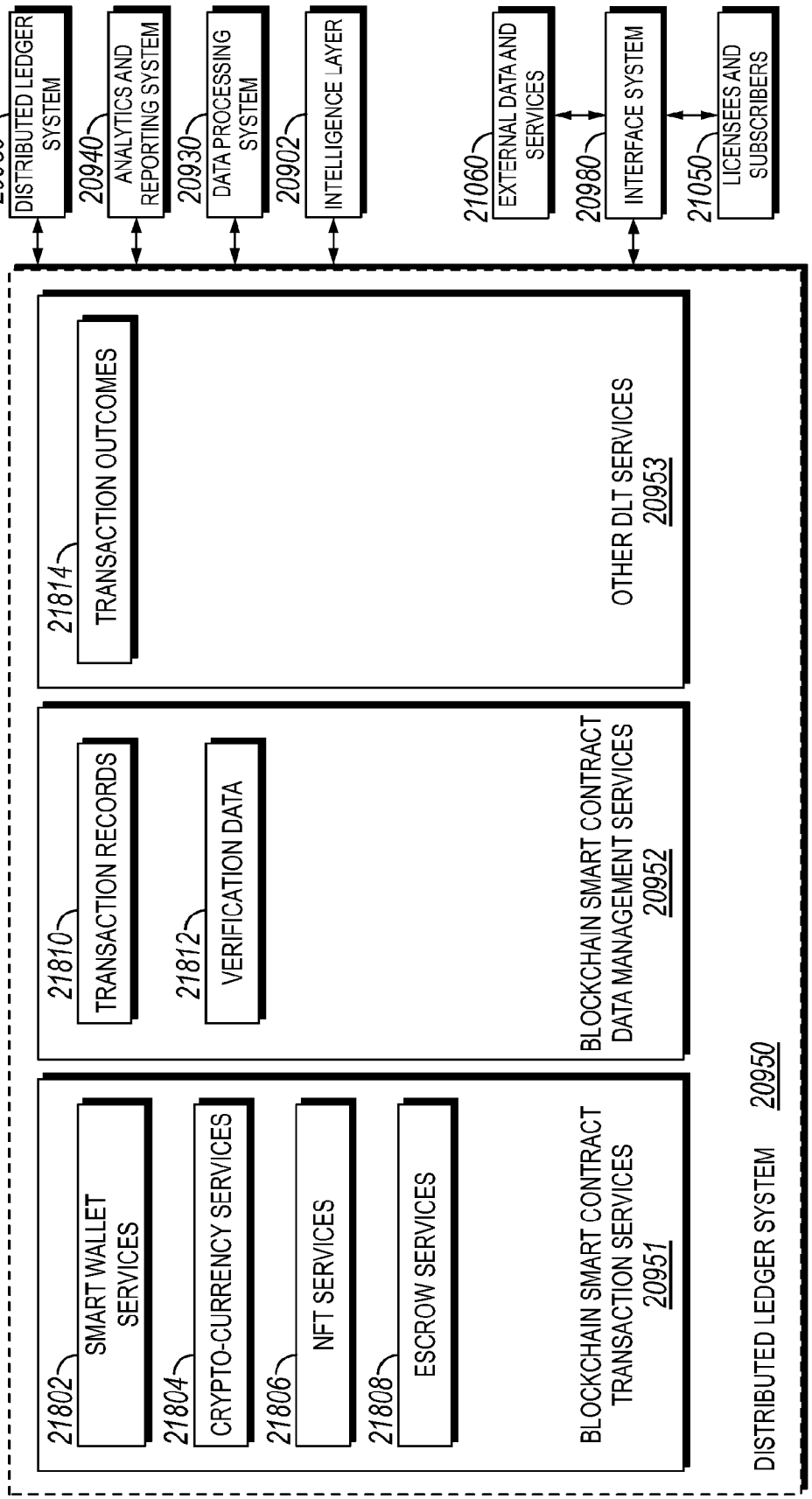

20950 DISTRIBUTED LEDGER SYSTEM
20940 ANALYTICS AND REPORTING SYSTEM
20930 DATA PROCESSING SYSTEM
20902 INTELLIGENCE LAYER
21060 EXTERNAL DATA AND SERVICES
20980 INTERFACE SYSTEM
21050 LICENSEES AND SUBSCRIBERS
21814 TRANSACTION OUTCOMES
OTHER DLT SERVICES 20953
21810 TRANSACTION RECORDS
21812 VERIFICATION DATA
BLOCKCHAIN SMART CONTRACT DATA MANAGEMENT SERVICES 20952
21802 SMART WALLET SERVICES
21804 CRYPTO-CURRENCY SERVICES
21806 NFT SERVICES
21808 ESCROW SERVICES
BLOCKCHAIN SMART CONTRACT TRANSACTION SERVICES 20951
DISTRIBUTED LEDGER SYSTEM 20950

FIG. 218

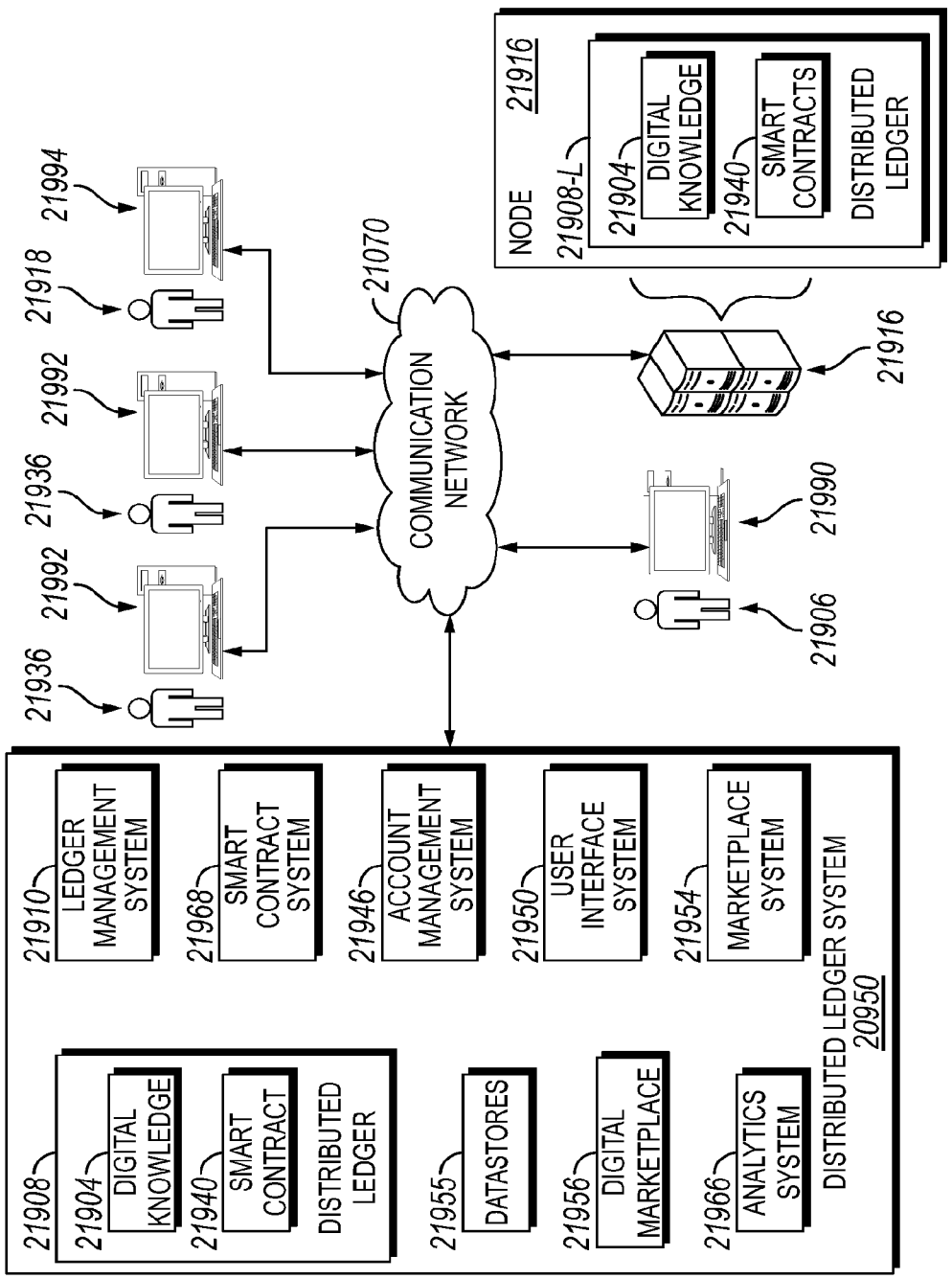

21994
21918
21992
21936
21992
21936
21070
COMMUNICATION NETWORK
NODE 21916
21908-L
21904 DIGITAL KNOWLEDGE
21940 SMART CONTRACTS
DISTRIBUTED LEDGER
21916
21990
21906
21910 LEDGER MANAGEMENT SYSTEM
21968 SMART CONTRACT SYSTEM
21946 ACCOUNT MANAGEMENT SYSTEM
21950 USER INTERFACE SYSTEM
21954 MARKETPLACE SYSTEM
21908
21904 DIGITAL KNOWLEDGE
21940 SMART CONTRACT
DISTRIBUTED LEDGER
21955 DATASTORES
21956 DIGITAL MARKETPLACE
21966 ANALYTICS SYSTEM
DISTRIBUTED LEDGER SYSTEM 20950

FIG. 219

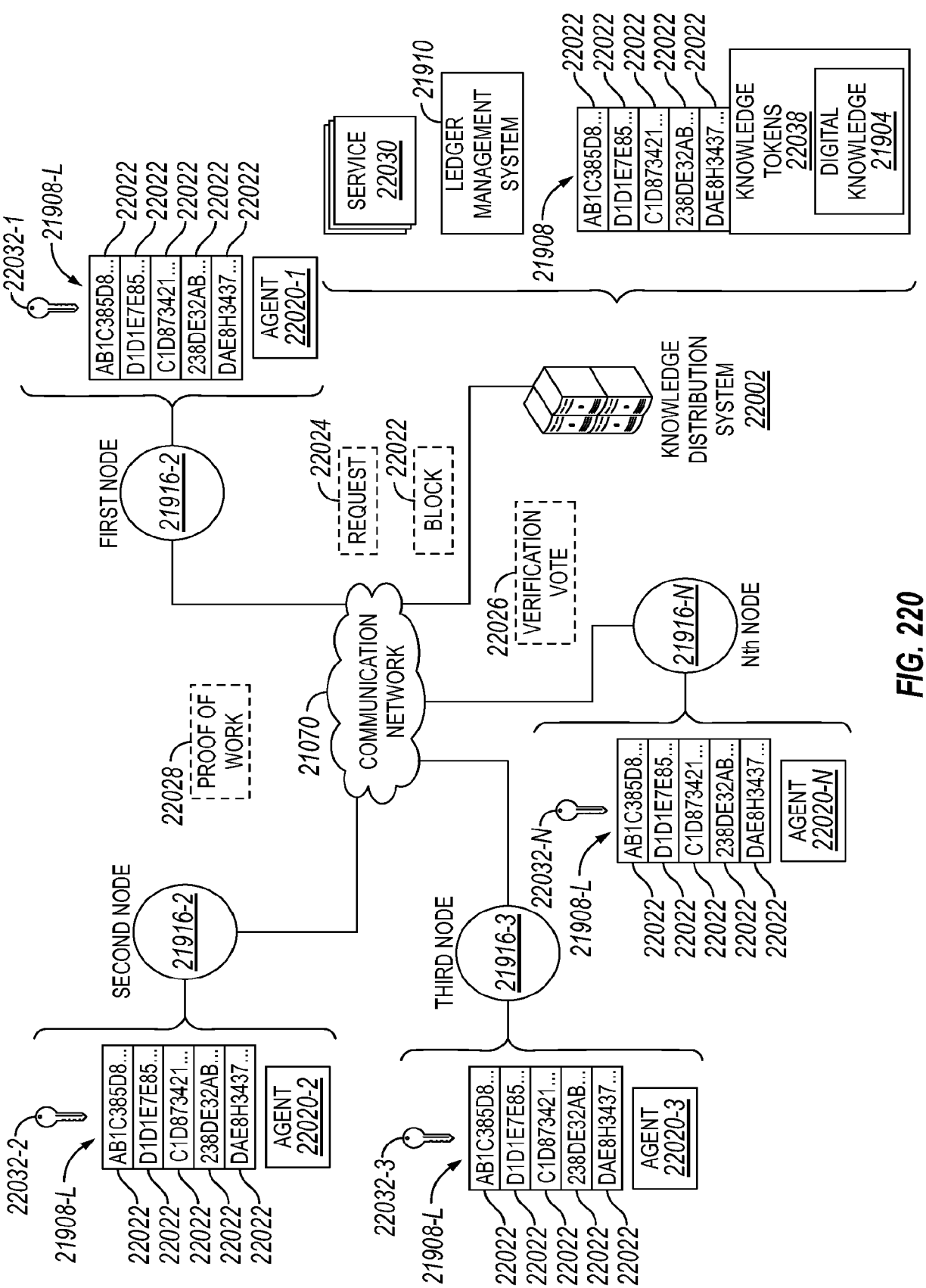

22032-1
21908-L
AB1C385D8...
D1D1E7E85...
C1D873421...
238DE32AB...
DAE8H3437...
22022
AGENT 22020-1
FIRST NODE 21916-2
SERVICE 22030
21910
LEDGER MANAGEMENT SYSTEM
21908
KNOWLEDGE TOKENS 22038
DIGITAL KNOWLEDGE 21904
KNOWLEDGE DISTRIBUTION SYSTEM 22002
22024
REQUEST
22022
BLOCK
22026
VERIFICATION VOTE
21916-N
Nth NODE
21070
COMMUNICATION NETWORK
22028
PROOF OF WORK
SECOND NODE 21916-2
THIRD NODE 21916-3
22032-2
22032-N
22032-3
AGENT 22020-2
AGENT 22020-N
AGENT 22020-3

FIG. 220

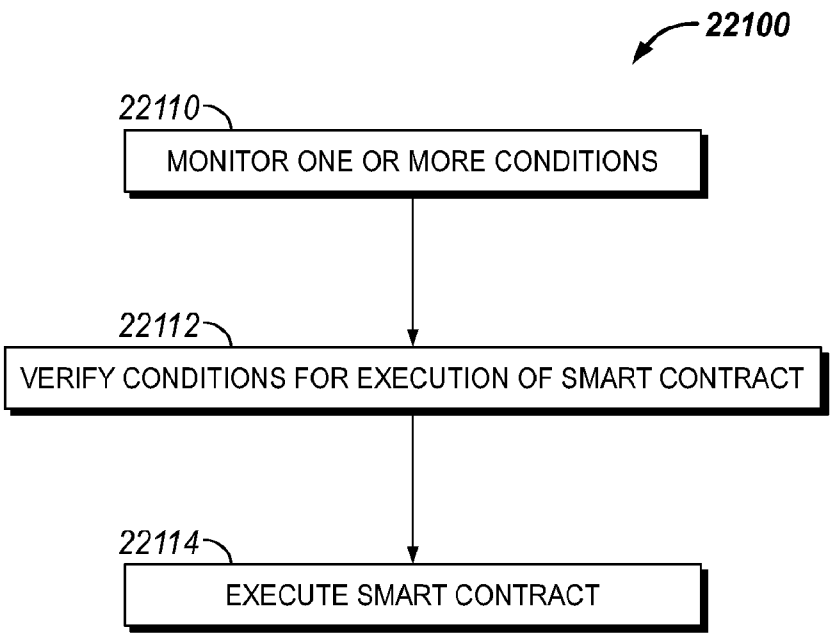

22100
22110
MONITOR ONE OR MORE CONDITIONS
22112
VERIFY CONDITIONS FOR EXECUTION OF SMART CONTRACT
22114
EXECUTE SMART CONTRACT

FIG. 221

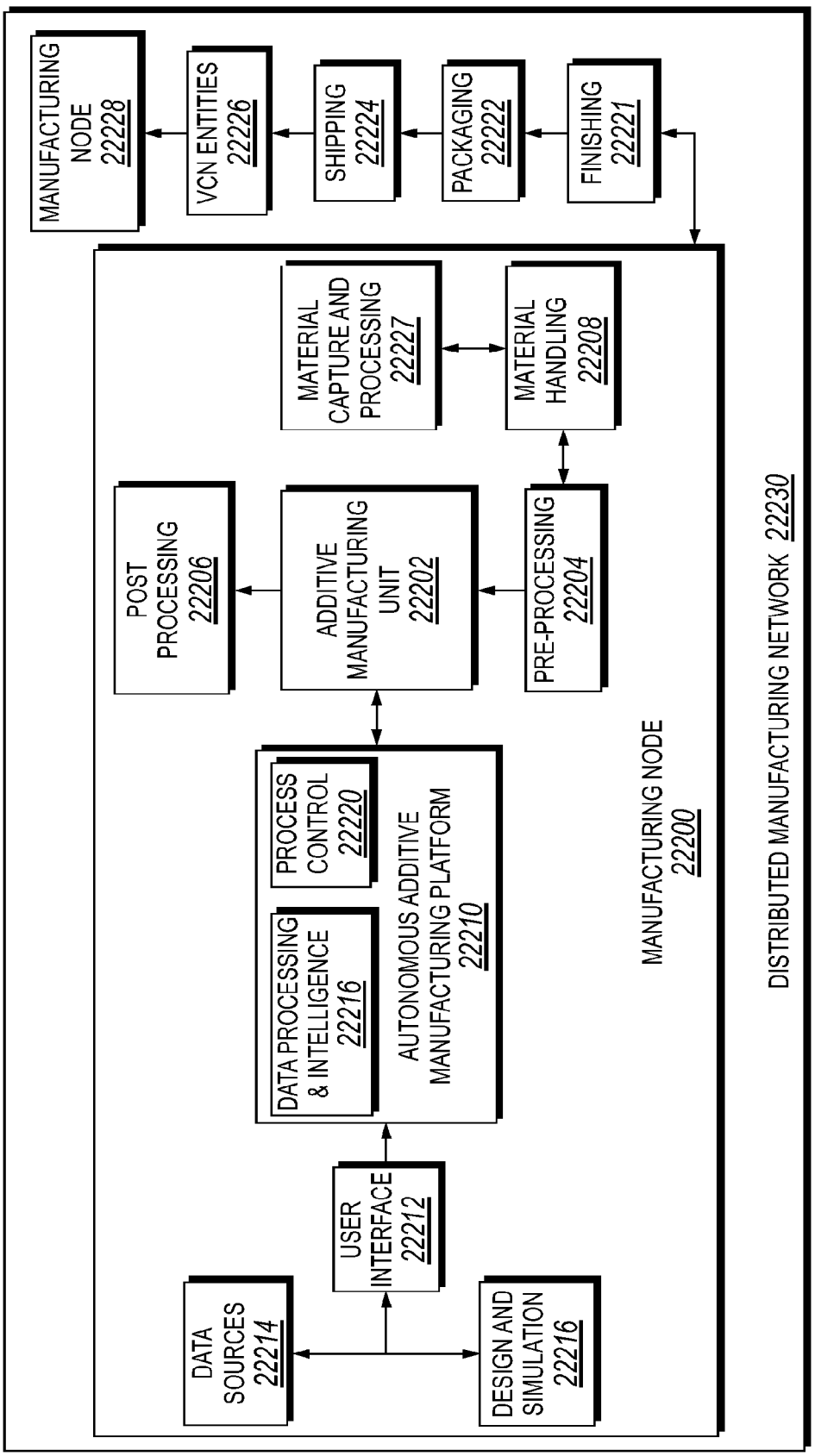

DISTRIBUTED MANUFACTURING NETWORK 22230
MANUFACTURING NODE 22200
MANUFACTURING NODE 22228
VCN ENTITIES 22226
SHIPPING 22224
PACKAGING 22222
FINISHING 22221
MATERIAL CAPTURE AND PROCESSING 22227
MATERIAL HANDLING 22208
POST PROCESSING 22206
ADDITIVE MANUFACTURING UNIT 22202
PRE-PROCESSING 22204
PROCESS CONTROL 22220
DATA PROCESSING & INTELLIGENCE 22216
AUTONOMOUS ADDITIVE MANUFACTURING PLATFORM 22210
USER INTERFACE 22212
DATA SOURCES 22214
DESIGN AND SIMULATION 22216

FIG. 222

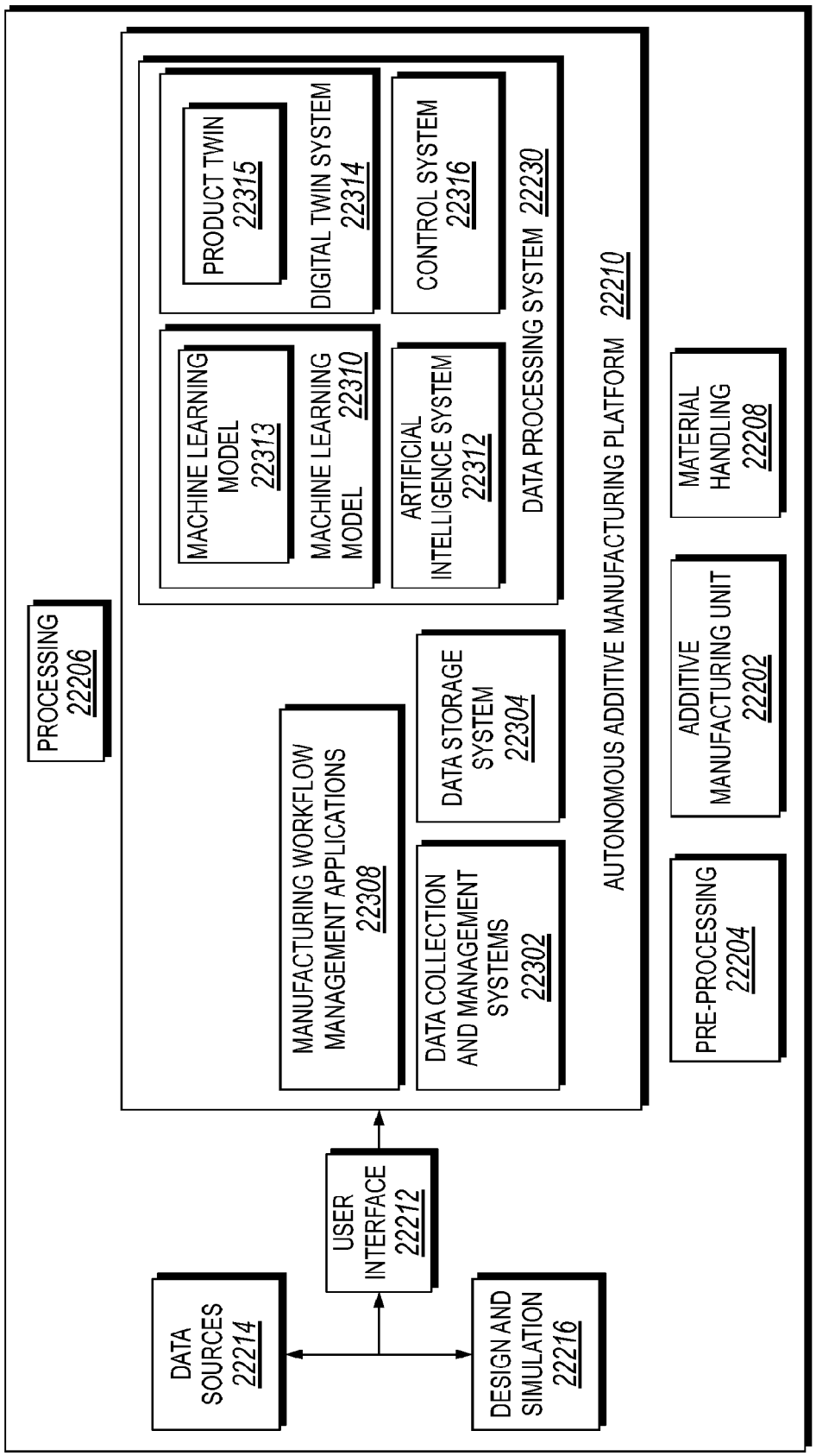

AUTONOMOUS ADDITIVE MANUFACTURING PLATFORM 22210
PROCESSING 22206
DATA PROCESSING SYSTEM 22230
MACHINE LEARNING MODEL 22313
MACHINE LEARNING MODEL 22310
ARTIFICIAL INTELLIGENCE SYSTEM 22312
PRODUCT TWIN 22315
DIGITAL TWIN SYSTEM 22314
CONTROL SYSTEM 22316
MANUFACTURING WORKFLOW MANAGEMENT APPLICATIONS 22308
DATA STORAGE SYSTEM 22304
DATA COLLECTION AND MANAGEMENT SYSTEMS 22302
PRE-PROCESSING 22204
ADDITIVE MANUFACTURING UNIT 22202
MATERIAL HANDLING 22208
USER INTERFACE 22212
DATA SOURCES 22214
DESIGN AND SIMULATION 22216

FIG. 223

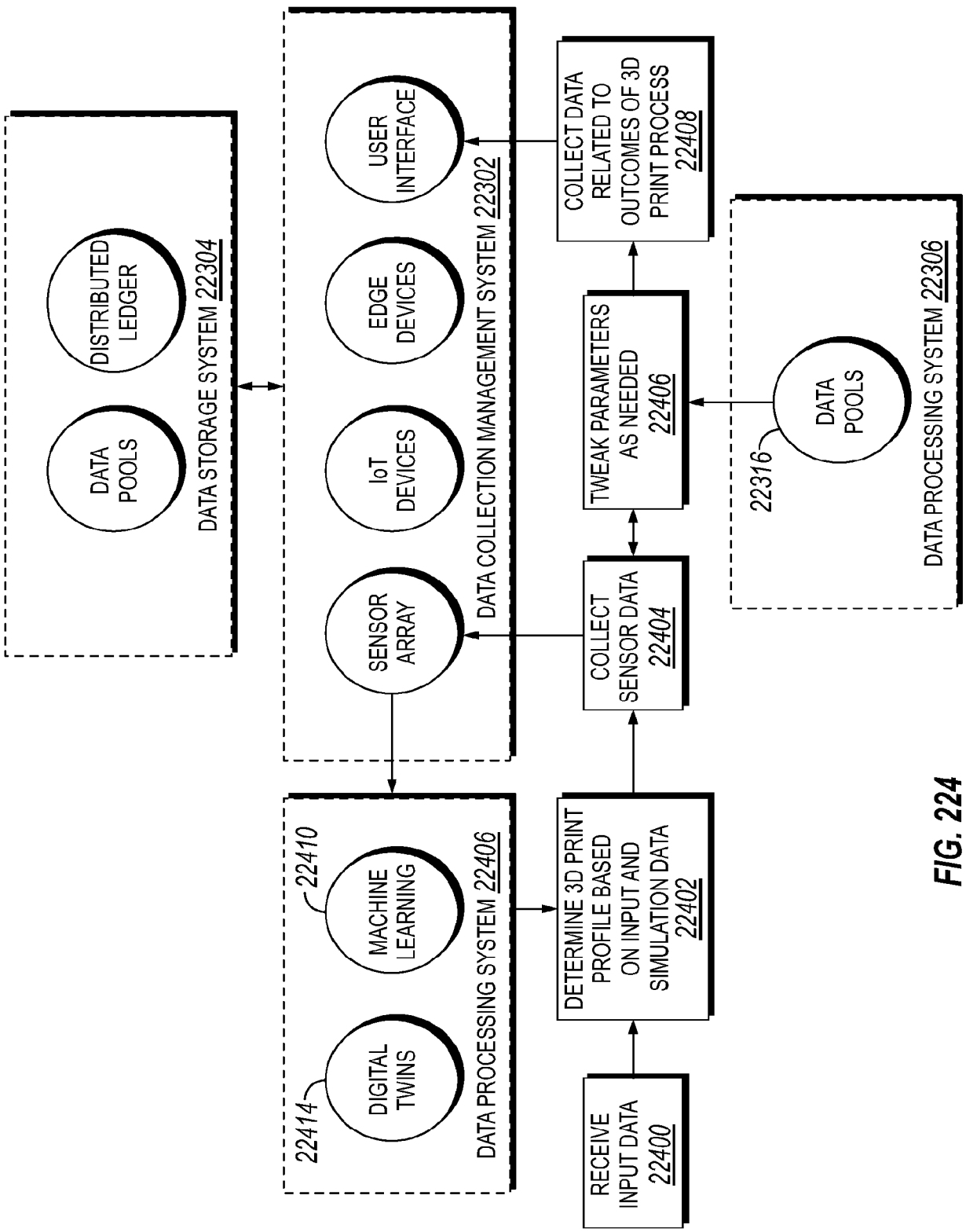

DATA STORAGE SYSTEM 22304
DATA POOLS
DISTRIBUTED LEDGER
DATA COLLECTION MANAGEMENT SYSTEM 22302
SENSOR ARRAY
IoT DEVICES
EDGE DEVICES
USER INTERFACE
DATA PROCESSING SYSTEM 22406
22414
DIGITAL TWINS
22410
MACHINE LEARNING
RECEIVE INPUT DATA 22400
DETERMINE 3D PRINT PROFILE BASED ON INPUT AND SIMULATION DATA 22402
COLLECT SENSOR DATA 22404
TWEAK PARAMETERS AS NEEDED 22406
COLLECT DATA RELATED TO OUTCOMES OF 3D PRINT PROCESS 22408
DATA PROCESSING SYSTEM 22306
22316
DATA POOLS

FIG. 224

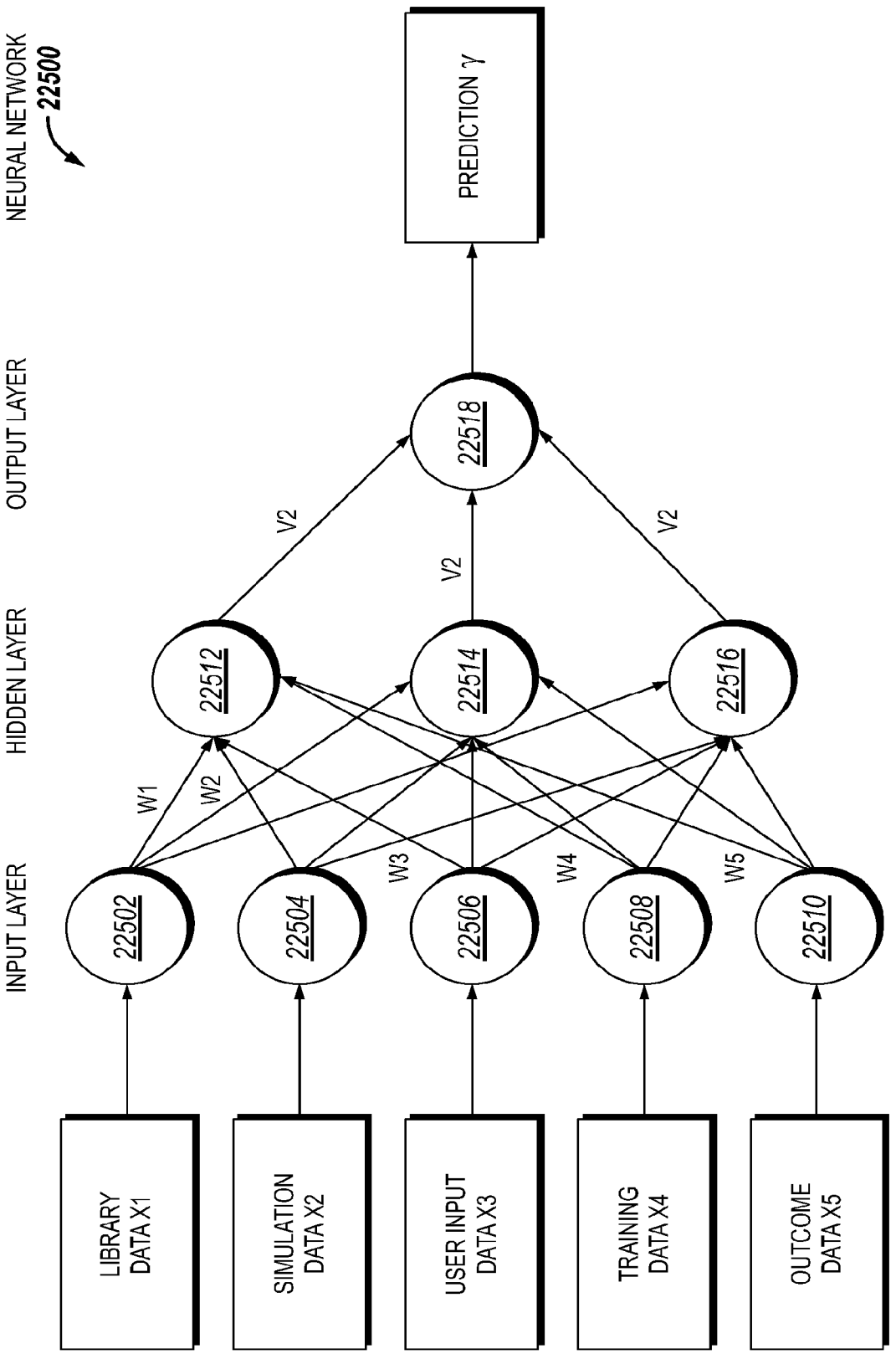

NEURAL NETWORK
22500
INPUT LAYER
HIDDEN LAYER
OUTPUT LAYER
LIBRARY DATA X1
SIMULATION DATA X2
USER INPUT DATA X3
TRAINING DATA X4
OUTCOME DATA X5
22502
22504
22506
22508
22510
22512
22514
22516
22518
W1
W2
W3
W4
W5
V2
V2
V2
PREDICTION γ

FIG. 225A

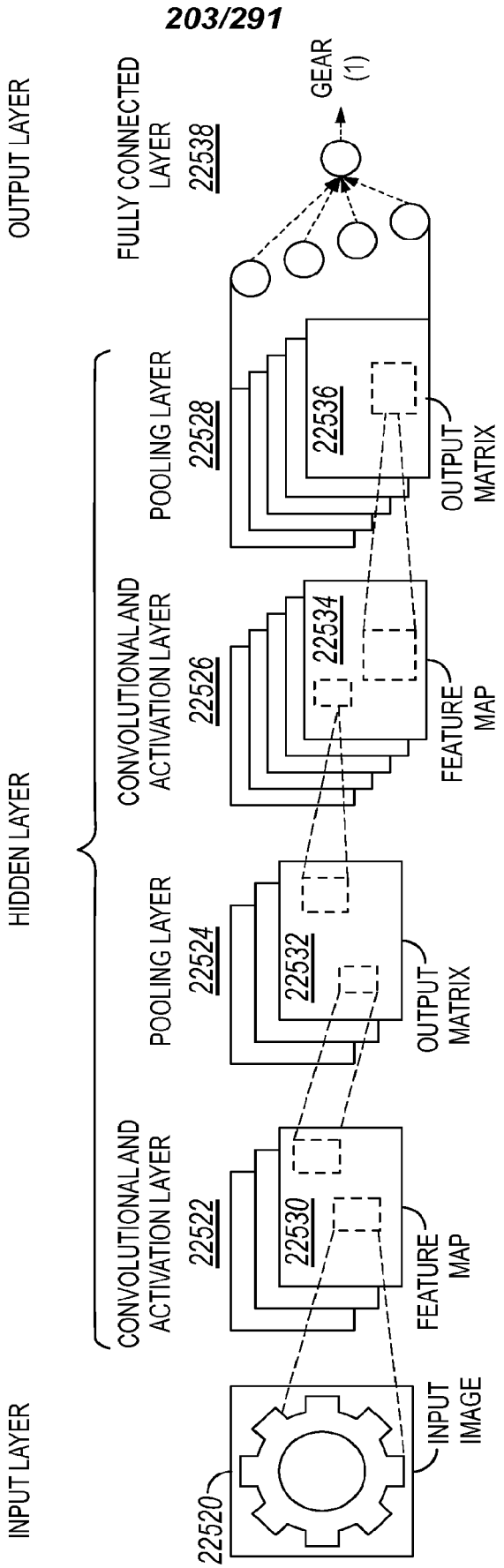

INPUT LAYER
HIDDEN LAYER
OUTPUT LAYER
22520
INPUT IMAGE
CONVOLUTIONAL AND ACTIVATION LAYER
22522
22530
FEATURE MAP
POOLING LAYER
22524
22532
OUTPUT MATRIX
CONVOLUTIONAL AND ACTIVATION LAYER
22526
22534
FEATURE MAP
POOLING LAYER
22528
22536
OUTPUT MATRIX
FULLY CONNECTED LAYER
22538
GEAR (1)

FIG. 225B

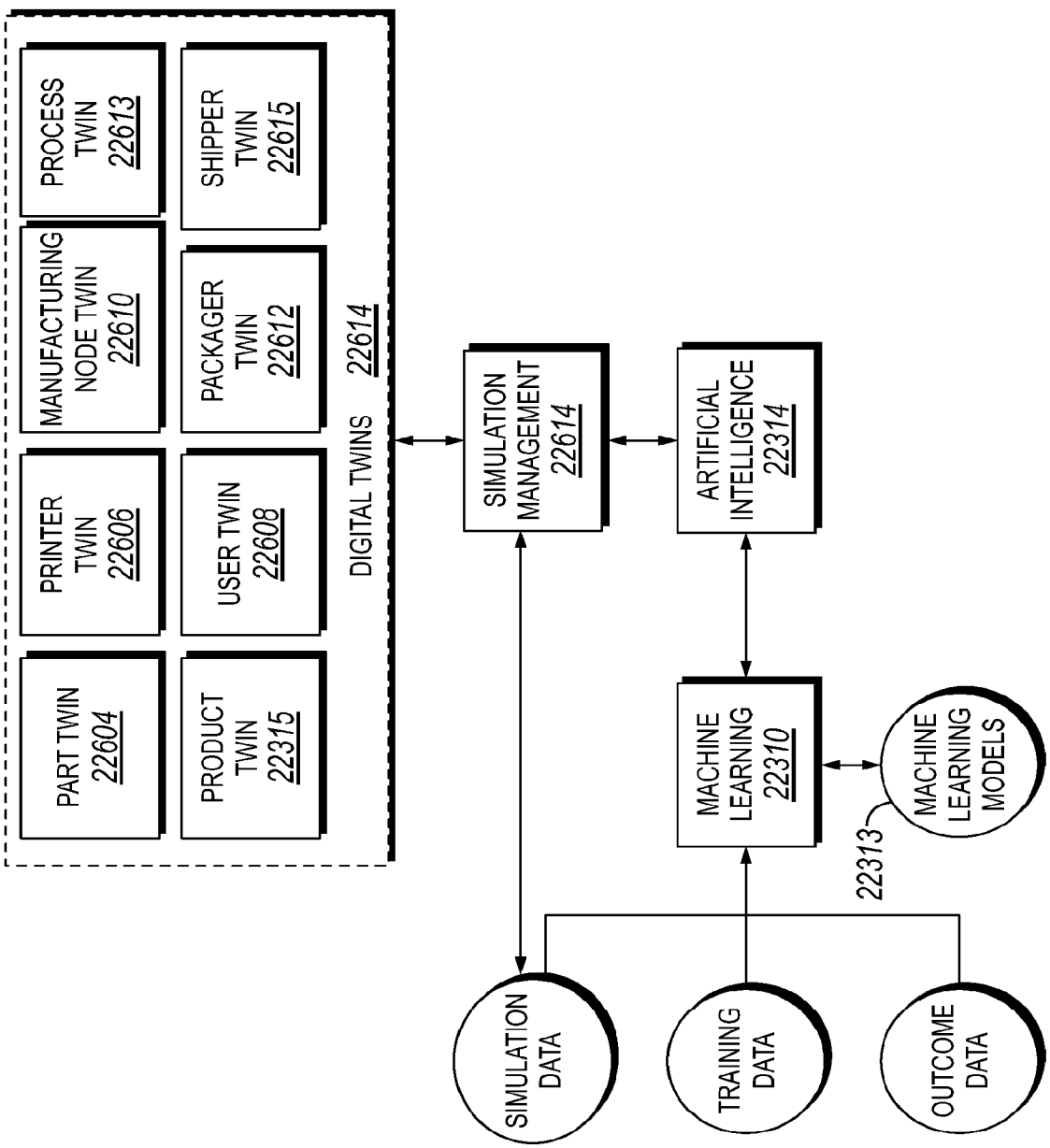

DIGITAL TWINS 22614
PART TWIN 22604
PRINTER TWIN 22606
MANUFACTURING NODE TWIN 22610
PROCESS TWIN 22613
PRODUCT TWIN 22315
USER TWIN 22608
PACKAGER TWIN 22612
SHIPPER TWIN 22615
SIMULATION MANAGEMENT 22614
ARTIFICIAL INTELLIGENCE 22314
MACHINE LEARNING 22310
MACHINE LEARNING MODELS
22313
SIMULATION DATA
TRAINING DATA
OUTCOME DATA

FIG. 226

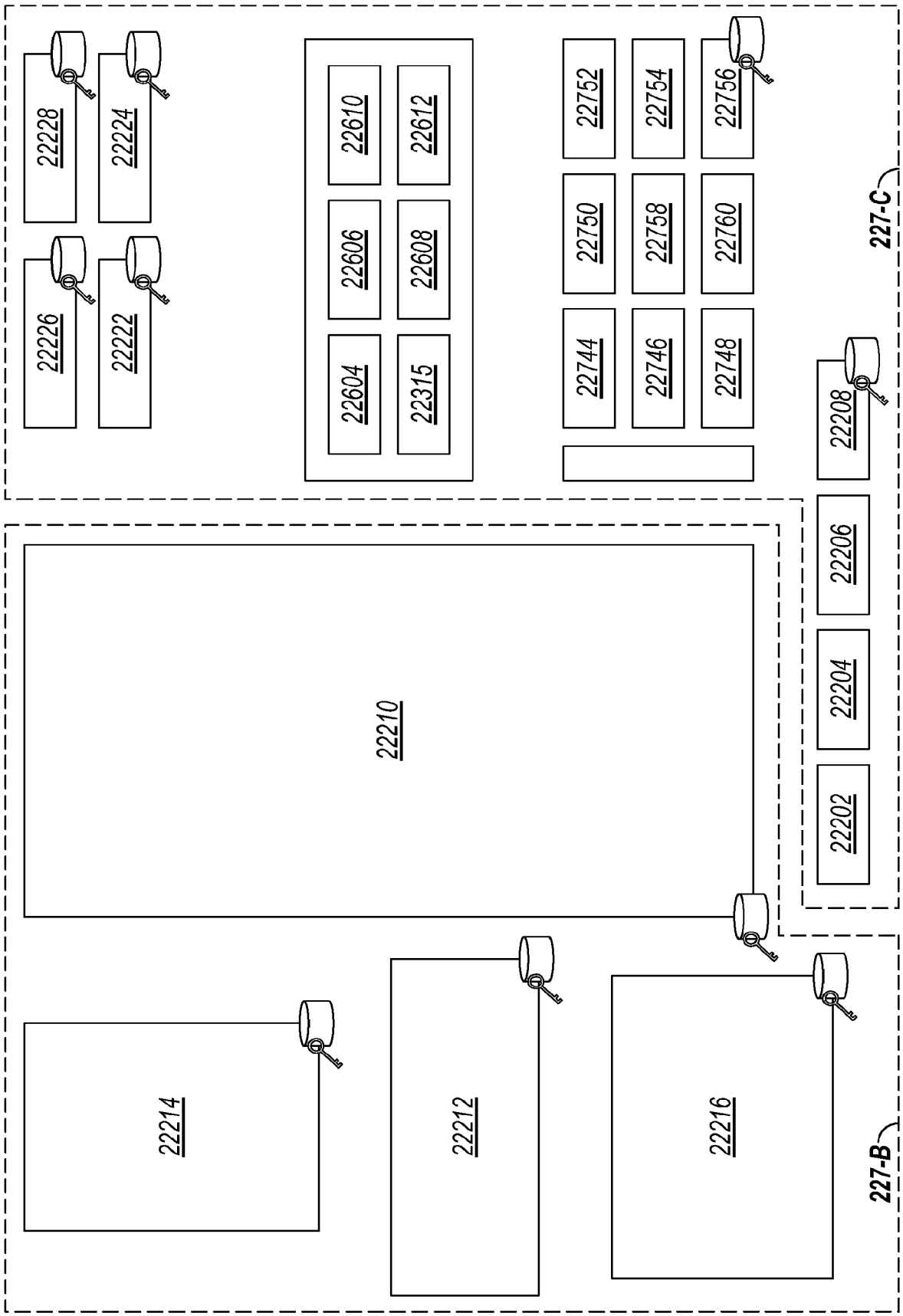

22228
22224
22226
22222
22610
22612
22606
22608
22604
22315
22752
22754
22756
22750
22758
22760
22744
22746
22748
22208
227-C
22206
22204
22202
22210
22214
22212
22216
227-B

FIG. 227-A

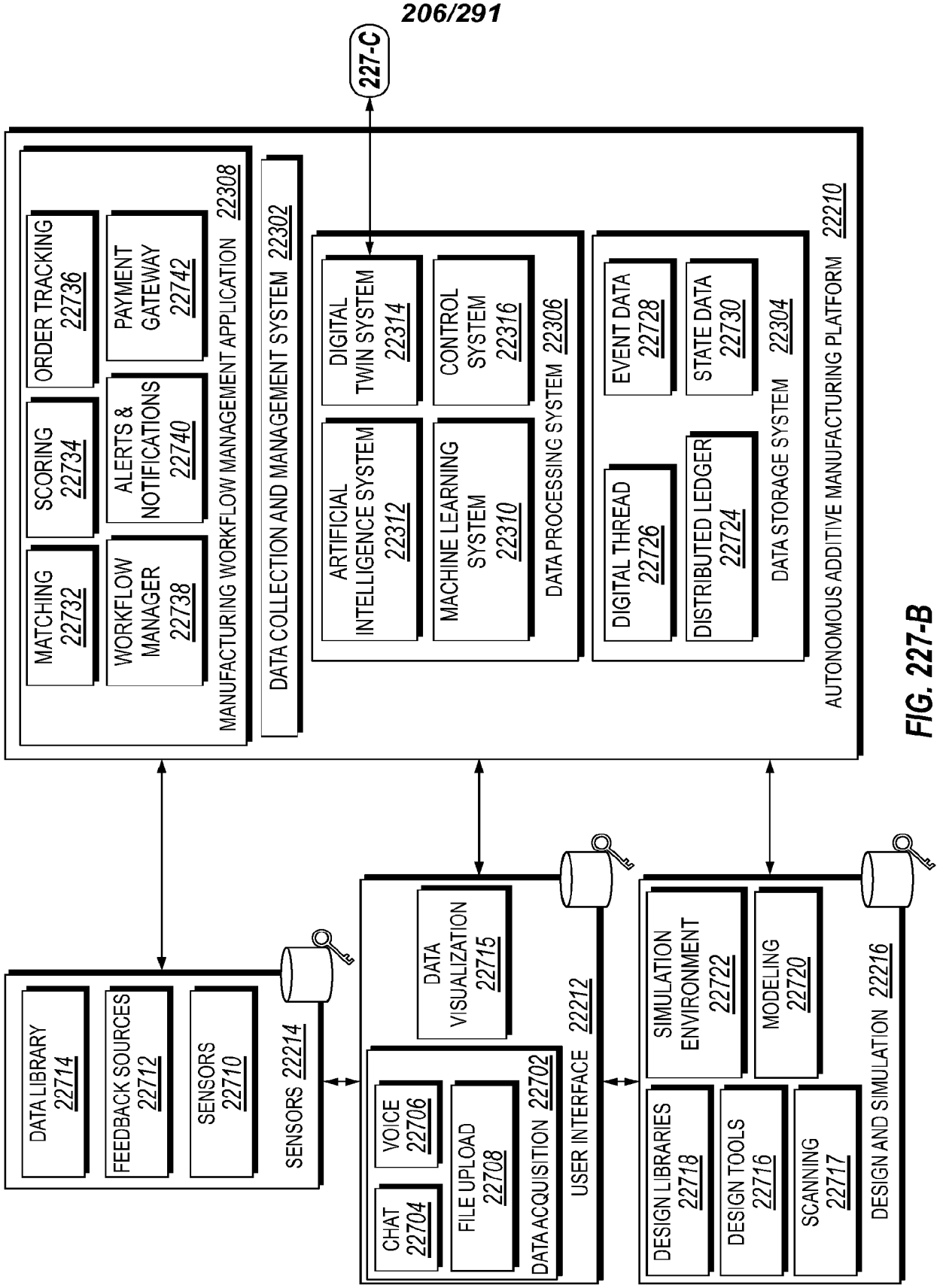

227-C
AUTONOMOUS ADDITIVE MANUFACTURING PLATFORM 22210
MANUFACTURING WORKFLOW MANAGEMENT APPLICATION 22308
MATCHING 22732
WORKFLOW MANAGER 22738
SCORING 22734
ALERTS & NOTIFICATIONS 22740
ORDER TRACKING 22736
PAYMENT GATEWAY 22742
DATA COLLECTION AND MANAGEMENT SYSTEM 22302
DATA PROCESSING SYSTEM 22306
ARTIFICIAL INTELLIGENCE SYSTEM 22312
MACHINE LEARNING SYSTEM 22310
DIGITAL TWIN SYSTEM 22314
CONTROL SYSTEM 22316
DATA STORAGE SYSTEM 22304
DIGITAL THREAD 22726
DISTRIBUTED LEDGER 22724
EVENT DATA 22728
STATE DATA 22730
DATA LIBRARY 22714
FEEDBACK SOURCES 22712
SENSORS 22710
SENSORS 22214
USER INTERFACE 22212
DATA ACQUISITION 22702
CHAT 22704
VOICE 22706
FILE UPLOAD 22708
DATA VISUALIZATION 22715
DESIGN AND SIMULATION 22216
DESIGN LIBRARIES 22718
DESIGN TOOLS 22716
SCANNING 22717
SIMULATION ENVIRONMENT 22722
MODELING 22720

