

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property

Organization

International Bureau

(43) International Publication Date

31 October 2019 (31.10.2019)



(10) International Publication Number

WO 2019/209889 A2

(51) International Patent Classification:

Not classified

(21) International Application Number:

PCT/US2019/028812

(22) International Filing Date:

23 April 2019 (23.04.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/661,595 23 April 2018 (23.04.2018) US

62/667,153 04 May 2018 (04.05.2018) US

(72) Inventor; and

(71) Applicant: KIKINIS, Dan [US/US]; 169 E Portola Ave,
Los Altos, CA 94022 (US).

(72) Inventor: BIRGER, Ari; 2916 NW Bucklin Hill Road,
Suite 485, Silverdale, WA 98383 (US).

(74) Agent: GALVIN, Brian, R.; Galvin Patent Law LLC, 2916
NW Bucklin Hill Road, Suite 485, Silverdale, WA 98383
(US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished
upon receipt of that report (Rule 48.2(g))

(54) Title: ENHANCED INTERNATIONAL PAYMENT TRANSACTION SYSTEM AND METHOD

(57) Abstract: A system and methods for reducing transaction latency and costs, micro payments that can be handled cost effectively, cracking the limits to growth, being a stable and localized store of value, coexisting with multiple cryptocurrencies, ease of use by the masses, and enhancing criminal deterrents.



WO 2019/209889 A2

ENHANCED INTERNATIONAL PAYMENT TRANSACTION SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATIONS

Application No.	Date Filed	Title
Current application	Herewith	ENHANCED INTERNATIONAL PAYMENT TRANSACTION SYSTEM AND METHOD
62/667,153	May 4, 2018	<i>is a PCT filing of, and claims priority to:</i> ENHANCED INTERNATIONAL PAYMENT TRANSACTION SYSTEM AND METHOD
62/661,595	Apr 23, 2018	<i>and is also a PCT filing of, and claims priority to:</i> SYSTEM AND METHOD FOR ENHANCED REALTIME SETTLEMENT SYSTEMS
the entire specification of each of which is incorporated herein by reference.		

5

BACKGROUND

Field of the Art

[001] The disclosure relates to the field of computing devices, and more particularly to the field of handling electronic transactions using digital currency.

Discussion of the State of the Art

- 10 [002] Some of the cybercurrency systems in use today have serious shortcomings, because they use blockchain. As the blockchain gets longer, transactions can take as long as half an hour, or more, to reach a critical number of confirmations in the blockchain. This latency in concluding a transaction leads to some uncertainty about the value of the transaction until it closes. Combined with the current volatility of some cybercurrency, especially small
- 15 transactions are affected, so that micro transactions become unattractive. For example, in a transaction that is equivalent to 50 cents and takes half an hour to conclude, the currency may fluctuate as much as 25 percent or even 50 percent in that half hour. Thus a user may lose a large amount of the value of the transaction in the time required to complete the transaction.
- 20 [003] One of the problems in digital currency systems is how to control those systems in a country or regional currency, and, more in particular, how to Bootstrap a system in such a

way that it can be “taken over” in a friendly way by the government of that country or region, without any disruption or problems at all.

[004] Known to the inventors is a system for executing cybocurrency transactions, especially small transactions, to avoid currency fluctuation risks and to close transactions quickly. By using a set of high-performance scalability tests, users can quickly get a repeatable test infrastructure to validate the performance and scaling goals for such a system. Further, they can build a system that they can use to understand and design the final product and can show to potential partners and investors. This goal, of product design and demonstration, can be achieved by building the system in phases, using the same generated dataset as input for each phase, and measuring performance of each phase in a repeatable way.

[005] What is clearly needed is a system and method for organizing and managing a regional or country-wide blockchain transaction system with multiple partners, so that it can be started initially as a completely private system, but then be converted easily and without any disruptions into an official currency system.

[006] What is also needed is a system of testing of high-performance scalability, and in particular system stability, as well as other aspects.

[007] There are elements with first and second generation cryptocurrency solutions that limit their growth for mainstream use, where individuals can use them in everyday activities like they use a credit card or cash today.

[008] A further limitation in contemporary cryptocurrency trading systems is the need for multiple trades to conduct relatively simple transactions, with traders often subjected to multiple bid/ask spreads and low liquidity. For a first example:

1---Trader A sells US\$ and buys L-US\$ 1to1 no bid/ask crossed.

2---Trader A crosses bid/ask to sell L-US\$ and buys LG (Liquideum Global Token)---

25 Trade 1

3---Trader A crosses bid/ask to sell LG and to buy L-euro---Trade 2

4---Trader A sells L-euro 1 to 1 for Euro no bid ask crossed.

[009] A second example is the way the current sovereign spot FX market works:

1---Trader A sells US\$ and buys Euro---Only 1 Trade

[010] A third example is the way the current Crypto market works:

1—Trader A crosses bid/ask to sell US\$ and Buy a Crypto.—Trade 1

2—Trader A crosses bid/ask to sell Crypto and to buy Euro—Trade 2

[011] Rare cryptos or currencies will create larger splits and costs and may take longer to
5 fill. Clearing houses may shy away from filling orders with unknow/marginal players.

[012] These limitations include poor transactional performance and scalability, excess costs,
fundamental limits to the number of available coins, currency value stability within and
between economic regions, support of multiple currency valuations, simplicity of use, and
ease of use for illegal activities.

10 [013] What is needed is a system and method allowing to perform a transaction like in
Example 1 above, but in which only ONE Trade occurs, thereby dramatically reducing risk
and hence cost of the transaction.

SUMMARY

[014] Accordingly, the inventor has conceived and reduced to practice, systems and
15 methods for enhanced international payment transactions.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[015] The accompanying drawings illustrate several aspects and, together with the
description, serve to explain the principles of the invention according to the aspects. It will be
appreciated by one skilled in the art that the particular arrangements illustrated in the
20 drawings are merely exemplary, and are not to be considered as limiting of the scope of the
invention or the claims herein in any way.

[016] Fig. 1(PRIOR ART) is a block diagram illustrating a typical blockchain system, as
currently known in the art.

[017] Fig. 2 shows an overview of an exemplary computing device, according to one aspect.

25 [018] Fig. 3 shows an exemplary overview of a standard cloud computing infrastructure,
according to an aspect.

- [019] Fig. 4 shows an exemplary enhanced cybercurrency transaction system, according to an aspect.
- [020] Fig. 5 shows a block diagram of a proactive, complete close method, according to an aspect.
- 5 [021] Fig. 6 shows a block diagram of an “on the fly, as you go” type close method, according to an aspect.
- [022] Fig. 7 shows a two-tier coin system, according to an aspect.
- [023] Fig. 8 is a flow diagram of an exemplary exchange process, according to an aspect.
- [024] Fig. 9 is a flow diagram of another exemplary exchange process, according to an aspect.
- 10 [025] Fig. 10 is a block diagram of an extended address space, according to an aspect.
- [026] Fig. 11 is a block diagram illustrating an exemplary hardware architecture of a computing device.
- [027] Fig. 12 is a block diagram illustrating an exemplary logical architecture for a client device.
- 15 [028] Fig. 13 is a block diagram showing an exemplary architectural arrangement of clients, servers, and external services.
- [029] Fig. 14 is another block diagram illustrating an exemplary hardware architecture of a computing device.
- 20 [030] Fig. 15 shows an overview of an exemplary high-performance scalability test configuration, according to an aspect.
- [031] Fig. 16 shows an exemplary testing system, according to an aspect.
- [032] Fig. 17 shows a simplified version of an exemplary typical in-country network, according to an aspect.
- 25 [033] Fig. 18 shows an exemplary network, according to an aspect.
- [034] Fig. 19 shows an exemplary system connecting banks, customers, and clearing houses, according to an aspect.