FIG. 227-B

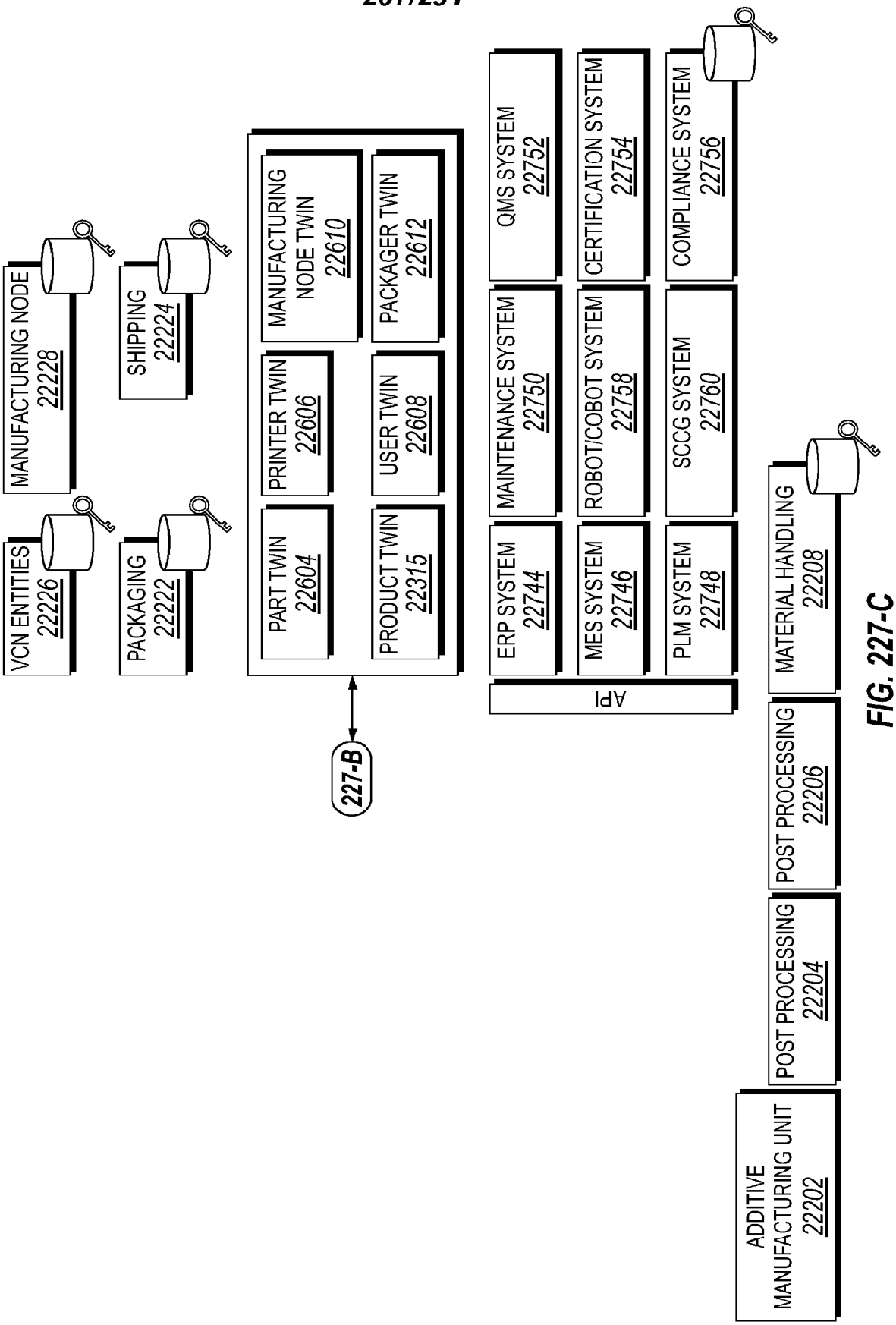

ADDITIVE MANUFACTURING UNIT 22202
POST PROCESSING 22204
POST PROCESSING 22206
MATERIAL HANDLING 22208
ERP SYSTEM 22744
MES SYSTEM 22746
PLM SYSTEM 22748
MAINTENANCE SYSTEM 22750
ROBOT/COBOT SYSTEM 22758
SCCG SYSTEM 22760
QMS SYSTEM 22752
CERTIFICATION SYSTEM 22754
COMPLIANCE SYSTEM 22756
API
227-B
PART TWIN 22604
PRINTER TWIN 22606
PRODUCT TWIN 22315
USER TWIN 22608
MANUFACTURING NODE TWIN 22610
PACKAGER TWIN 22612
VCN ENTITIES 22226
PACKAGING 22222
MANUFACTURING NODE 22228
SHIPPING 22224

FIG. 227-C

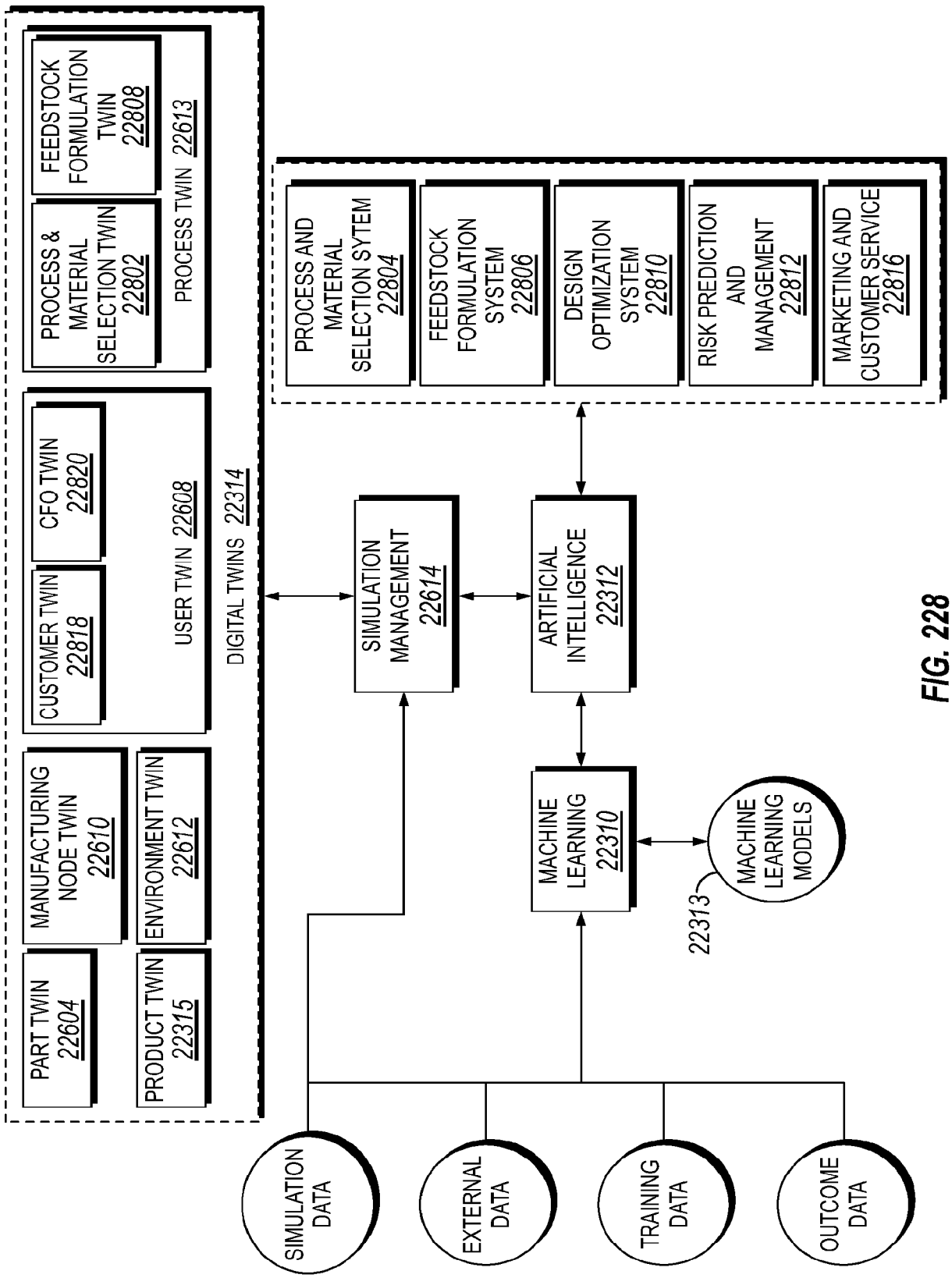

DIGITAL TWINS 22314
PART TWIN 22604
MANUFACTURING NODE TWIN 22610
PRODUCT TWIN 22315
ENVIRONMENT TWIN 22612
USER TWIN 22608
CUSTOMER TWIN 22818
CFO TWIN 22820
PROCESS TWIN 22613
PROCESS & MATERIAL SELECTION TWIN 22802
FEEDSTOCK FORMULATION TWIN 22808
SIMULATION MANAGEMENT 22614
ARTIFICIAL INTELLIGENCE 22312
MACHINE LEARNING 22310
22313
MACHINE LEARNING MODELS
PROCESS AND MATERIAL SELECTION SYTEM 22804
FEEDSTOCK FORMULATION SYSTEM 22806
DESIGN OPTIMIZATION SYSTEM 22810
RISK PREDICTION AND MANAGEMENT 22812
MARKETING AND CUSTOMER SERVICE 22816
SIMULATION DATA
EXTERNAL DATA
TRAINING DATA
OUTCOME DATA

FIG. 228

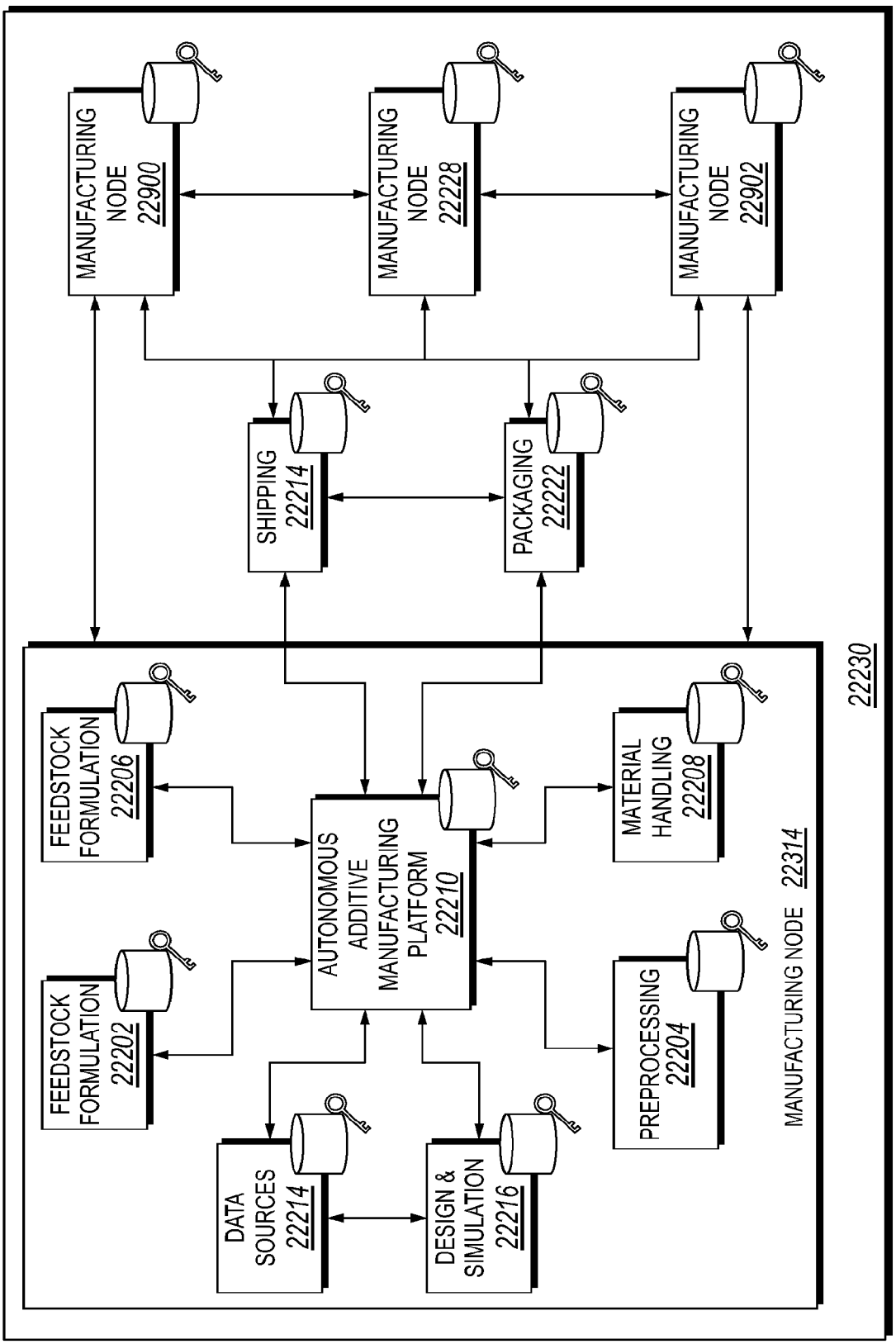

MANUFACTURING NODE 22900
MANUFACTURING NODE 22228
MANUFACTURING NODE 22902
SHIPPING 22214
PACKAGING 22222
FEEDSTOCK FORMULATION 22206
FEEDSTOCK FORMULATION 22202
AUTONOMOUS ADDITIVE MANUFACTURING PLATFORM 22210
MATERIAL HANDLING 22208
PREPROCESSING 22204
DATA SOURCES 22214
DESIGN & SIMULATION 22216
MANUFACTURING NODE 22314
22230

FIG. 229

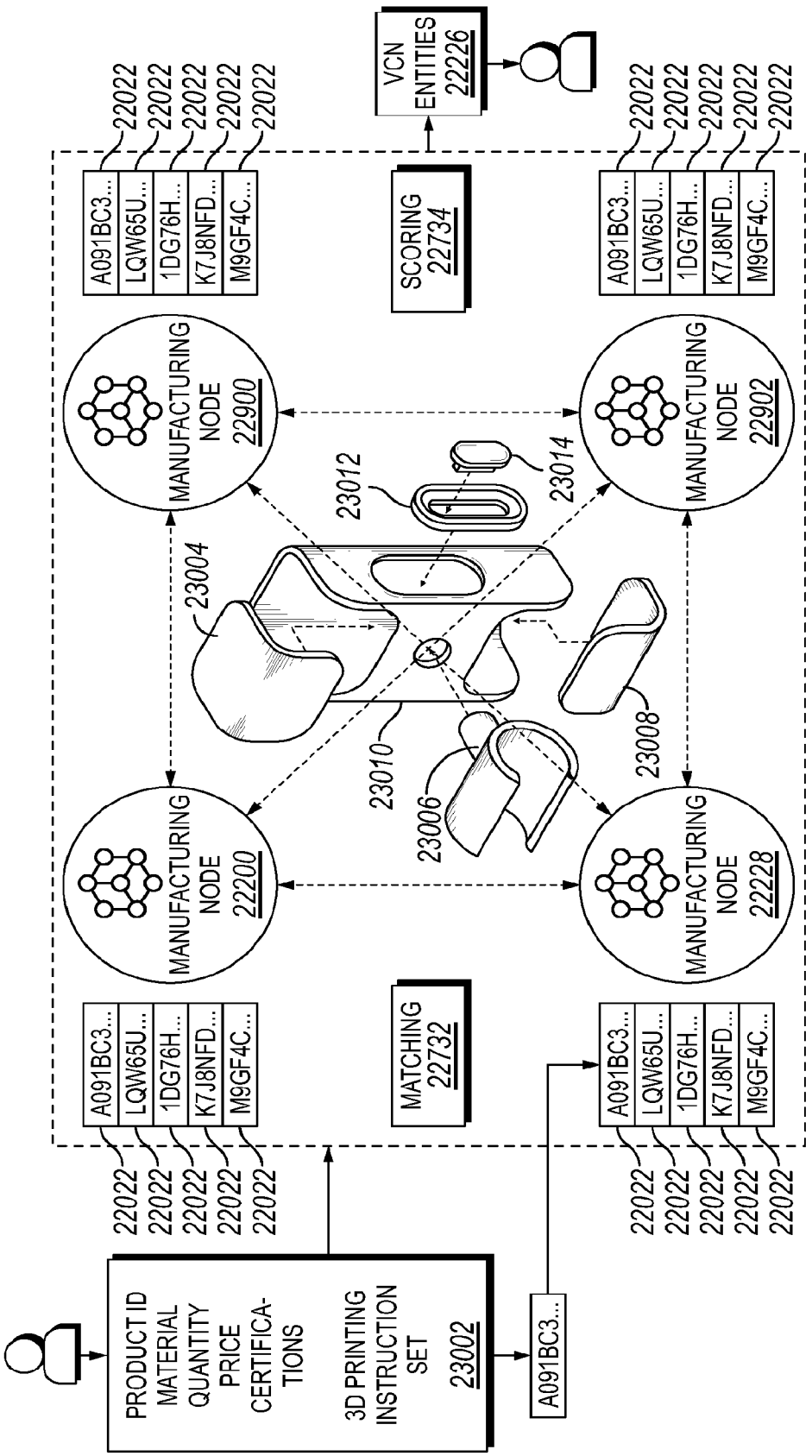

PRODUCT ID
MATERIAL
QUANTITY
PRICE
CERTIFICA-
TIONS
3D PRINTING
INSTRUCTION
SET
23002
A091BC3...
MATCHING
22732
SCORING
22734
VCN
ENTITIES
22226
MANUFACTURING
NODE
22200
MANUFACTURING
NODE
22900
MANUFACTURING
NODE
22902
MANUFACTURING
NODE
22228
A091BC3...
LQW65U...
1DG76H...
K7J8NFD...
M9GF4C...
22022
23004
23006
23008
23010
23012
23014

FIG. 230

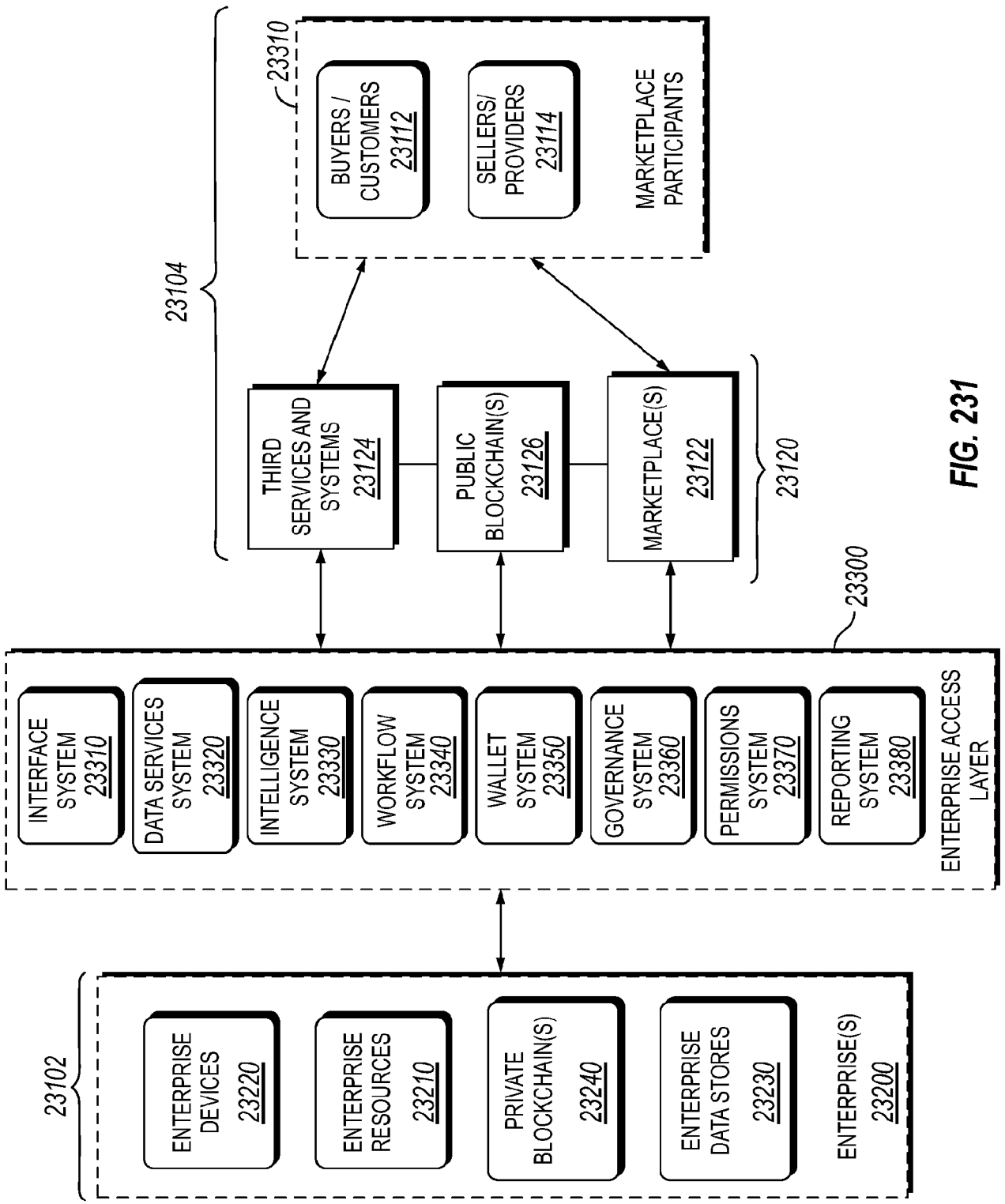

23102
ENTERPRISE(S)
23200
ENTERPRISE DEVICES
23220
ENTERPRISE RESOURCES
23210
PRIVATE BLOCKCHAIN(S)
23240
ENTERPRISE DATA STORES
23230
ENTERPRISE ACCESS LAYER
23300
INTERFACE SYSTEM
23310
DATA SERVICES SYSTEM
23320
INTELLIGENCE SYSTEM
23330
WORKFLOW SYSTEM
23340
WALLET SYSTEM
23350
GOVERNANCE SYSTEM
23360
PERMISSIONS SYSTEM
23370
REPORTING SYSTEM
23380
23104
THIRD SERVICES AND SYSTEMS
23124
PUBLIC BLOCKCHAIN(S)
23126
MARKETPLACE(S)
23122
23120
23310
BUYERS / CUSTOMERS
23112
SELLERS/ PROVIDERS
23114
MARKETPLACE PARTICIPANTS

FIG. 231

ENTERPRISE(S)
23200
DATA SOURCE 23250
CRM SYSTEMS
PLM SYSTEM
HEALTHCARE SYSTEMS
HR SYSTEM
SUPPLY CHAIN SYSTEM
ENTERPRISE ANALYTICS 23260
MARKET ALAYTICS
STATISTICAL ANALYSES
DEMOGRAPHICS
DEVICES 23220
PROCESSORS
IoT / IIoT
USER DEVICES
PRIVATE BLOCKCHAIN SYSTEM 23240
ENTERPRISE ACCESS LAYER 23300
INTERFACE SYSTEM 23210
API / SDK
GUI
AUTHENTICATION
SECURITY PROTOCOLS
INTERFACE LIBRARIES
DATA SERVICES SYSTEM 23220
DATA PROCESSING
NETWORKING
DATA STORAGE
ENCODING
DATABASE MANAGER
HARDWARE
WORKFLOW SYSTEM 23240
DEFINITIONS
LIBRARIES
OPTIMIZATION
WORKFLOW MANAGEMENT
INTELLIGENCE SYSTEM 23330
INTELLIGENCE SERVICE CONTROLLER
AI MODULES
WALLET SYSTEM 23350
ORESTRATION
AUTHORIZATION
INTERFACES
CONVERSIONS
GOVERNANCE SYSTEM 23360
CUSTOM
ETHICAL
TESTING
LEGAL
TRAINING
MARKET SPECIFIC
PERMISSIONS SYSTEM 23370
PRIVACY RULES
GRANULARITY
TRANSACTOR ID
REQUESTS
APPROVALS
NEED TO KNOW
REPORTING SYSTEM 23380
COMPLIANCE
FRAUD
FINANCIAL
QUERIED
LEGAL
STATISTICS
ORCHESTRATED MARKETPLACES 23122
INSURANCE
LENDING
FINANCE
(n)
PUBLIC BLOCKCHAIN(S) 23126
THIRD-PARTY SYSTEMS / SERVICES 23124

FIG. 232

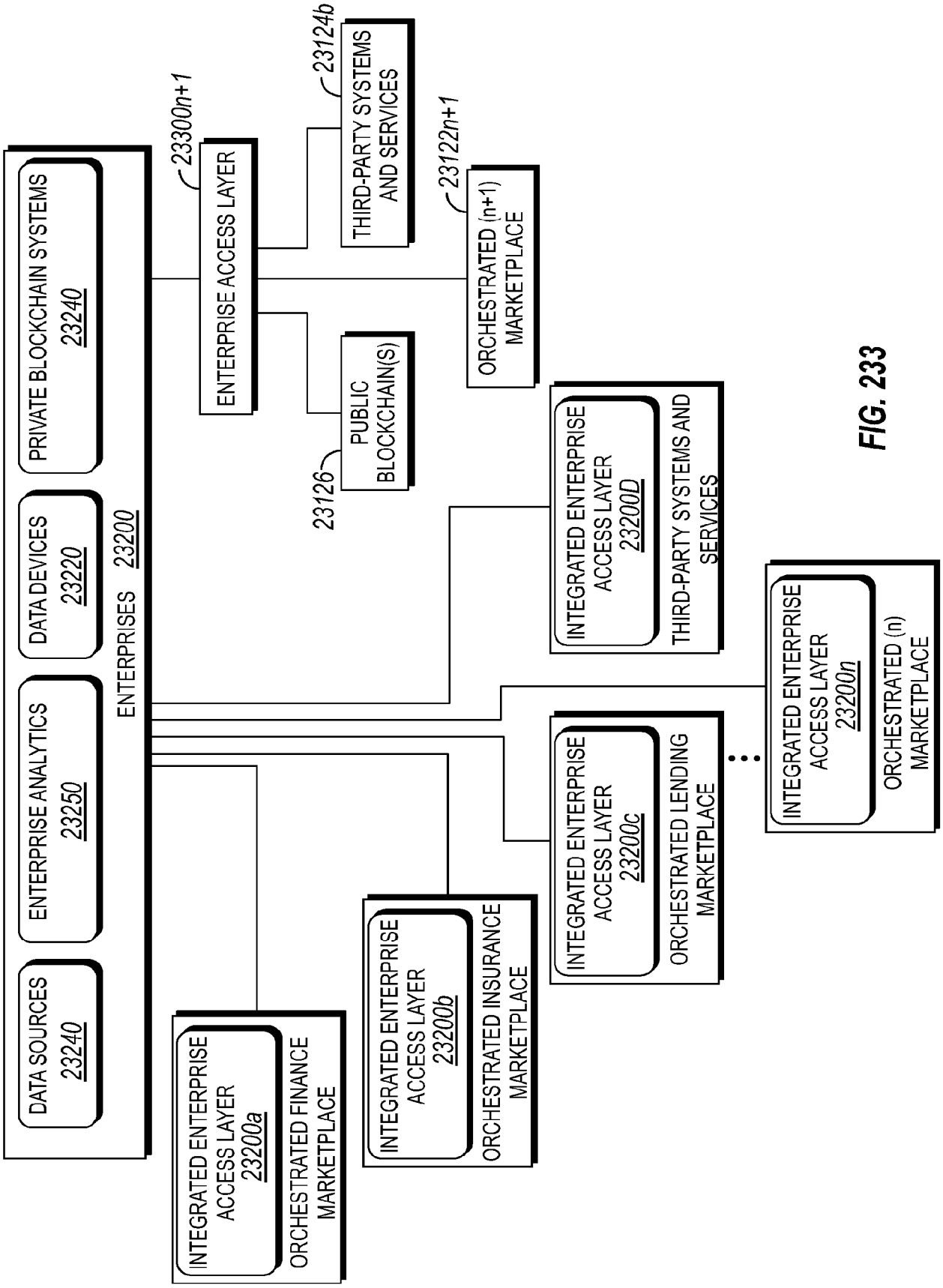

ENTERPRISES 23200
DATA SOURCES 23240
ENTERPRISE ANALYTICS 23250
DATA DEVICES 23220
PRIVATE BLOCKCHAIN SYSTEMS 23240
23300n+1
ENTERPRISE ACCESS LAYER
23124b
THIRD-PARTY SYSTEMS AND SERVICES
23122n+1
ORCHESTRATED (n+1) MARKETPLACE
23126
PUBLIC BLOCKCHAIN(S)
INTEGRATED ENTERPRISE ACCESS LAYER 23200a
ORCHESTRATED FINANCE MARKETPLACE
INTEGRATED ENTERPRISE ACCESS LAYER 23200b
ORCHESTRATED INSURANCE MARKETPLACE
INTEGRATED ENTERPRISE ACCESS LAYER 23200c
ORCHESTRATED LENDING MARKETPLACE
INTEGRATED ENTERPRISE ACCESS LAYER 23200D
THIRD-PARTY SYSTEMS AND SERVICES
INTEGRATED ENTERPRISE ACCESS LAYER 23200n
ORCHESTRATED (n) MARKETPLACE

FIG. 233

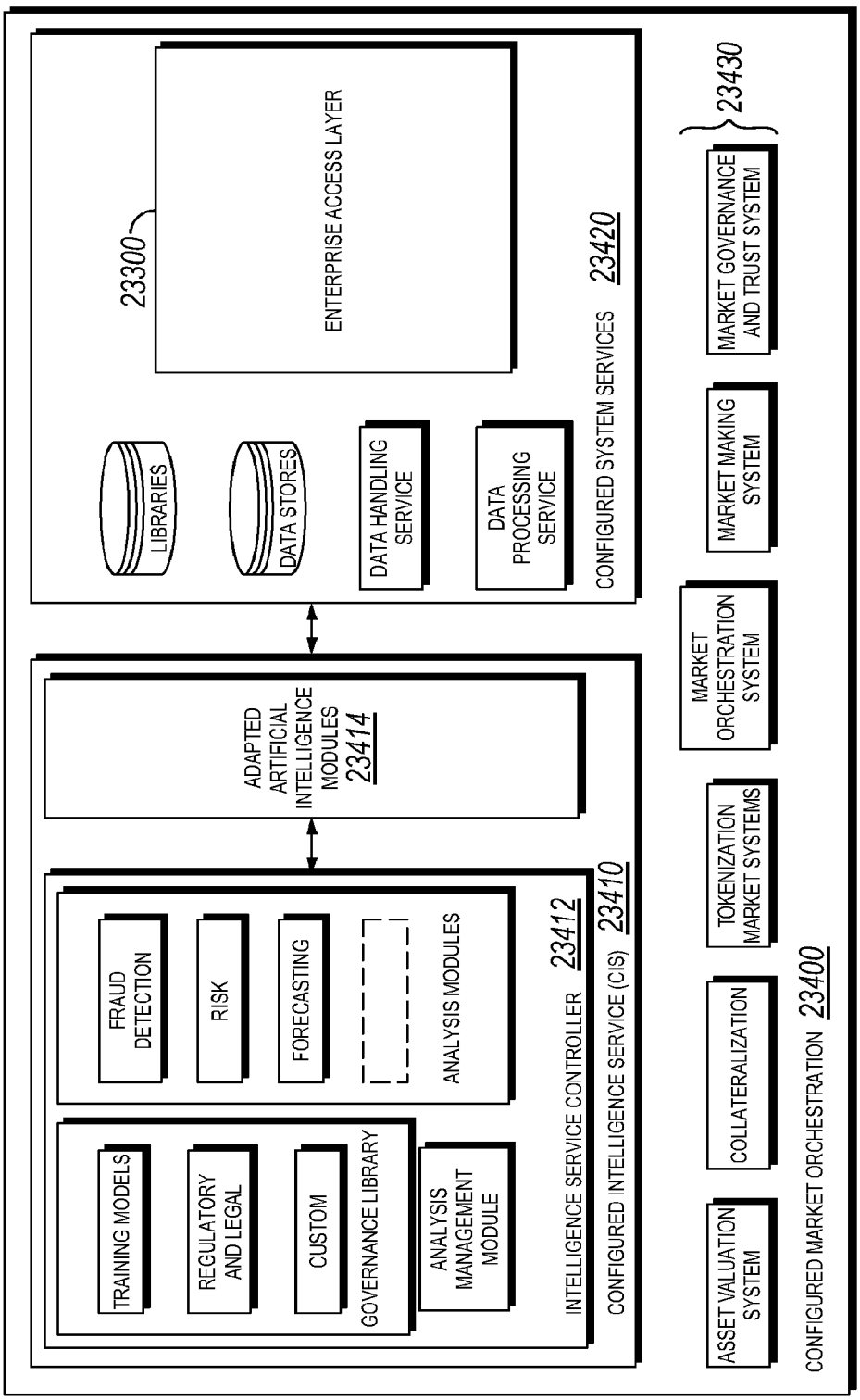

CONFIGURED MARKET ORCHESTRATION 23400
ASSET VALUATION SYSTEM
COLLATERALIZATION
TOKENIZATION MARKET SYSTEMS
MARKET ORCHESTRATION SYSTEM
MARKET MAKING SYSTEM
MARKET GOVERNANCE AND TRUST SYSTEM
23430
CONFIGURED INTELLIGENCE SERVICE (CIS) 23410
INTELLIGENCE SERVICE CONTROLLER 23412
GOVERNANCE LIBRARY
TRAINING MODELS
REGULATORY AND LEGAL
CUSTOM
ANALYSIS MANAGEMENT MODULE
ANALYSIS MODULES
FRAUD DETECTION
RISK
FORECASTING
ADAPTED ARTIFICIAL INTELLIGENCE MODULES 23414
CONFIGURED SYSTEM SERVICES 23420
DATA PROCESSING SERVICE
DATA HANDLING SERVICE
DATA STORES
LIBRARIES
ENTERPRISE ACCESS LAYER
23300

FIG. 234

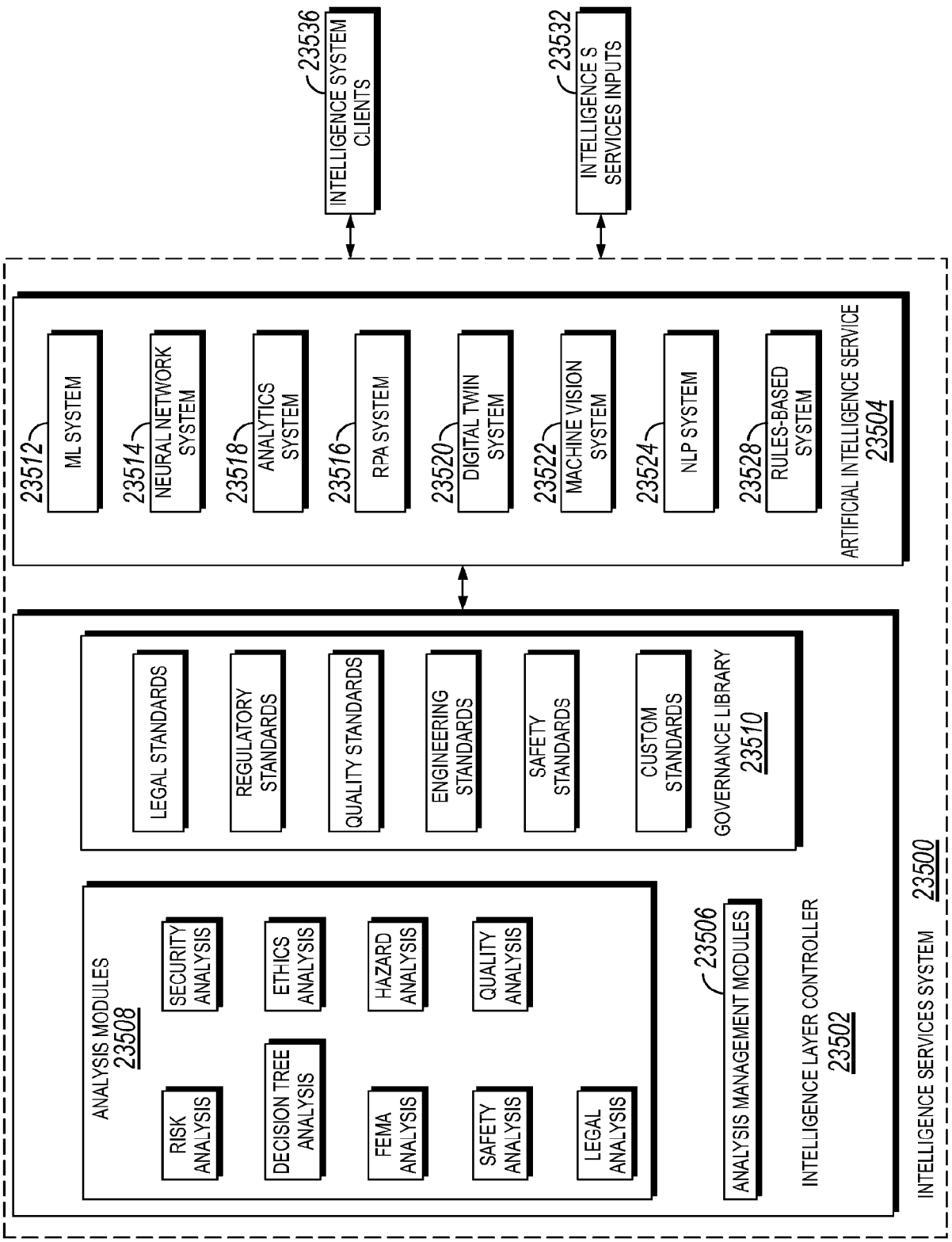

23536
INTELLIGENCE SYSTEM CLIENTS
23532
INTELLIGENCE S SERVICES INPUTS
ARTIFICIAL INTELLIGENCE SERVICE 23504
23512 ML SYSTEM
23514 NEURAL NETWORK SYSTEM
23518 ANALYTICS SYSTEM
23516 RPA SYSTEM
23520 DIGITAL TWIN SYSTEM
23522 MACHINE VISION SYSTEM
23524 NLP SYSTEM
23528 RULES-BASED SYSTEM
GOVERNANCE LIBRARY 23510
LEGAL STANDARDS
REGULATORY STANDARDS
QUALITY STANDARDS
ENGINEERING STANDARDS
SAFETY STANDARDS
CUSTOM STANDARDS
ANALYSIS MODULES 23508
RISK ANALYSIS
SECURITY ANALYSIS
DECISION TREE ANALYSIS
ETHICS ANALYSIS
FEMA ANALYSIS
HAZARD ANALYSIS
SAFETY ANALYSIS
QUALITY ANALYSIS
LEGAL ANALYSIS
23506
ANALYSIS MANAGEMENT MODULES
INTELLIGENCE LAYER CONTROLLER 23502
INTELLIGENCE SERVICES SYSTEM 23500

FIG. 235

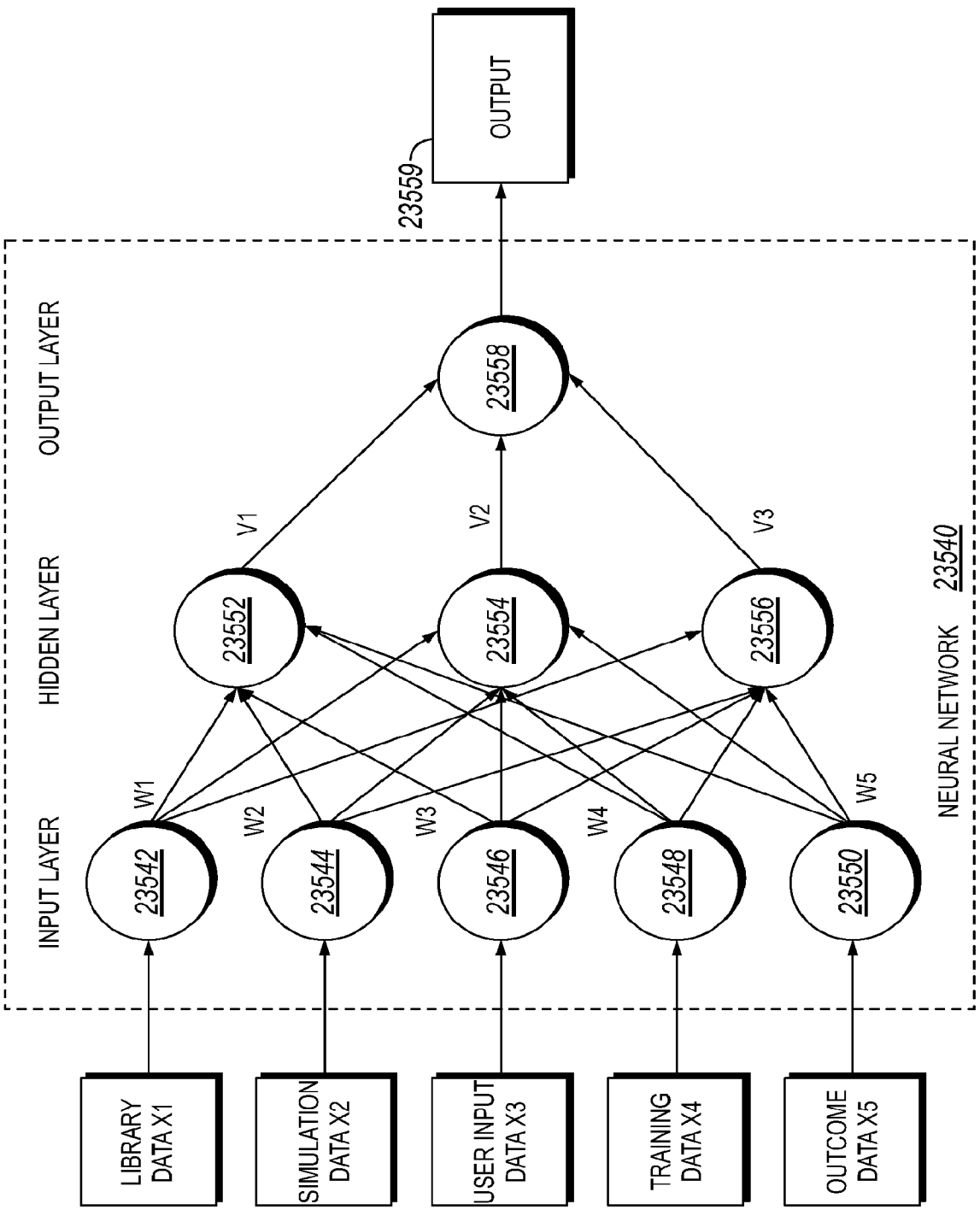

OUTPUT
23559
OUTPUT LAYER
HIDDEN LAYER
INPUT LAYER
NEURAL NETWORK 23540
23558
23552
23554
23556
23542
23544
23546
23548
23550
V1
V2
V3
W1
W2
W3
W4
W5
LIBRARY DATA X1
SIMULATION DATA X2
USER INPUT DATA X3
TRAINING DATA X4
OUTCOME DATA X5

FIG. 236

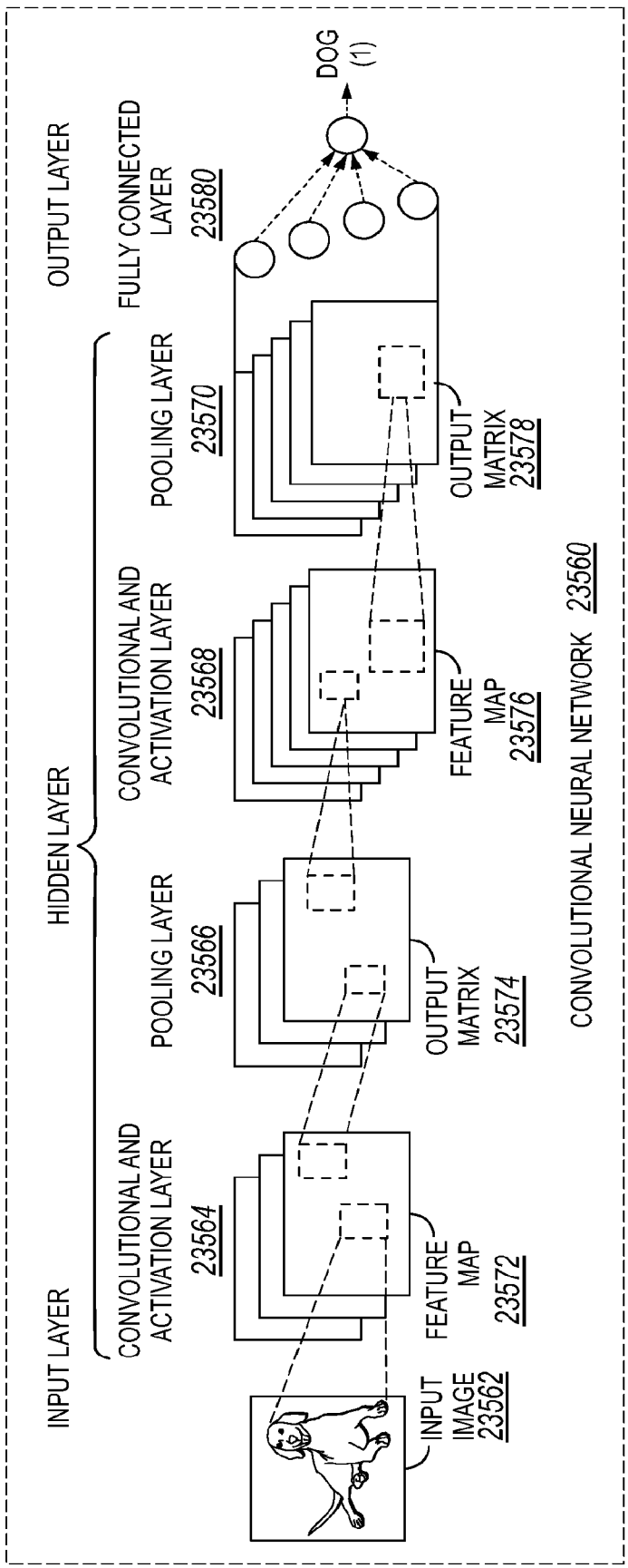

INPUT LAYER
HIDDEN LAYER
OUTPUT LAYER
INPUT IMAGE 23562
CONVOLUTIONAL AND ACTIVATION LAYER 23564
FEATURE MAP 23572
POOLING LAYER 23566
OUTPUT MATRIX 23574
CONVOLUTIONAL AND ACTIVATION LAYER 23568
FEATURE MAP 23576
POOLING LAYER 23570
OUTPUT MATRIX 23578
FULLY CONNECTED LAYER 23580
DOG (1)
CONVOLUTIONAL NEURAL NETWORK 23560

FIG. 237

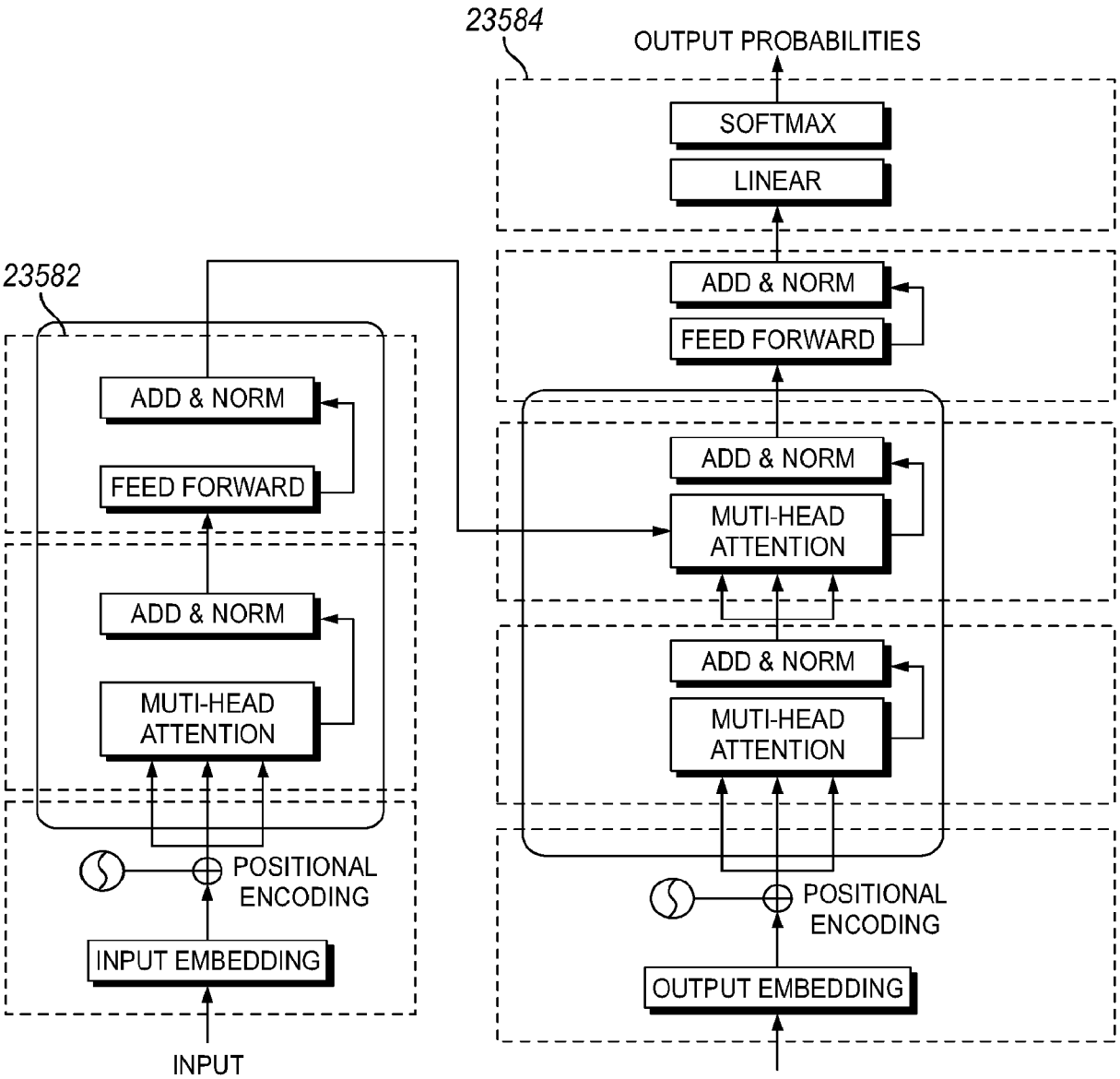

23584
OUTPUT PROBABILITIES
SOFTMAX
LINEAR
ADD & NORM
FEED FORWARD
ADD & NORM
MUTI-HEAD ATTENTION
ADD & NORM
MUTI-HEAD ATTENTION
POSITIONAL ENCODING
OUTPUT EMBEDDING
23582
ADD & NORM
FEED FORWARD
ADD & NORM
MUTI-HEAD ATTENTION
POSITIONAL ENCODING
INPUT EMBEDDING
INPUT

FIG. 238

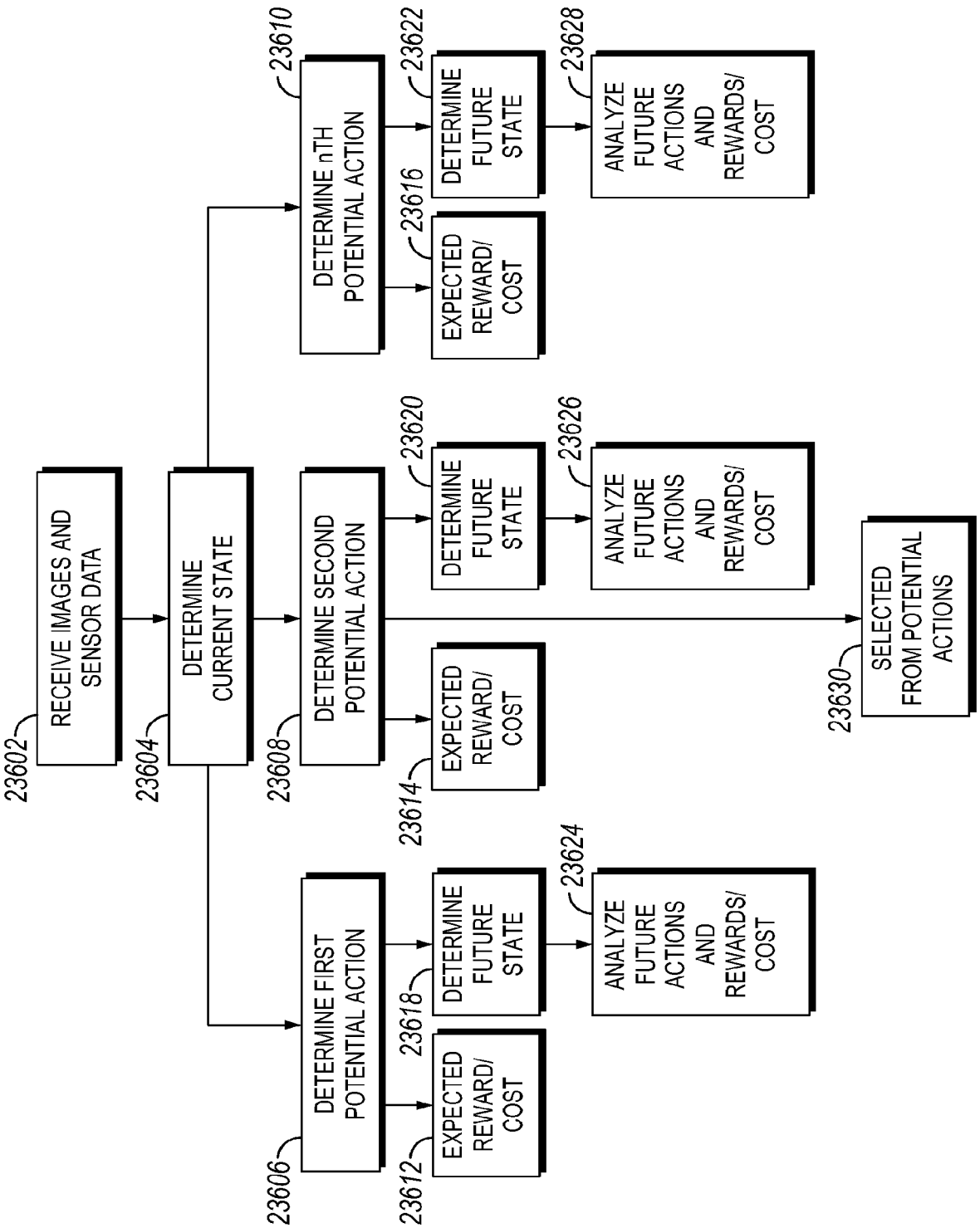

RECEIVE IMAGES AND SENSOR DATA
23602
DETERMINE CURRENT STATE
23604
DETERMINE FIRST POTENTIAL ACTION
23606
EXPECTED REWARD/ COST
23612
DETERMINE FUTURE STATE
23618
ANALYZE FUTURE ACTIONS AND REWARDS/ COST
23624
DETERMINE SECOND POTENTIAL ACTION
23608
EXPECTED REWARD/ COST
23614
DETERMINE FUTURE STATE
23620
ANALYZE FUTURE ACTIONS AND REWARDS/ COST
23626
DETERMINE nTH POTENTIAL ACTION
23610
EXPECTED REWARD/ COST
23616
DETERMINE FUTURE STATE
23622
ANALYZE FUTURE ACTIONS AND REWARDS/ COST
23628
SELECTED FROM POTENTIAL ACTIONS
23630

FIG. 239

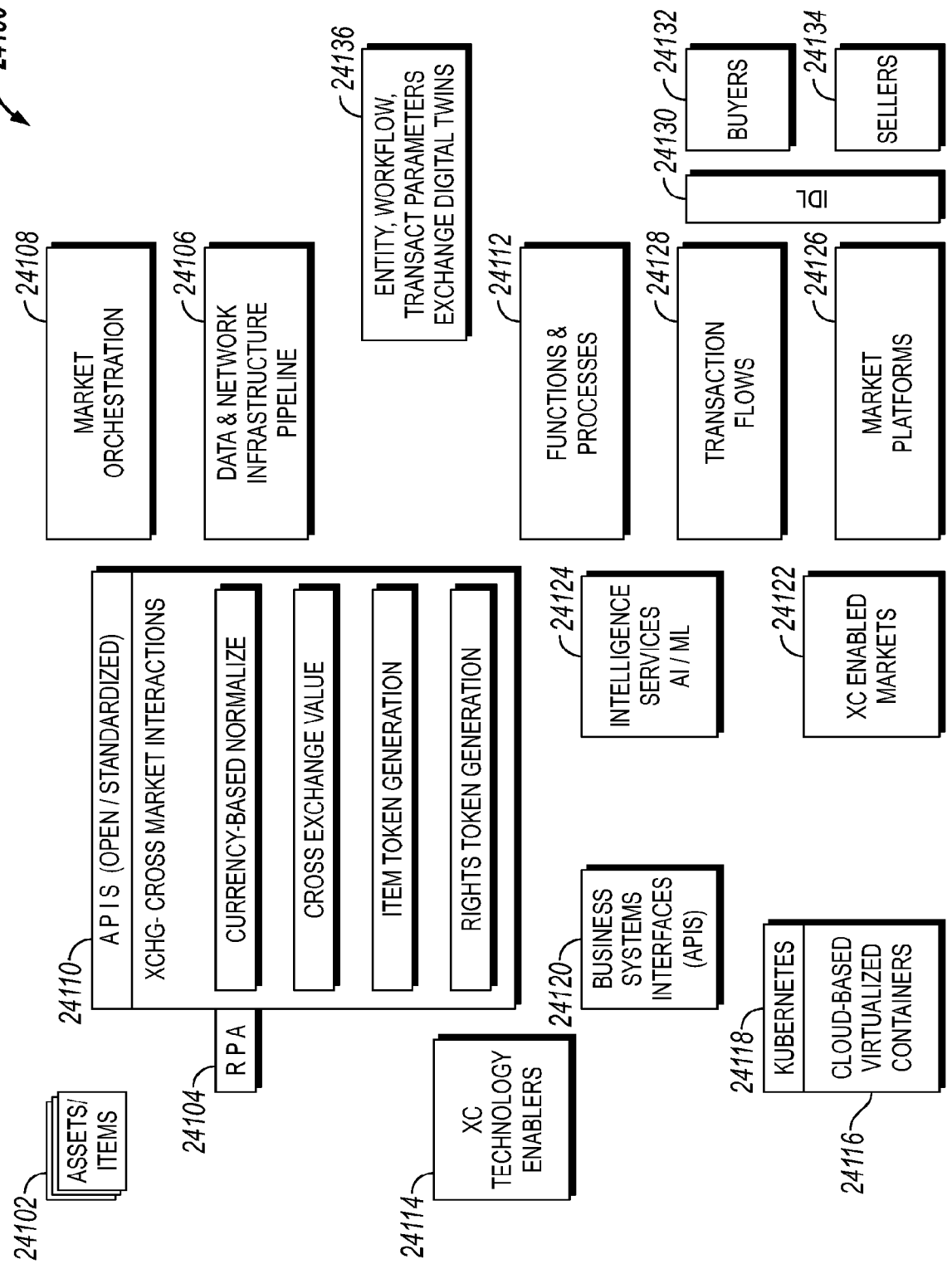

24100
24108
MARKET ORCHESTRATION
24106
DATA & NETWORK INFRASTRUCTURE PIPELINE
24136
ENTITY, WORKFLOW, TRANSACT PARAMETERS EXCHANGE DIGITAL TWINS
24112
FUNCTIONS & PROCESSES
24128
TRANSACTION FLOWS
24126
MARKET PLATFORMS
24130
BUYERS
24132
24134
SELLERS
DL
24110
A P I S (OPEN / STANDARDIZED)
XCHG- CROSS MARKET INTERACTIONS
CURRENCY-BASED NORMALIZE
CROSS EXCHANGE VALUE
ITEM TOKEN GENERATION
RIGHTS TOKEN GENERATION
24124
INTELLIGENCE SERVICES AI / ML
24122
XC ENABLED MARKETS
24102
ASSETS/ ITEMS
24104
R P A
24114
XC TECHNOLOGY ENABLERS
24120
BUSINESS SYSTEMS INTERFACES (APIS)
24118
KUBERNETES
CLOUD-BASED VIRTUALIZED CONTAINERS
24116

FIG. 240

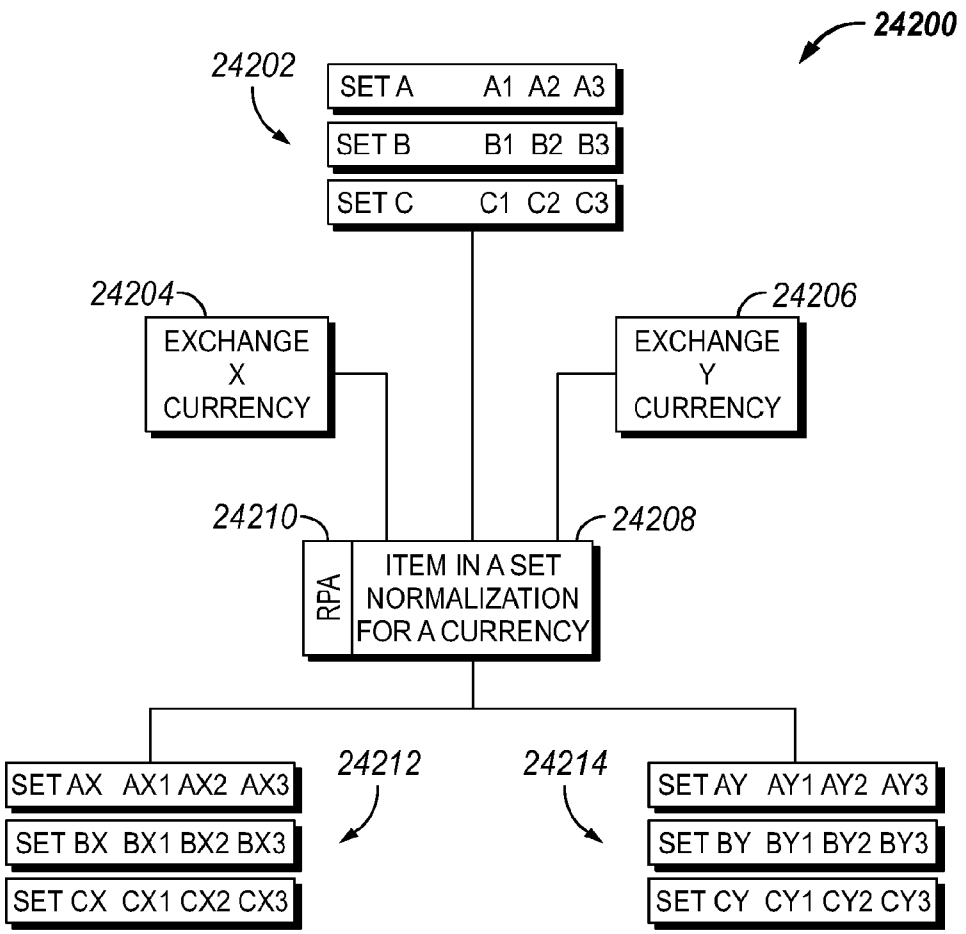

24200
24202
SET A A1 A2 A3
SET B B1 B2 B3
SET C C1 C2 C3
24204
EXCHANGE X CURRENCY
24206
EXCHANGE Y CURRENCY
24210
24208
RPA
ITEM IN A SET NORMALIZATION FOR A CURRENCY
24212
24214
SET AX AX1 AX2 AX3
SET BX BX1 BX2 BX3
SET CX CX1 CX2 CX3
SET AY AY1 AY2 AY3
SET BY BY1 BY2 BY3
SET CY CY1 CY2 CY3

FIG. 241

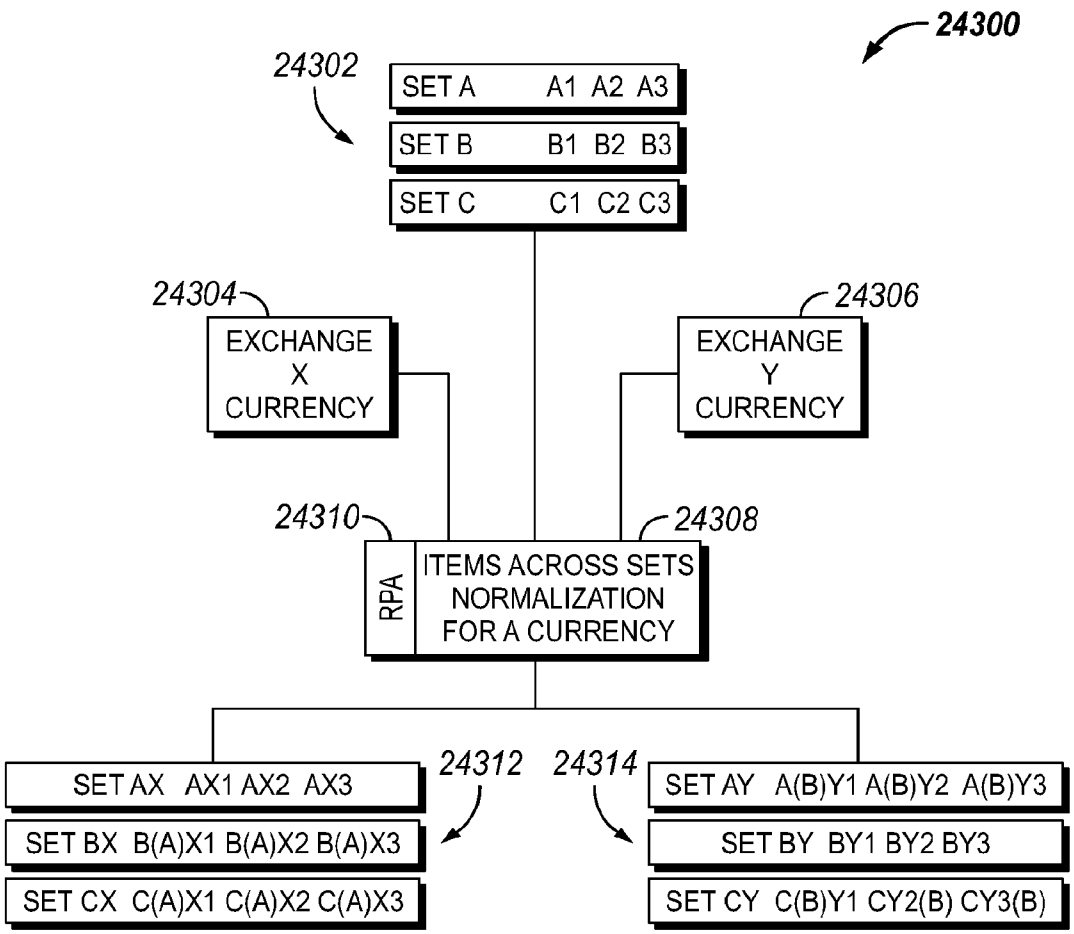

24300
24302
SET A A1 A2 A3
SET B B1 B2 B3
SET C C1 C2 C3
24304
EXCHANGE X CURRENCY
24306
EXCHANGE Y CURRENCY
24310
24308
RPA
ITEMS ACROSS SETS NORMALIZATION FOR A CURRENCY
24312
24314
SET AX AX1 AX2 AX3
SET BX B(A)X1 B(A)X2 B(A)X3
SET CX C(A)X1 C(A)X2 C(A)X3
SET AY A(B)Y1 A(B)Y2 A(B)Y3
SET BY BY1 BY2 BY3
SET CY C(B)Y1 CY2(B) CY3(B)

FIG. 242

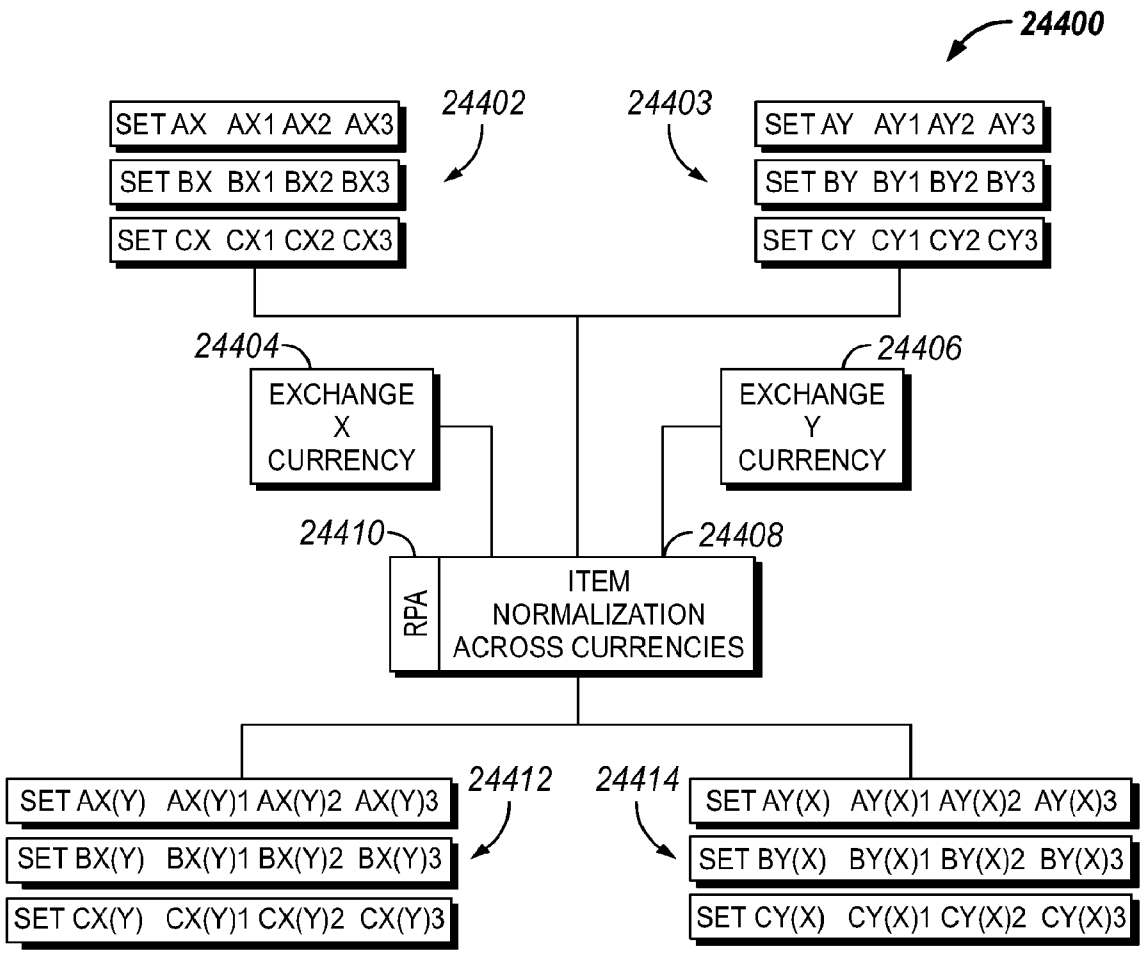

24400
24402
24403
SET AX AX1 AX2 AX3
SET BX BX1 BX2 BX3
SET CX CX1 CX2 CX3
SET AY AY1 AY2 AY3
SET BY BY1 BY2 BY3
SET CY CY1 CY2 CY3
24404
24406
EXCHANGE X CURRENCY
EXCHANGE Y CURRENCY
24410
24408
RPA
ITEM NORMALIZATION ACROSS CURRENCIES
24412
24414
SET AX(Y) AX(Y)1 AX(Y)2 AX(Y)3
SET BX(Y) BX(Y)1 BX(Y)2 BX(Y)3
SET CX(Y) CX(Y)1 CX(Y)2 CX(Y)3
SET AY(X) AY(X)1 AY(X)2 AY(X)3
SET BY(X) BY(X)1 BY(X)2 BY(X)3
SET CY(X) CY(X)1 CY(X)2 CY(X)3

FIG. 243

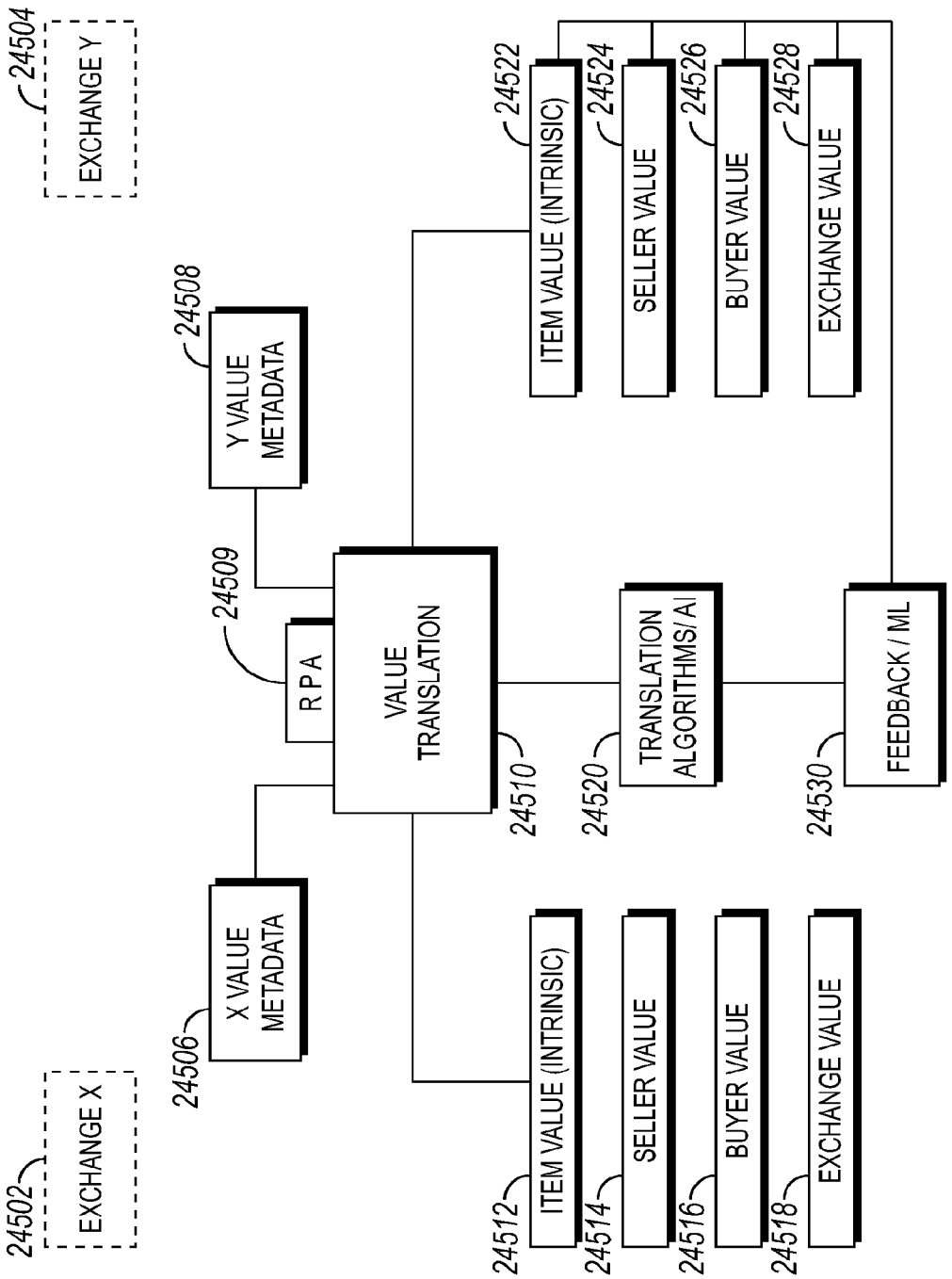

24504
EXCHANGE Y
24508
Y VALUE METADATA
24509
R P A
VALUE TRANSLATION
24510
24522
ITEM VALUE (INTRINSIC)
24524
SELLER VALUE
24526
BUYER VALUE
24528
EXCHANGE VALUE
24520
TRANSLATION ALGORITHMS/ AI
24530
FEEDBACK / ML
24506
X VALUE METADATA
24502
EXCHANGE X
24512
ITEM VALUE (INTRINSIC)
24514
SELLER VALUE
24516
BUYER VALUE
24518
EXCHANGE VALUE

FIG. 244

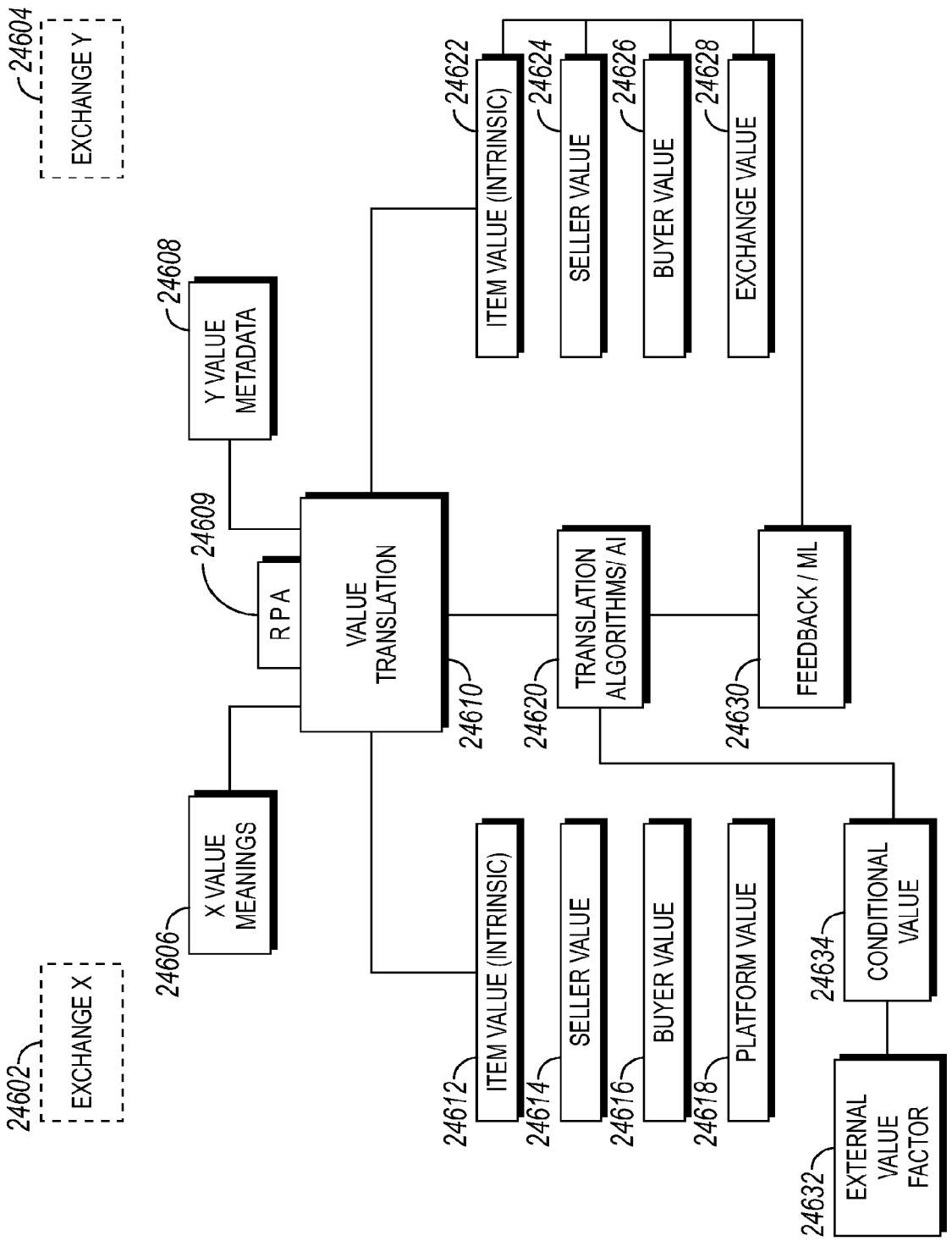

24604
EXCHANGE Y
24608
Y VALUE METADATA
24609
R P A
VALUE TRANSLATION
24610
24622
ITEM VALUE (INTRINSIC)
24624
SELLER VALUE
24626
BUYER VALUE
24628
EXCHANGE VALUE
24620
TRANSLATION ALGORITHMS/ AI
24630
FEEDBACK / ML
24602
EXCHANGE X
24606
X VALUE MEANINGS
24612
ITEM VALUE (INTRINSIC)
24614
SELLER VALUE
24616
BUYER VALUE
24618
PLATFORM VALUE
24634
CONDITIONAL VALUE
24632
EXTERNAL VALUE FACTOR

FIG. 245

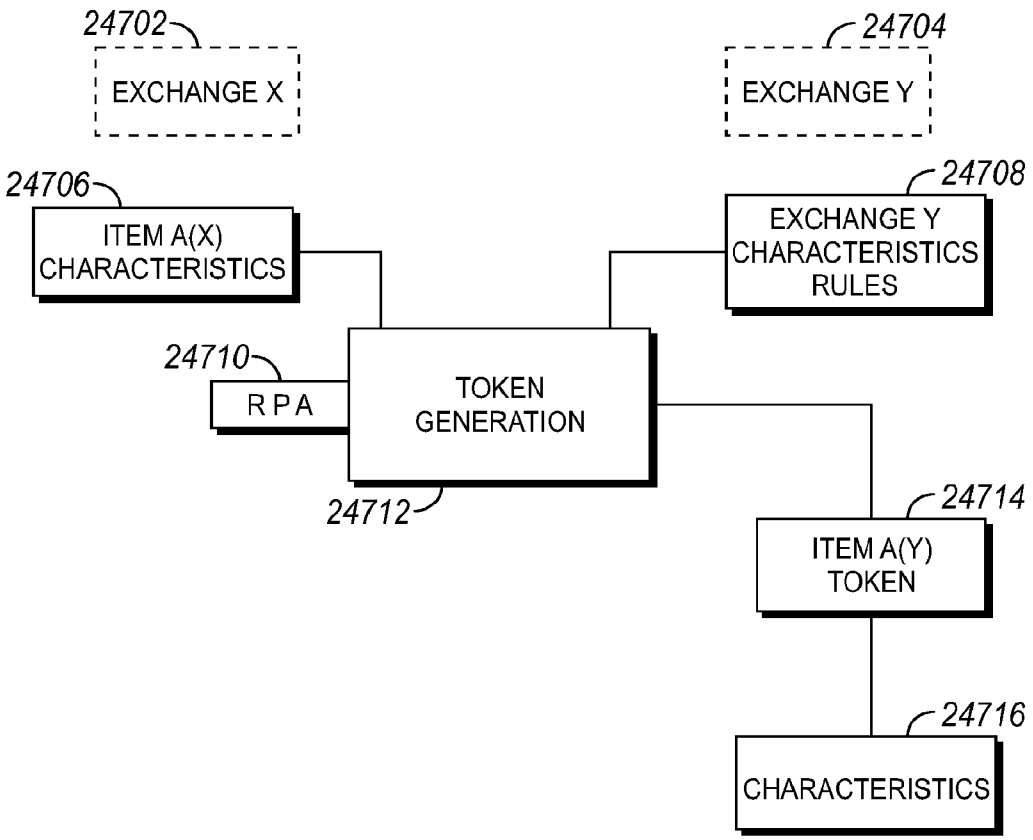

24702
EXCHANGE X
24704
EXCHANGE Y
24706
ITEM A(X) CHARACTERISTICS
24708
EXCHANGE Y CHARACTERISTICS RULES
24710
R P A
TOKEN GENERATION
24712
24714
ITEM A(Y) TOKEN
24716
CHARACTERISTICS

FIG. 246

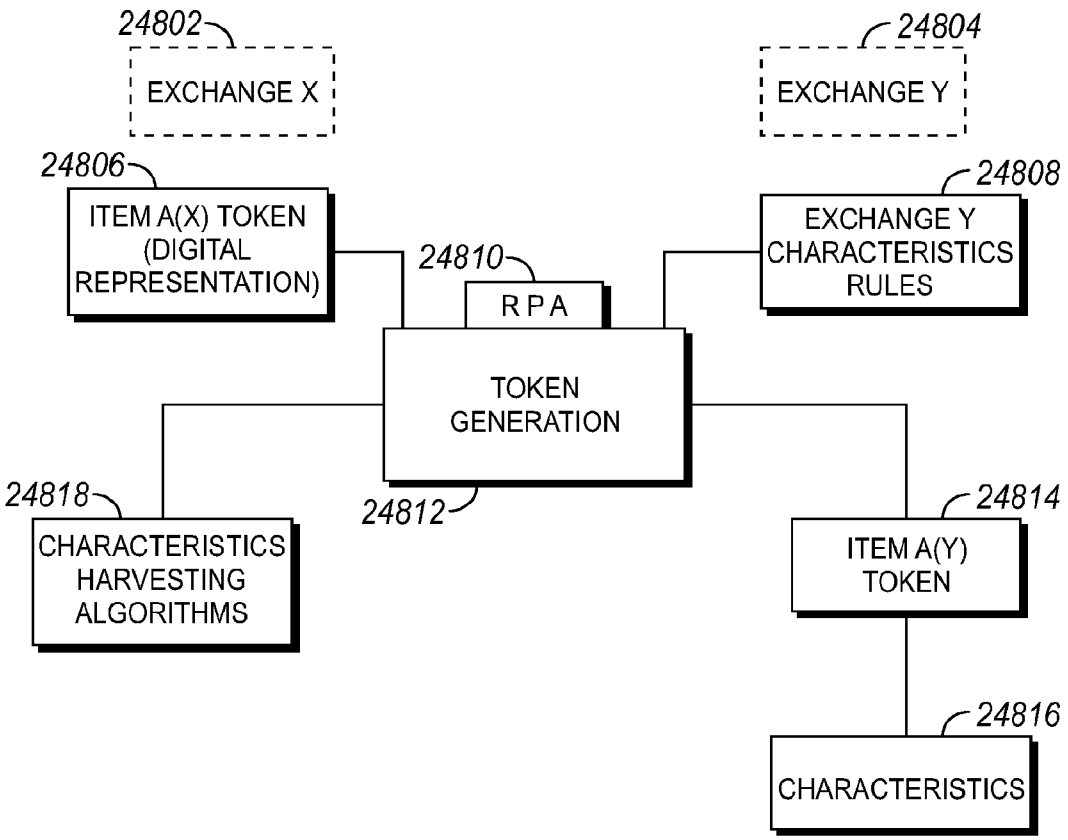

24802
EXCHANGE X
24804
EXCHANGE Y
24806
ITEM A(X) TOKEN (DIGITAL REPRESENTATION)
24808
EXCHANGE Y CHARACTERISTICS RULES
24810
RPA
TOKEN GENERATION
24812
24818
CHARACTERISTICS HARVESTING ALGORITHMS
24814
ITEM A(Y) TOKEN
24816
CHARACTERISTICS

FIG. 247

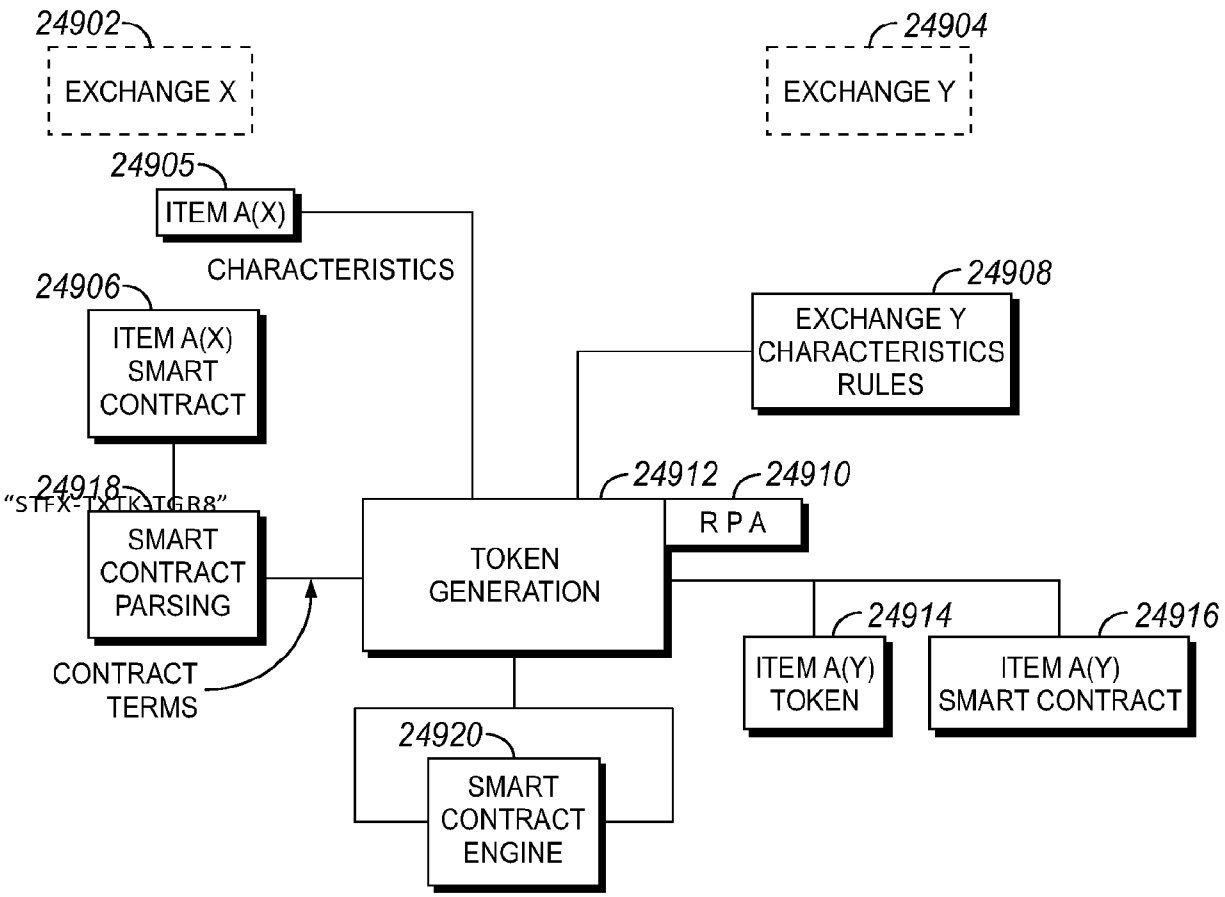

24902
EXCHANGE X
24904
EXCHANGE Y
24905
ITEM A(X)
CHARACTERISTICS
24906
ITEM A(X) SMART CONTRACT
24908
EXCHANGE Y CHARACTERISTICS RULES
24918
"STFX-TXTKATGR8"
SMART CONTRACT PARSING
24912
24910
R P A
TOKEN GENERATION
24914
ITEM A(Y) TOKEN
24916
ITEM A(Y) SMART CONTRACT
CONTRACT TERMS
24920
SMART CONTRACT ENGINE

FIG. 248

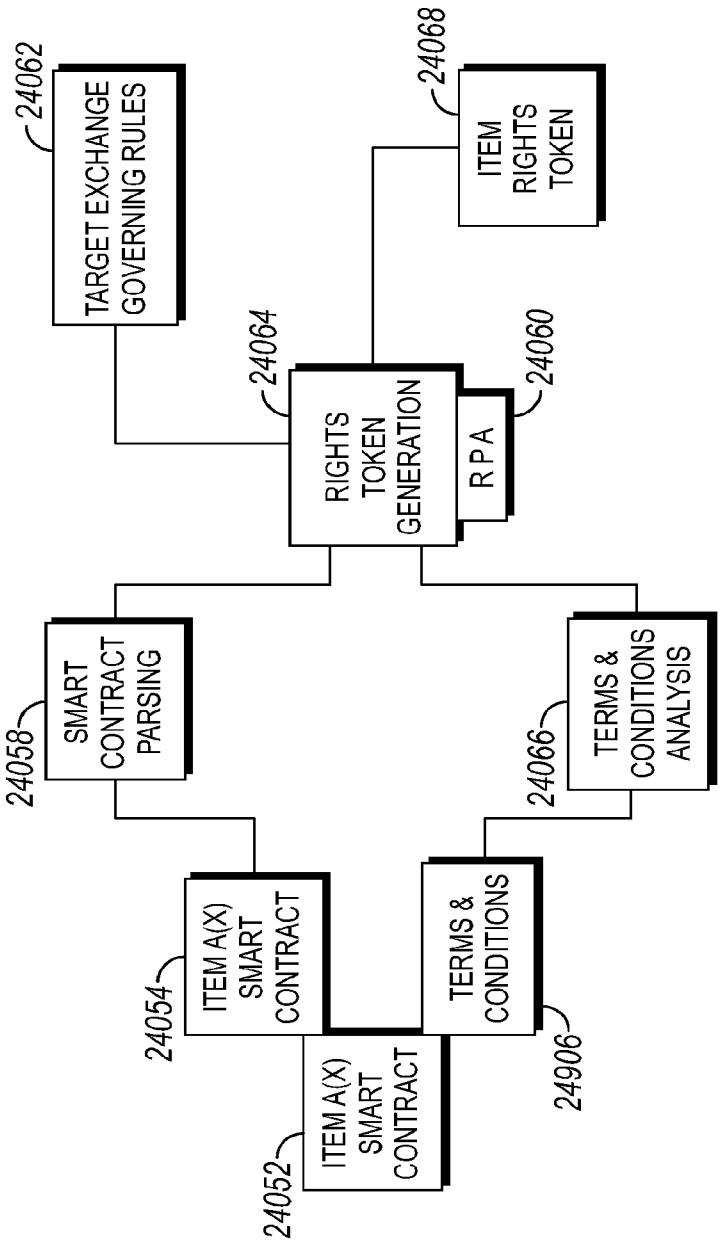

24062
TARGET EXCHANGE GOVERNING RULES
24068
ITEM RIGHTS TOKEN
24064
RIGHTS TOKEN GENERATION
24060
RPA
24058
SMART CONTRACT PARSING
24066
TERMS & CONDITIONS ANALYSIS
24054
ITEM A(X) SMART CONTRACT
24906
TERMS & CONDITIONS
24052
ITEM A(X) SMART CONTRACT

FIG. 249

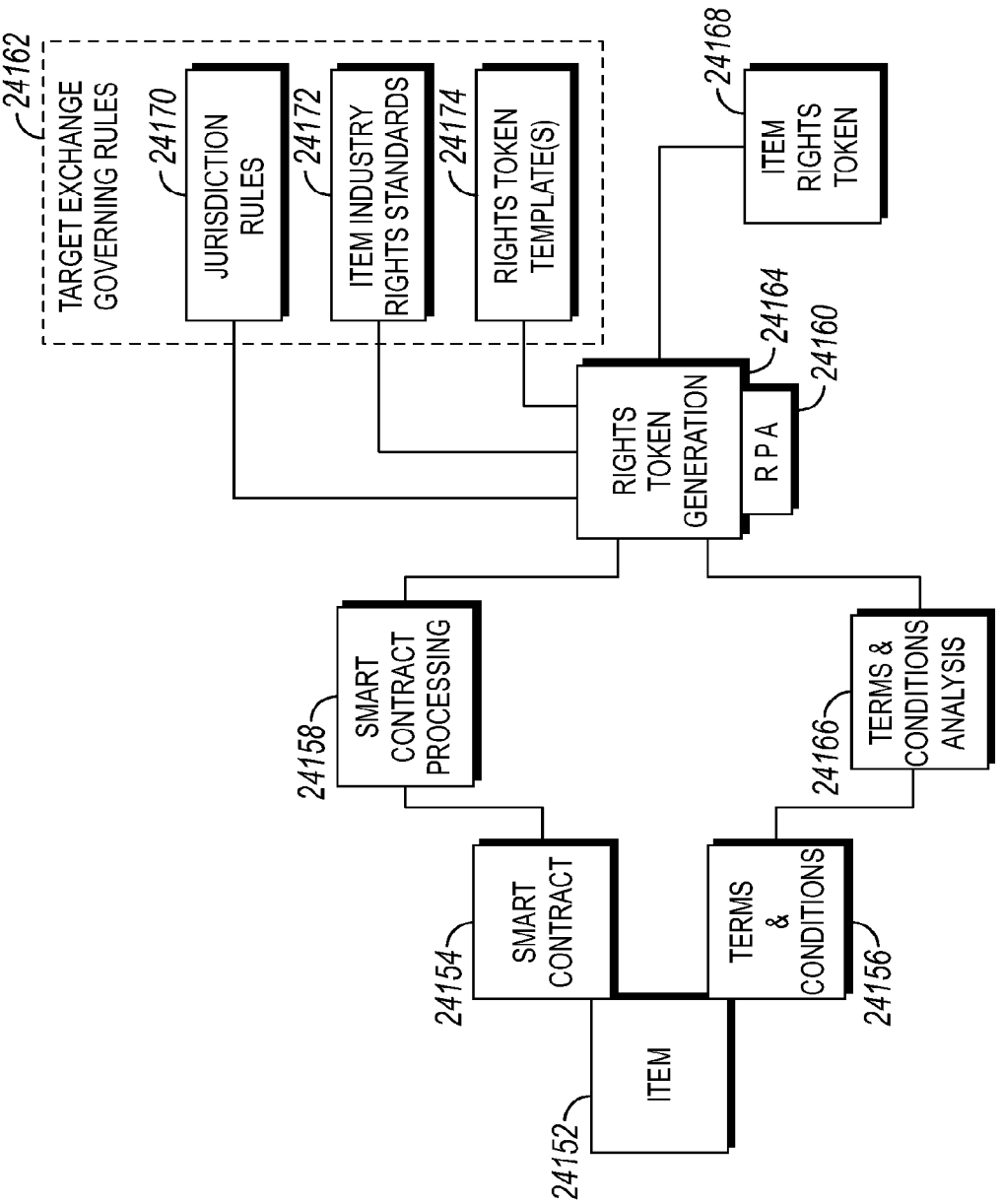

24162
TARGET EXCHANGE GOVERNING RULES
24170
JURISDICTION RULES
24172
ITEM INDUSTRY RIGHTS STANDARDS
24174
RIGHTS TOKEN TEMPLATE(S)
24168
ITEM RIGHTS TOKEN
24164
24160
RIGHTS TOKEN GENERATION
R P A
24158
SMART CONTRACT PROCESSING
24166
TERMS & CONDITIONS ANALYSIS
24154
SMART CONTRACT
TERMS & CONDITIONS
24156
ITEM
24152

FIG. 250

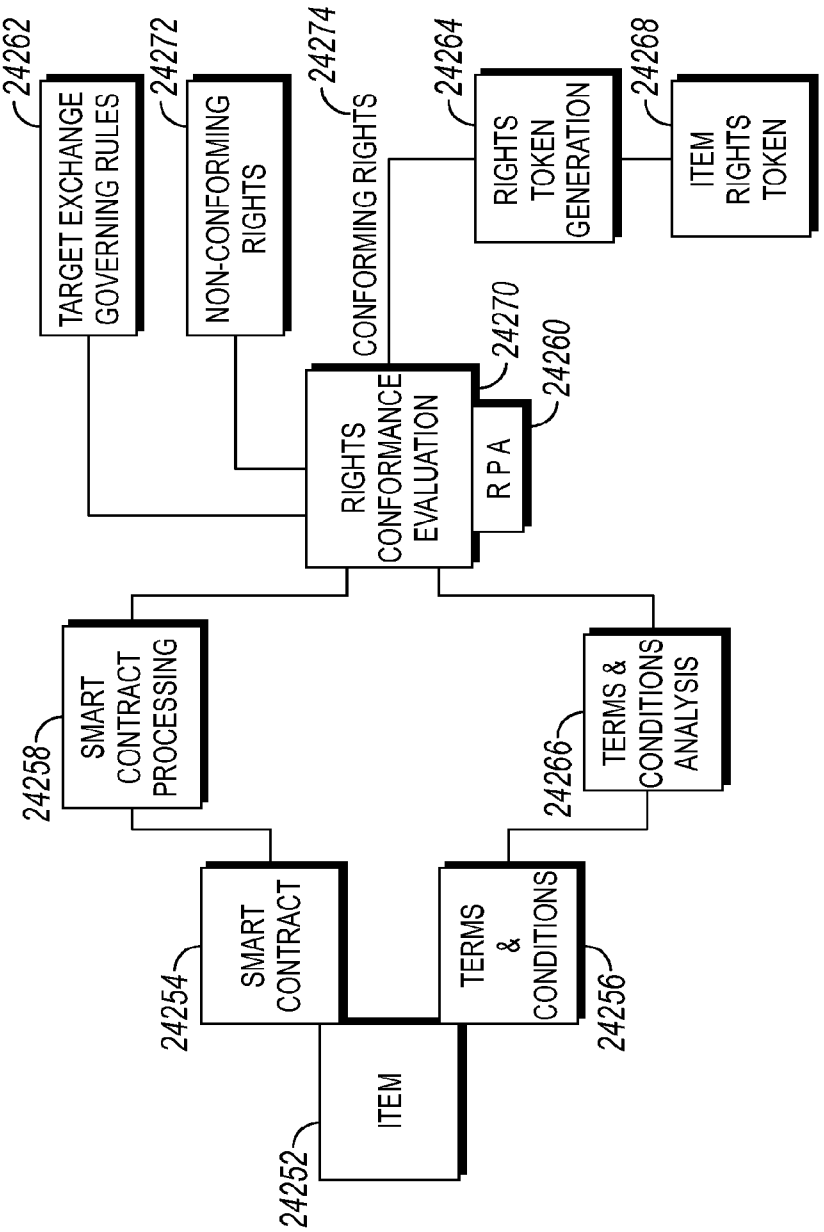

24262
TARGET EXCHANGE GOVERNING RULES
24272
NON-CONFORMING RIGHTS
24274
CONFORMING RIGHTS
24264
RIGHTS TOKEN GENERATION
24268
ITEM RIGHTS TOKEN
24270
24260
RIGHTS CONFORMANCE EVALUATION
R P A
24258
SMART CONTRACT PROCESSING
24266
TERMS & CONDITIONS ANALYSIS
24254
SMART CONTRACT
TERMS & CONDITIONS
24256
ITEM
24252

FIG. 251

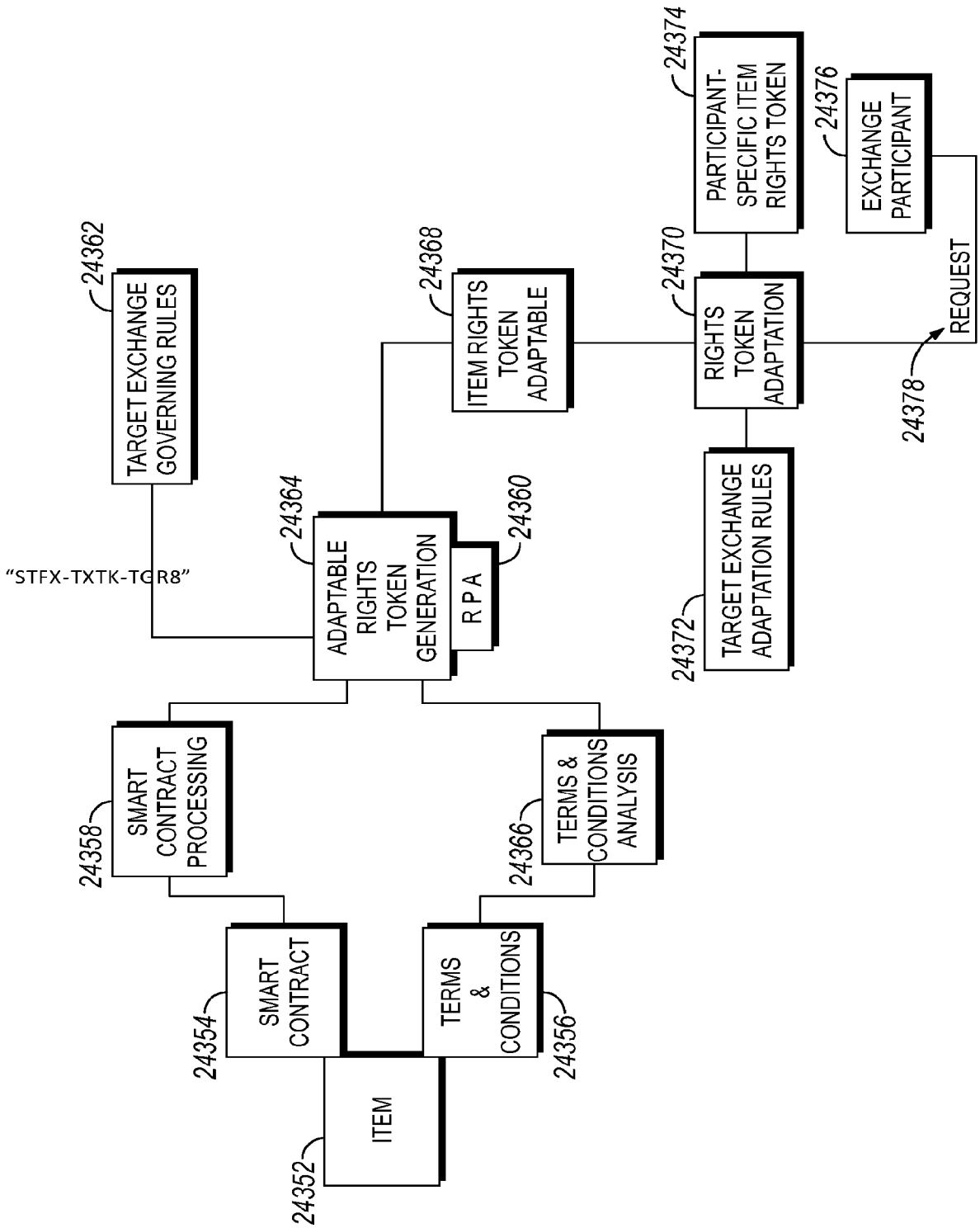

24374
PARTICIPANT-SPECIFIC ITEM RIGHTS TOKEN
24376
EXCHANGE PARTICIPANT
24362
TARGET EXCHANGE GOVERNING RULES
24368
ITEM RIGHTS TOKEN ADAPTABLE
24370
RIGHTS TOKEN ADAPTATION
REQUEST
24378
"STFX-TXTK-TGR8"
24364
ADAPTABLE RIGHTS TOKEN GENERATION
RPA
24360
24372
TARGET EXCHANGE ADAPTATION RULES
24358
SMART CONTRACT PROCESSING
24366
TERMS & CONDITIONS ANALYSIS
24354
SMART CONTRACT
TERMS & CONDITIONS
24356
ITEM
24352

FIG. 252

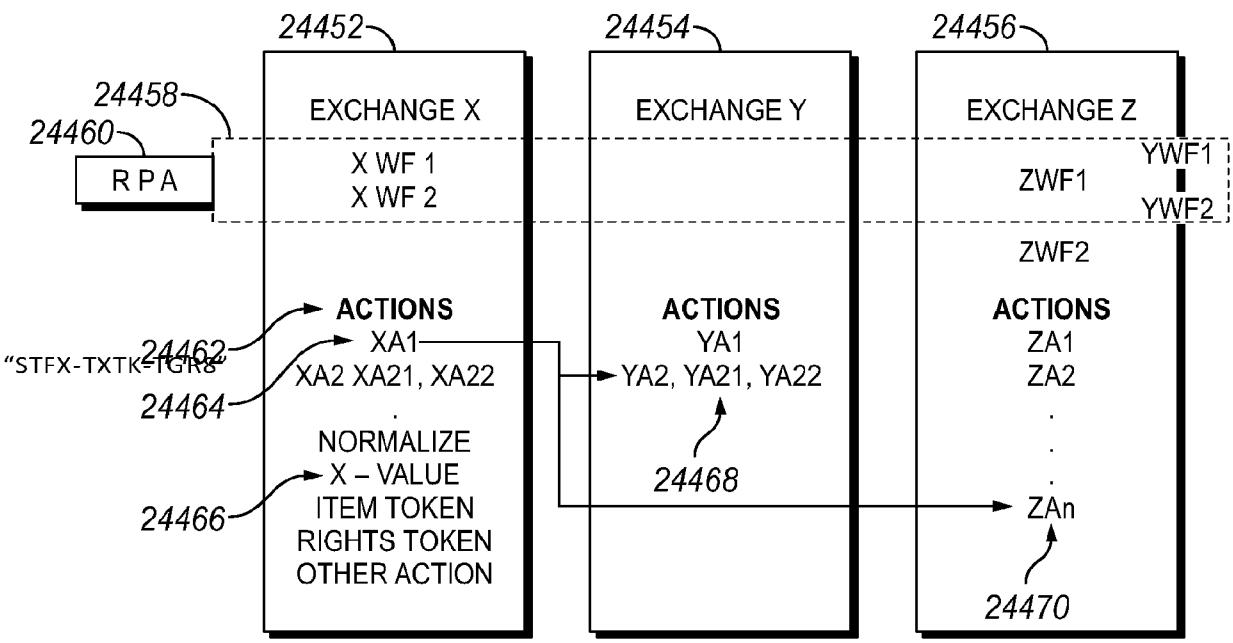

24452
24454
24456
24458
24460
EXCHANGE X
EXCHANGE Y
EXCHANGE Z
RPA
X WF 1
X WF 2
YWF1
ZWF1
YWF2
ZWF2
ACTIONS
XA1
XA2 XA21, XA22
.
NORMALIZE
X – VALUE
ITEM TOKEN
RIGHTS TOKEN
OTHER ACTION
ACTIONS
YA1
YA2, YA21, YA22
ACTIONS
ZA1
ZA2
.
.
.
ZAn
"STFX-TXTK-TGR8"
24462
24464
24466
24468
24470

FIG. 253

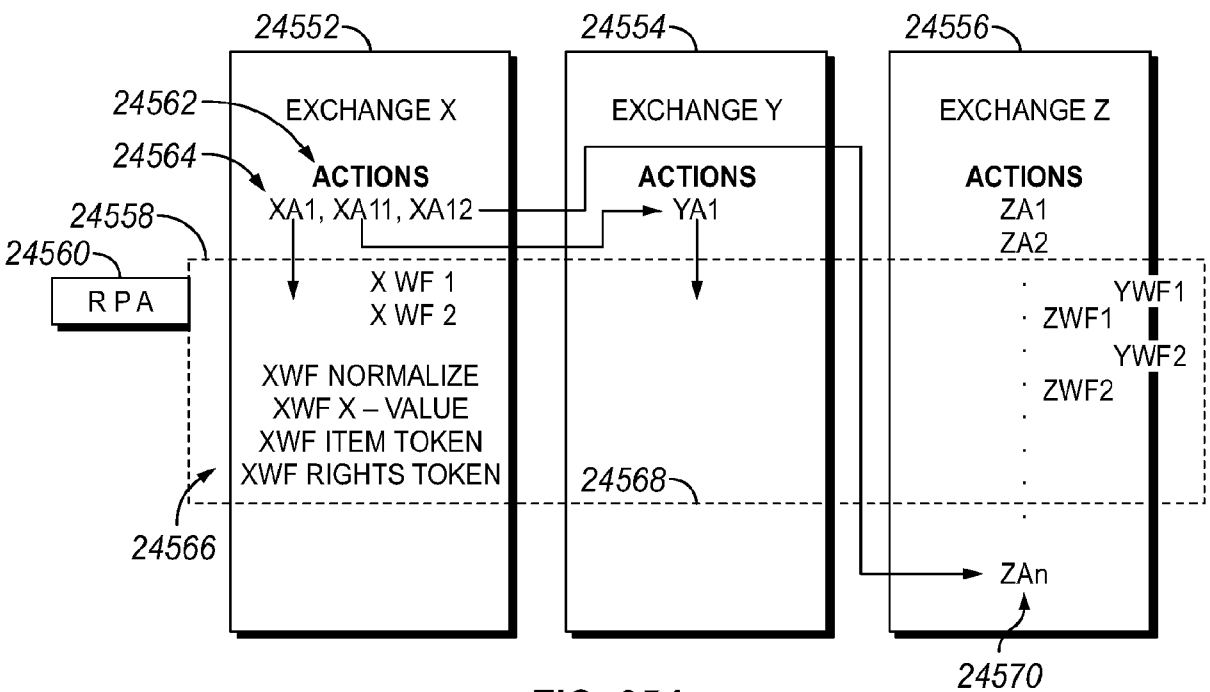

24552
24554
24556
24562
24564
24558
24560
EXCHANGE X
EXCHANGE Y
EXCHANGE Z
ACTIONS
XA1, XA11, XA12
ACTIONS
YA1
ACTIONS
ZA1
ZA2
RPA
X WF 1
X WF 2
YWF1
ZWF1
YWF2
ZWF2
XWF NORMALIZE
XWF X – VALUE
XWF ITEM TOKEN
XWF RIGHTS TOKEN
24568
24566
ZAn
24570

FIG. 254

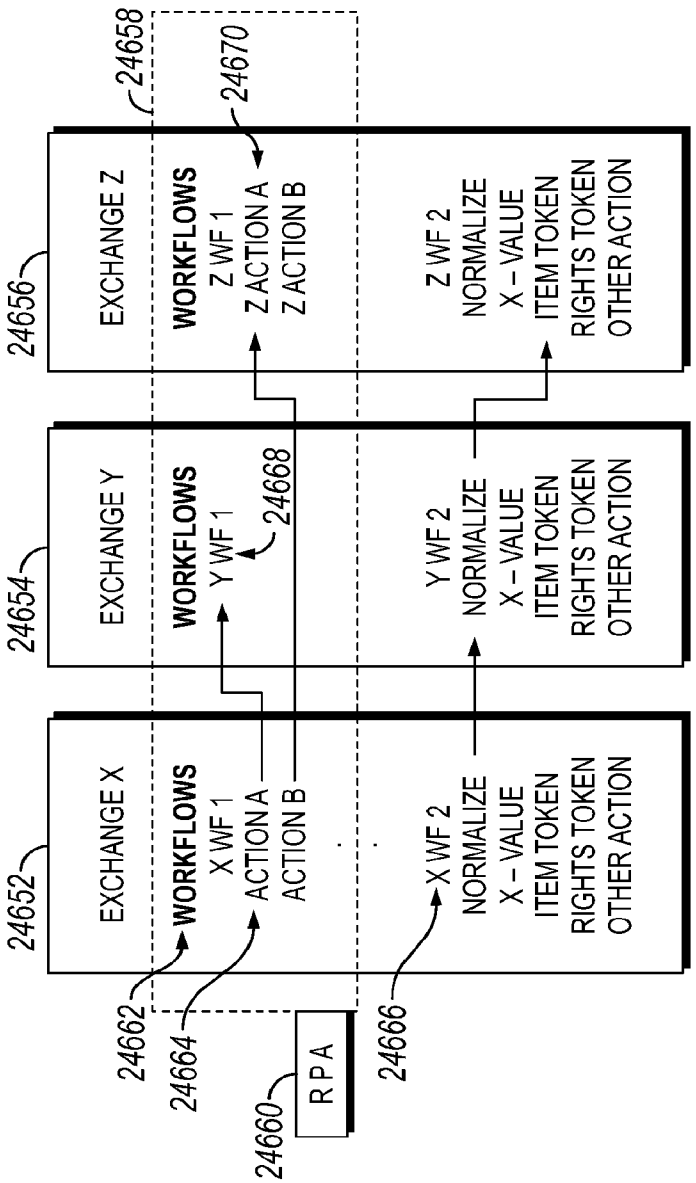

24658
24670
24656
EXCHANGE Z
WORKFLOWS
Z WF 1
Z ACTION A
Z ACTION B
Z WF 2
NORMALIZE
X – VALUE
ITEM TOKEN
RIGHTS TOKEN
OTHER ACTION
24654
EXCHANGE Y
WORKFLOWS
Y WF 1
24668
Y WF 2
NORMALIZE
X – VALUE
ITEM TOKEN
RIGHTS TOKEN
OTHER ACTION
24652
EXCHANGE X
WORKFLOWS
X WF 1
ACTION A
ACTION B
X WF 2
NORMALIZE
X – VALUE
ITEM TOKEN
RIGHTS TOKEN
OTHER ACTION
24662
24664
24660
RPA
24666

FIG. 255

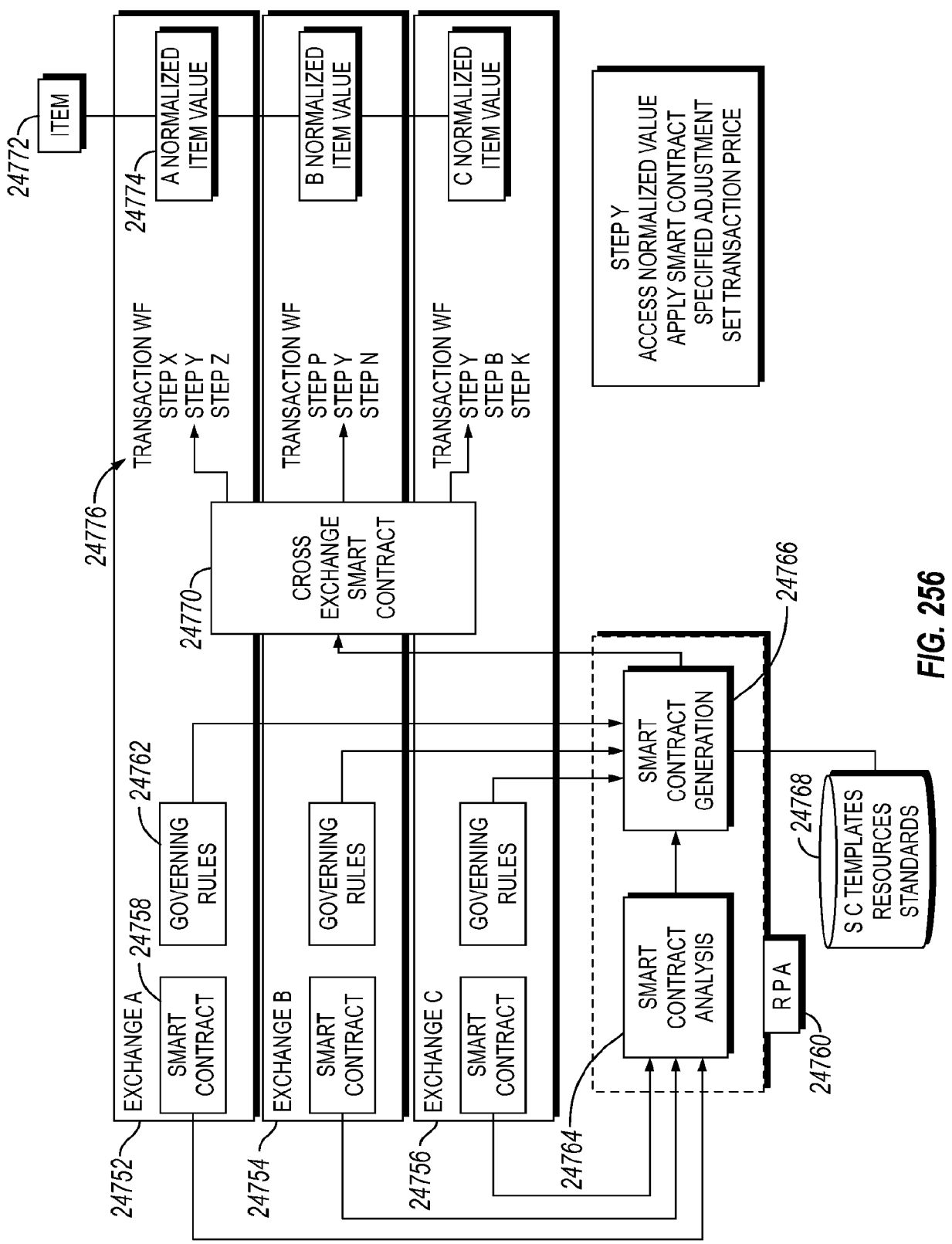

24772
ITEM
24774
A NORMALIZED ITEM VALUE
B NORMALIZED ITEM VALUE
C NORMALIZED ITEM VALUE
STEP Y
ACCESS NORMALIZED VALUE
APPLY SMART CONTRACT SPECIFIED ADJUSTMENT
SET TRANSACTION PRICE
24776
TRANSACTION WF
STEP X
STEP Y
STEP Z
TRANSACTION WF
STEP P
STEP Y
STEP N
TRANSACTION WF
STEP Y
STEP B
STEP K
24770
CROSS EXCHANGE SMART CONTRACT
24766
SMART CONTRACT GENERATION
24762
GOVERNING RULES
GOVERNING RULES
GOVERNING RULES
24758
EXCHANGE A
SMART CONTRACT
EXCHANGE B
SMART CONTRACT
EXCHANGE C
SMART CONTRACT
24768
S C TEMPLATES RESOURCES STANDARDS
SMART CONTRACT ANALYSIS
R P A
24760
24752
24754
24756
24764

FIG. 256

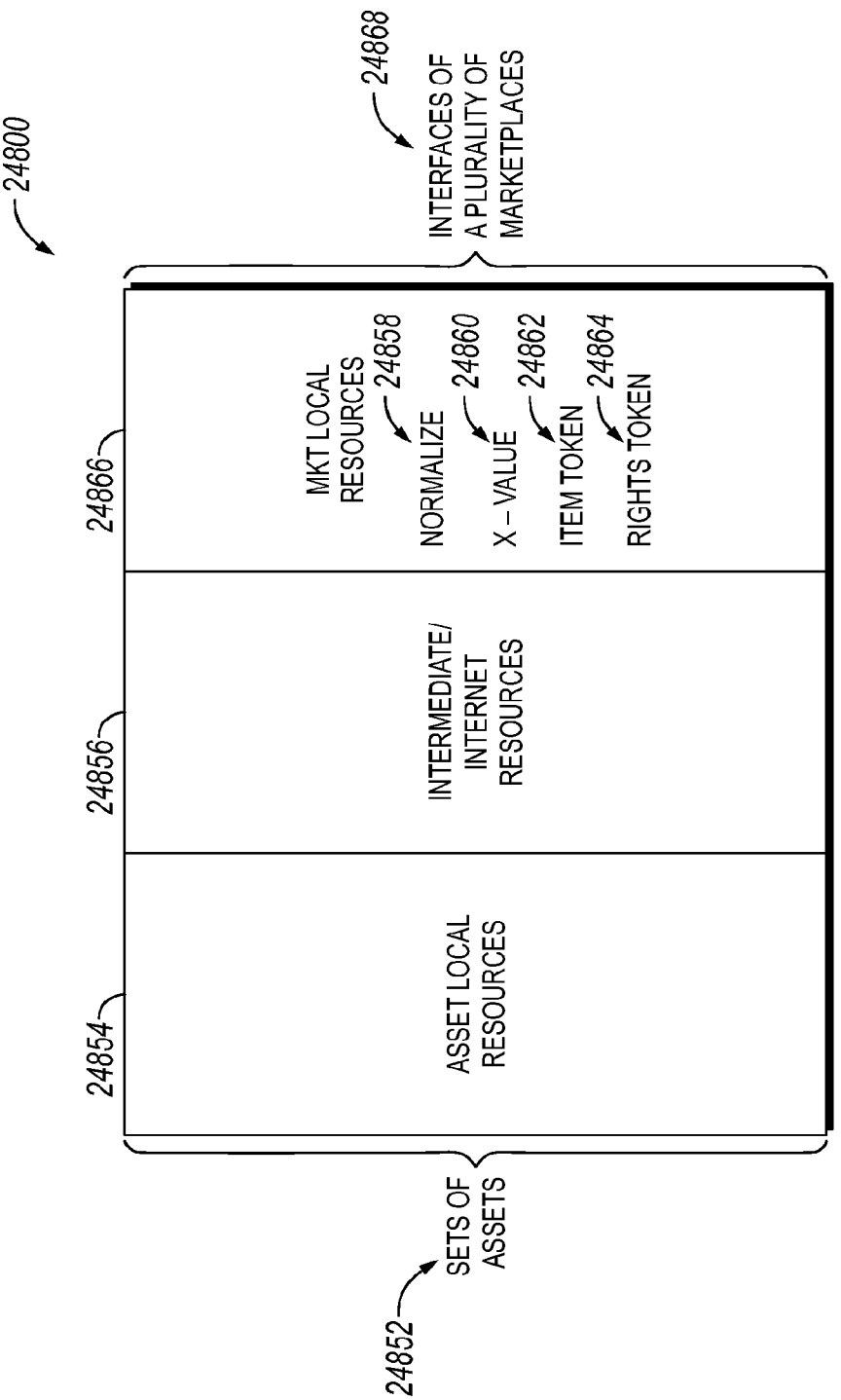

24800
24868
INTERFACES OF A PLURALITY OF MARKETPLACES
24866
MKT LOCAL RESOURCES
24858
NORMALIZE
24860
X – VALUE
24862
ITEM TOKEN
24864
RIGHTS TOKEN
24856
INTERMEDIATE/ INTERNET RESOURCES
24854
ASSET LOCAL RESOURCES
SETS OF ASSETS
24852

FIG. 257

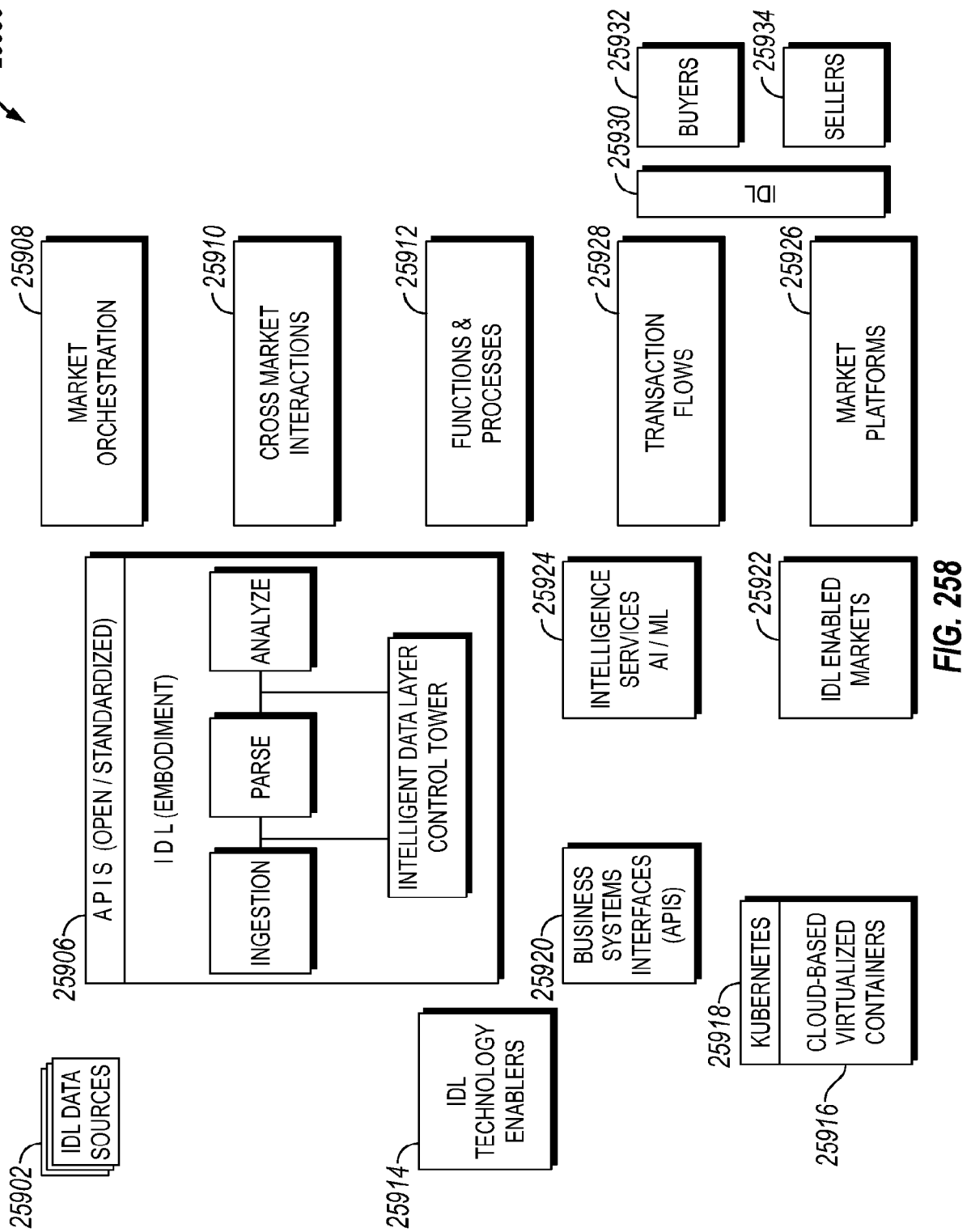

25900
25908
MARKET ORCHESTRATION
25910
CROSS MARKET INTERACTIONS
25912
FUNCTIONS & PROCESSES
25928
TRANSACTION FLOWS
25926
MARKET PLATFORMS
25930
IDL
25932
BUYERS
25934
SELLERS
25906
APIS (OPEN / STANDARDIZED)
IDL (EMBODIMENT)
INGESTION
PARSE
ANALYZE
INTELLIGENT DATA LAYER CONTROL TOWER
25924
INTELLIGENCE SERVICES AI / ML
25922
IDL ENABLED MARKETS
25902
IDL DATA SOURCES
25914
IDL TECHNOLOGY ENABLERS
25920
BUSINESS SYSTEMS INTERFACES (APIS)
25918
KUBERNETES
CLOUD-BASED VIRTUALIZED CONTAINERS
25916

FIG. 258

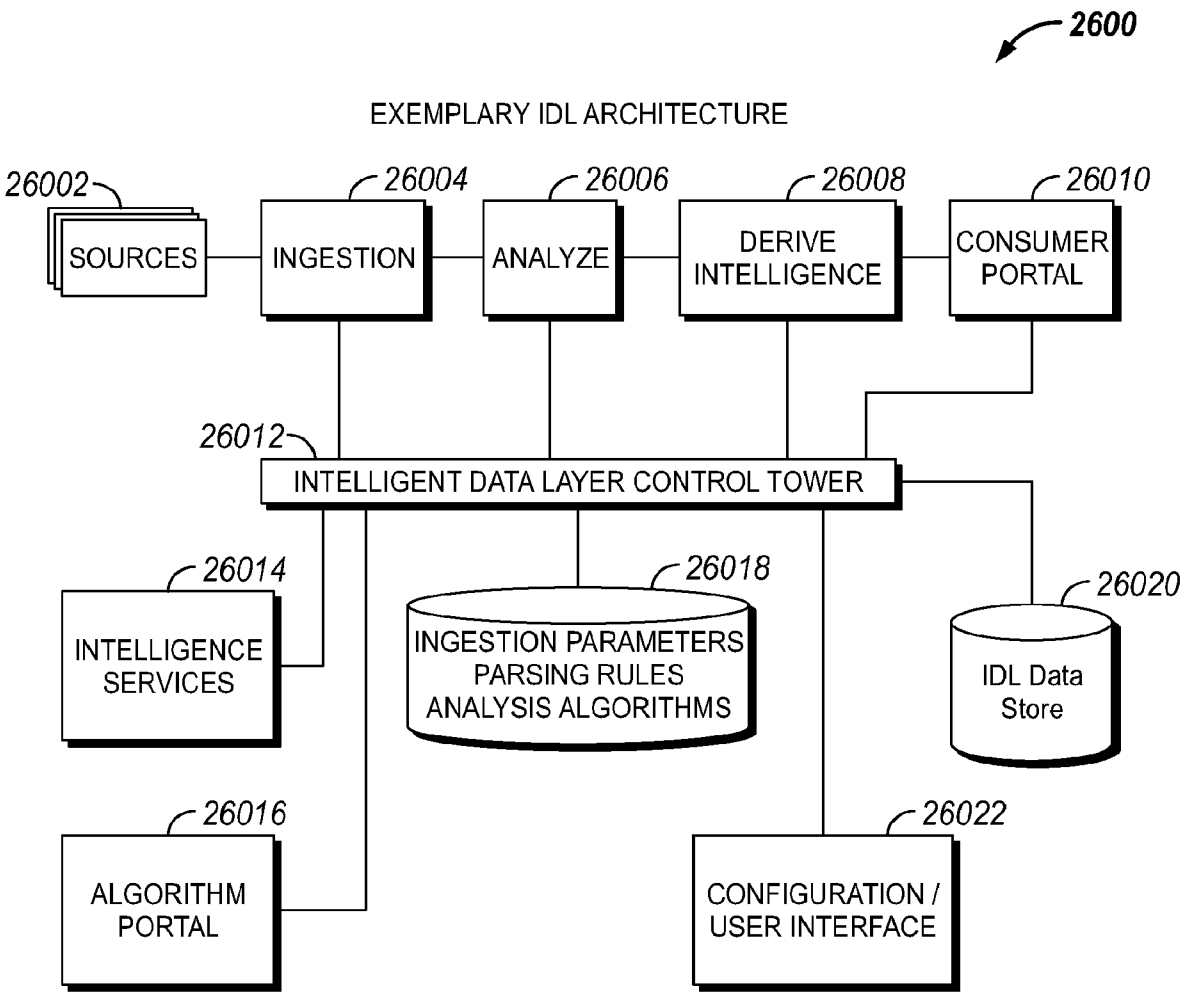

2600
EXEMPLARY IDL ARCHITECTURE
26002
SOURCES
26004
INGESTION
26006
ANALYZE
26008
DERIVE INTELLIGENCE
26010
CONSUMER PORTAL
26012
INTELLIGENT DATA LAYER CONTROL TOWER
26014
INTELLIGENCE SERVICES
26018
INGESTION PARAMETERS
PARSING RULES
ANALYSIS ALGORITHMS
26020
IDL Data Store
26016
ALGORITHM PORTAL
26022
CONFIGURATION / USER INTERFACE

FIG. 259

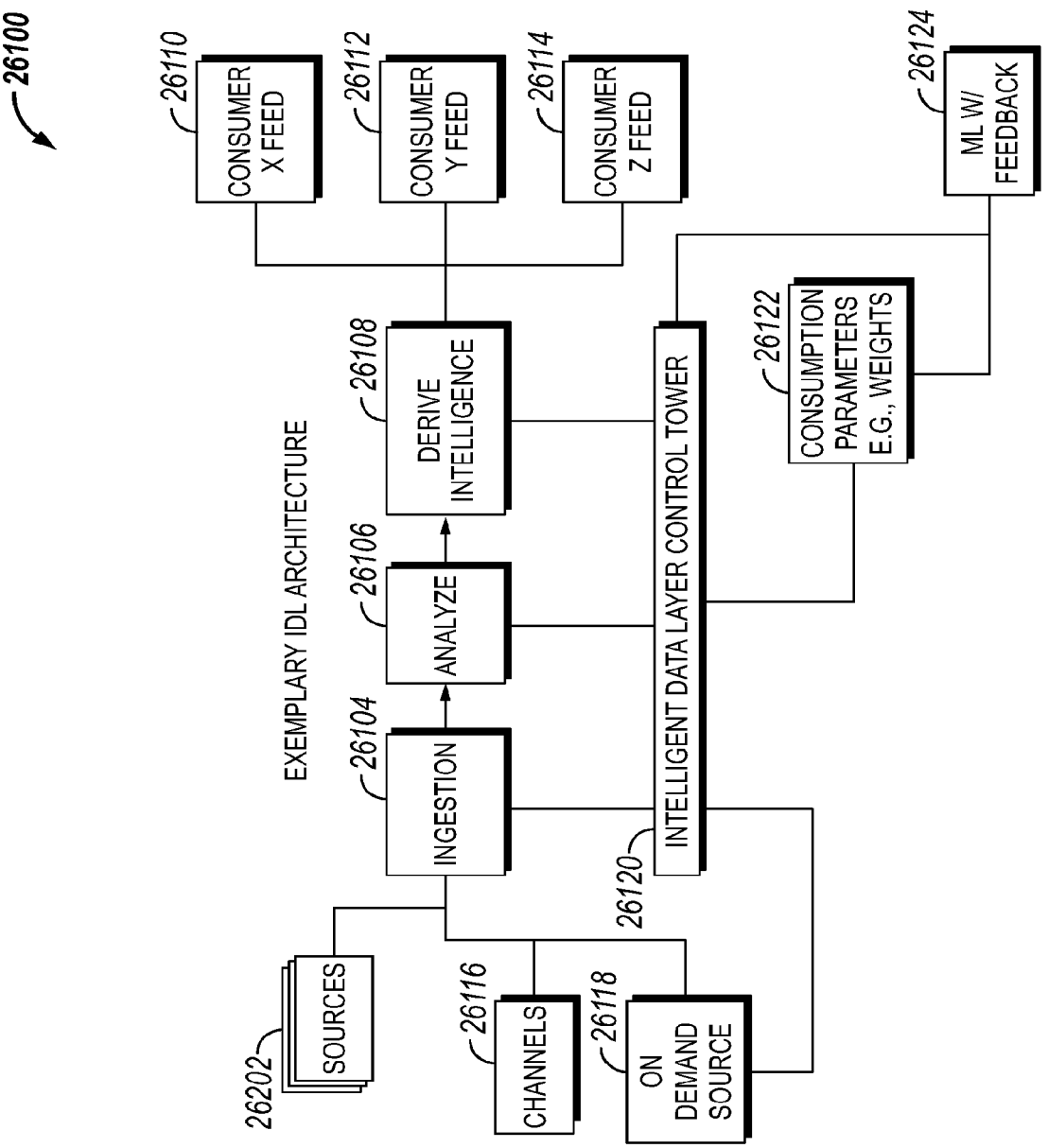

26100
EXEMPLARY IDL ARCHITECTURE
26110
CONSUMER X FEED
26112
CONSUMER Y FEED
26114
CONSUMER Z FEED
26124
ML W/ FEEDBACK
26108
DERIVE INTELLIGENCE
26106
ANALYZE
26104
INGESTION
26122
CONSUMPTION PARAMETERS E.G., WEIGHTS
INTELLIGENT DATA LAYER CONTROL TOWER
26120
26202
SOURCES
26116
CHANNELS
26118
ON DEMAND SOURCE

FIG. 260

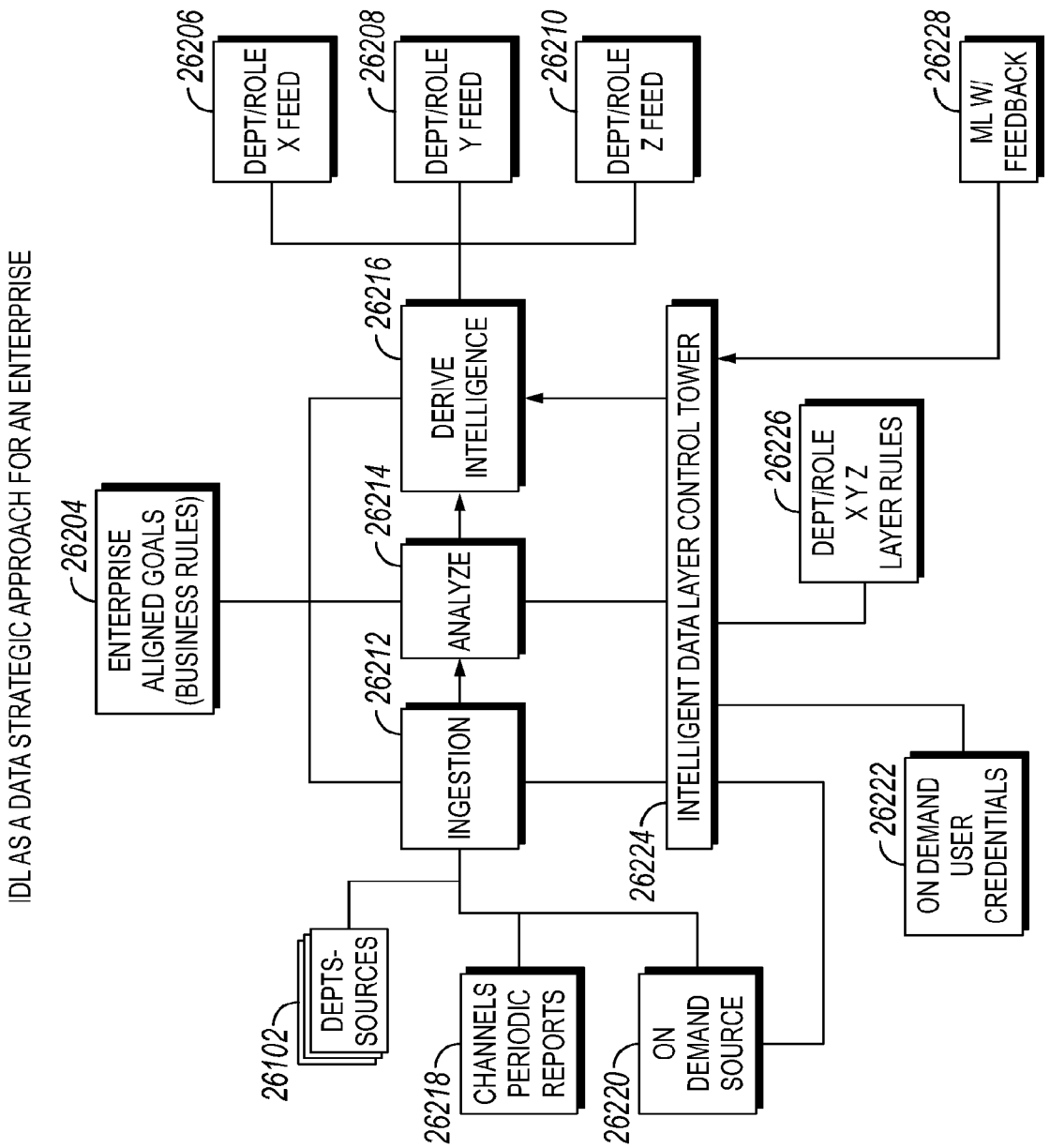

IDL AS A DATA STRATEGIC APPROACH FOR AN ENTERPRISE
26102
DEPTS-SOURCES
26218
CHANNELS PERIODIC REPORTS
26220
ON DEMAND SOURCE
26212
INGESTION
26214
ANALYZE
26216
DERIVE INTELLIGENCE
26204
ENTERPRISE ALIGNED GOALS (BUSINESS RULES)
26206
DEPT/ROLE X FEED
26208
DEPT/ROLE Y FEED
26210
DEPT/ROLE Z FEED
26224
INTELLIGENT DATA LAYER CONTROL TOWER
26226
DEPT/ROLE X Y Z LAYER RULES
26222
ON DEMAND USER CREDENTIALS
26228
ML W/ FEEDBACK

FIG. 261

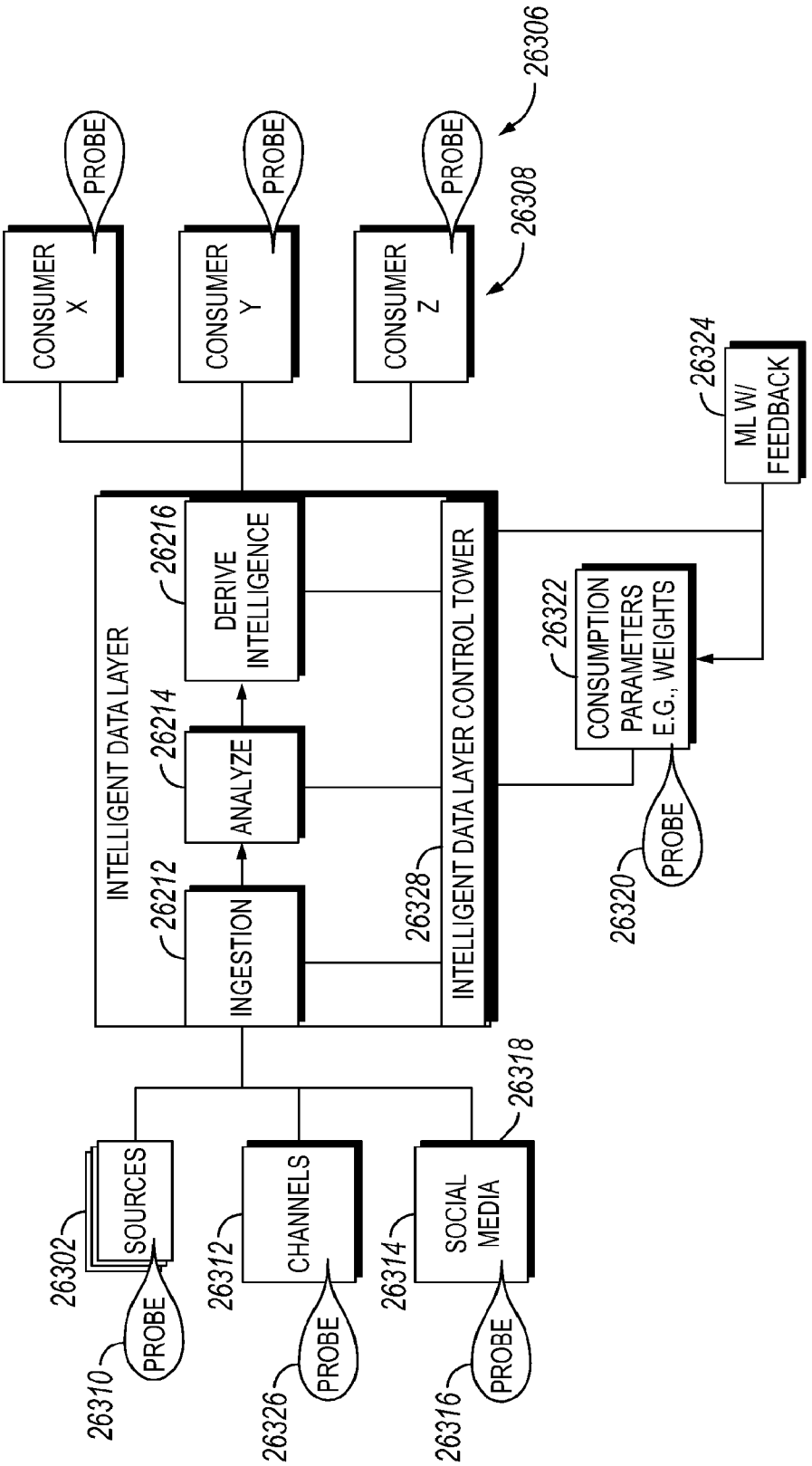
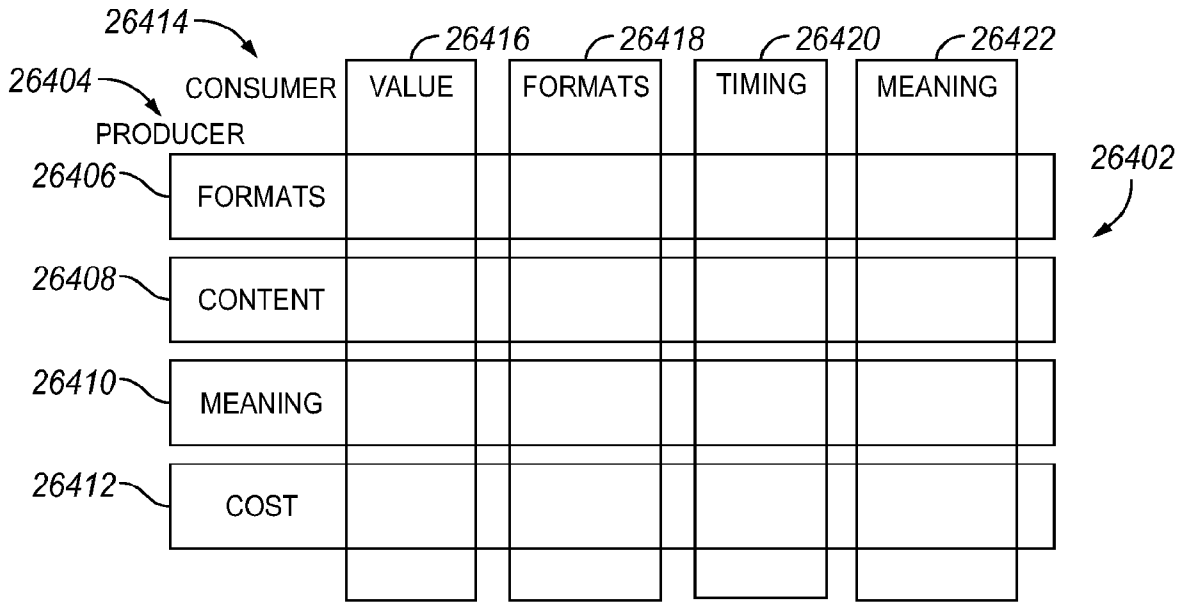

26306
26308
CONSUMER X
CONSUMER Y
CONSUMER Z
PROBE
PROBE
PROBE
26324
ML W/ FEEDBACK
INTELLIGENT DATA LAYER
26216
DERIVE INTELLIGENCE
26214
ANALYZE
26212
INGESTION
26328
INTELLIGENT DATA LAYER CONTROL TOWER
26322
CONSUMPTION PARAMETERS E.G., WEIGHTS
26320
PROBE
26318
26302
SOURCES
26310
PROBE
26312
CHANNELS
26326
PROBE
26314
SOCIAL MEDIA
26316
PROBE

FIG. 262

IDL VALUE ADD- MAPPING PARAMETERS OF A DATA PRODUCER WITH A DATA CONSUMER



EX: P-M WITH C-V
IDL ENABLES PUTTING A VALUE TO A CONSUMER OF A MEANING OF A SOURCE OF DATA

EX: P-C WITH C-M
IDL ENABLES ASCRIBING A MEANING TO A CONSUMER FOR A COST OF COLLECTION BY A PRODUCER

EX: P-C WITH C-V
IDL ENABLES DETERMINING A RELATIONSHIP BETWEEN CONSUMER PERCEIVED VALUE TO PRODUCER COSTS

EX: P-C WITH C-T
IDL ENABLES DETERMINING WHEN PRODUCER CONTENT IS REQUIRED BY A CONSUMER

FIG. 263

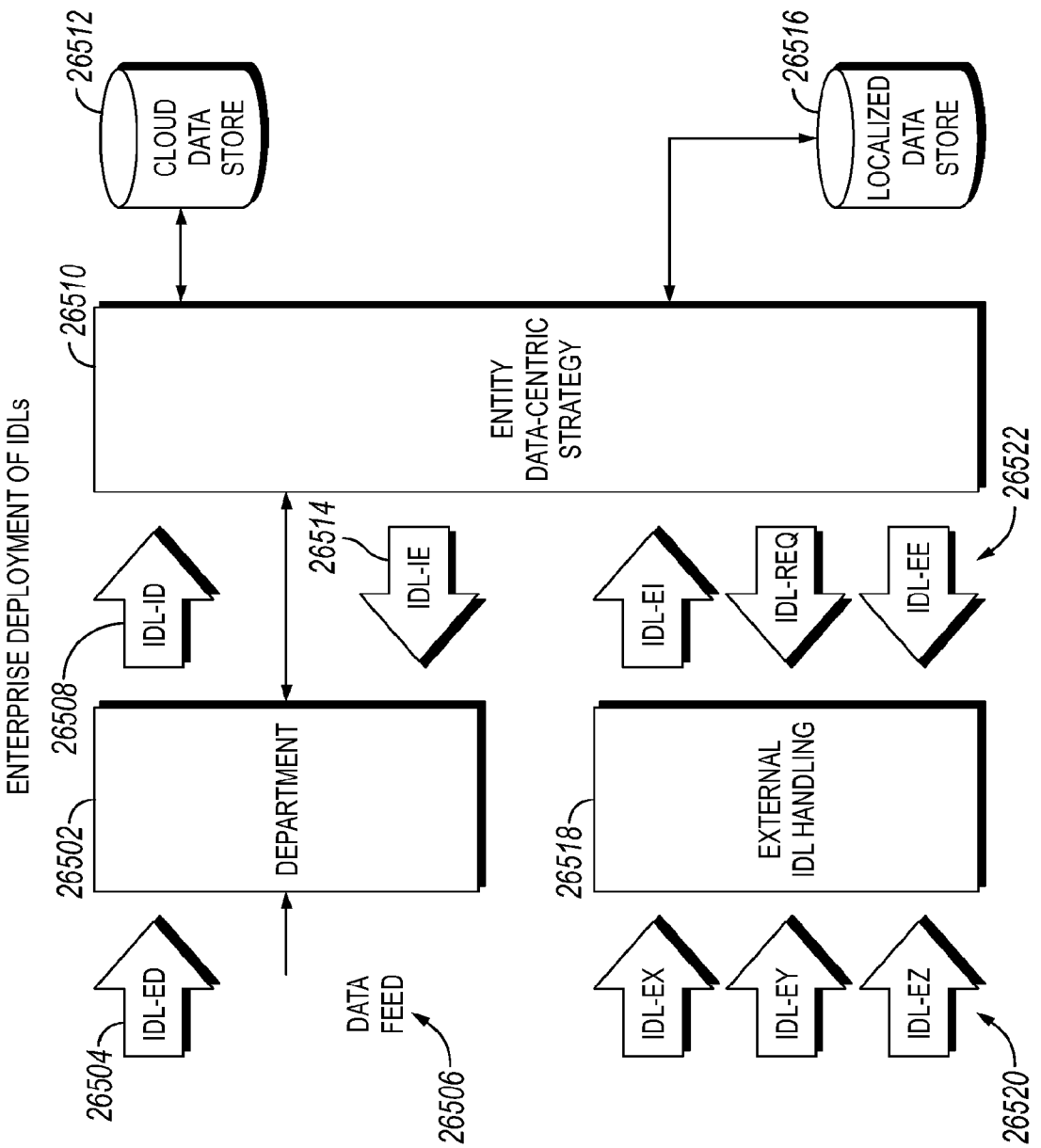

ENTERPRISE DEPLOYMENT OF IDLs
26512
CLOUD DATA STORE
26516
LOCALIZED DATA STORE
26510
ENTITY DATA-CENTRIC STRATEGY
26522
26514
IDL-ID
IDL-IE
IDL-EI
IDL-REQ
IDL-EE
26508
26502
DEPARTMENT
26518
EXTERNAL IDL HANDLING
IDL-ED
IDL-EX
IDL-EY
IDL-EZ
26504
DATA FEED
26506
26520

FIG. 264

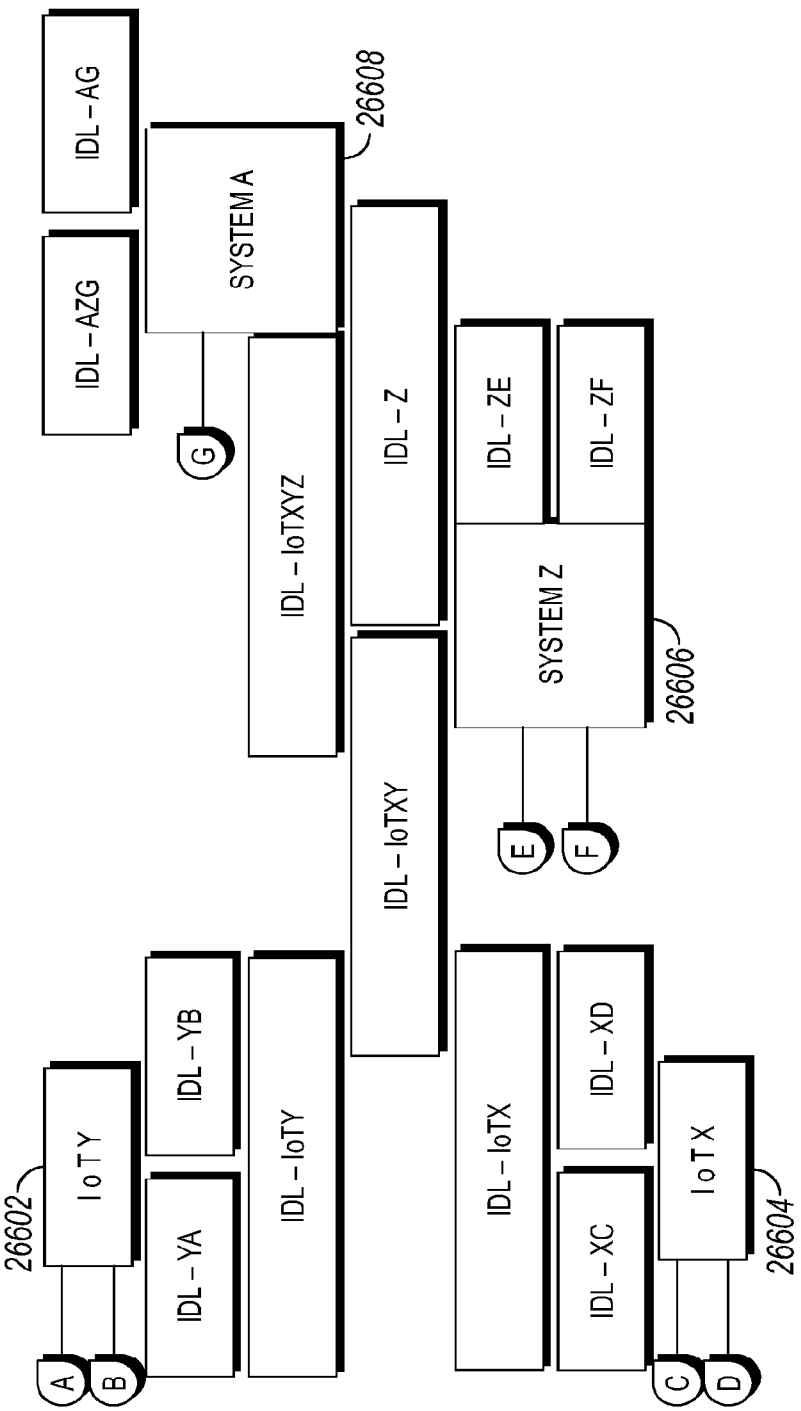

IDL – AG
IDL – AZG
SYSTEM A
26608
G
IDL – IoTXYZ
IDL – Z
IDL – ZE
IDL – ZF
SYSTEM Z
26606
E
F
IDL – IoTXY
IDL – IoTY
IDL – YB
IDL – YA
IoT Y
26602
A
B
IDL – IoTX
IDL – XD
IDL – XC
IoT X
26604
C
D

FIG. 265

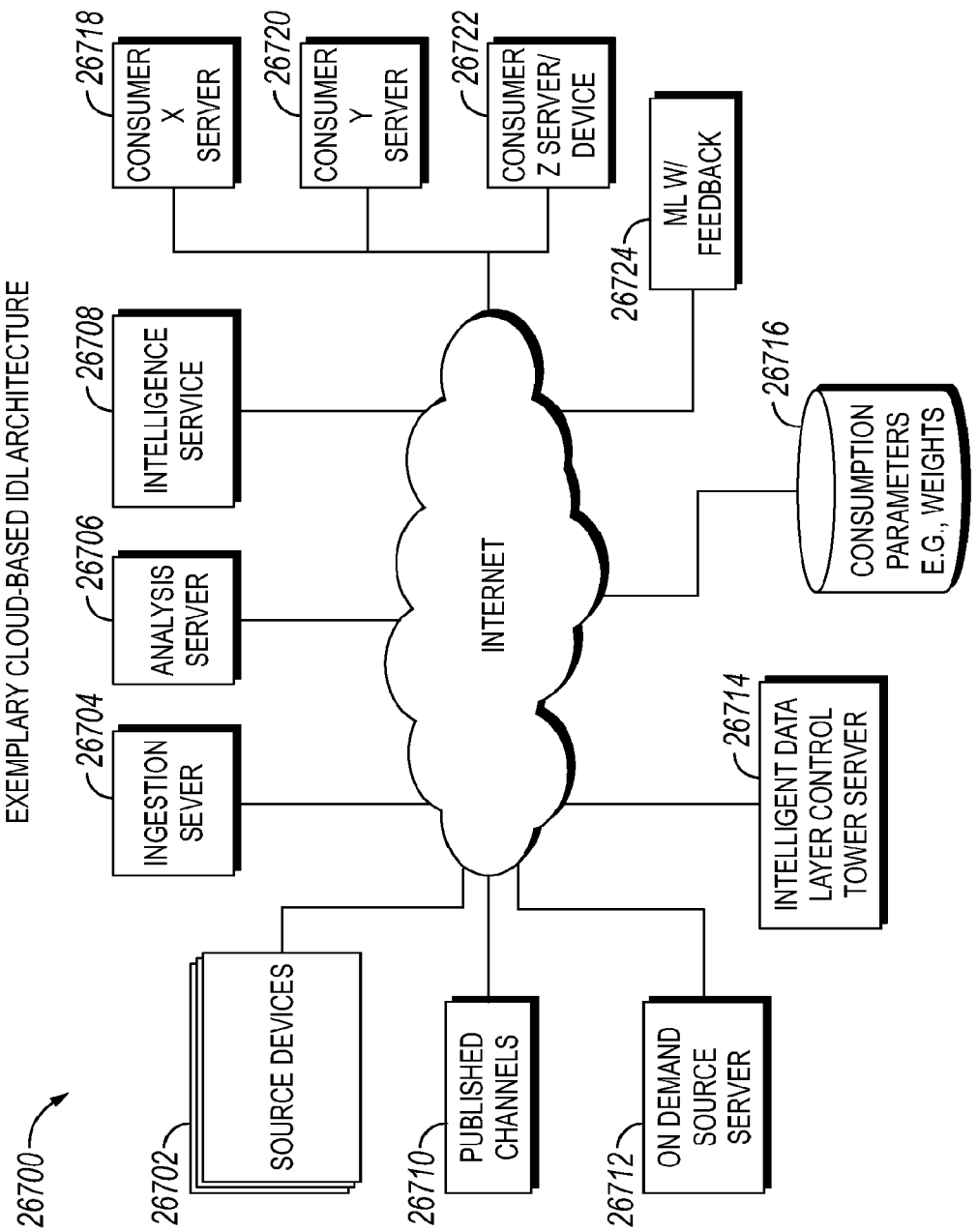

EXEMPLARY CLOUD-BASED IDL ARCHITECTURE
26700
26702
SOURCE DEVICES
26704
INGESTION SEVER
26706
ANALYSIS SERVER
26708
INTELLIGENCE SERVICE
26710
PUBLISHED CHANNELS
26712
ON DEMAND SOURCE SERVER
INTERNET
26714
INTELLIGENT DATA LAYER CONTROL TOWER SERVER
26716
CONSUMPTION PARAMETERS E.G., WEIGHTS
26718
CONSUMER X SERVER
26720
CONSUMER Y SERVER
26722
CONSUMER Z SERVER/ DEVICE
26724
ML W/ FEEDBACK

FIG. 266

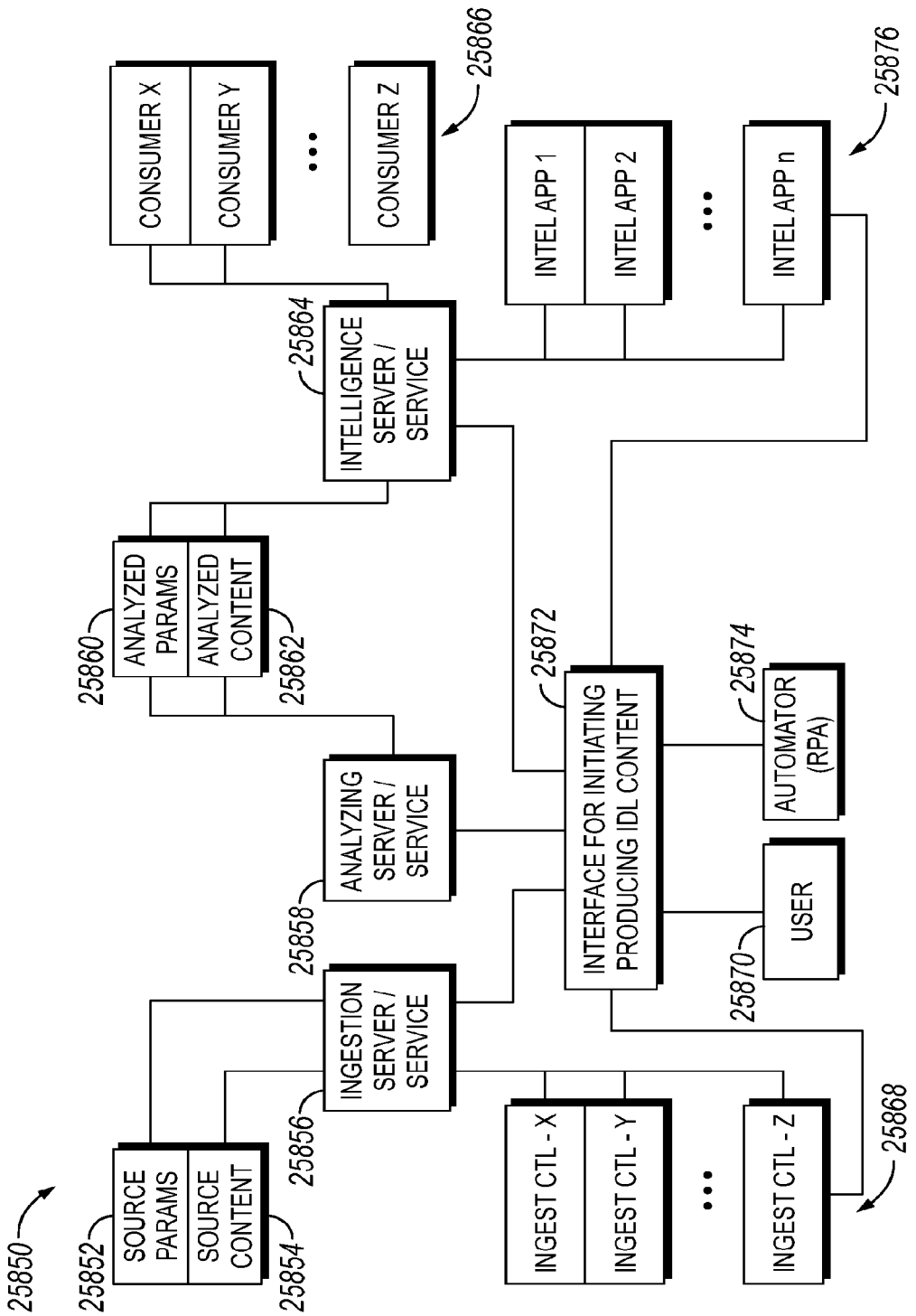

25850
25852
SOURCE PARAMS
25854
SOURCE CONTENT
25856
INGESTION SERVER / SERVICE
25858
ANALYZING SERVER / SERVICE
25860
ANALYZED PARAMS
25862
ANALYZED CONTENT
25864
INTELLIGENCE SERVER / SERVICE
25866
CONSUMER X
CONSUMER Y
CONSUMER Z
25868
INGEST CTL - X
INGEST CTL - Y
INGEST CTL - Z
25870
USER
25872
INTERFACE FOR INITIATING PRODUCING IDL CONTENT
25874
AUTOMATOR (RPA)
25876
INTEL APP 1
INTEL APP 2
INTEL APP n

FIG. 267

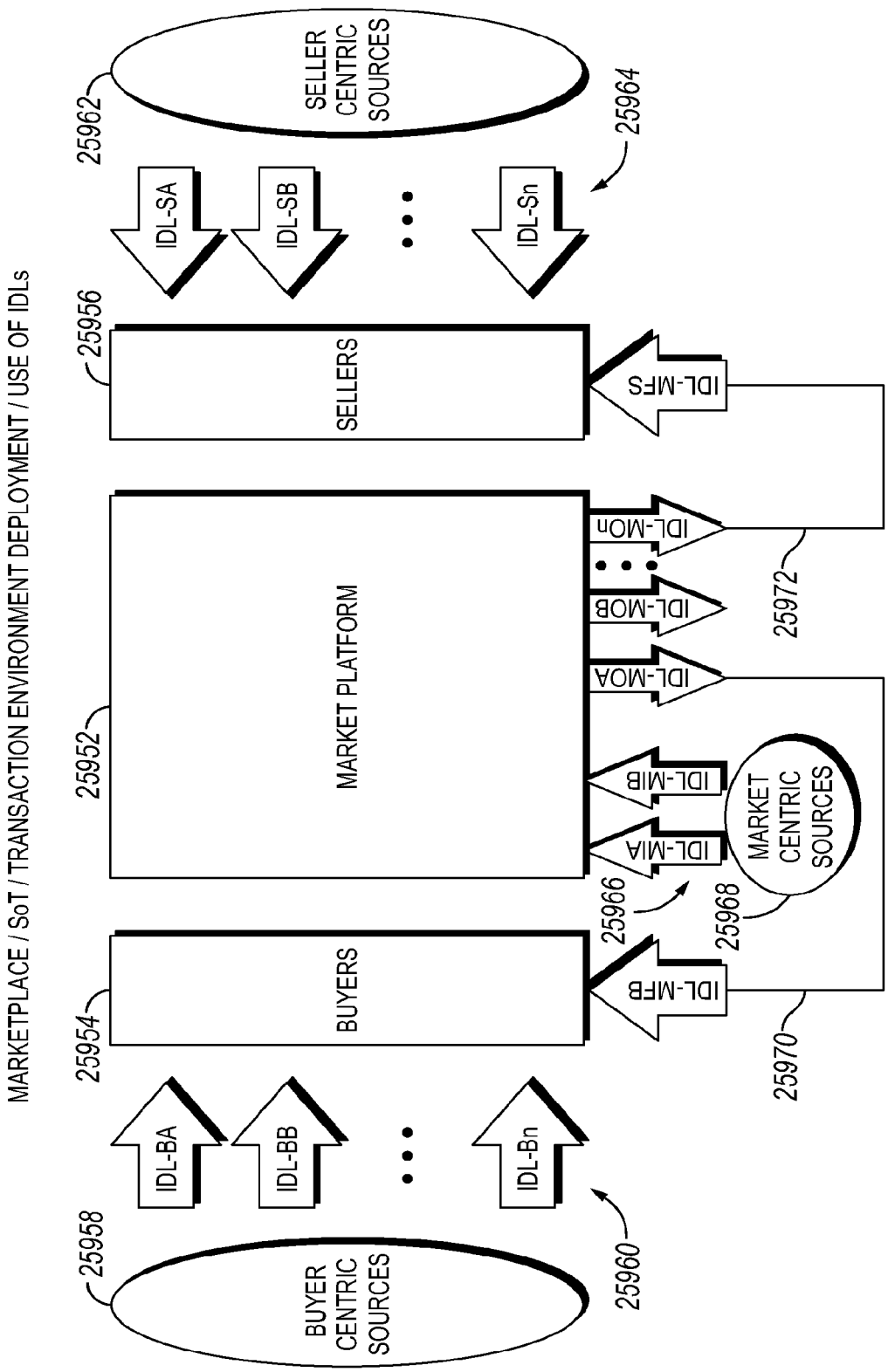

MARKETPLACE / SoT / TRANSACTION ENVIRONMENT DEPLOYMENT / USE OF IDLs
25962
SELLER CENTRIC SOURCES
25964
IDL-SA
IDL-SB
IDL-Sn
25956
SELLERS
IDL-MFS
25952
MARKET PLATFORM
IDL-MOn
IDL-MOB
IDL-MOA
IDL-MIB
IDL-MIA
25966
25968
MARKET CENTRIC SOURCES
25972
25954
BUYERS
IDL-MFB
25970
IDL-BA
IDL-BB
IDL-Bn
25958
BUYER CENTRIC SOURCES
25960

FIG. 268

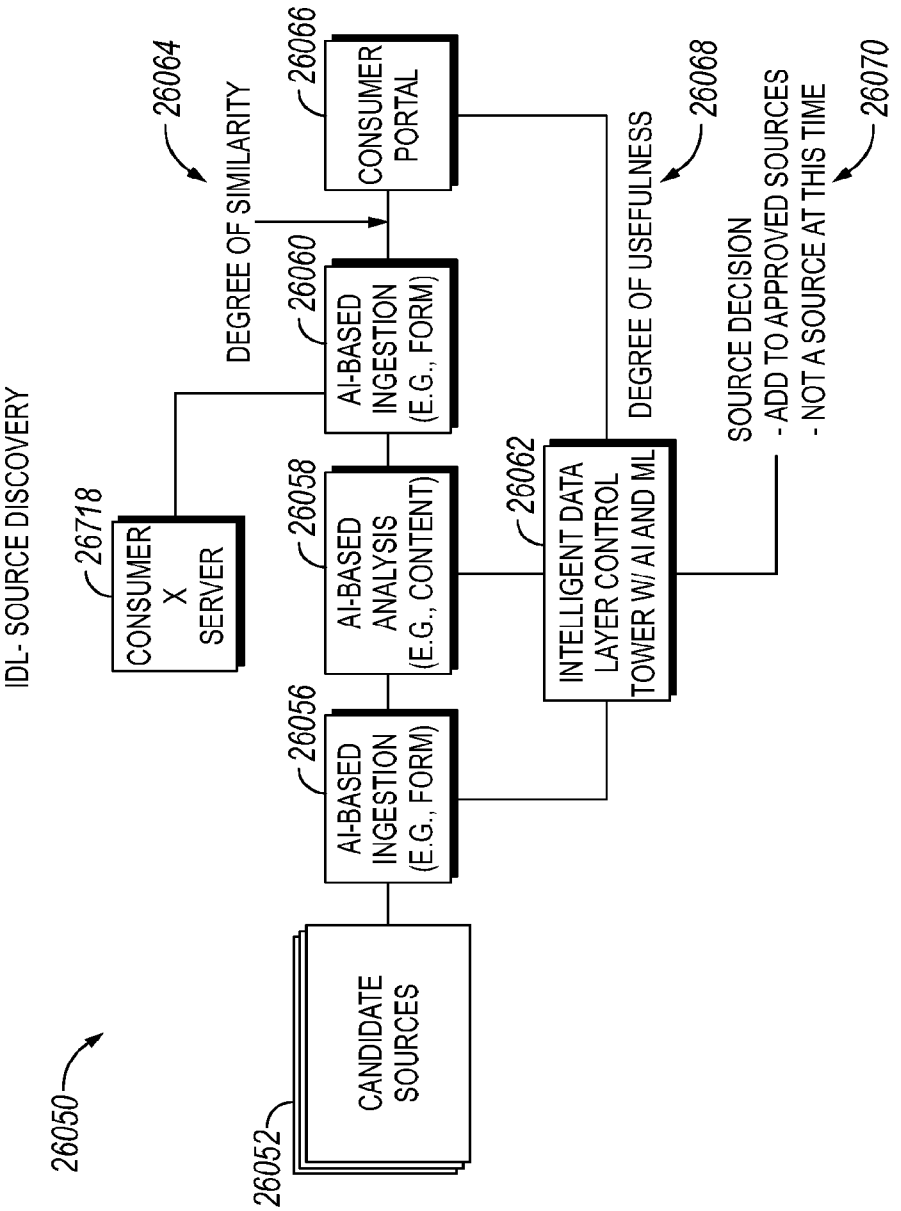

IDL- SOURCE DISCOVERY
26050
CANDIDATE SOURCES
26052
AI-BASED INGESTION (E.G., FORM)
26056
AI-BASED ANALYSIS (E.G., CONTENT)
26058
AI-BASED INGESTION (E.G., FORM)
26060
CONSUMER PORTAL
26066
CONSUMER X SERVER
26718
INTELLIGENT DATA LAYER CONTROL TOWER W/ AI AND ML
26062
26064
DEGREE OF SIMILARITY
DEGREE OF USEFULNESS
26068
SOURCE DECISION
- ADD TO APPROVED SOURCES
- NOT A SOURCE AT THIS TIME
26070

FIG. 269

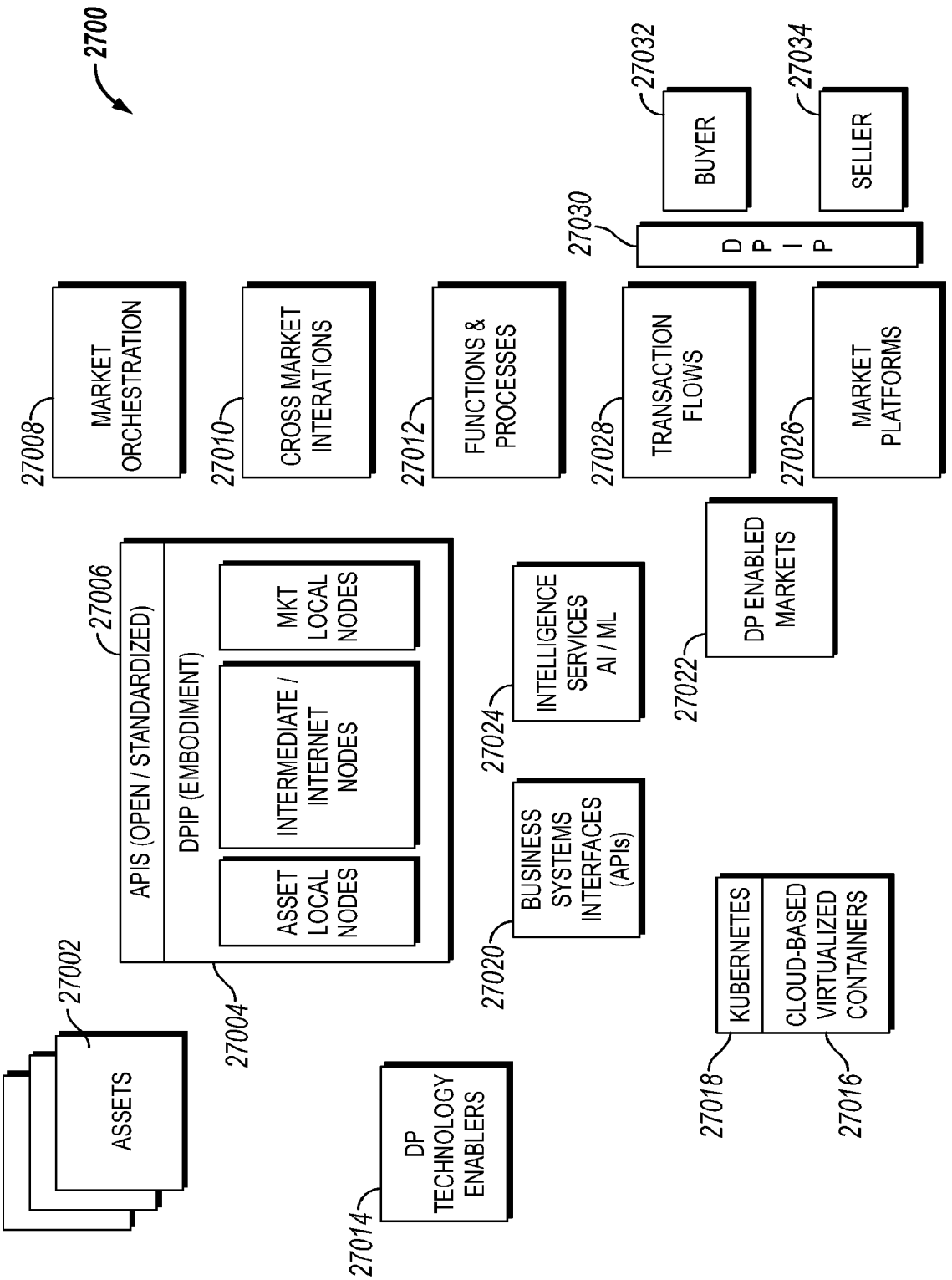

2700
27008
MARKET ORCHESTRATION
27010
CROSS MARKET INTERATIONS
27012
FUNCTIONS & PROCESSES
27028
TRANSACTION FLOWS
27026
MARKET PLATFORMS
27030
D P I P
27032
BUYER
27034
SELLER
27006
APIS (OPEN / STANDARDIZED)
DPIP (EMBODIMENT)
ASSET LOCAL NODES
INTERMEDIATE / INTERNET NODES
MKT LOCAL NODES
27004
27002
ASSETS
27014
DP TECHNOLOGY ENABLERS
27020
BUSINESS SYSTEMS INTERFACES (APIs)
27024
INTELLIGENCE SERVICES AI / ML
27022
DP ENABLED MARKETS
27018
KUBERNETES
CLOUD-BASED VIRTUALIZED CONTAINERS
27016

FIG. 270

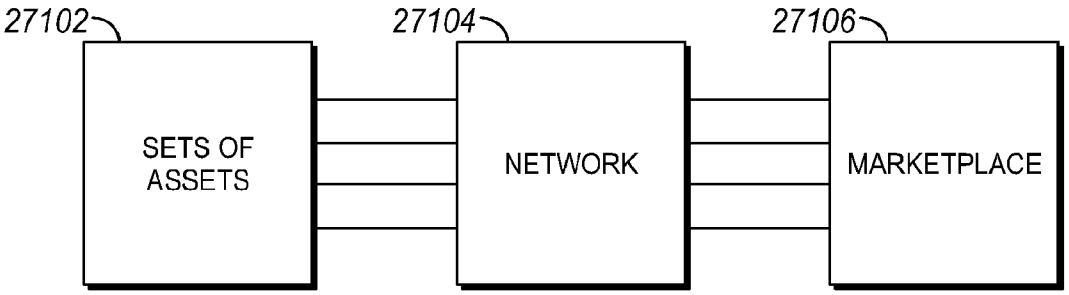


FIG. 271

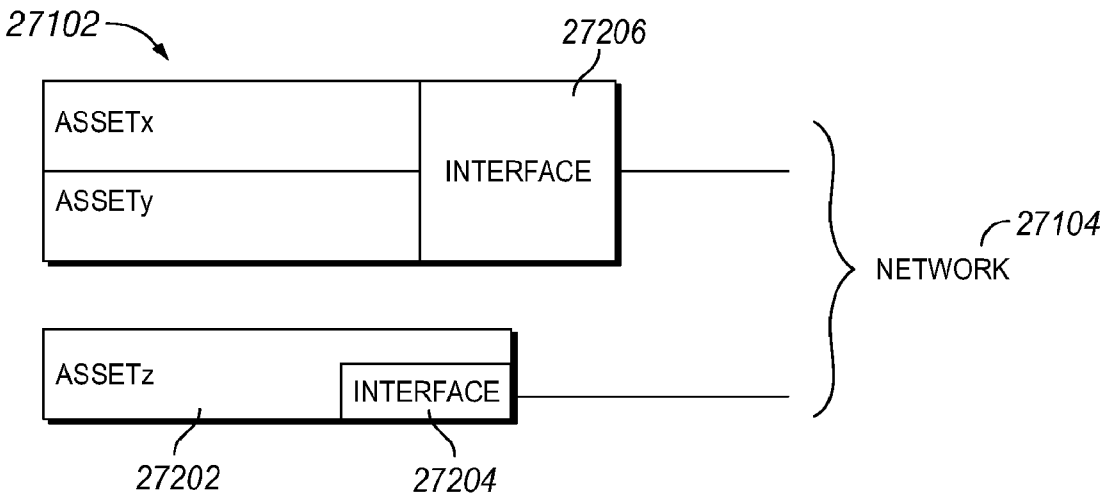


FIG. 272

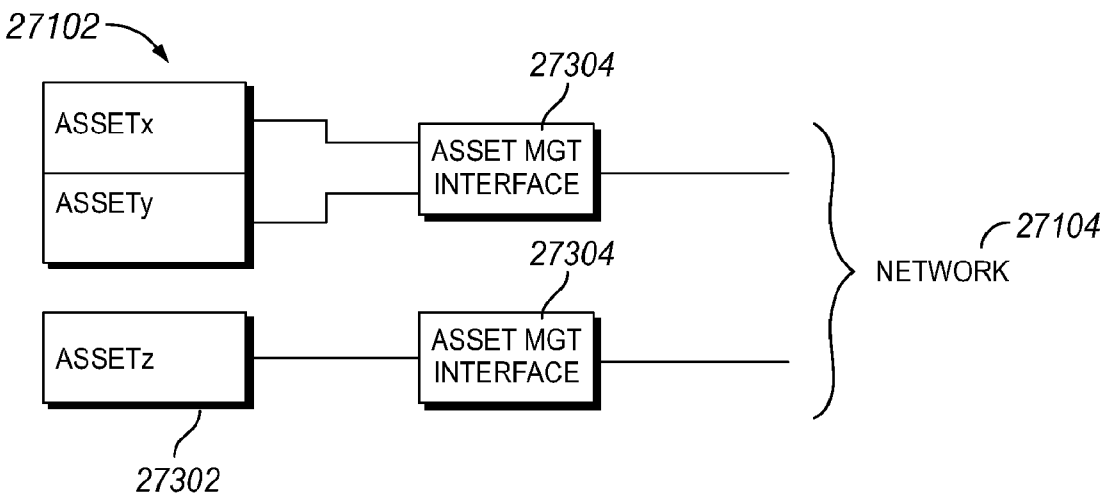


FIG. 273

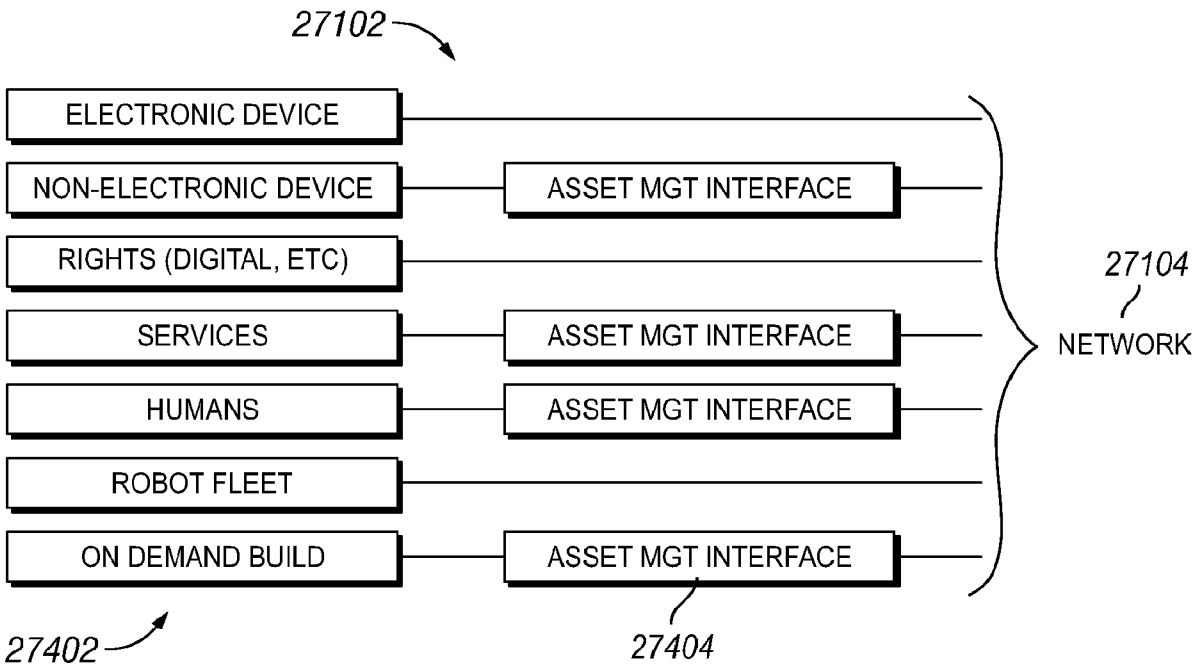


FIG. 274

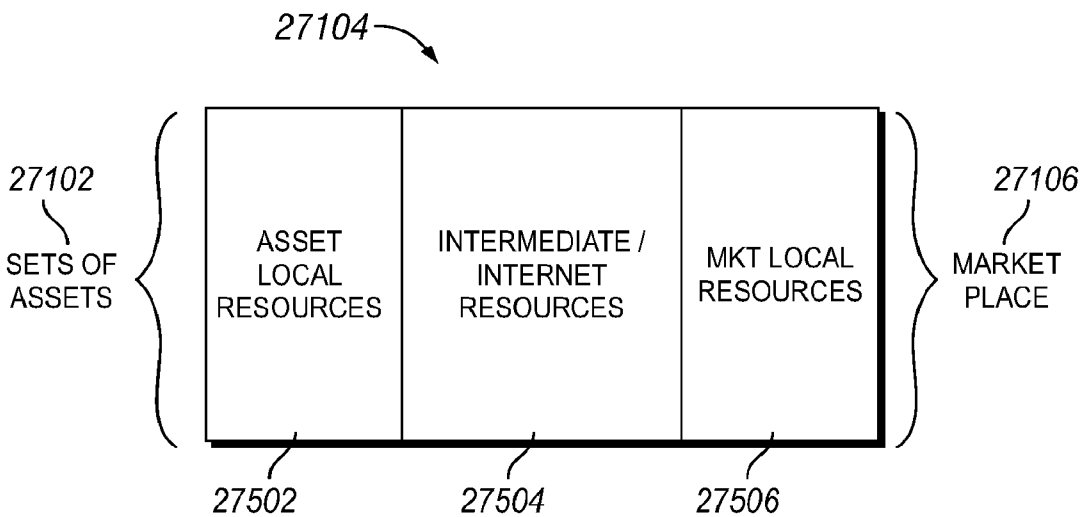


FIG. 275

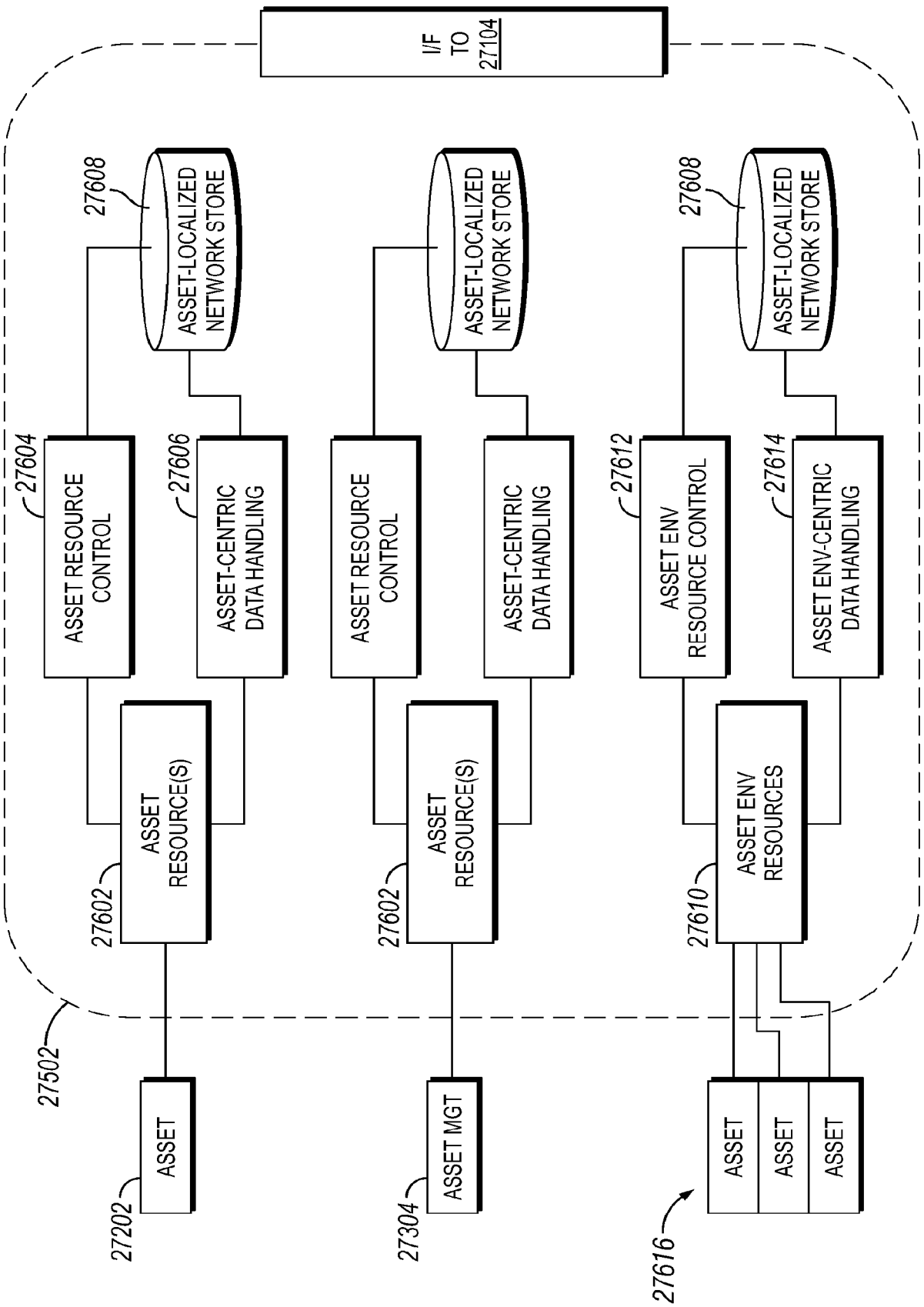

I/F TO 27104
27608
ASSET-LOCALIZED NETWORK STORE
27604
ASSET RESOURCE CONTROL
27606
ASSET-CENTRIC DATA HANDLING
27602
ASSET RESOURCE(S)
27608
ASSET-LOCALIZED NETWORK STORE
ASSET RESOURCE CONTROL
ASSET-CENTRIC DATA HANDLING
27602
ASSET RESOURCE(S)
27608
ASSET-LOCALIZED NETWORK STORE
27612
ASSET ENV RESOURCE CONTROL
27614
ASSET ENV-CENTRIC DATA HANDLING
27610
ASSET ENV RESOURCES
27502
27202
ASSET
27304
ASSET MGT
27616
ASSET
ASSET
ASSET

FIG. 276

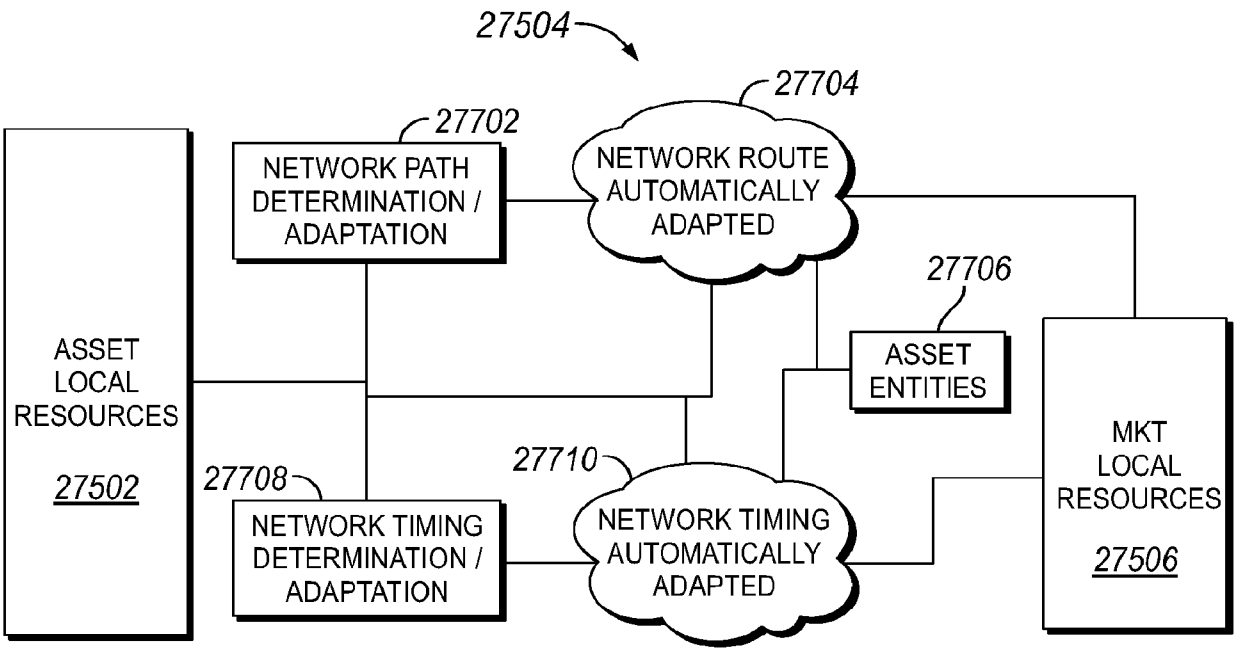

27504
27704
27702
NETWORK PATH DETERMINATION / ADAPTATION
NETWORK ROUTE AUTOMATICALLY ADAPTED
27706
ASSET LOCAL RESOURCES
27502
ASSET ENTITIES
MKT LOCAL RESOURCES
27506
27710
27708
NETWORK TIMING DETERMINATION / ADAPTATION
NETWORK TIMING AUTOMATICALLY ADAPTED

FIG. 277

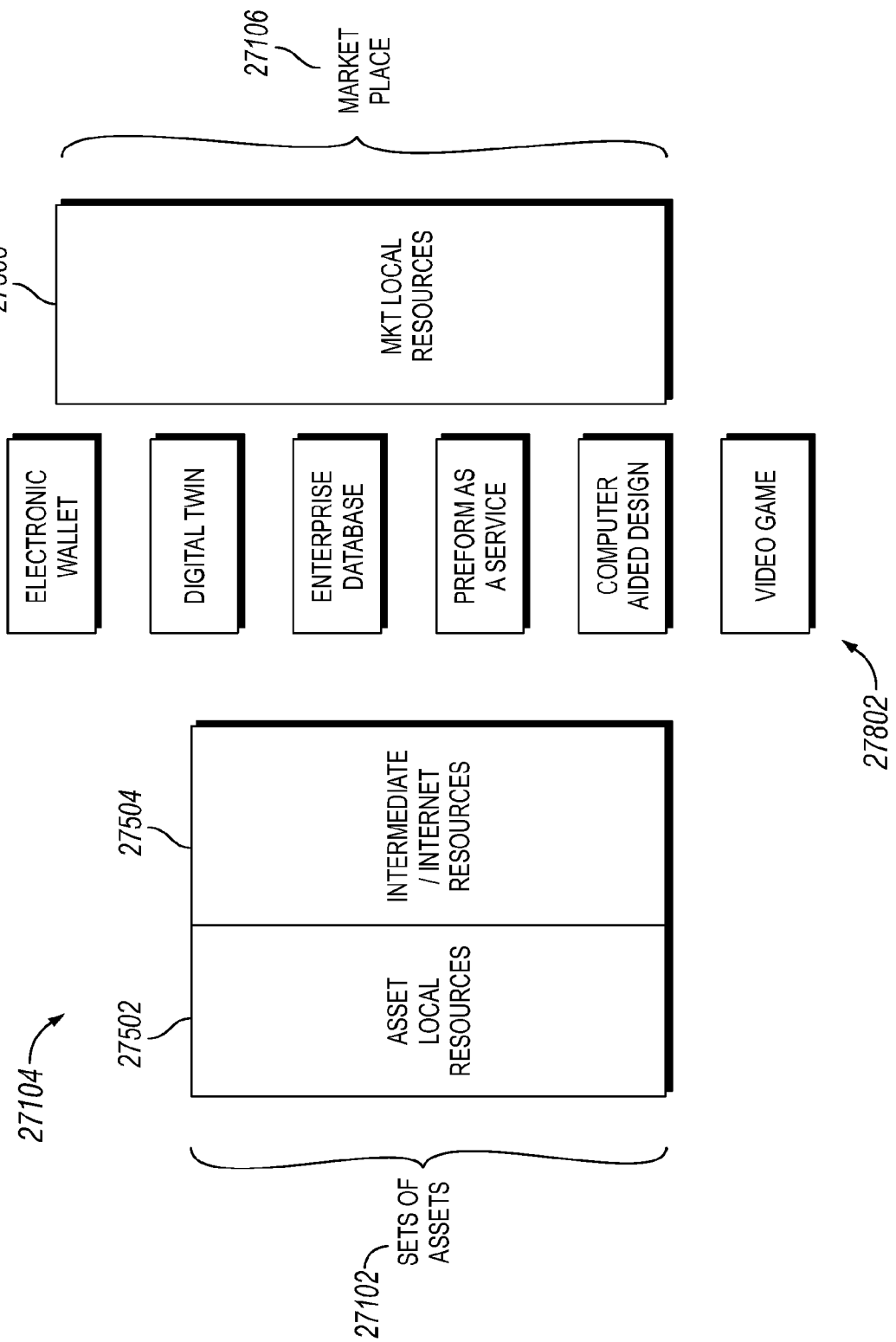

27106
MARKET PLACE
27506
MKT LOCAL RESOURCES
ELECTRONIC WALLET
DIGITAL TWIN
ENTERPRISE DATABASE
PREFORM AS A SERVICE
COMPUTER AIDED DESIGN
VIDEO GAME
27802
27104
27504
INTERMEDIATE / INTERNET RESOURCES
27502
ASSET LOCAL RESOURCES
SETS OF ASSETS
27102

FIG. 278

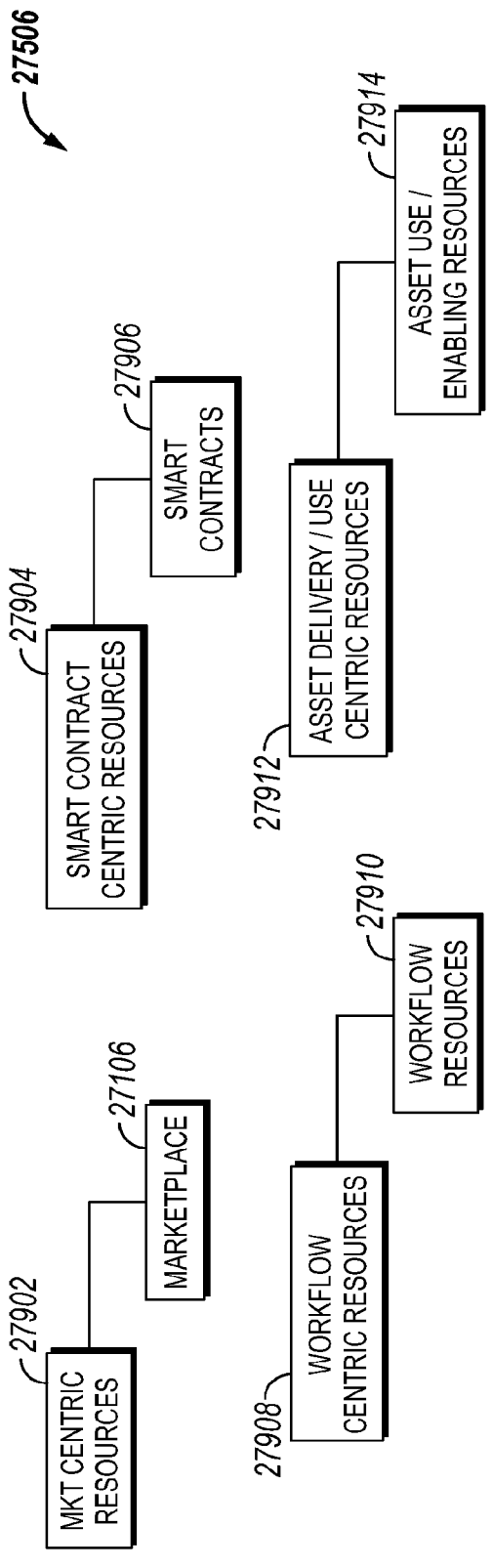


FIG. 279

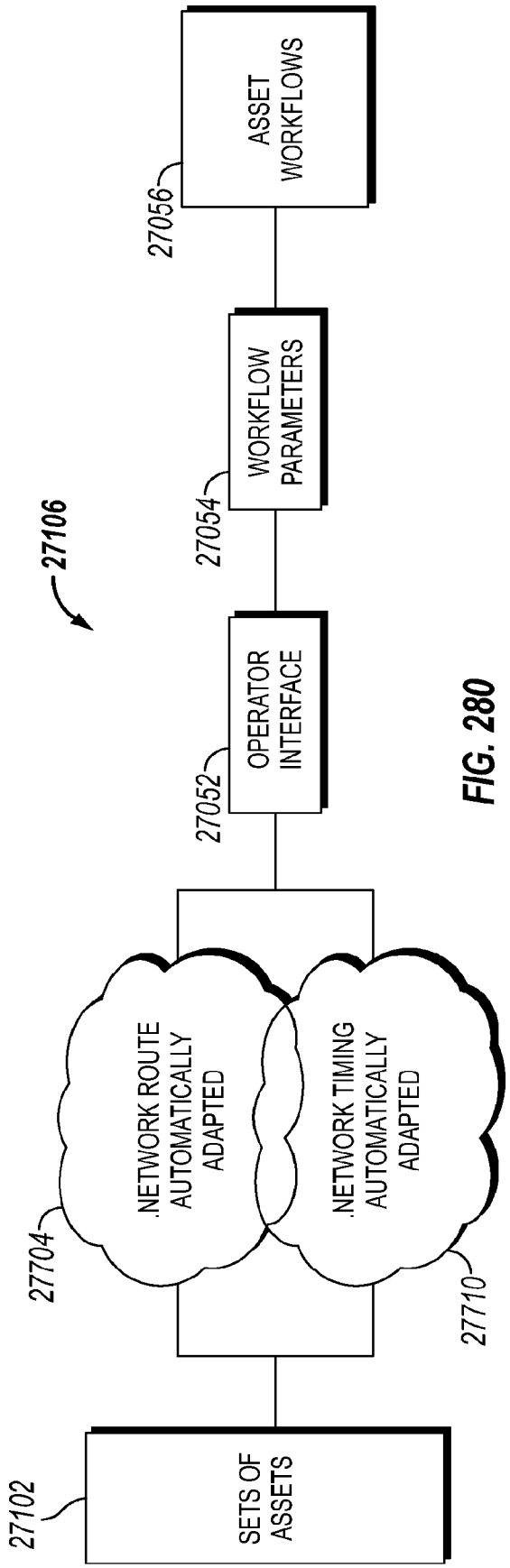


FIG. 280

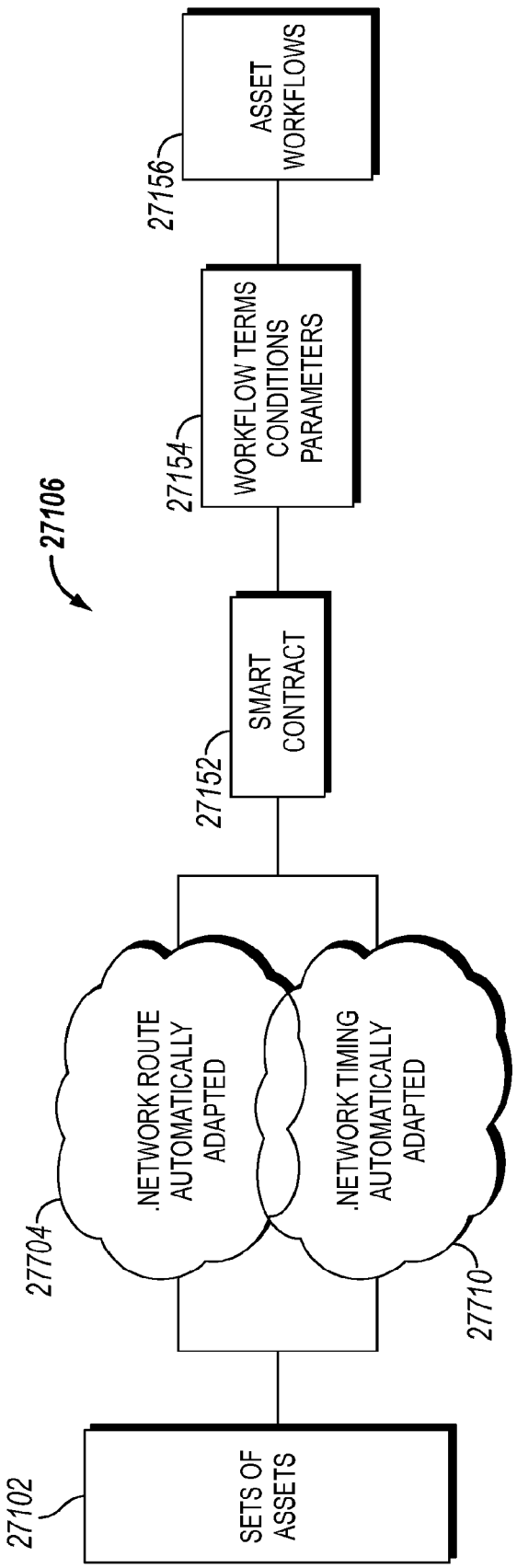

27106
27102
SETS OF ASSETS
27704
.NETWORK ROUTE AUTOMATICALLY ADAPTED
27710
.NETWORK TIMING AUTOMATICALLY ADAPTED
27152
SMART CONTRACT
27154
WORKFLOW TERMS CONDITIONS PARAMETERS
27156
ASSET WORKFLOWS

FIG. 281

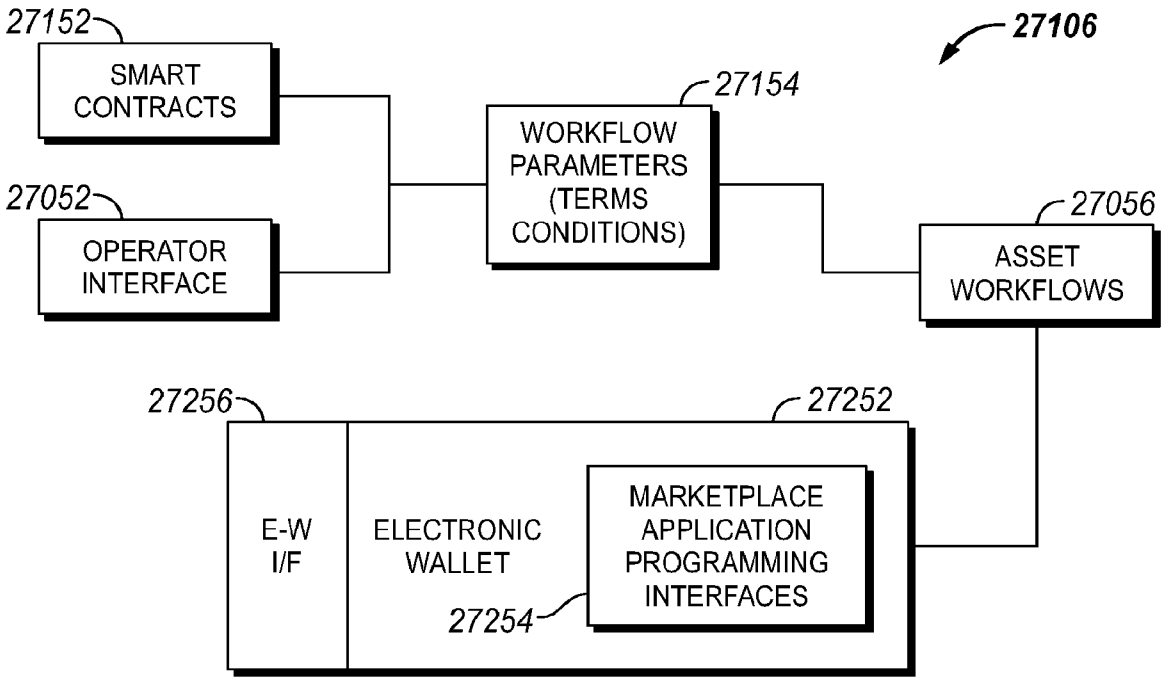


FIG. 282

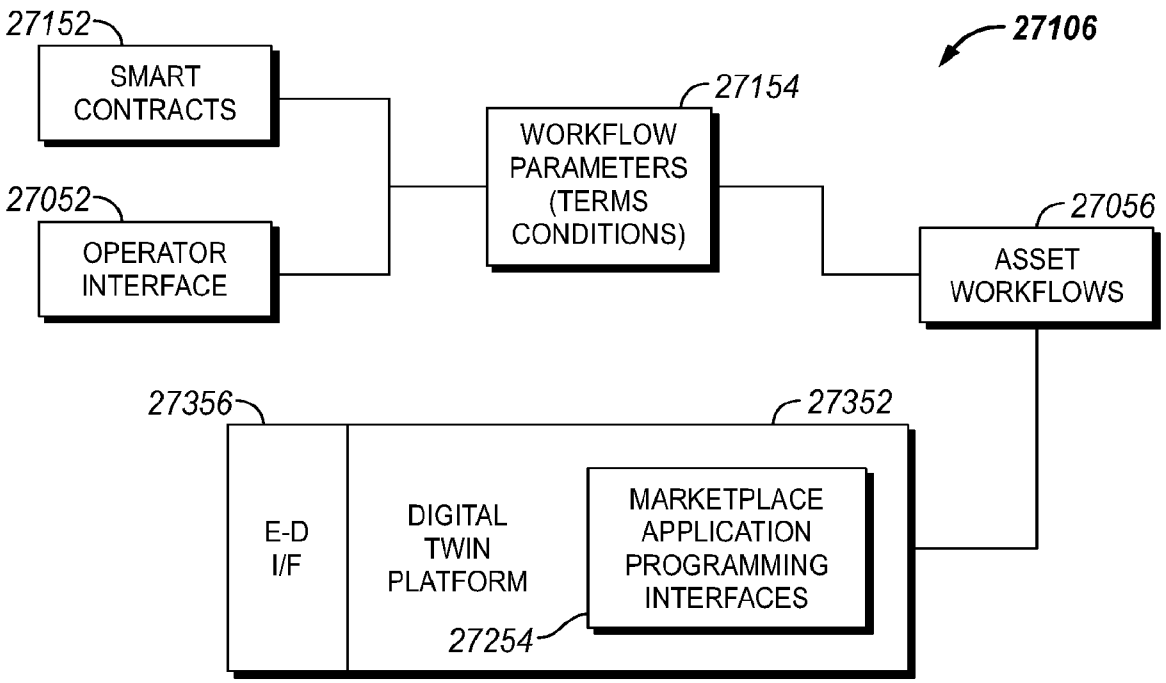


FIG. 283

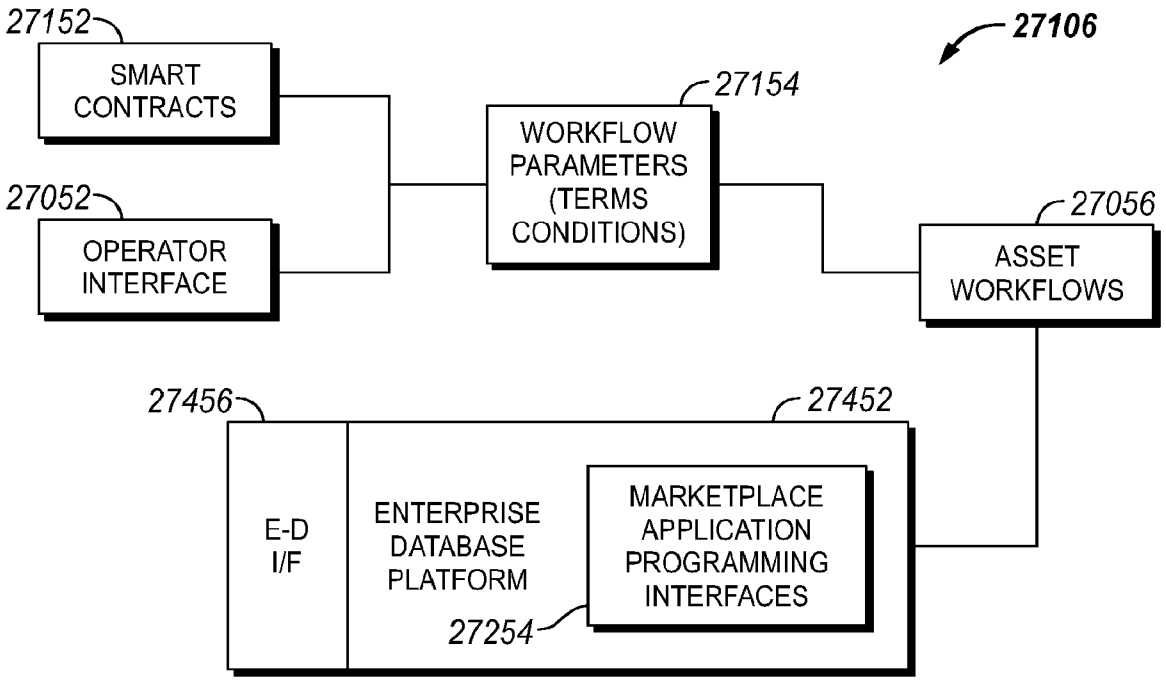


FIG. 284

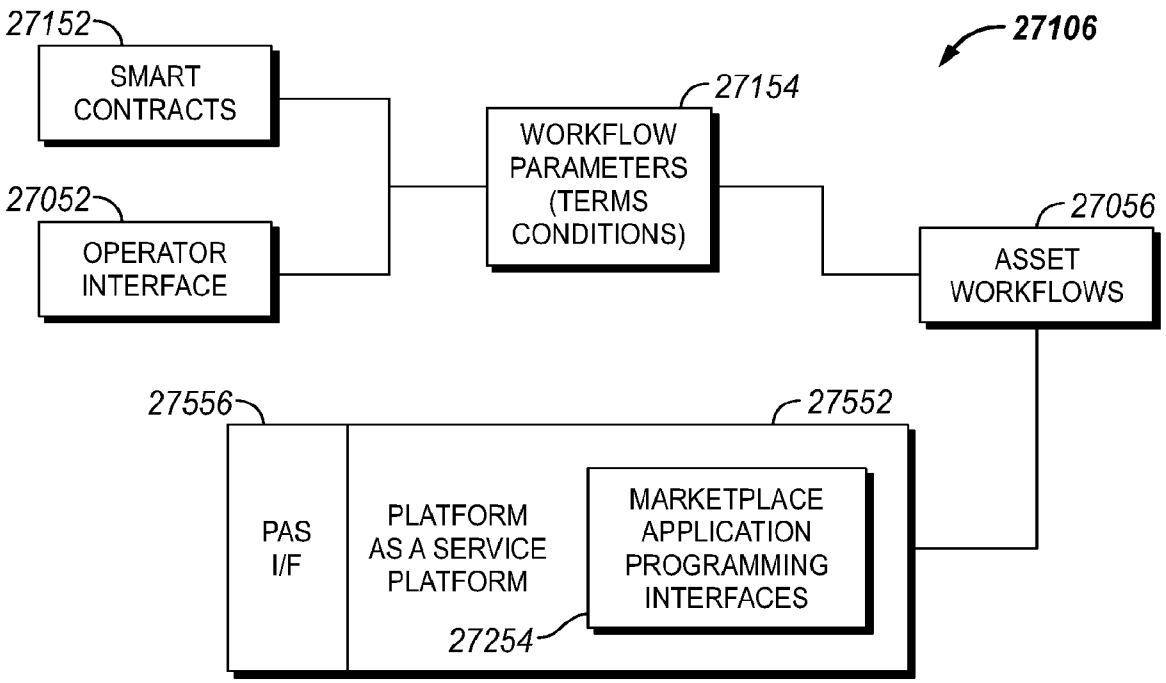


FIG. 285

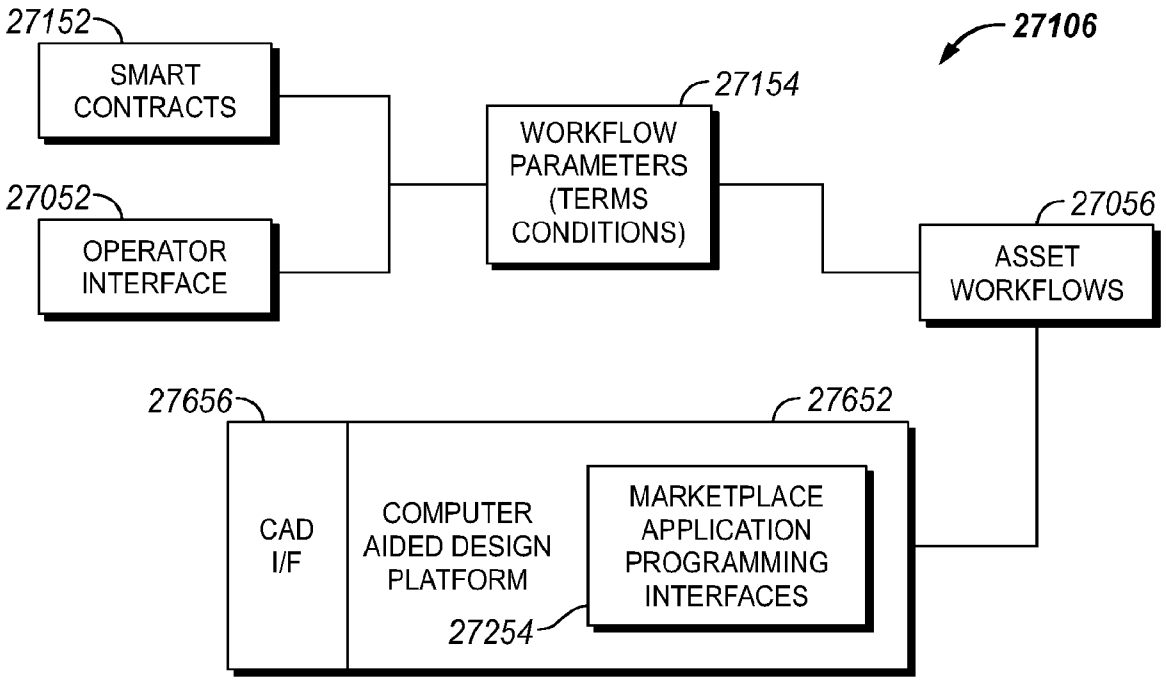


FIG. 286

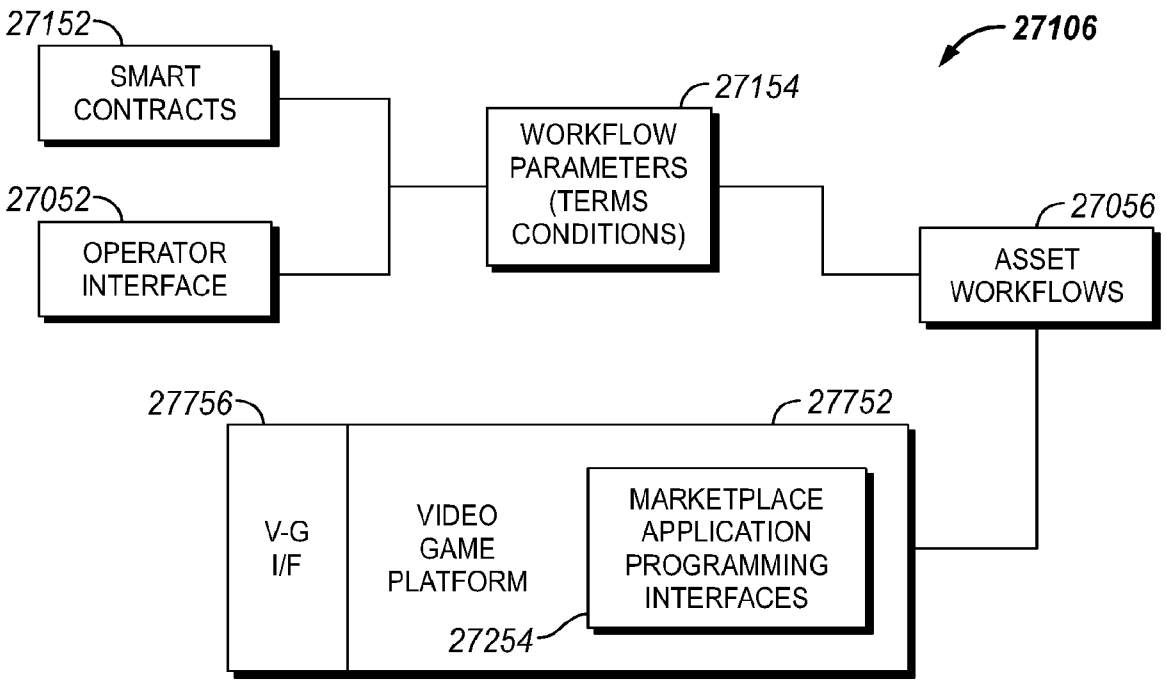


FIG. 287

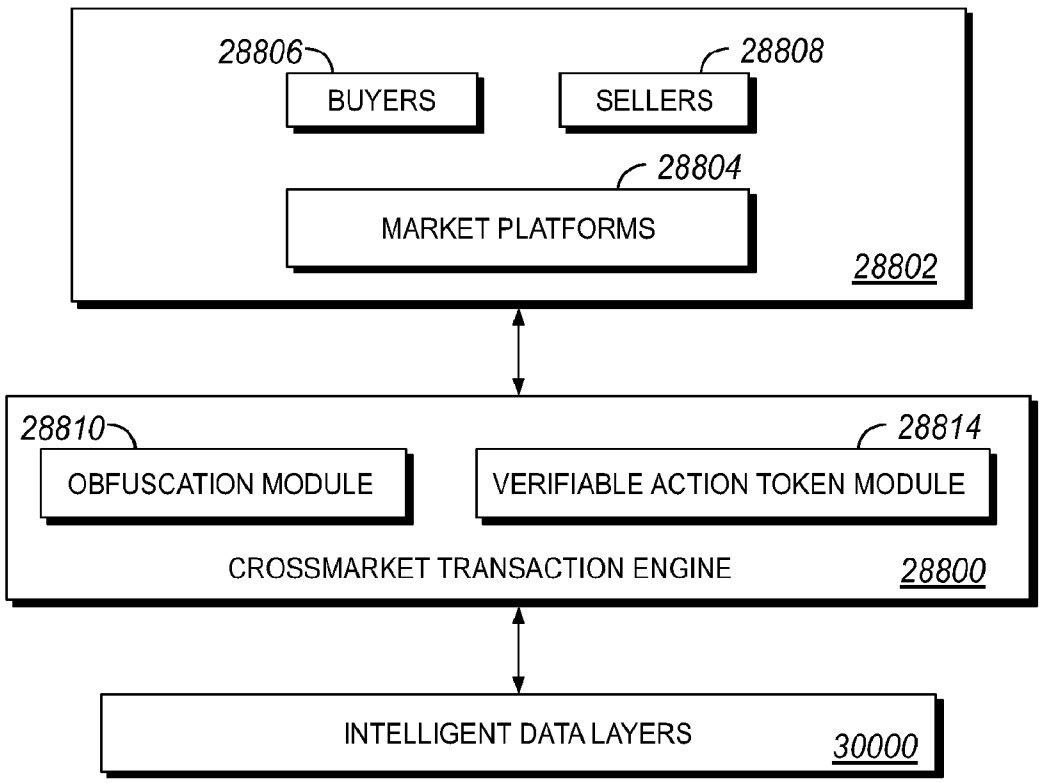


FIG. 288

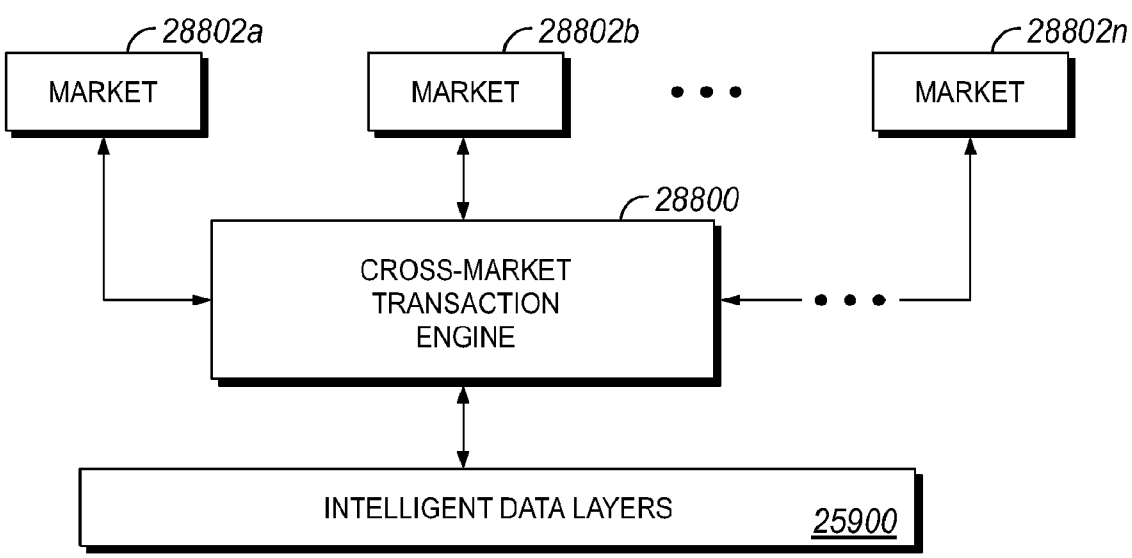


FIG. 289

EXTERNAL DATA
HISTORICAL DATA
GOV
Edu
PUBLIC
PRIVATE
DIRECTED DATA
SENSORS
SURVEYS
SOCIAL MEDIA
CROWD SOURCING
IoT
DATA TRANSACTIONS
DATA CLIENTS
DATA PROVIDERS
WORKFLOWS
MARKET PREDICTION SYSTEM PLATFORM
29000
DATA ACCESS LAYER
TRANSACTION SYSTEM
SMART CONTRACTS
BLOCKCHAIN SERVICES
WALLET SYSTEMS
DATA WORKFLOWS
WORKFLOW DEFINITIONS
WORKFLOW MANAGEMENT
WORKFLOW LIBRARIES
INTERFACE SYSTEM
API/SDK
GUI
REQUESTS
APPROVALS
INTERFACE LIBRARIES
DATA ANALYSIS
PARAMETER COMPUTING SERVICES
QUANTUM COMPUTING
CHIP COMPUTING
PARAMETER ANALYSIS
ANALYSIS MANAGEMENT
PARAMETER LIBRARY
INTELLIGENCE SYSTEM
INTELLIGENCE SERVICE CONTROLLER
ANALYSIS MANAGEMENT
GOVERNANCE LIBRARY
ANALYSIS MODULES
AI MODULES
NLP
RPA
NEURAL NETWORKS
ML
ANALYTICS
DIGITAL TWINS
DATA SERVICES
COMPRESSION
NETWORKS
HARDWARE
ENCODING
DATA STORAGE
DATABASE MANAGER
DATA PROCESSING

FIG. 290

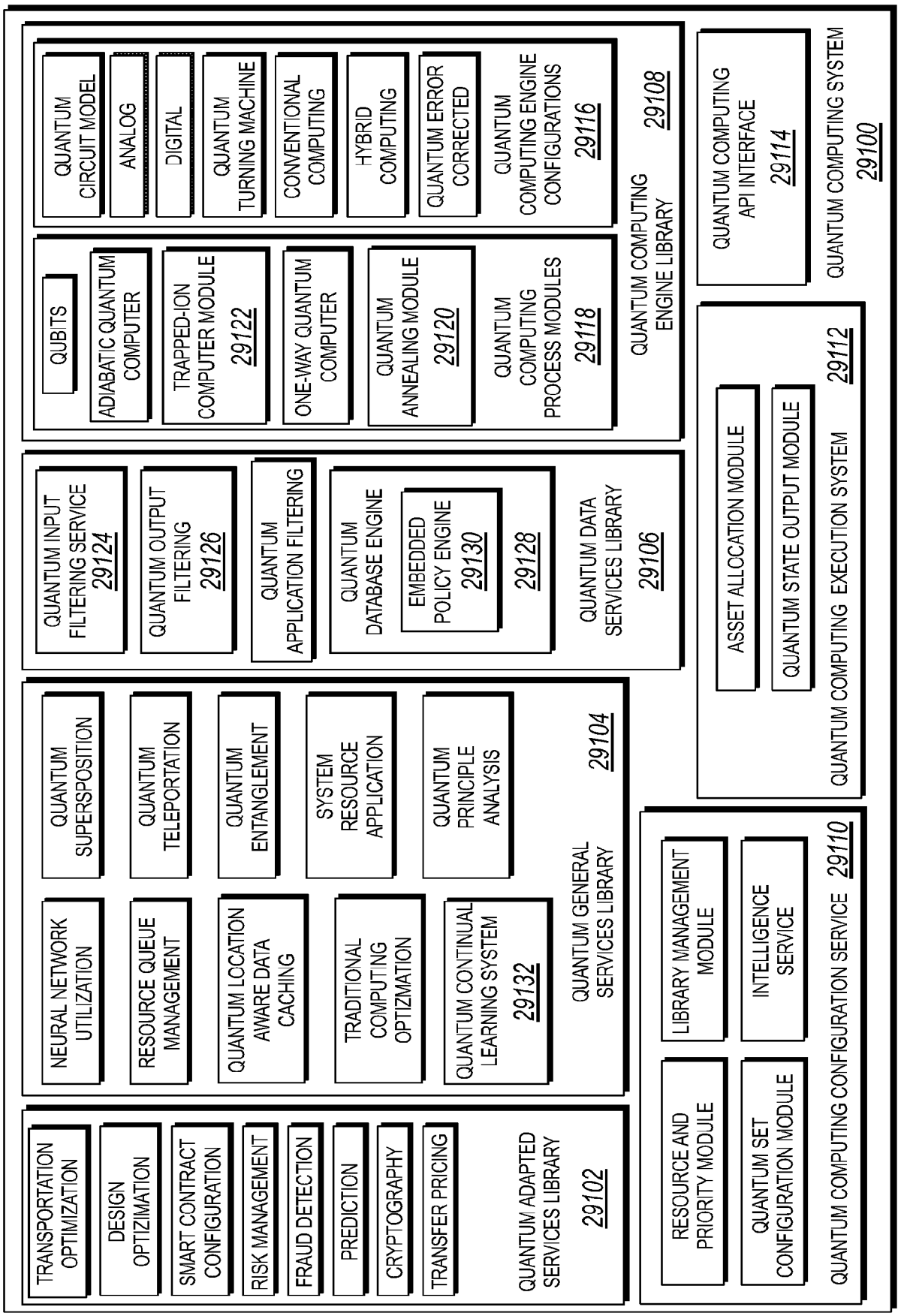

QUANTUM COMPUTING SYSTEM 29100
QUANTUM COMPUTING API INTERFACE 29114
QUANTUM COMPUTING ENGINE LIBRARY 29108
QUANTUM CIRCUIT MODEL
ANALOG
DIGITAL
QUANTUM TURNING MACHINE
CONVENTIONAL COMPUTING
HYBRID COMPUTING
QUANTUM ERROR CORRECTED
QUANTUM COMPUTING ENGINE CONFIGURATIONS 29116
QUBITS
ADIABATIC QUANTUM COMPUTER
TRAPPED-ION COMPUTER MODULE 29122
ONE-WAY QUANTUM COMPUTER
QUANTUM ANNEALING MODULE 29120
QUANTUM COMPUTING PROCESS MODULES 29118
QUANTUM COMPUTING EXECUTION SYSTEM 29112
ASSET ALLOCATION MODULE
QUANTUM STATE OUTPUT MODULE
QUANTUM DATA SERVICES LIBRARY 29106
QUANTUM INPUT FILTERING SERVICE 29124
QUANTUM OUTPUT FILTERING 29126
QUANTUM APPLICATION FILTERING
QUANTUM DATABASE ENGINE
EMBEDDED POLICY ENGINE 29130
29128
QUANTUM GENERAL SERVICES LIBRARY 29104
QUANTUM SUPERSPOSITION
QUANTUM TELEPORTATION
QUANTUM ENTANGLEMENT
SYSTEM RESOURCE APPLICATION
QUANTUM PRINCIPLE ANALYSIS
NEURAL NETWORK UTILIZATION
RESOURCE QUEUE MANAGEMENT
QUANTUM LOCATION AWARE DATA CACHING
TRADITIONAL COMPUTING OPTIZMATION
QUANTUM CONTINUAL LEARNING SYSTEM 29132
QUANTUM ADAPTED SERVICES LIBRARY 29102
TRANSPORTATION OPTIMIZATION
DESIGN OPTIZIMATION
SMART CONTRACT CONFIGURATION
RISK MANAGEMENT
FRAUD DETECTION
PREDICTION
CRYPTOGRAPHY
TRANSFER PRICING
QUANTUM COMPUTING CONFIGURATION SERVICE 29110
RESOURCE AND PRIORITY MODULE
QUANTUM SET CONFIGURATION MODULE
LIBRARY MANAGEMENT MODULE
INTELLIGENCE SERVICE

FIG. 291

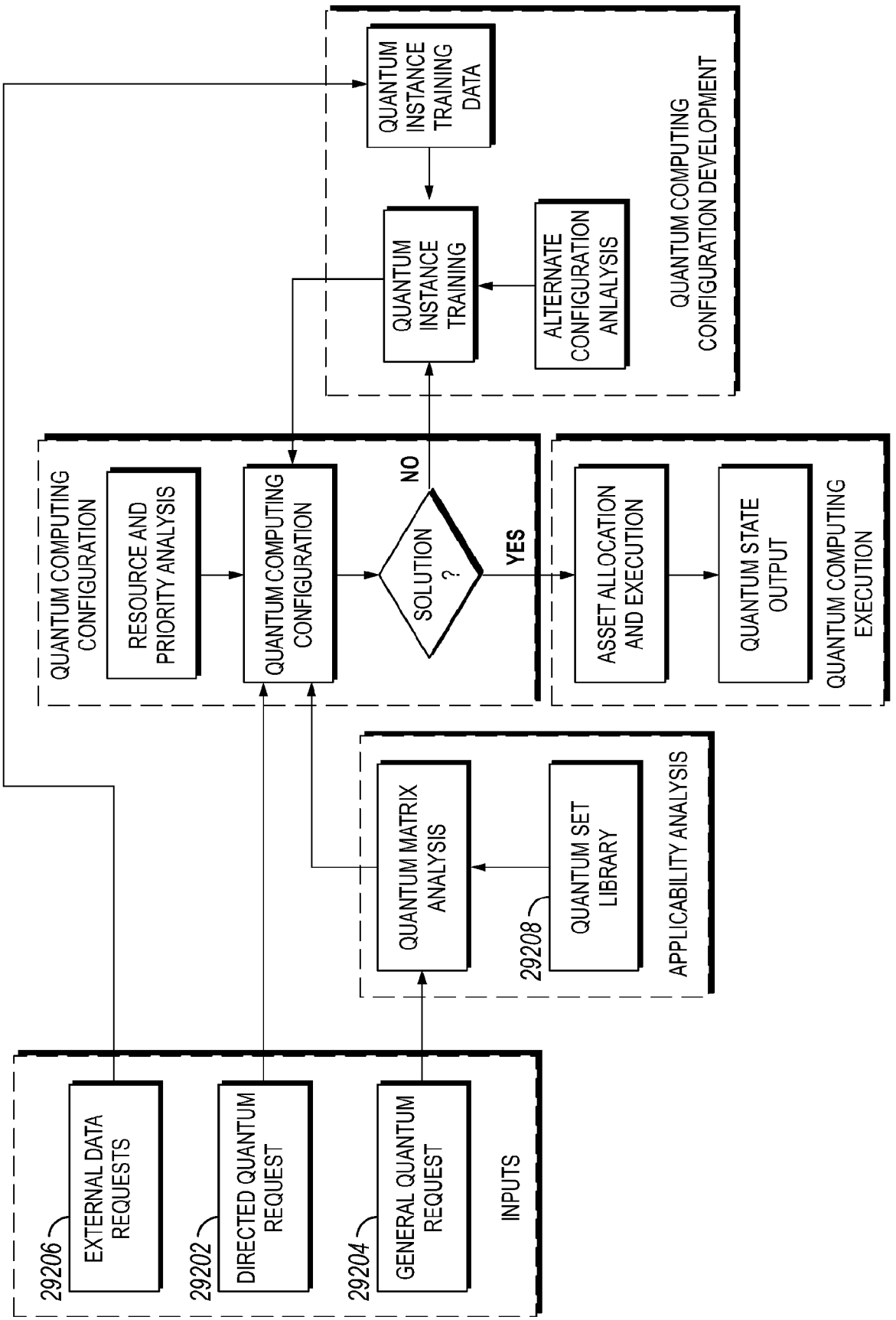

INPUTS
29206
EXTERNAL DATA REQUESTS
29202
DIRECTED QUANTUM REQUEST
29204
GENERAL QUANTUM REQUEST
APPLICABILITY ANALYSIS
29208
QUANTUM SET LIBRARY
QUANTUM MATRIX ANALYSIS
QUANTUM COMPUTING CONFIGURATION
RESOURCE AND PRIORITY ANALYSIS
QUANTUM COMPUTING CONFIGURATION
SOLUTION ?
NO
YES
QUANTUM COMPUTING EXECUTION
ASSET ALLOCATION AND EXECUTION
QUANTUM STATE OUTPUT
QUANTUM COMPUTING CONFIGURATION DEVELOPMENT
QUANTUM INSTANCE TRAINING DATA
QUANTUM INSTANCE TRAINING
ALTERNATE CONFIGURATION ANLALYSIS

FIG. 292

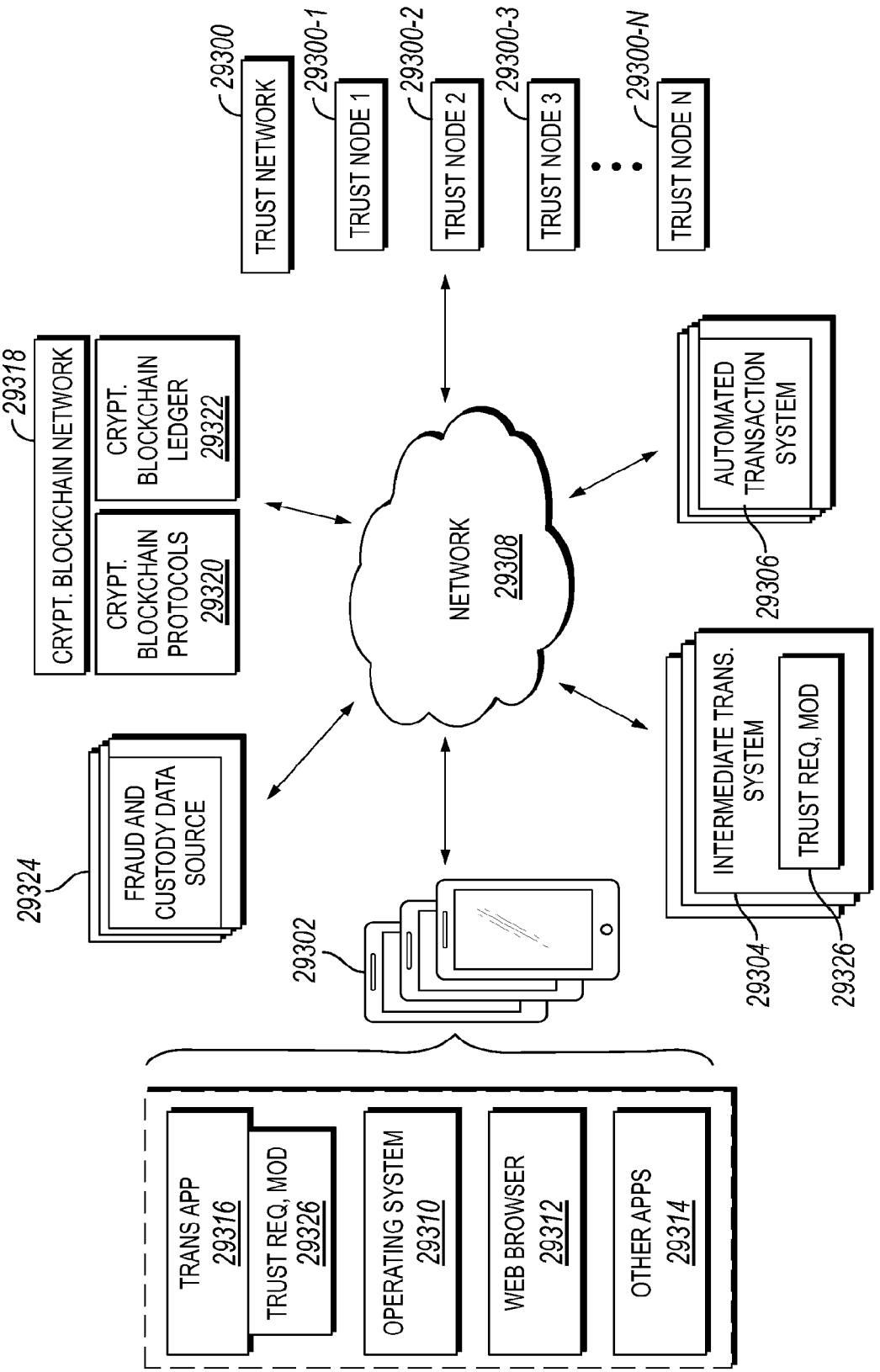

29300
TRUST NETWORK
29300-1
TRUST NODE 1
29300-2
TRUST NODE 2
29300-3
TRUST NODE 3
29300-N
TRUST NODE N
29318
CRYPT. BLOCKCHAIN NETWORK
CRYPT. BLOCKCHAIN LEDGER 29322
CRYPT. BLOCKCHAIN PROTOCOLS 29320
NETWORK 29308
AUTOMATED TRANSACTION SYSTEM
29306
29324
FRAUD AND CUSTODY DATA SOURCE
29302
INTERMEDIATE TRANS. SYSTEM
TRUST REQ, MOD
29304
29326
TRANS APP 29316
TRUST REQ, MOD 29326
OPERATING SYSTEM 29310
WEB BROWSER 29312
OTHER APPS 29314

FIG. 293

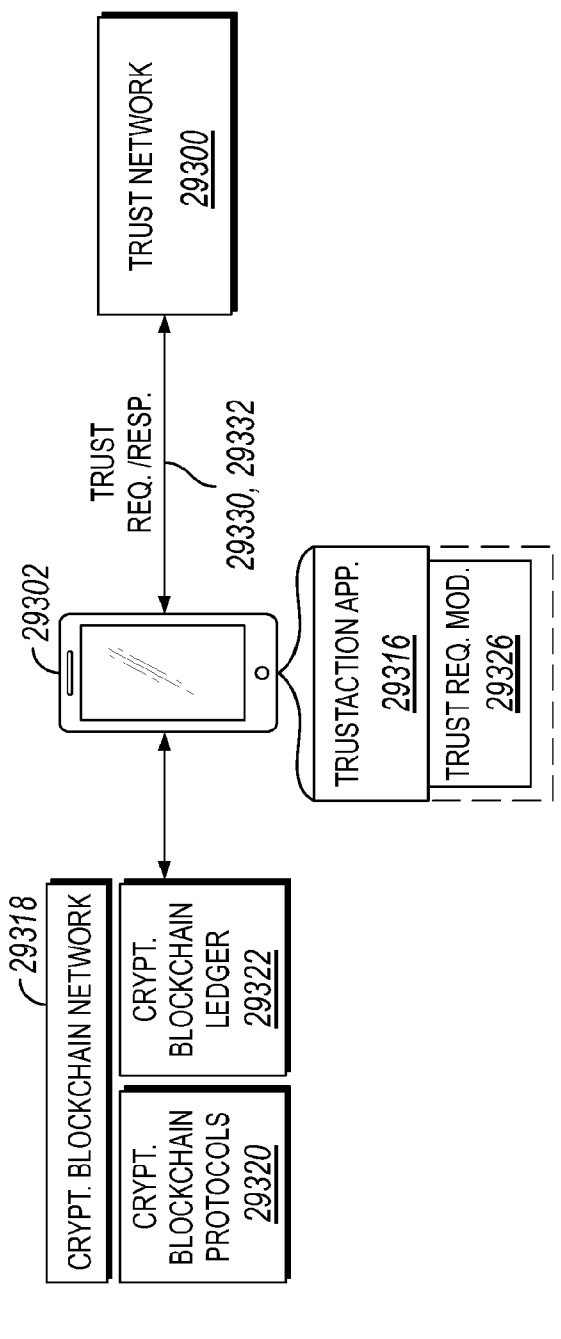


FIG. 294

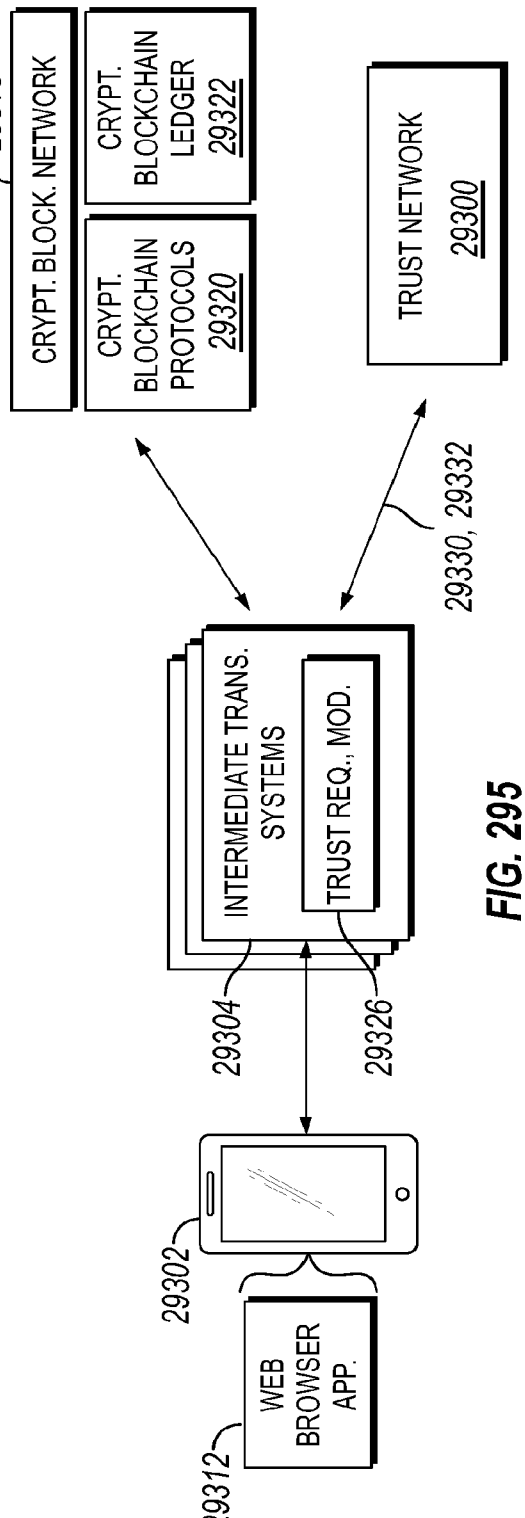


FIG. 295

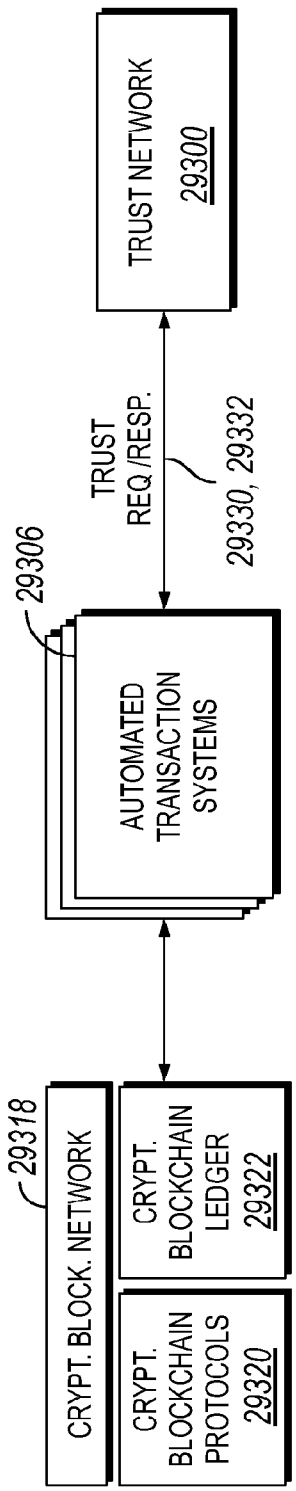


FIG. 296

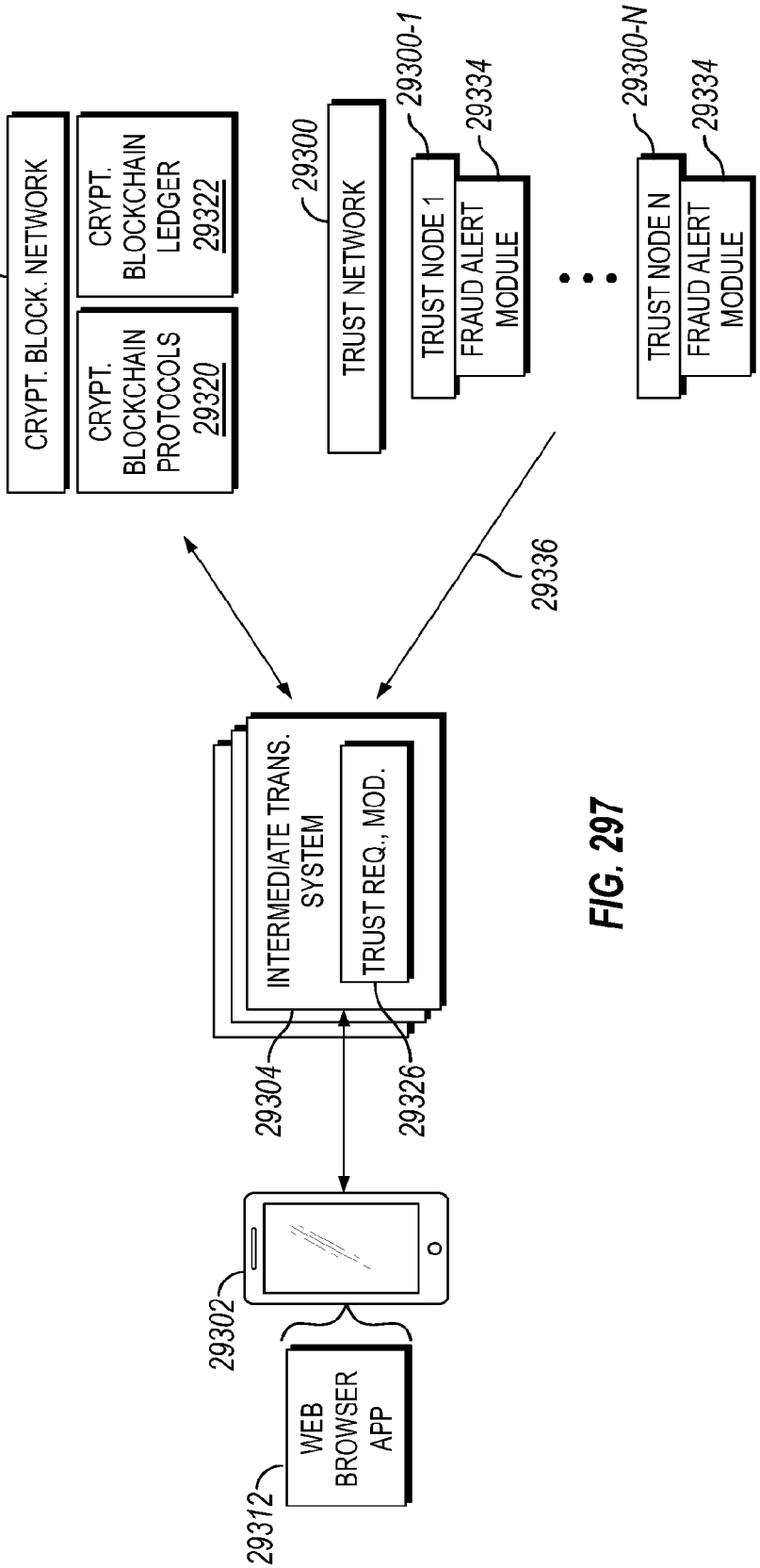


FIG. 297

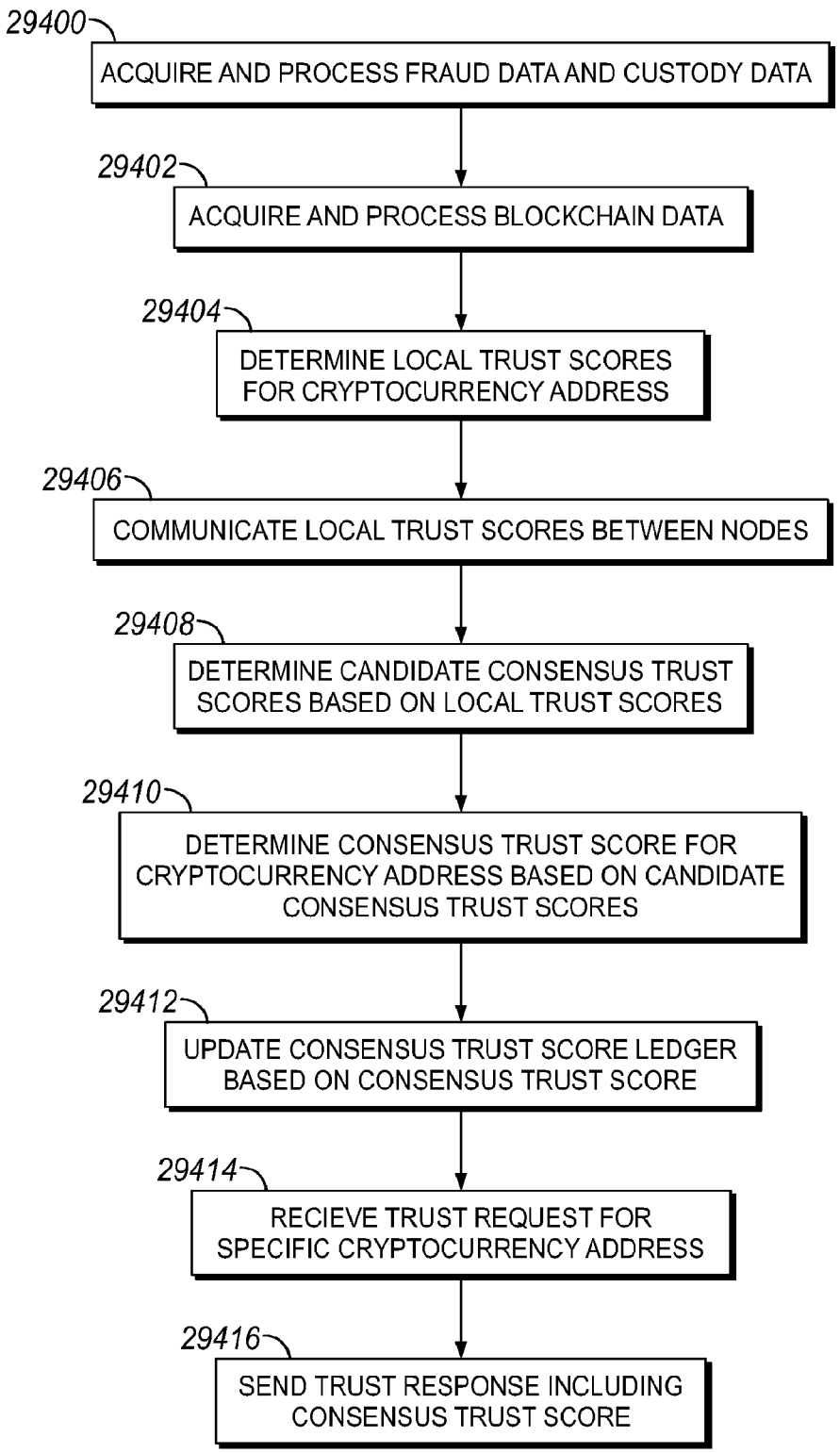

29400
ACQUIRE AND PROCESS FRAUD DATA AND CUSTODY DATA
29402
ACQUIRE AND PROCESS BLOCKCHAIN DATA
29404
DETERMINE LOCAL TRUST SCORES FOR CRYPTOCURRENCY ADDRESS
29406
COMMUNICATE LOCAL TRUST SCORES BETWEEN NODES
29408
DETERMINE CANDIDATE CONSENSUS TRUST SCORES BASED ON LOCAL TRUST SCORES
29410
DETERMINE CONSENSUS TRUST SCORE FOR CRYPTOCURRENCY ADDRESS BASED ON CANDIDATE CONSENSUS TRUST SCORES
29412
UPDATE CONSENSUS TRUST SCORE LEDGER BASED ON CONSENSUS TRUST SCORE
29414
RECIEVE TRUST REQUEST FOR SPECIFIC CRYPTOCURRENCY ADDRESS
29416
SEND TRUST RESPONSE INCLUDING CONSENSUS TRUST SCORE

FIG. 298

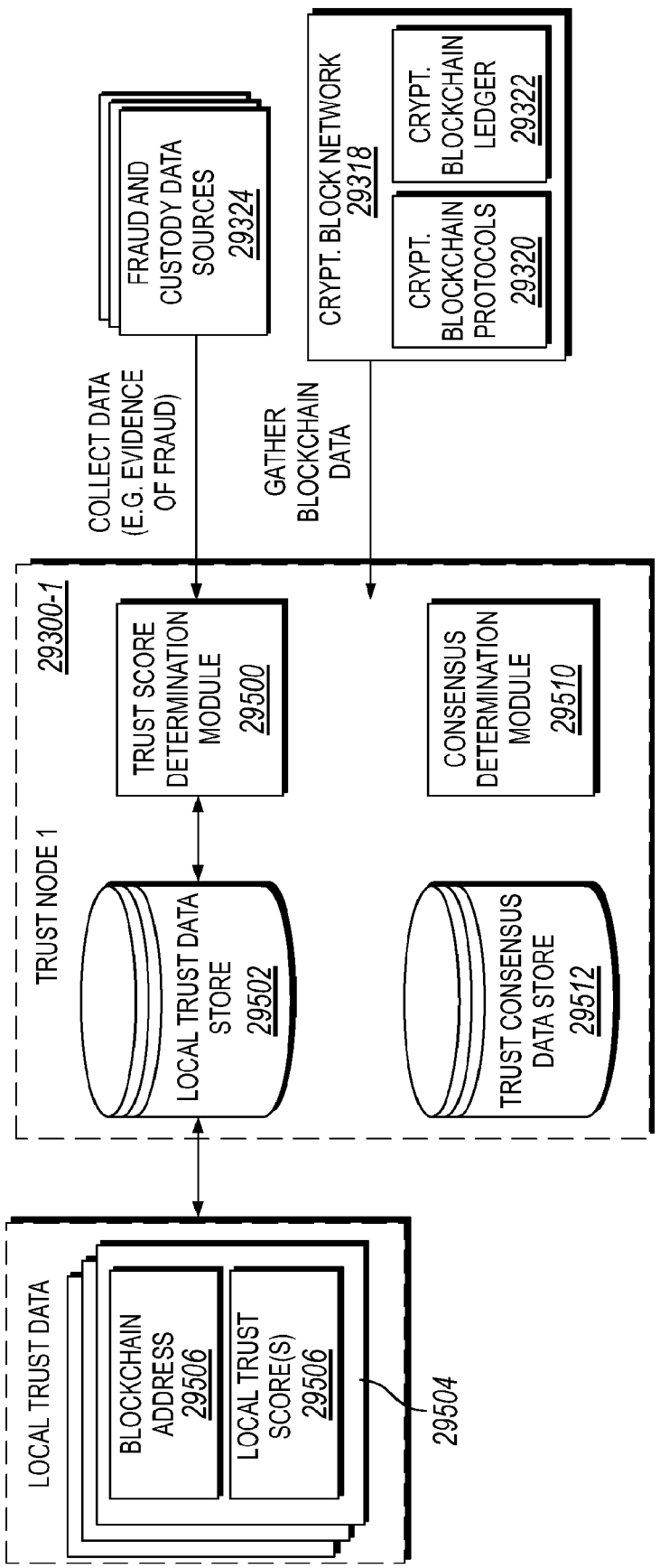

FRAUD AND CUSTODY DATA SOURCES 29324
CRYPT. BLOCK NETWORK 29318
CRYPT. BLOCKCHAIN LEDGER 29322
CRYPT. BLOCKCHAIN PROTOCOLS 29320
COLLECT DATA (E.G. EVIDENCE OF FRAUD)
GATHER BLOCKCHAIN DATA
29300-1
TRUST NODE 1
TRUST SCORE DETERMINATION MODULE 29500
CONSENSUS DETERMINATION MODULE 29510
LOCAL TRUST DATA STORE 29502
TRUST CONSENSUS DATA STORE 29512
LOCAL TRUST DATA
BLOCKCHAIN ADDRESS 29506
LOCAL TRUST SCORE(S) 29506
29504

FIG. 299

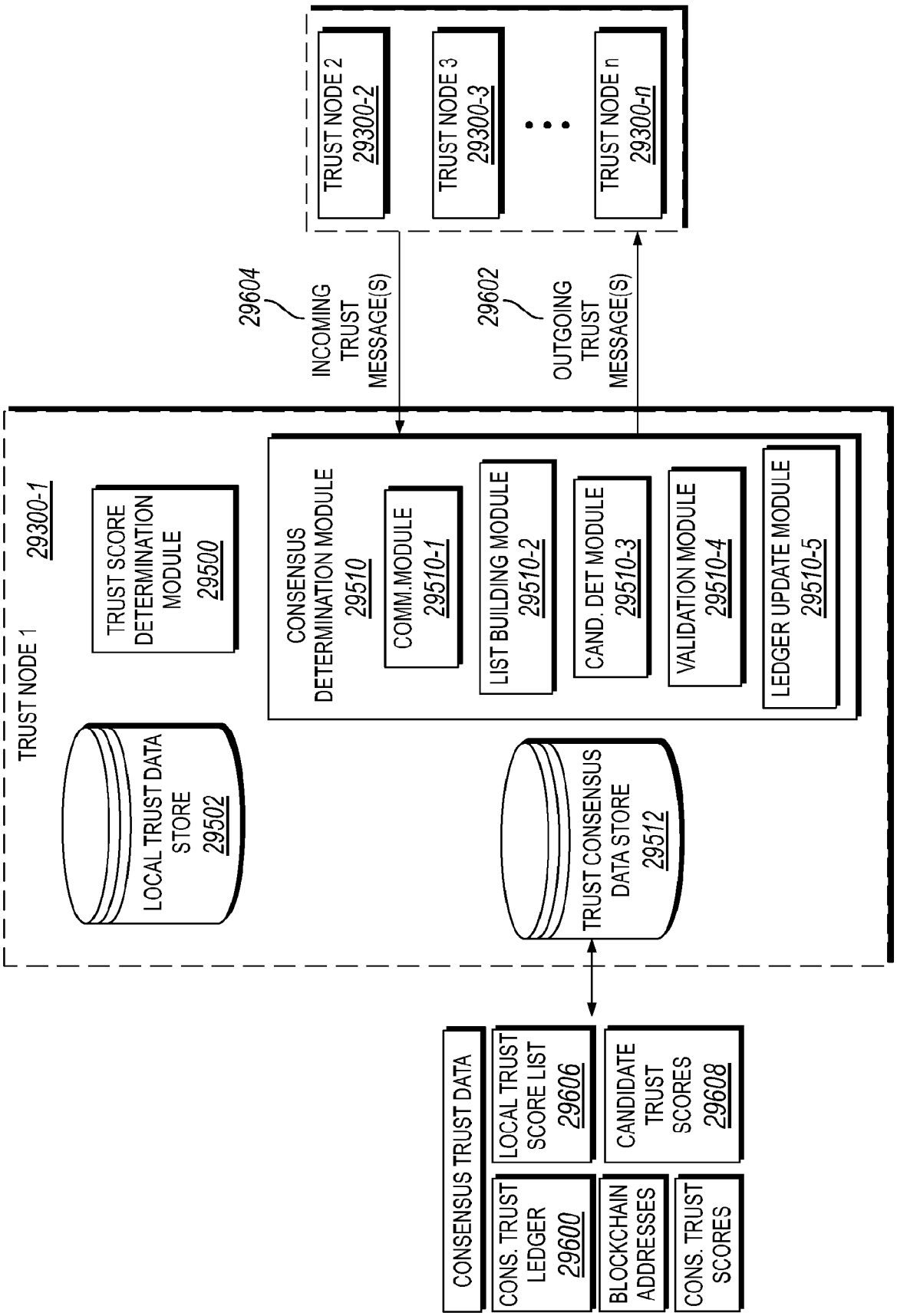

TRUST NODE 2
29300-2
TRUST NODE 3
29300-3
TRUST NODE n
29300-n
29604
INCOMING TRUST MESSAGE(S)
29602
OUTGOING TRUST MESSAGE(S)
TRUST NODE 1
29300-1
TRUST SCORE DETERMINATION MODULE
29500
CONSENSUS DETERMINATION MODULE
29510
COMM.MODULE
29510-1
LIST BUILDING MODULE
29510-2
CAND. DET MODULE
29510-3
VALIDATION MODULE
29510-4
LEDGER UPDATE MODULE
29510-5
LOCAL TRUST DATA STORE
29502
TRUST CONSENSUS DATA STORE
29512
CONSENSUS TRUST DATA
CONS. TRUST LEDGER
29600
LOCAL TRUST SCORE LIST
29606
CANDIDATE TRUST SCORES
29608
BLOCKCHAIN ADDRESSES
CONS. TRUST SCORES

FIG. 300

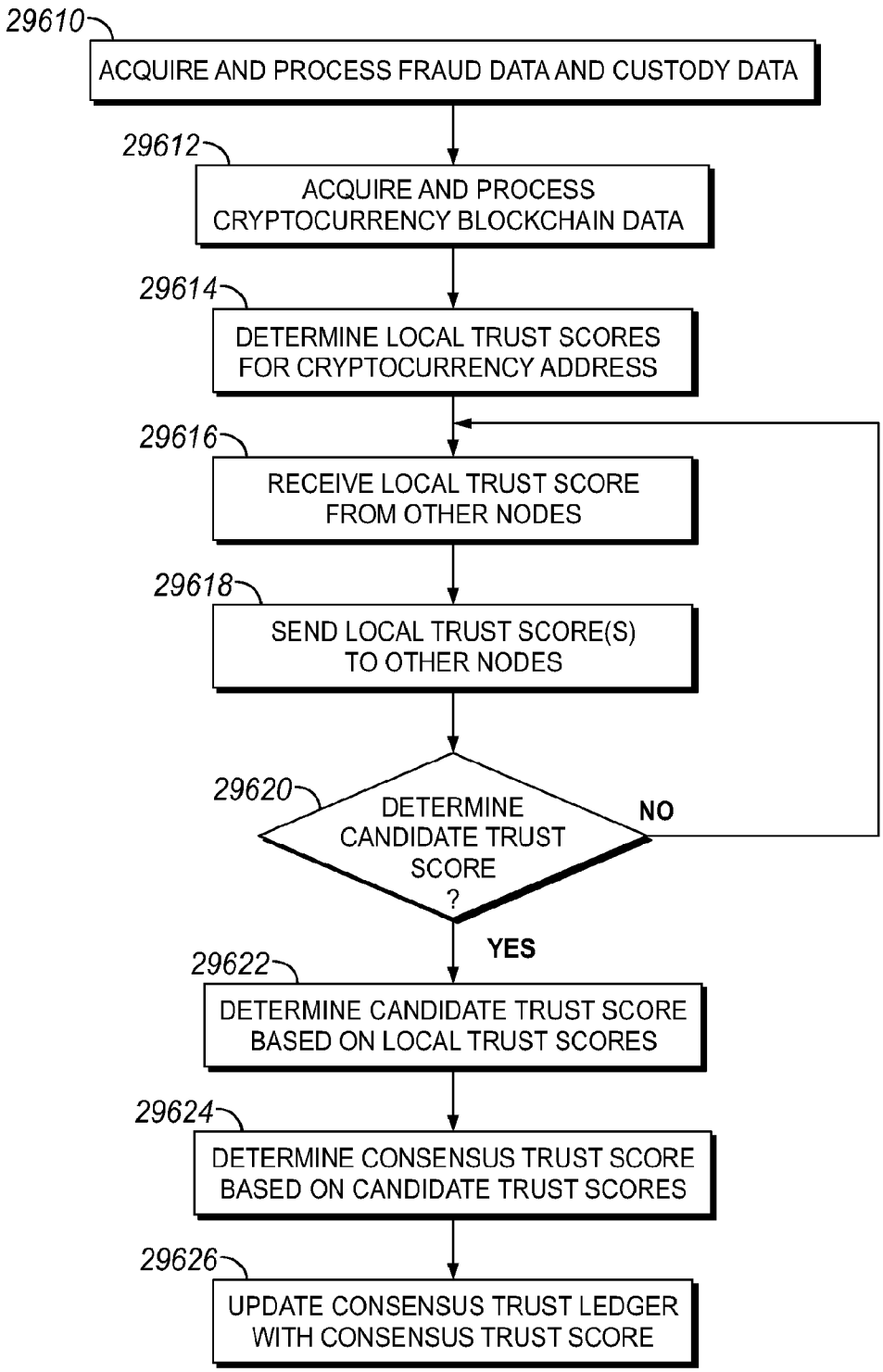

29610
ACQUIRE AND PROCESS FRAUD DATA AND CUSTODY DATA
29612
ACQUIRE AND PROCESS CRYPTOCURRENCY BLOCKCHAIN DATA
29614
DETERMINE LOCAL TRUST SCORES FOR CRYPTOCURRENCY ADDRESS
29616
RECEIVE LOCAL TRUST SCORE FROM OTHER NODES
29618
SEND LOCAL TRUST SCORE(S) TO OTHER NODES
29620
DETERMINE CANDIDATE TRUST SCORE ?
NO
YES
29622
DETERMINE CANDIDATE TRUST SCORE BASED ON LOCAL TRUST SCORES
29624
DETERMINE CONSENSUS TRUST SCORE BASED ON CANDIDATE TRUST SCORES
29626
UPDATE CONSENSUS TRUST LEDGER WITH CONSENSUS TRUST SCORE

FIG. 301

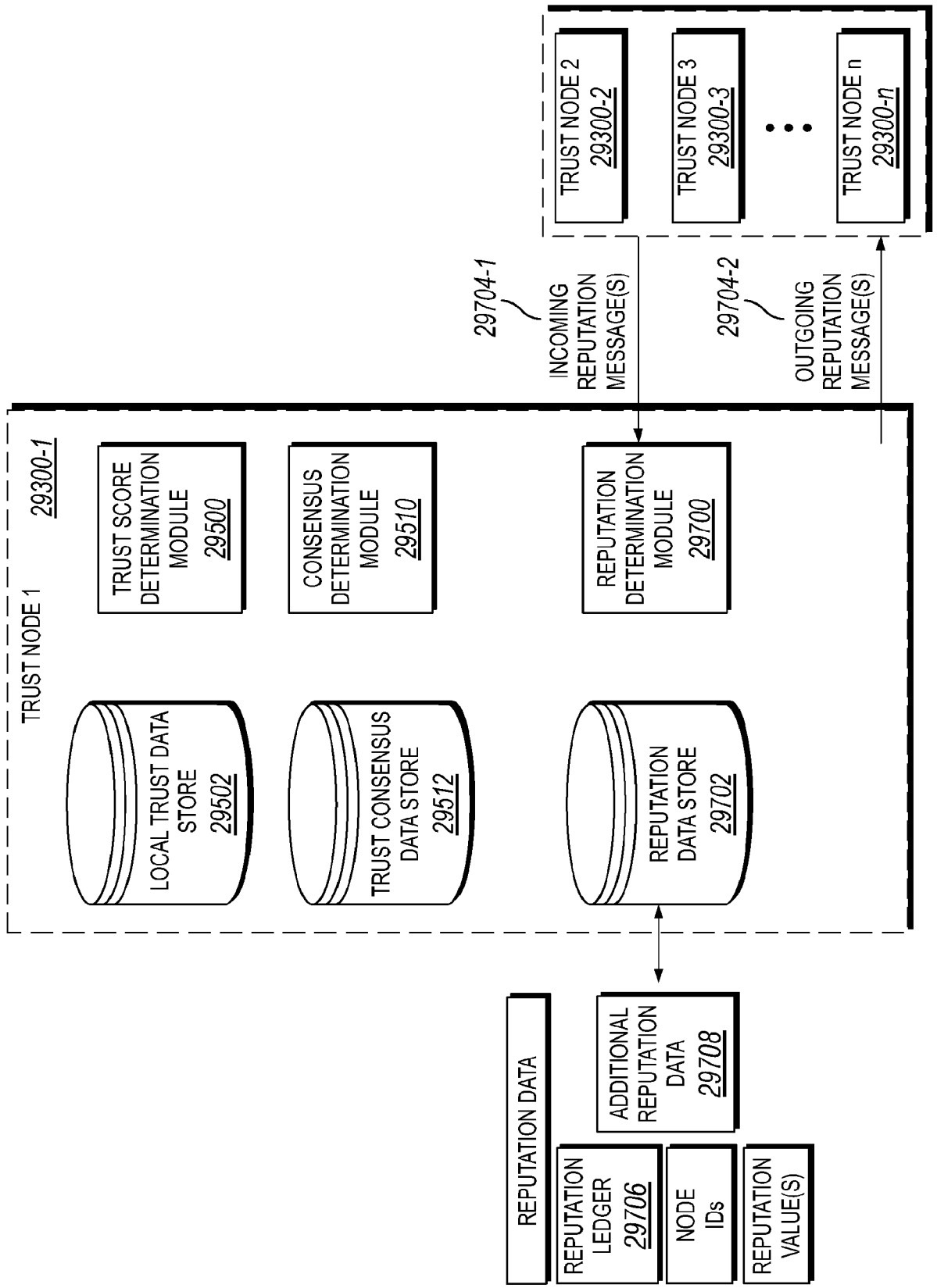

TRUST NODE 2
29300-2
TRUST NODE 3
29300-3
TRUST NODE n
29300-n
29704-1
INCOMING REPUTATION MESSAGE(S)
29704-2
OUTGOING REPUTATION MESSAGE(S)
TRUST NODE 1
29300-1
TRUST SCORE DETERMINATION MODULE
29500
CONSENSUS DETERMINATION MODULE
29510
REPUTATION DETERMINATION MODULE
29700
LOCAL TRUST DATA STORE
29502
TRUST CONSENSUS DATA STORE
29512
REPUTATION DATA STORE
29702
REPUTATION DATA
REPUTATION LEDGER
29706
NODE IDs
REPUTATION VALUE(S)
ADDITIONAL REPUTATION DATA
29708

FIG. 302

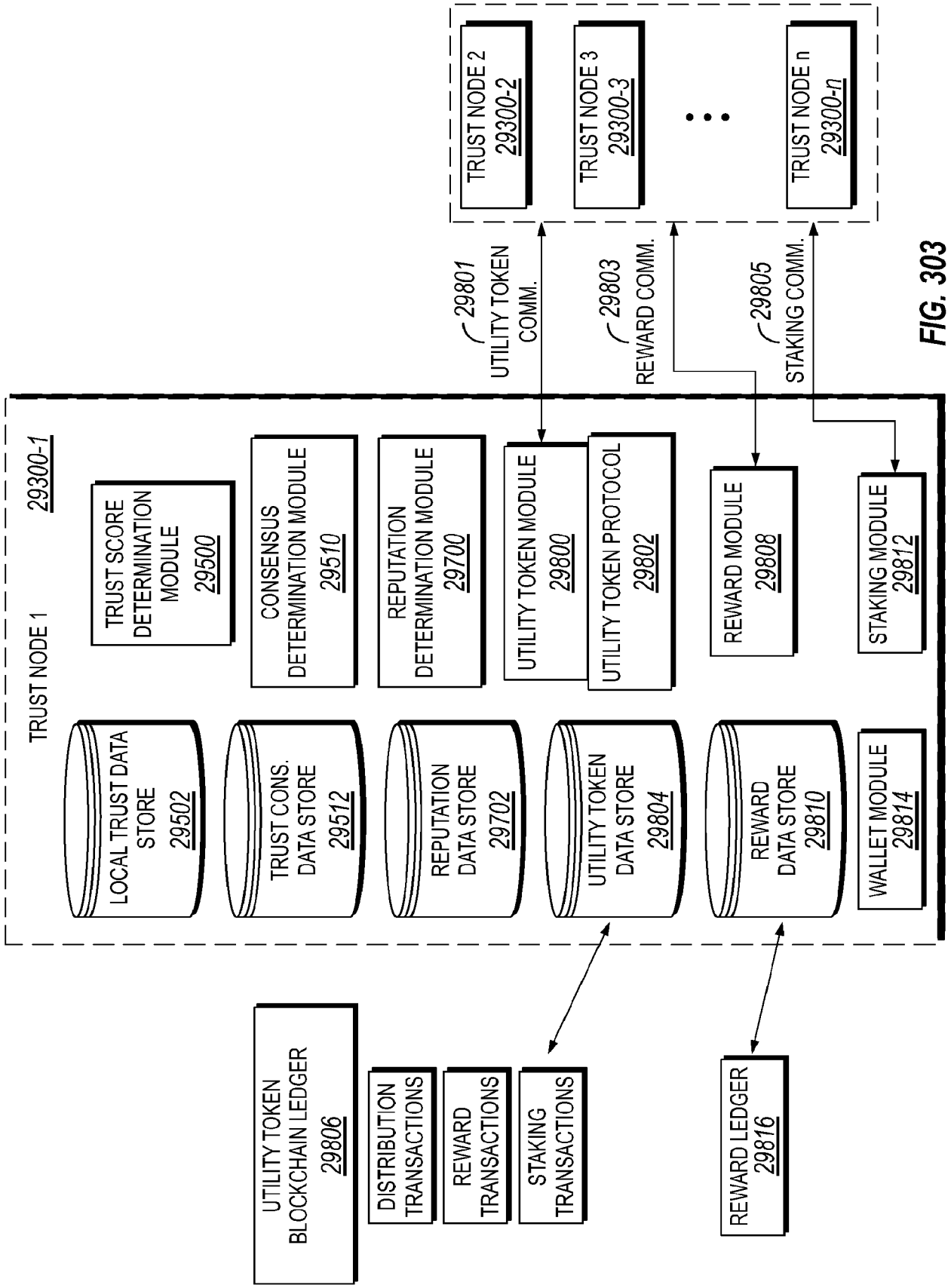

TRUST NODE 2
29300-2
TRUST NODE 3
29300-3
TRUST NODE n
29300-n
29801
UTILITY TOKEN COMM.
29803
REWARD COMM.
29805
STAKING COMM.
TRUST NODE 1
29300-1
TRUST SCORE DETERMINATION MODULE
29500
CONSENSUS DETERMINATION MODULE
29510
REPUTATION DETERMINATION MODULE
29700
UTILITY TOKEN MODULE
29800
UTILITY TOKEN PROTOCOL
29802
REWARD MODULE
29808
STAKING MODULE
29812
LOCAL TRUST DATA STORE
29502
TRUST CONS. DATA STORE
29512
REPUTATION DATA STORE
29702
UTILITY TOKEN DATA STORE
29804
REWARD DATA STORE
29810
WALLET MODULE
29814
UTILITY TOKEN BLOCKCHAIN LEDGER
29806
DISTRIBUTION TRANSACTIONS
REWARD TRANSACTIONS
STAKING TRANSACTIONS
REWARD LEDGER
29816

FIG. 303

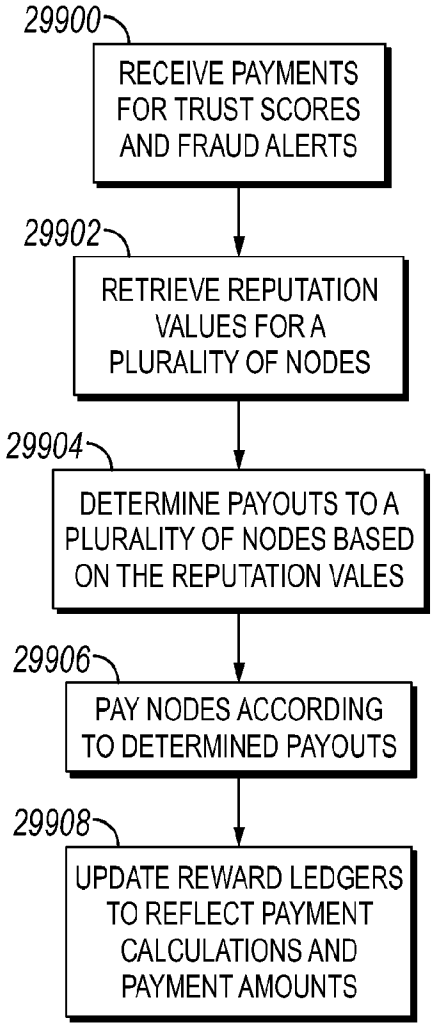


FIG. 304

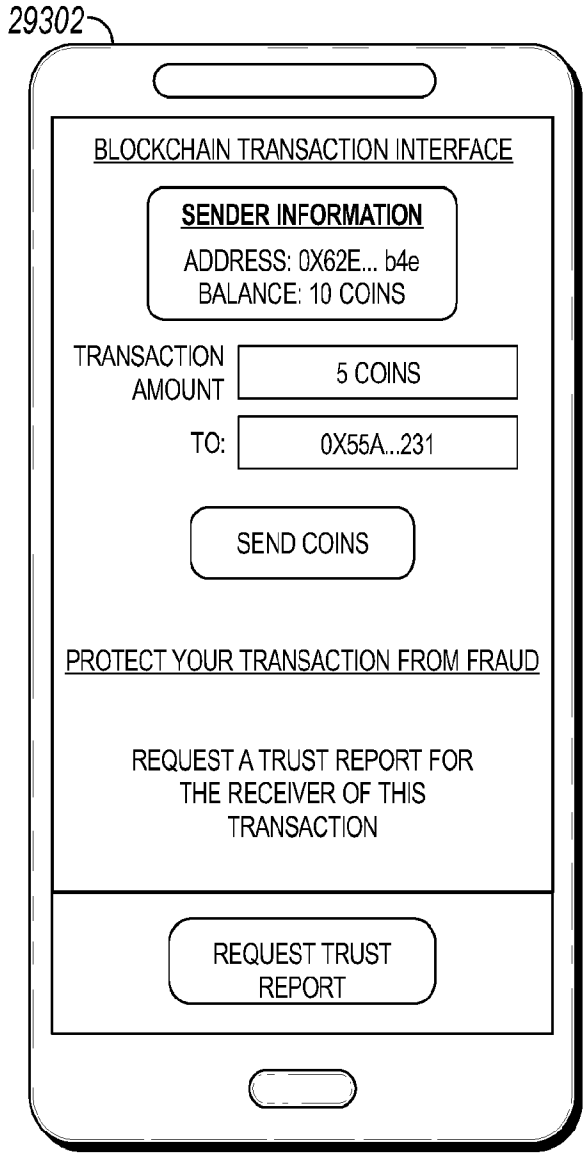


FIG. 305

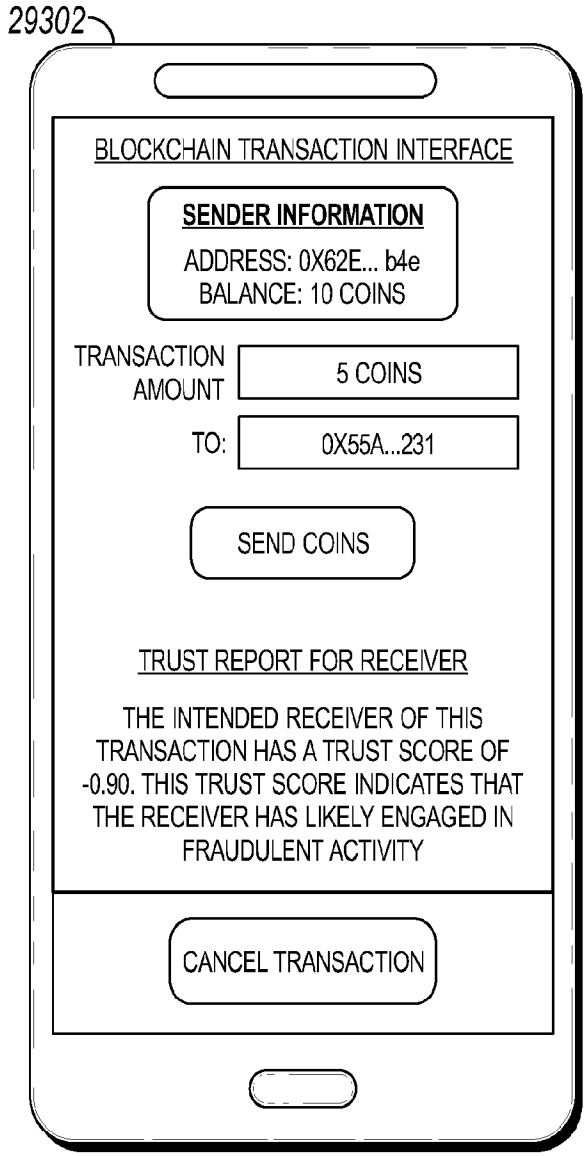


FIG. 306

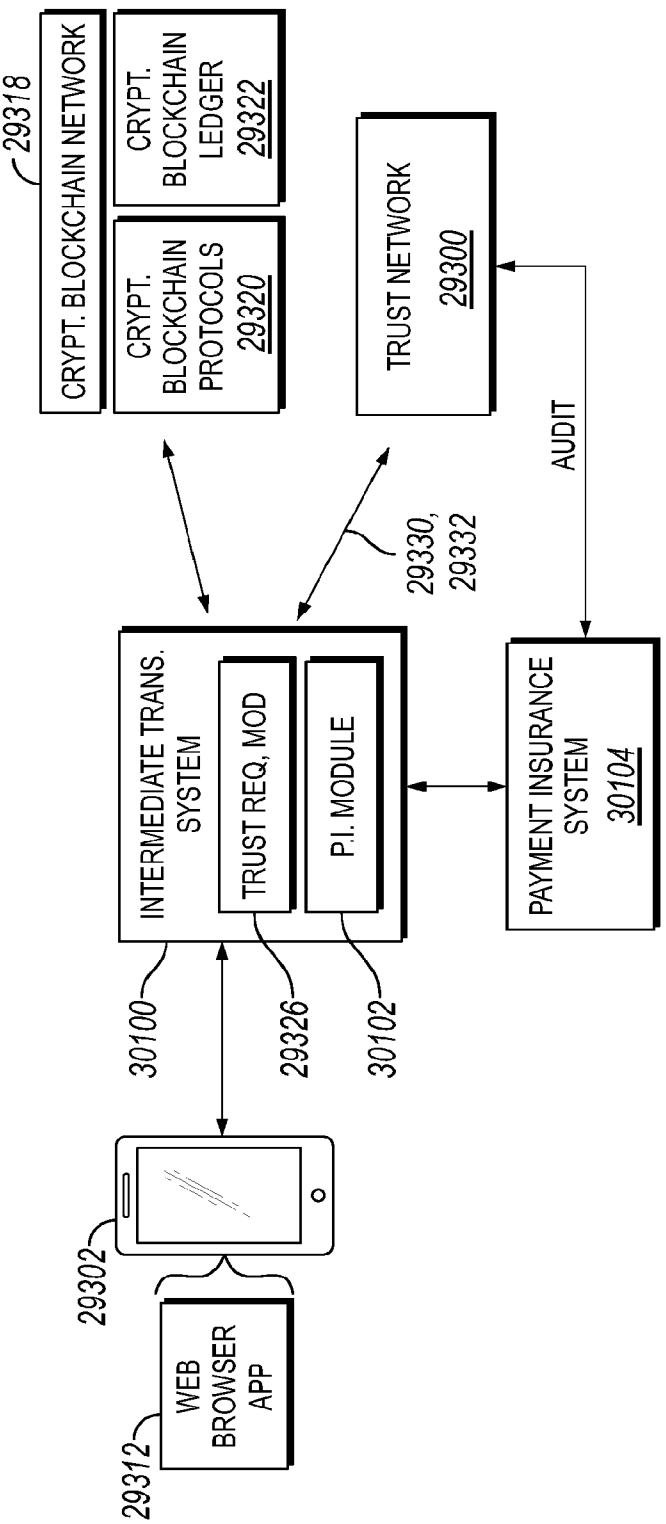


FIG. 307

STACKED UTOKEN	0	100k	1M	10M	100M
COST PER SCORE	x	.95x	.9x	.85x	.8x

FIG. 308

NODE SERVICES	LEVEL 1 NODE	LEVEL 2 NODE	LEVEL 3 NODE
DELIVER TRUST SCORES	YES	NO	NO
ADD EVIDENCE OF FRAUD	YES	NO	NO
DELIVER FRAUD ALERTS	YES	YES	NO
MANAGE TRUST SCORE UPDATES AND CONSENSUS	YES	YES	NO
CALCULATE TRUST SCORES	YES	YES	NO
ADD EVIDENCE OF CUSTODY	YES	YES	NO
VALIDATE AND STORE EVIDENCE OF FRAUD	YES	YES	YES
VALIDATE AND STORE EVIDENCE OF CUSTODY	YES	YES	YES

FIG. 309

NODES	100	200	300	400	500	600	700	800	900	1000
CLIQUES	100	200	300	400	500	600	700	800	900	1000
OVERLAP	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5
P(ADDRESS A)	0.05%	.038%	.033%	.031%	.030%	.029%	.029%	.028%	.028%	.028%

FIG. 310

UTOKEN STAKING AMOUNTS FOR LEVEL 1 NODES	MINIMUM NODES[3]	MAXIMUM NODES[4]	MINIMUM NODES[3]	MAXIMUM NODES[4]
	35% OF INITIAL UTOKEN		50% OF INITIAL UTOKEN	
3,5000,000	100.00	100.00	142.86	314.29
700,000	500.00	2,100.00	714.29	3,171.43
350,000	1,000.00	4,600.00	1,428.57	6,742.86
175,000	2,000.00	9,600.00	2,857.14	13,885.71
116,667	3,000.00	14,600.00	4,285.71	21,028.57
87,500	4,000.00	19,600.00	5,714.29	28,171.43
70,000	5,000.00	24,600.00	7,142.86	35,314.29

3 - MINIMUM NODES IS WHEN ALL NODES ARE LEVEL 1

4 - MAXIMUM NODES IS WHEN ALL 100 NODES ARE LEVEL1 AND THE REST ARE LEVEL 3

FIG. 311

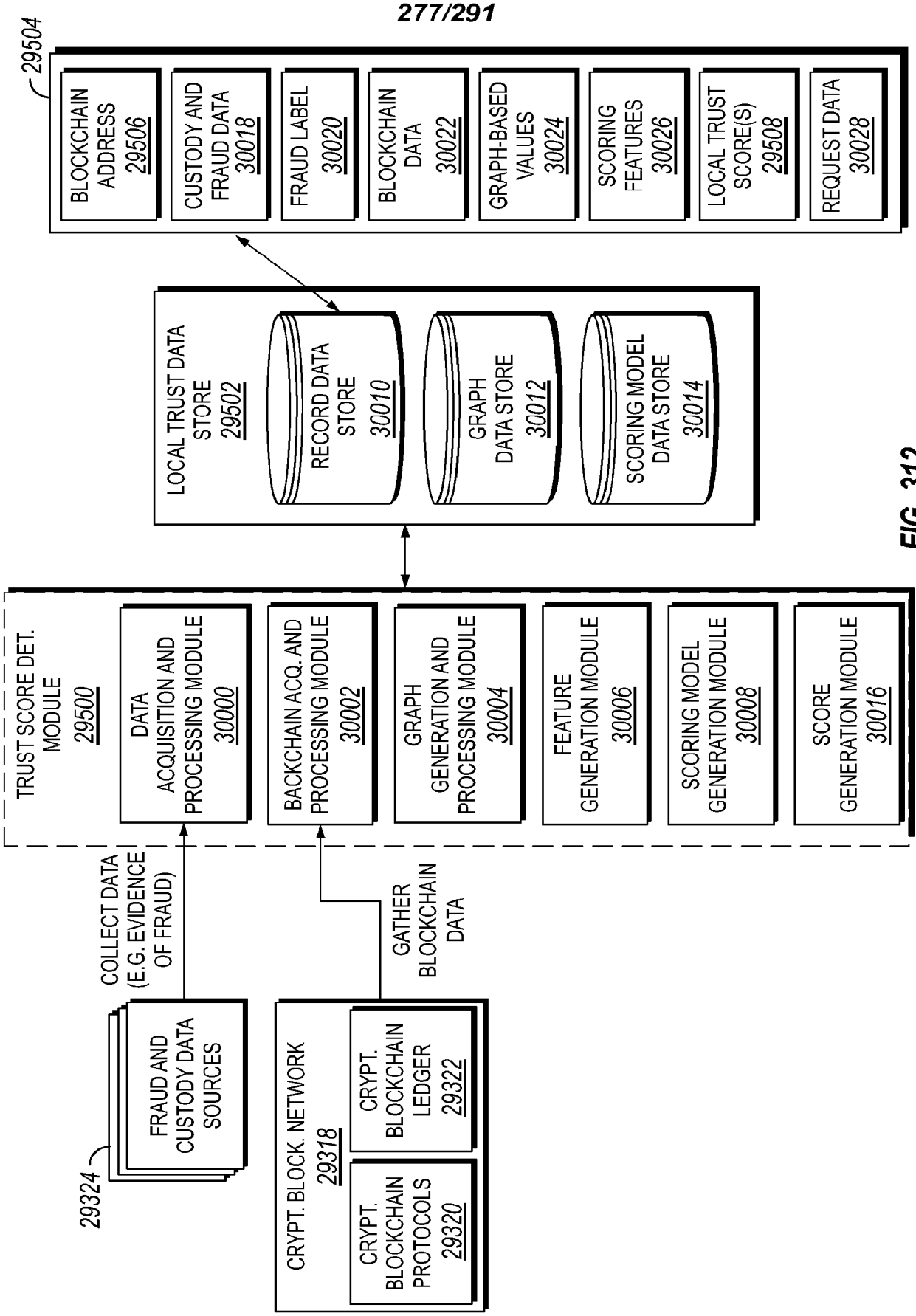

29504
BLOCKCHAIN ADDRESS 29506
CUSTODY AND FRAUD DATA 30018
FRAUD LABEL 30020
BLOCKCHAIN DATA 30022
GRAPH-BASED VALUES 30024
SCORING FEATURES 30026
LOCAL TRUST SCORE(S) 29508
REQUEST DATA 30028
LOCAL TRUST DATA STORE 29502
RECORD DATA STORE 30010
GRAPH DATA STORE 30012
SCORING MODEL DATA STORE 30014
TRUST SCORE DET. MODULE 29500
DATA ACQUISITION AND PROCESSING MODULE 30000
BACKCHAIN ACQ. AND PROCESSING MODULE 30002
GRAPH GENERATION AND PROCESSING MODULE 30004
FEATURE GENERATION MODULE 30006
SCORING MODEL GENERATION MODULE 30008
SCORE GENERATION MODULE 30016
COLLECT DATA (E.G. EVIDENCE OF FRAUD)
GATHER BLOCKCHAIN DATA
29324
FRAUD AND CUSTODY DATA SOURCES
CRYPT. BLOCK. NETWORK 29318
CRYPT. BLOCKCHAIN LEDGER 29322
CRYPT. BLOCKCHAIN PROTOCOLS 29320

FIG. 312

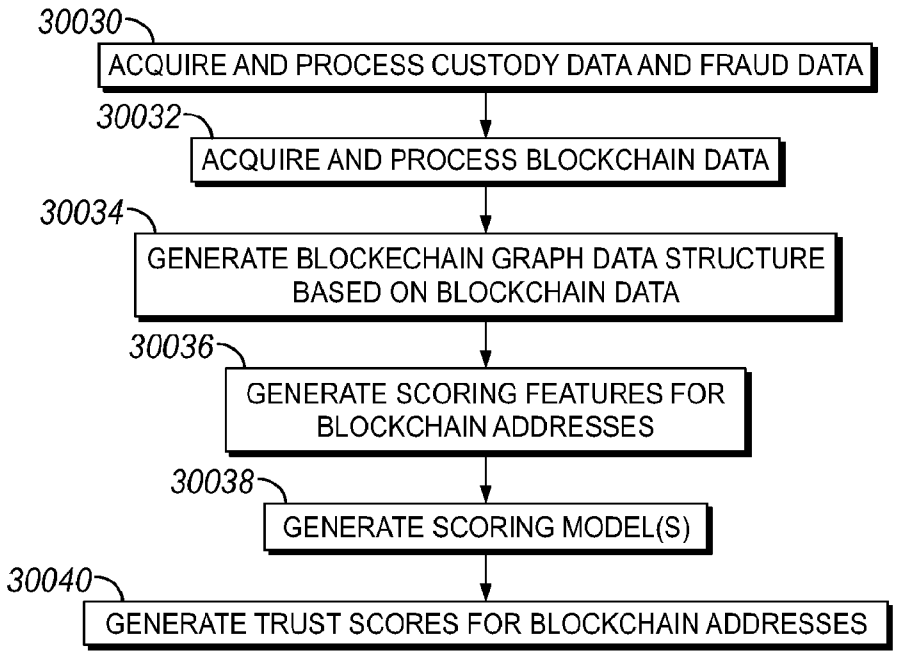


FIG. 313

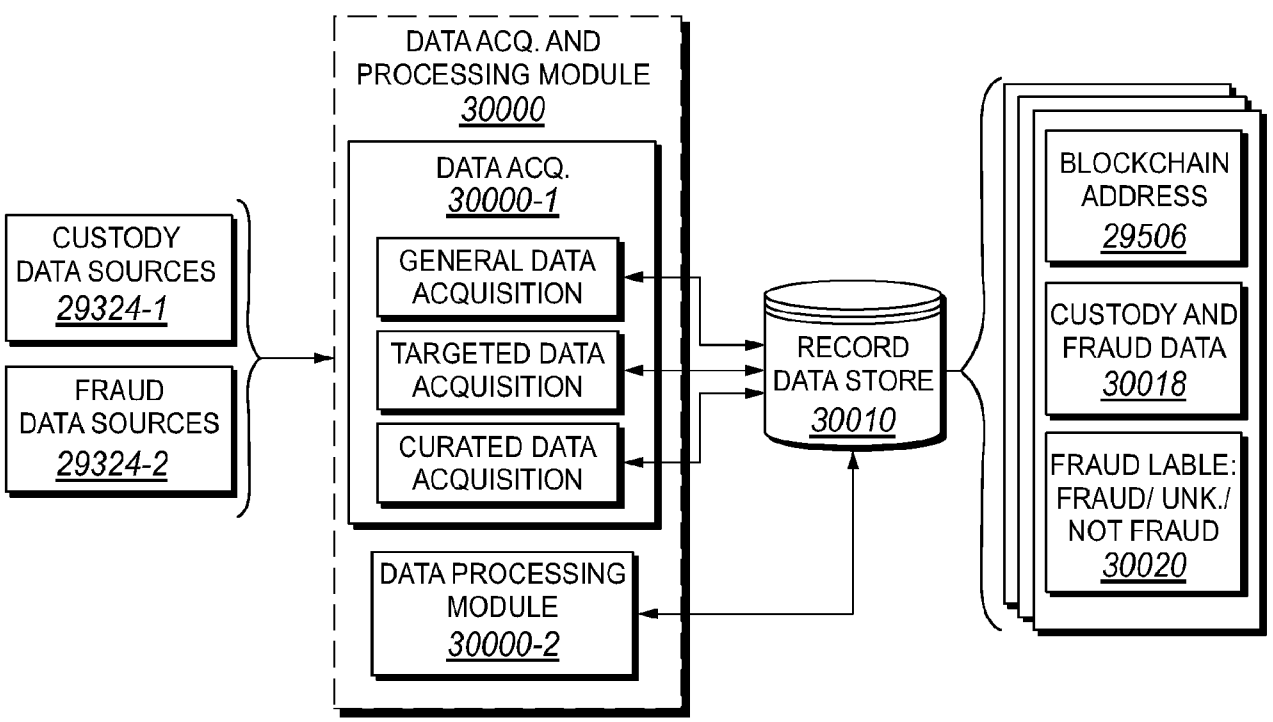


FIG. 314

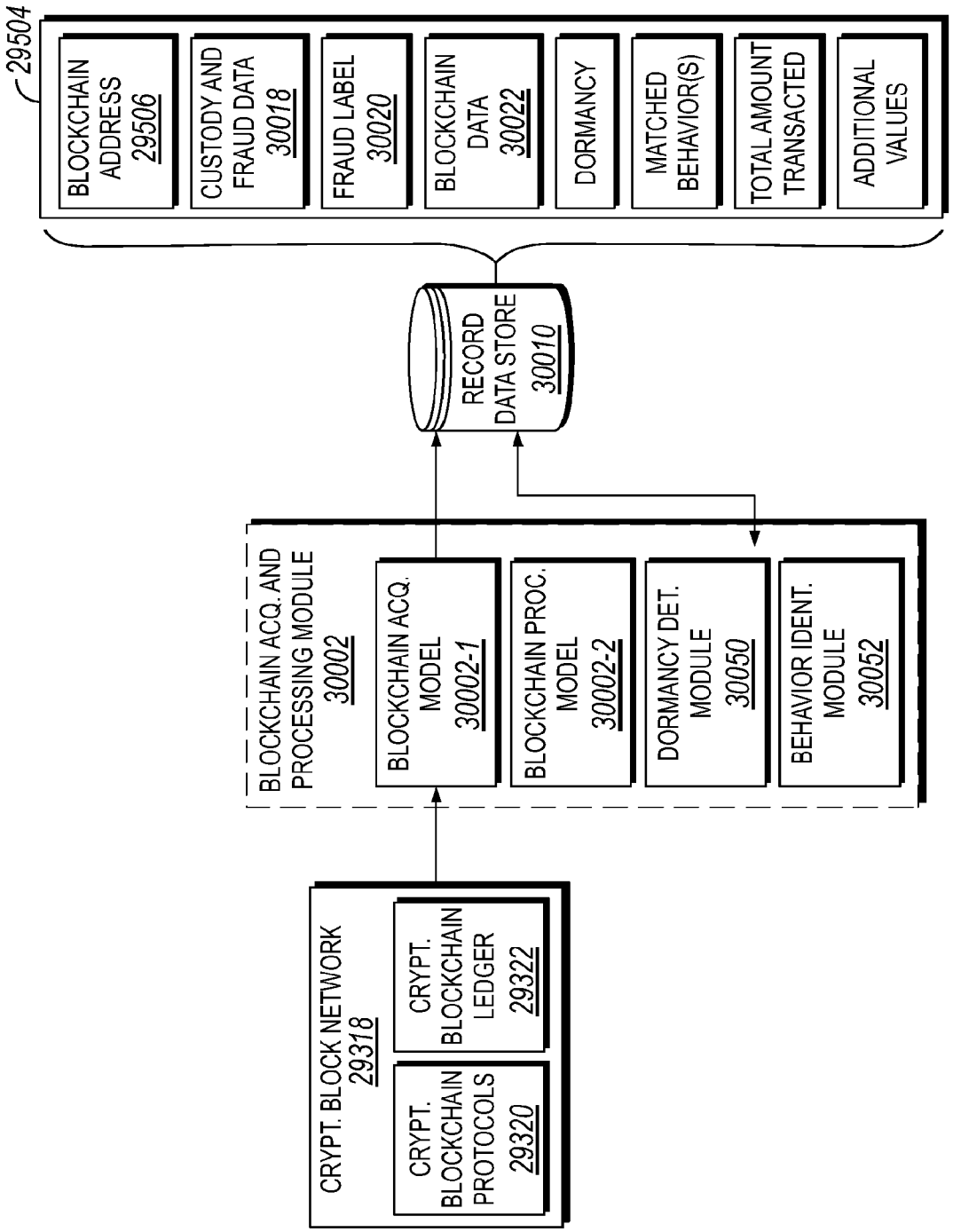

29504
BLOCKCHAIN ADDRESS 29506
CUSTODY AND FRAUD DATA 30018
FRAUD LABEL 30020
BLOCKCHAIN DATA 30022
DORMANCY
MATCHED BEHAVIOR(S)
TOTAL AMOUNT TRANSACTED
ADDITIONAL VALUES
RECORD DATA STORE 30010
BLOCKCHAIN ACQ. AND PROCESSING MODULE 30002
BLOCKCHAIN ACQ. MODEL 30002-1
BLOCKCHAIN PROC. MODEL 30002-2
DORMANCY DET. MODULE 30050
BEHAVIOR IDENT. MODULE 30052
CRYPT. BLOCK NETWORK 29318
CRYPT. BLOCKCHAIN LEDGER 29322
CRYPT. BLOCKCHAIN PROTOCOLS 29320

FIG. 315

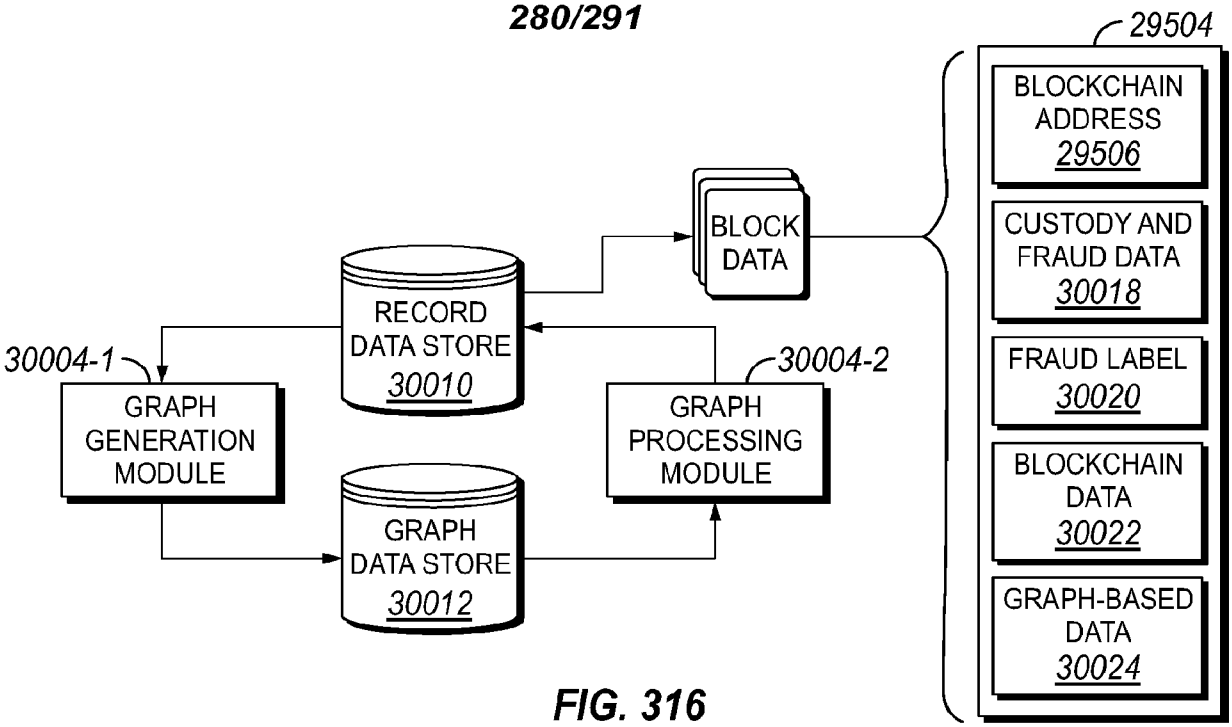


FIG. 316

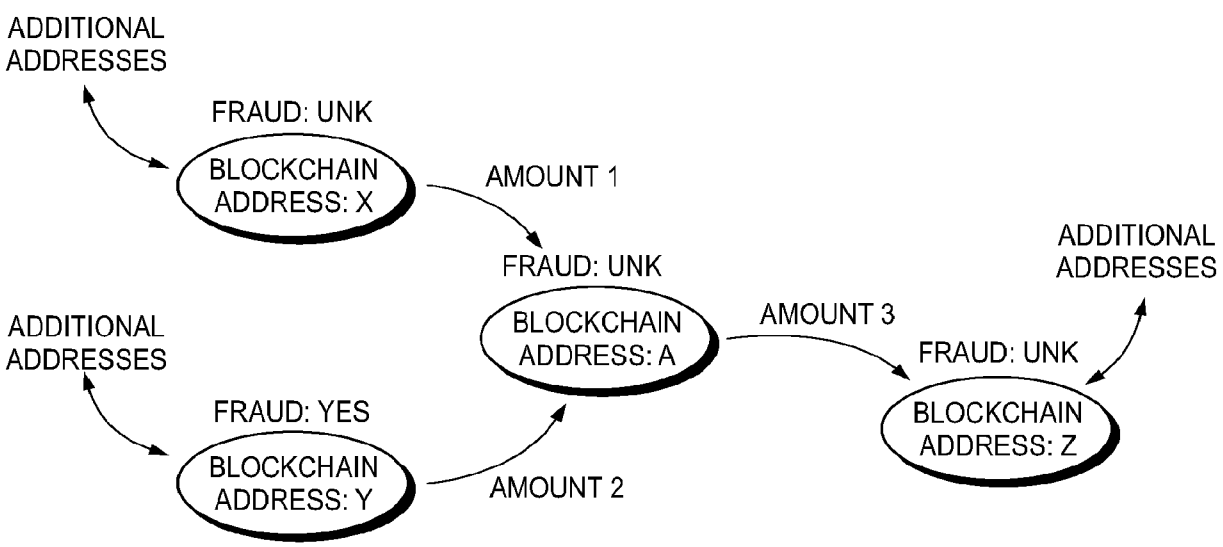


FIG. 317

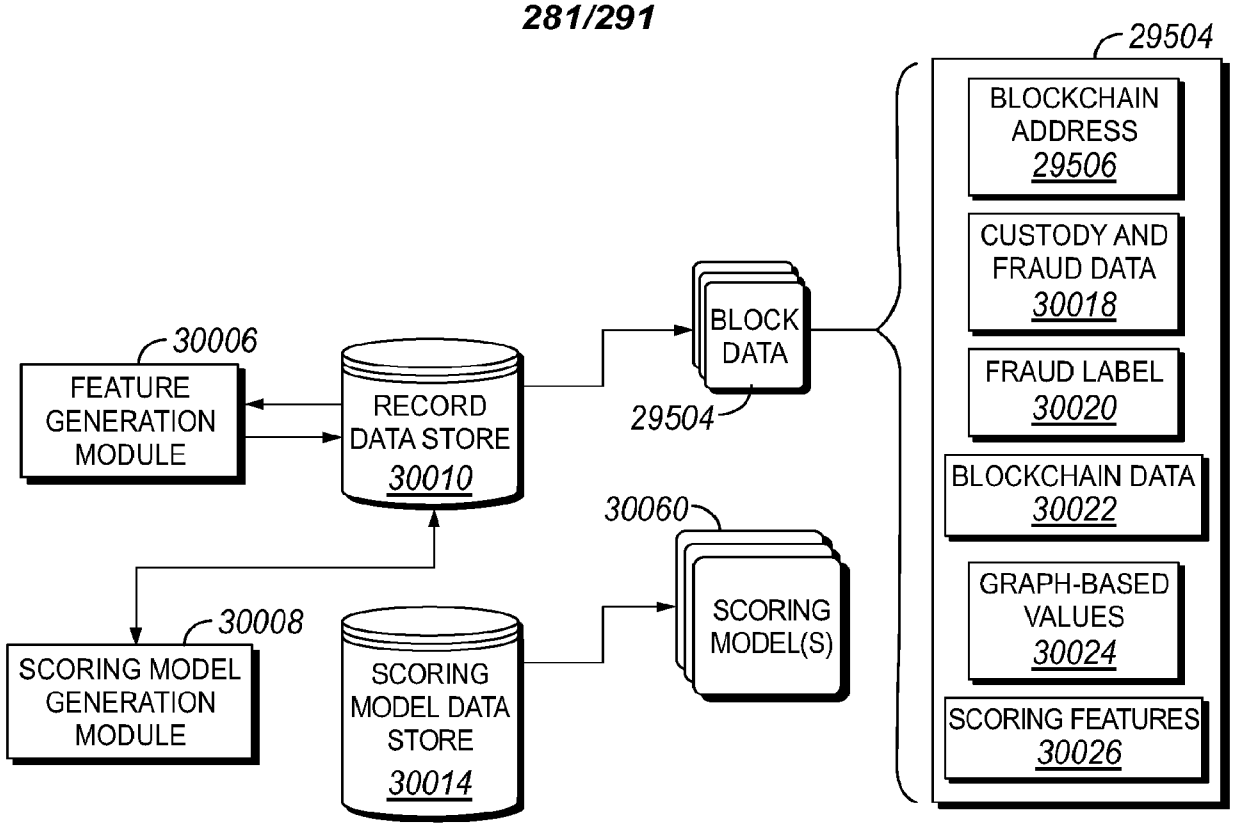


FIG. 318

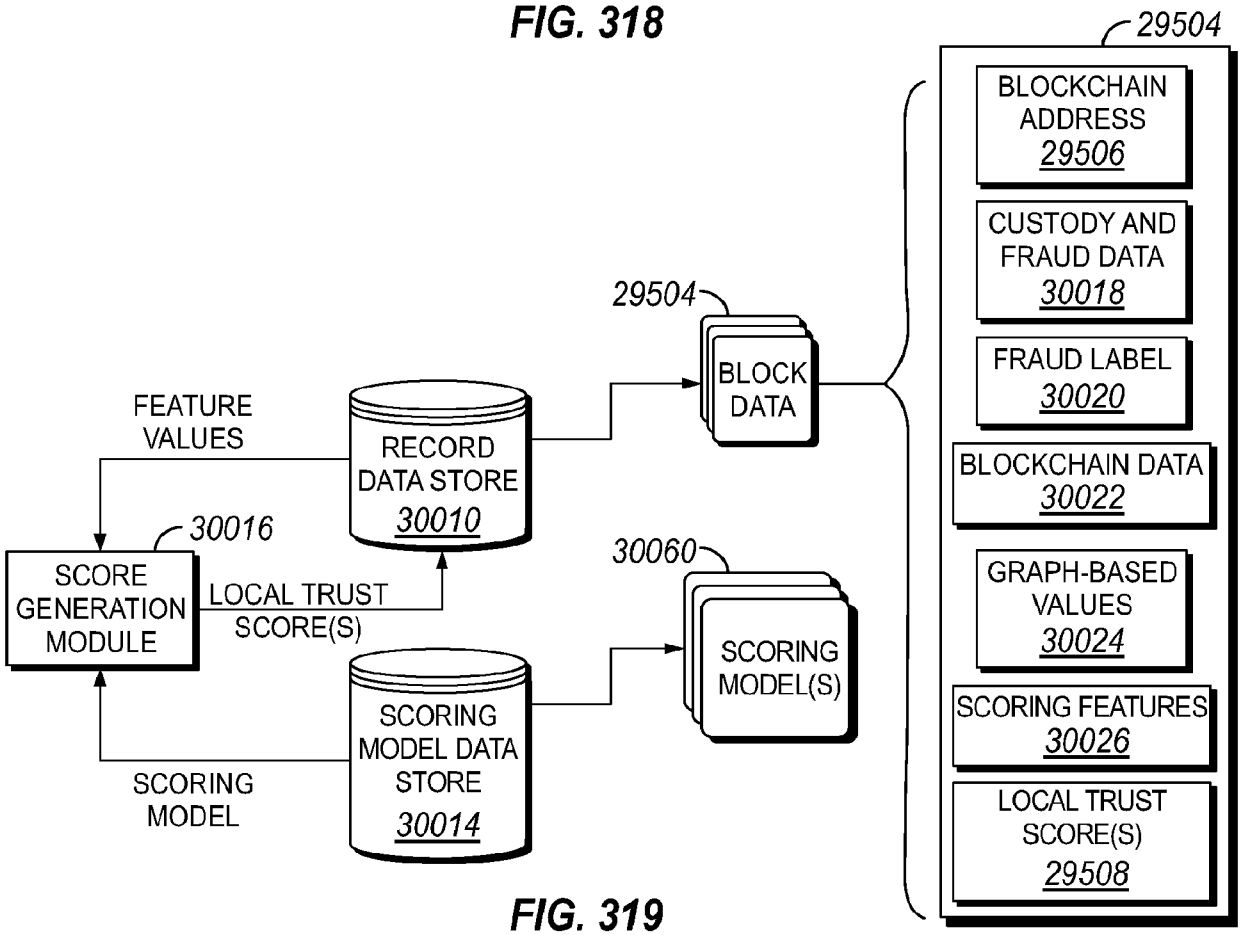


FIG. 319

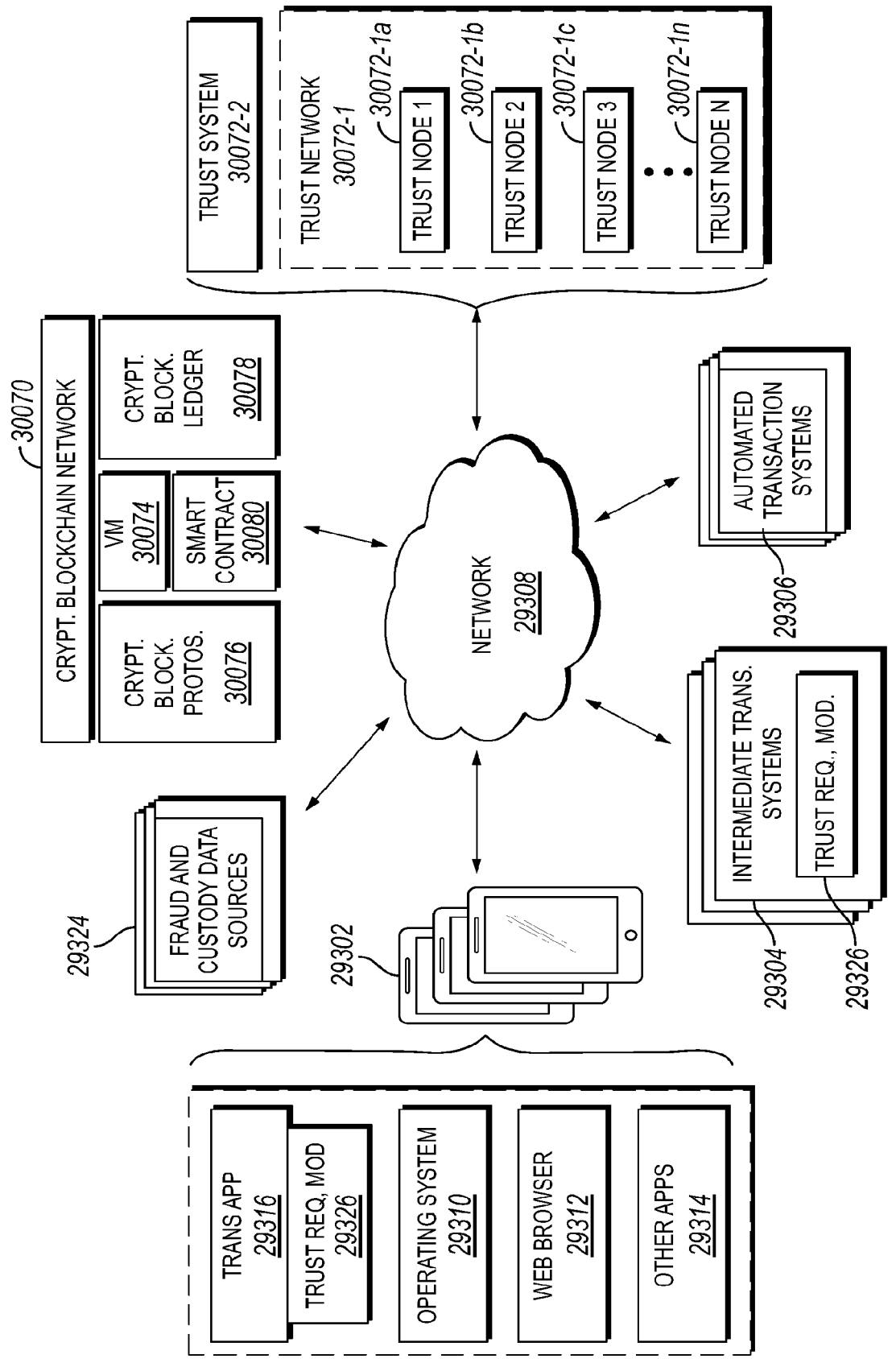

TRUST SYSTEM 30072-2
TRUST NETWORK 30072-1
30072-1a
TRUST NODE 1
30072-1b
TRUST NODE 2
30072-1c
TRUST NODE 3
30072-1n
TRUST NODE N
30070
CRYPT. BLOCKCHAIN NETWORK
CRYPT. BLOCK. LEDGER 30078
VM 30074
SMART CONTRACT 30080
CRYPT. BLOCK. PROTOS. 30076
NETWORK 29308
AUTOMATED TRANSACTION SYSTEMS
29306
INTERMEDIATE TRANS. SYSTEMS
TRUST REQ., MOD.
29304
29326
FRAUD AND CUSTODY DATA SOURCES
29324
29302
TRANS APP 29316
TRUST REQ, MOD 29326
OPERATING SYSTEM 29310
WEB BROWSER 29312
OTHER APPS 29314

FIG. 320

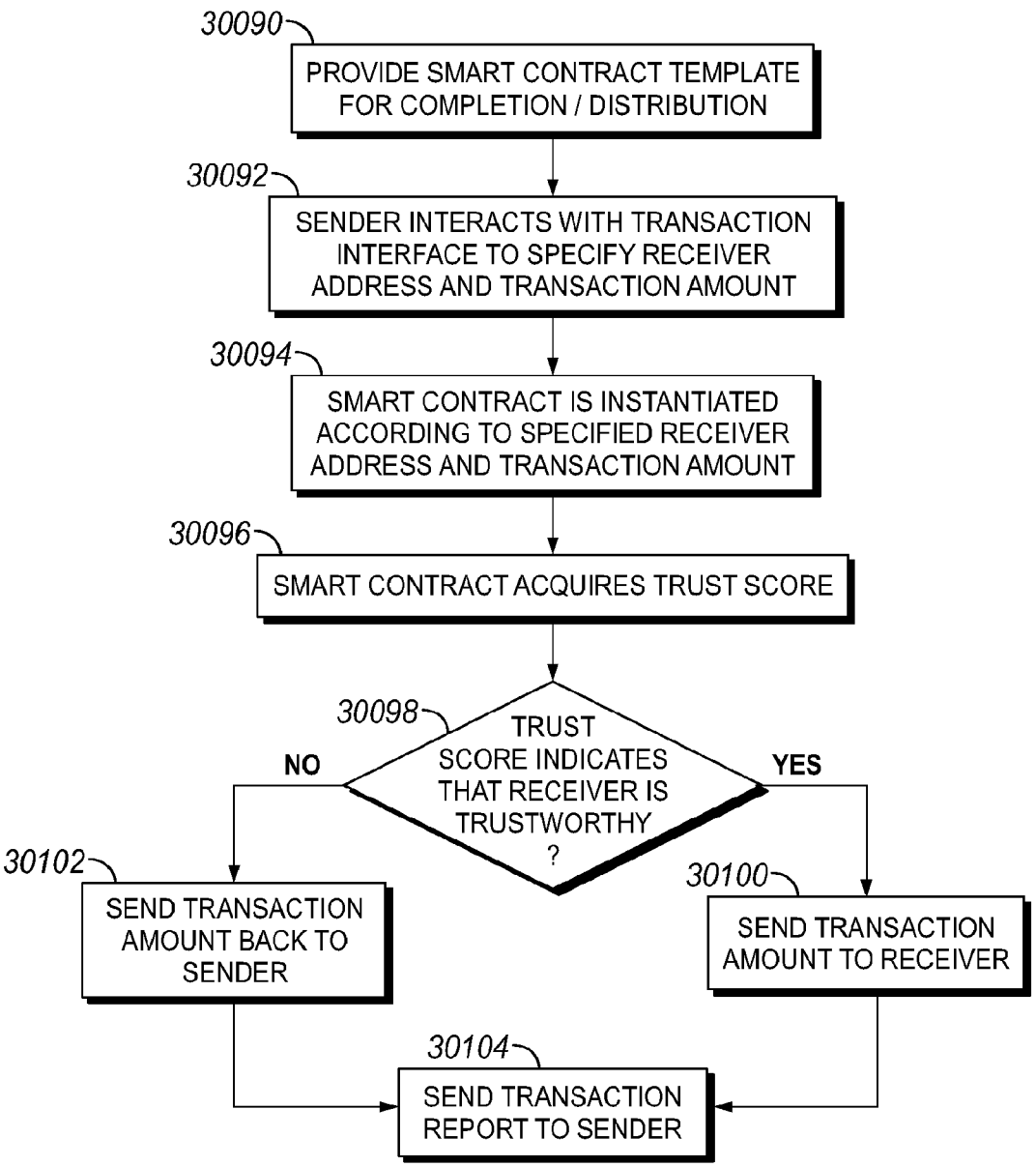

30090
PROVIDE SMART CONTRACT TEMPLATE FOR COMPLETION / DISTRIBUTION
30092
SENDER INTERACTS WITH TRANSACTION INTERFACE TO SPECIFY RECEIVER ADDRESS AND TRANSACTION AMOUNT
30094
SMART CONTRACT IS INSTANTIATED ACCORDING TO SPECIFIED RECEIVER ADDRESS AND TRANSACTION AMOUNT
30096
SMART CONTRACT ACQUIRES TRUST SCORE
30098
TRUST SCORE INDICATES THAT RECEIVER IS TRUSTWORTHY ?
NO
YES
30102
SEND TRANSACTION AMOUNT BACK TO SENDER
30100
SEND TRANSACTION AMOUNT TO RECEIVER
30104
SEND TRANSACTION REPORT TO SENDER

FIG. 321

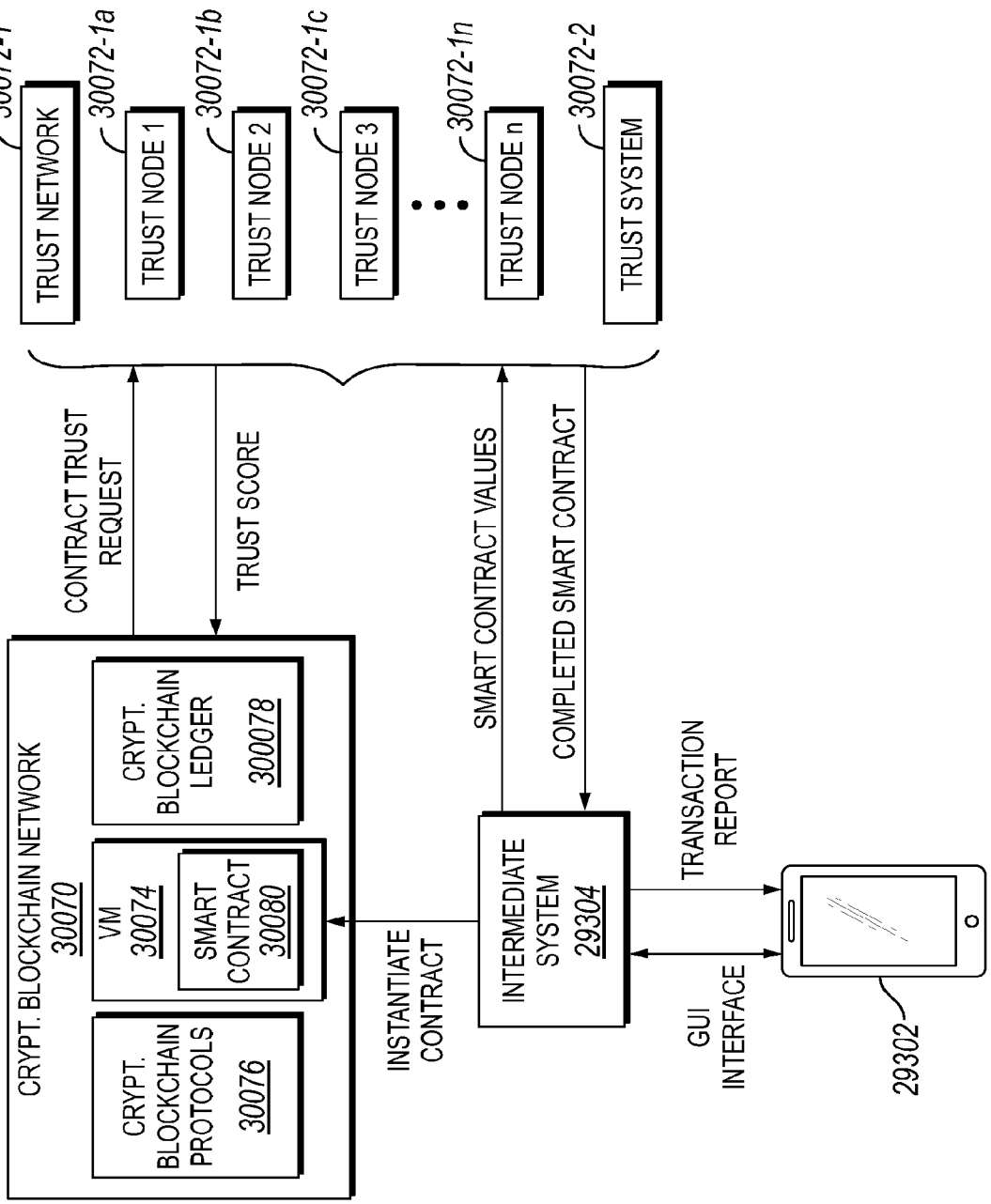

30072-1
TRUST NETWORK
30072-1a
TRUST NODE 1
30072-1b
TRUST NODE 2
30072-1c
TRUST NODE 3
30072-1n
TRUST NODE n
30072-2
TRUST SYSTEM
CONTRACT TRUST REQUEST
TRUST SCORE
SMART CONTRACT VALUES
COMPLETED SMART CONTRACT
CRYPT. BLOCKCHAIN NETWORK 30070
CRYPT. BLOCKCHAIN LEDGER 300078
VM 30074
SMART CONTRACT 30080
CRYPT. BLOCKCHAIN PROTOCOLS 30076
INSTANTIATE CONTRACT
INTERMEDIATE SYSTEM 29304
TRANSACTION REPORT
GUI INTERFACE
29302

FIG. 322

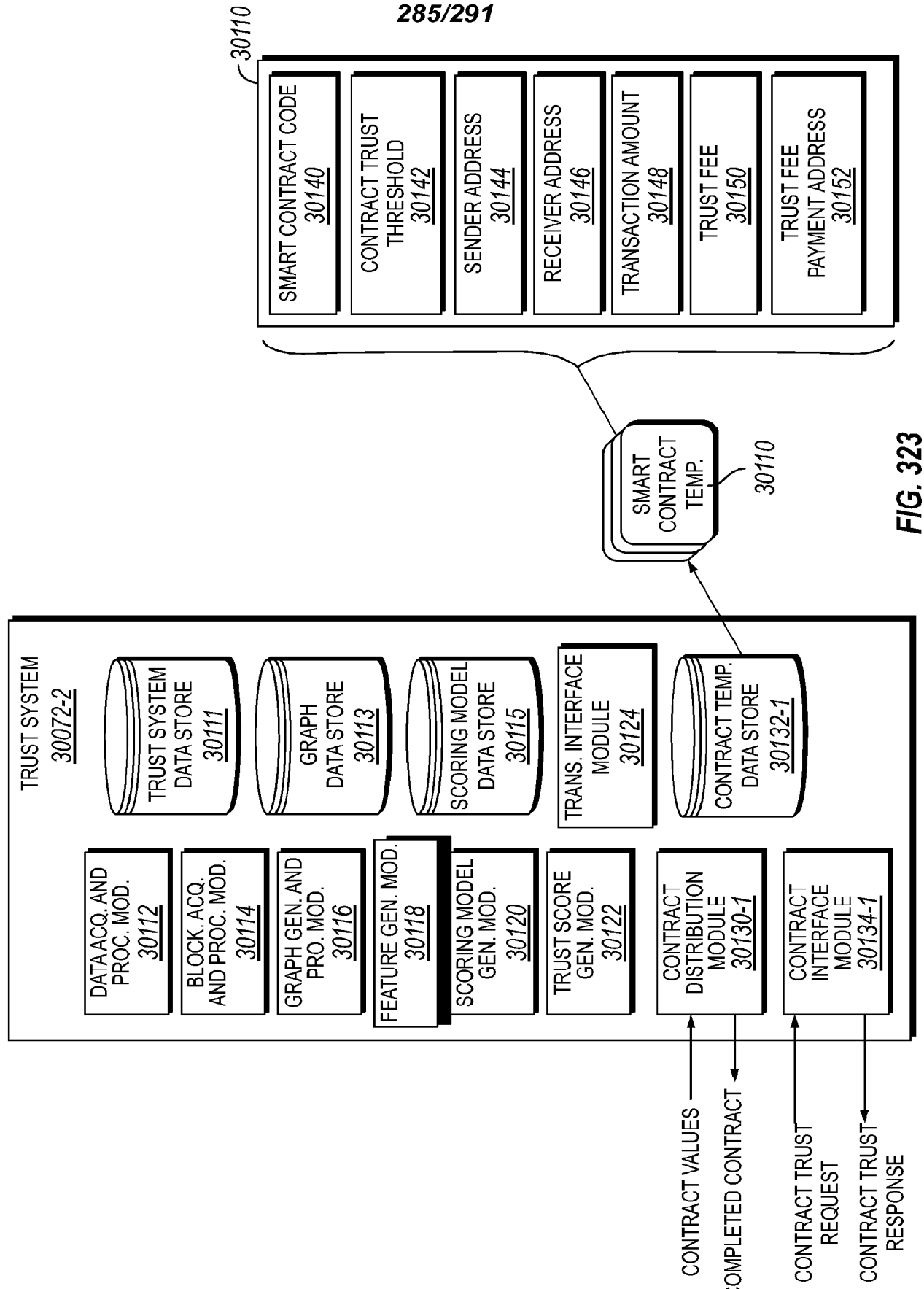

30110
SMART CONTRACT CODE 30140
CONTRACT TRUST THRESHOLD 30142
SENDER ADDRESS 30144
RECEIVER ADDRESS 30146
TRANSACTION AMOUNT 30148
TRUST FEE 30150
TRUST FEE PAYMENT ADDRESS 30152
SMART CONTRACT TEMP.
30110
TRUST SYSTEM 30072-2
TRUST SYSTEM DATA STORE 30111
GRAPH DATA STORE 30113
SCORING MODEL DATA STORE 30115
TRANS. INTERFACE MODULE 30124
CONTRACT TEMP. DATA STORE 30132-1
DATA ACQ. AND PROC. MOD. 30112
BLOCK. ACQ. AND PROC. MOD. 30114
GRAPH GEN. AND PRO. MOD. 30116
FEATURE GEN. MOD. 30118
SCORING MODEL GEN. MOD. 30120
TRUST SCORE GEN. MOD. 30122
CONTRACT DISTRIBUTION MODULE 30130-1
CONTRACT INTERFACE MODULE 30134-1
CONTRACT VALUES
COMPLETED CONTRACT
CONTRACT TRUST REQUEST
CONTRACT TRUST RESPONSE

FIG. 323

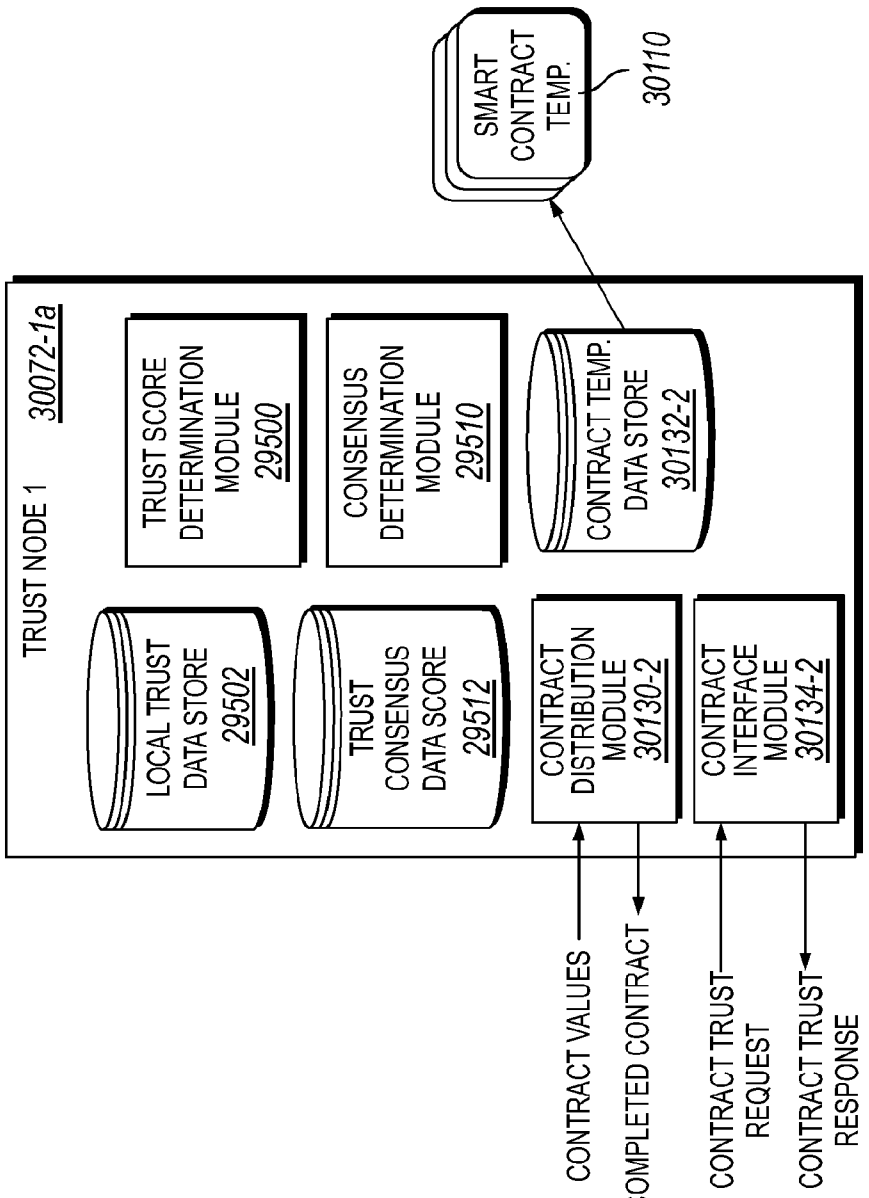

TRUST NODE 1 30072-1a
TRUST SCORE DETERMINATION MODULE 29500
CONSENSUS DETERMINATION MODULE 29510
CONTRACT TEMP. DATA STORE 30132-2
LOCAL TRUST DATA STORE 29502
TRUST CONSENSUS DATA SCORE 29512
CONTRACT DISTRIBUTION MODULE 30130-2
CONTRACT INTERFACE MODULE 30134-2
SMART CONTRACT TEMP.
30110
CONTRACT VALUES
COMPLETED CONTRACT
CONTRACT TRUST REQUEST
CONTRACT TRUST RESPONSE

FIG. 324

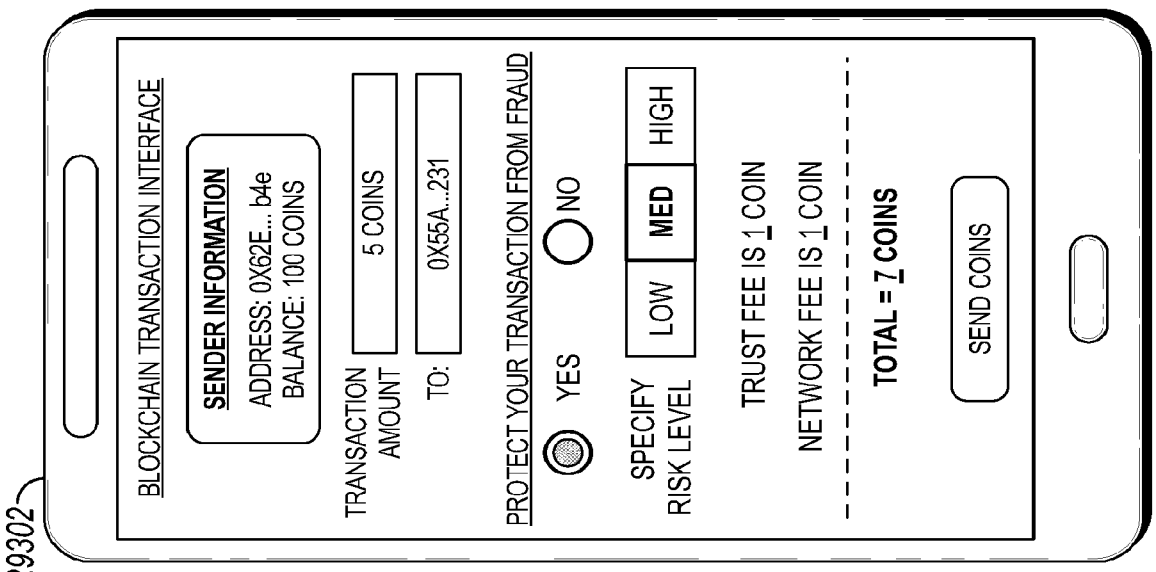


FIG. 325

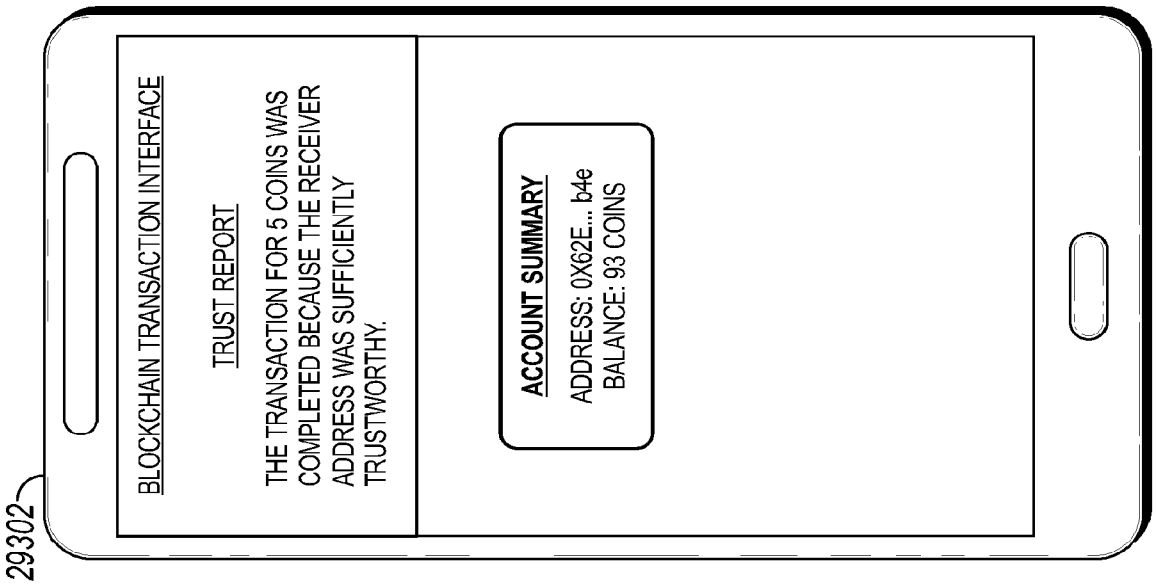


FIG. 326

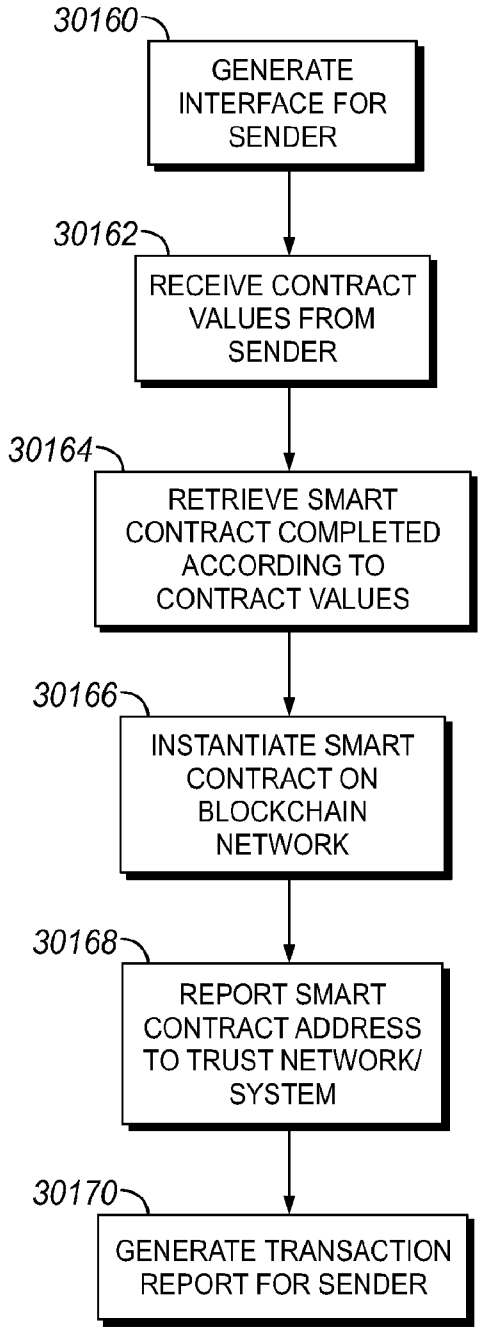


FIG. 327

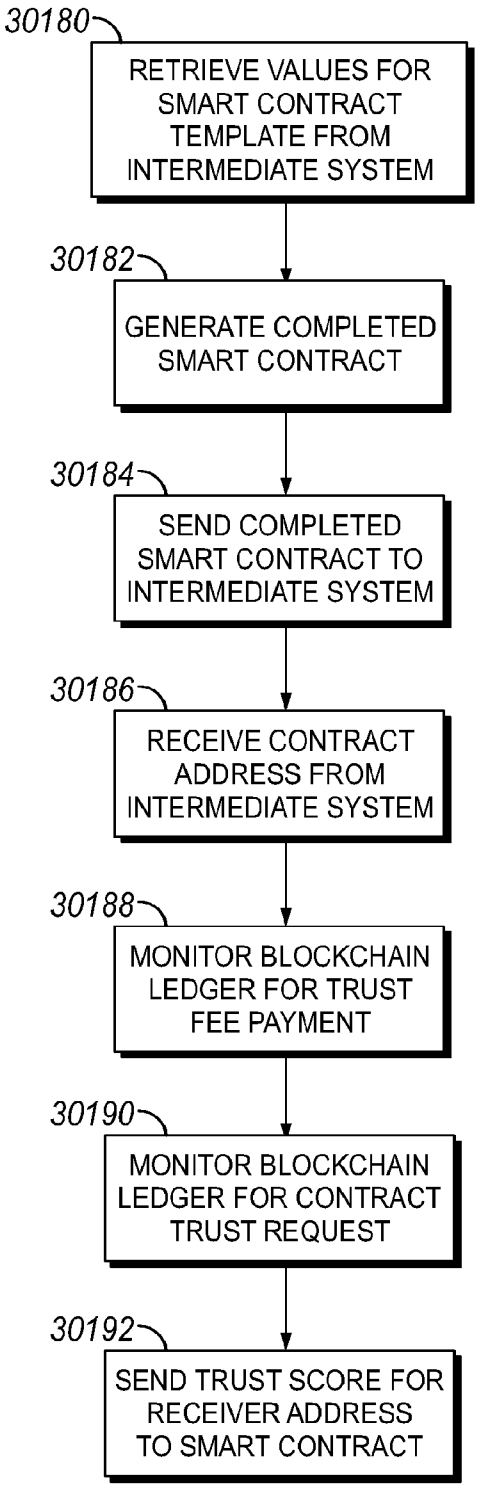


FIG. 328

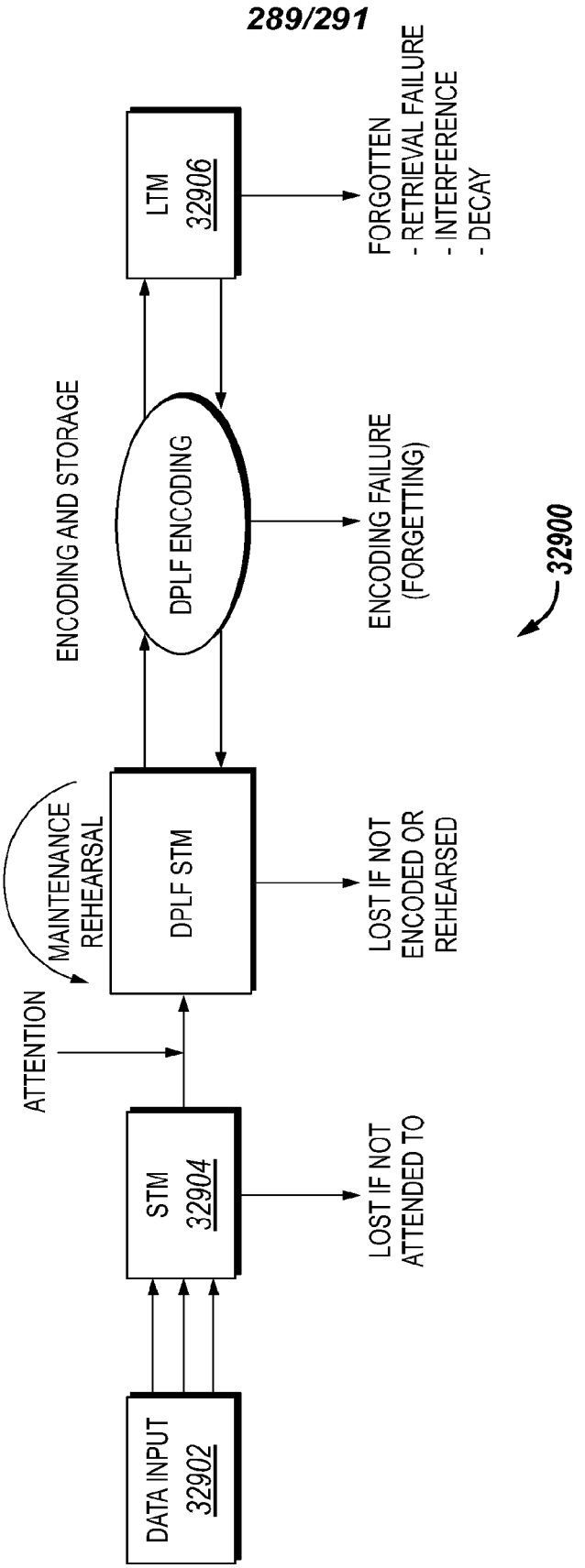

DATA INPUT
32902
STM
32904
ATTENTION
LOST IF NOT
ATTENDED TO
DPLF STM
MAINTENANCE
REHEARSAL
LOST IF NOT
ENCODED OR
REHEARSED
DPLF ENCODING
ENCODING AND STORAGE
ENCODING FAILURE
(FORGETTING)
LTM
32906
FORGOTTEN
- RETRIEVAL FAILURE
- INTERFERENCE
- DECAY
32900

FIG. 329

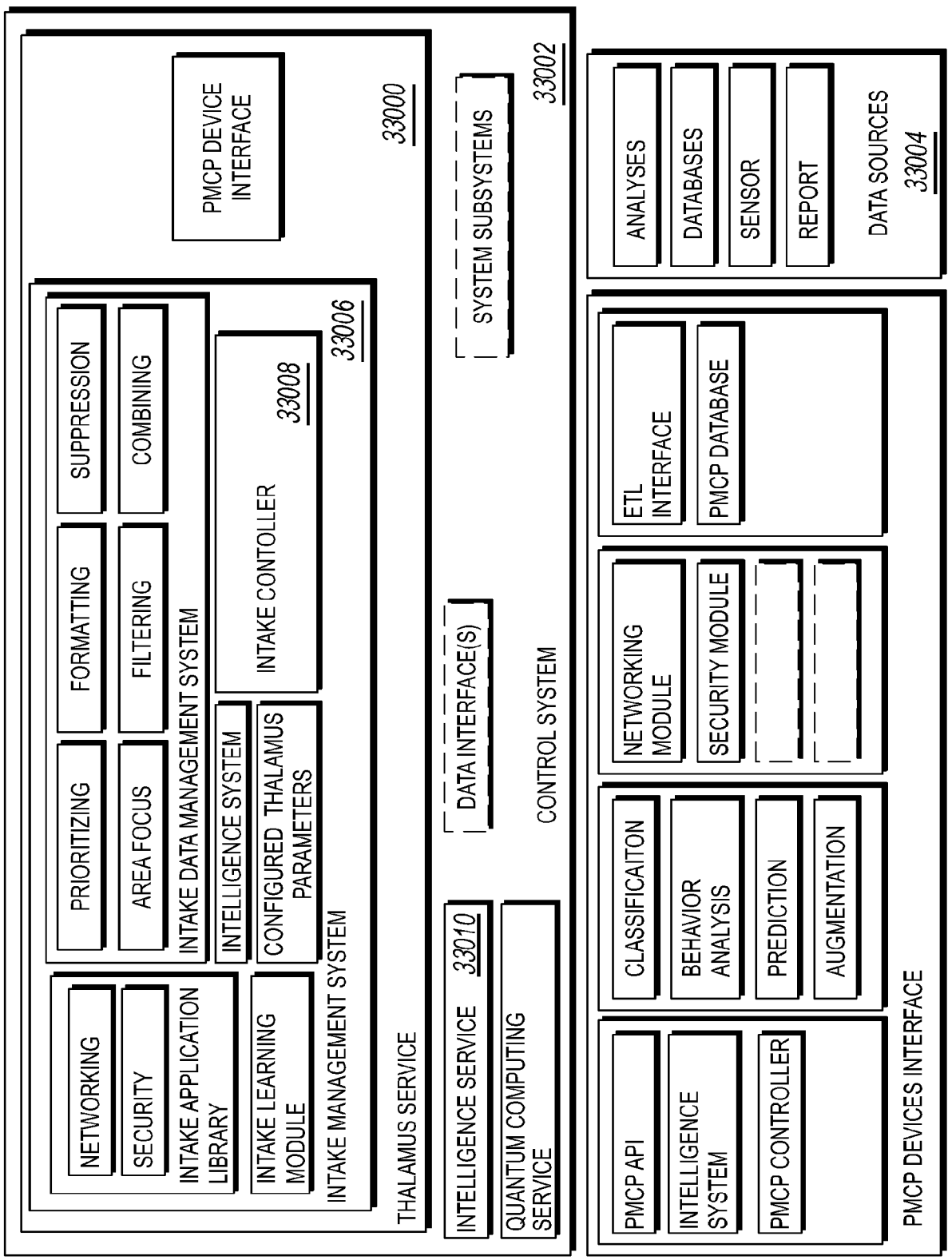

THALAMUS SERVICE
33000
NETWORKING
SECURITY
INTAKE APPLICATION LIBRARY
INTAKE LEARNING MODULE
INTAKE MANAGEMENT SYSTEM
33006
PRIORITIZING
FORMATTING
SUPPRESSION
AREA FOCUS
FILTERING
COMBINING
INTAKE DATA MANAGEMENT SYSTEM
INTELLIGENCE SYSTEM
CONFIGURED THALAMUS PARAMETERS
INTAKE CONTOLLER
33008
PMCP DEVICE INTERFACE
INTELLIGENCE SERVICE
33010
QUANTUM COMPUTING SERVICE
DATA INTERFACE(S)
CONTROL SYSTEM
SYSTEM SUBSYSTEMS
33002
PMCP API
INTELLIGENCE SYSTEM
PMCP CONTROLLER
CLASSIFICAITON
BEHAVIOR ANALYSIS
PREDICTION
AUGMENTATION
NETWORKING MODULE
SECURITY MODULE
ETL INTERFACE
PMCP DATABASE
PMCP DEVICES INTERFACE
ANALYSES
DATABASES
SENSOR
REPORT
DATA SOURCES
33004

FIG. 330

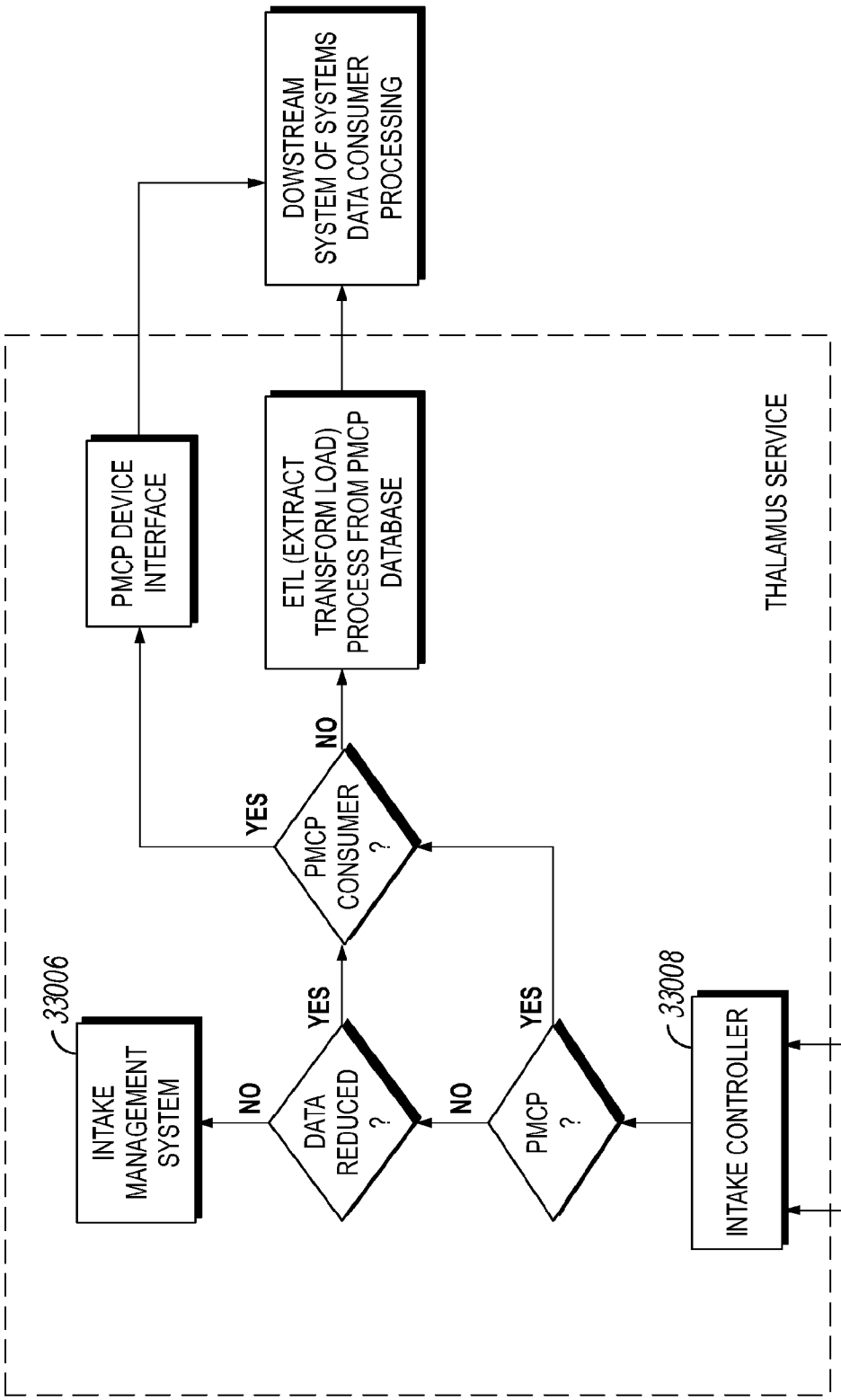

DOWSTREAM SYSTEM OF SYSTEMS DATA CONSUMER PROCESSING
PMCP DEVICE INTERFACE
ETL (EXTRACT TRANSFORM LOAD) PROCESS FROM PMCP DATABASE
THALAMUS SERVICE
YES
NO
PMCP CONSUMER ?
33006
INTAKE MANAGEMENT SYSTEM
YES
NO
DATA REDUCED ?
YES
NO
PMCP ?
33008
INTAKE CONTROLLER
PRECONFIGURED PMCP DEVICE WITH LOCAL PROCESSING
SENSORS, EXTERNAL SYSTEMS, PROCESS DATA

FIG. 331