[035] Fig. 20 shows an exemplary overview of a transaction according to the novel approach.

DETAILED DESCRIPTION

[036] The inventor has conceived, and reduced to practice, systems and methods for enhanced international payment transactions.

[037] One or more different aspects may be described in the present application. Further, for one or more of the aspects described herein, numerous alternative arrangements may be described; it should be appreciated that these are presented for illustrative purposes only and are not limiting of the aspects contained herein or the claims presented herein in any way.

One or more of the arrangements may be widely applicable to numerous aspects, as may be readily apparent from the disclosure. In general, arrangements are described in sufficient detail to enable those skilled in the art to practice one or more of the aspects, and it should be appreciated that other arrangements may be utilized and that structural, logical, software, electrical and other changes may be made without departing from the scope of the particular aspects. Particular features of one or more of the aspects described herein may be described with reference to one or more particular aspects or figures that form a part of the present disclosure, and in which are shown, by way of illustration, specific arrangements of one or more of the aspects. It should be appreciated, however, that such features are not limited to usage in the one or more particular aspects or figures with reference to which they are described. The present disclosure is neither a literal description of all arrangements of one or more of the aspects nor a listing of features of one or more of the aspects that must be present in all arrangements.

[038] Headings of sections provided in this patent application and the title of this patent application are for convenience only, and are not to be taken as limiting the disclosure in any way.

[039] Devices that are in communication with each other need not be in continuous communication with each other, unless expressly specified otherwise. In addition, devices that are in communication with each other may communicate directly or indirectly through one or more communication means or intermediaries, logical or physical.

[040] A description of an aspect with several components in communication with each other does not imply that all such components are required. To the contrary, a variety of optional components may be described to illustrate a wide variety of possible aspects and in order to more fully illustrate one or more aspects. Similarly, although process steps, method
5 steps, algorithms or the like may be described in a sequential order, such processes, methods and algorithms may generally be configured to work in alternate orders, unless specifically stated to the contrary. In other words, any sequence or order of steps that may be described in this patent application does not, in and of itself, indicate a requirement that the steps be performed in that order. The steps of described processes may be performed in any order
10 practical. Further, some steps may be performed simultaneously despite being described or implied as occurring non-simultaneously (e.g., because one step is described after the other step). Moreover, the illustration of a process by its depiction in a drawing does not imply that the illustrated process is exclusive of other variations and modifications thereto, does not imply that the illustrated process or any of its steps are necessary to one or more of the
15 aspects, and does not imply that the illustrated process is preferred. Also, steps are generally described once per aspect, but this does not mean they must occur once, or that they may only occur once each time a process, method, or algorithm is carried out or executed. Some steps may be omitted in some aspects or some occurrences, or some steps may be executed more than once in a given aspect or occurrence.

[041] When a single device or article is described herein, it will be readily apparent that more than one device or article may be used in place of a single device or article. Similarly, where more than one device or article is described herein, it will be readily apparent that a single device or article may be used in place of the more than one device or article.

[042] The functionality or the features of a device may be alternatively embodied by one or
25 more other devices that are not explicitly described as having such functionality or features. Thus, other aspects need not include the device itself.

[043] Techniques and mechanisms described or referenced herein will sometimes be described in singular form for clarity. However, it should be appreciated that particular aspects may include multiple iterations of a technique or multiple instantiations of a
30 mechanism unless noted otherwise. Process descriptions or blocks in figures should be

understood as representing modules, segments, or portions of code which include one or more executable instructions for implementing specific logical functions or steps in the process. Alternate implementations are included within the scope of various aspects in which, for example, functions may be executed out of order from that shown or discussed, including
5 substantially concurrently or in reverse order, depending on the functionality involved, as would be understood by those having ordinary skill in the art.

Conceptual Architecture

[044] The inventors have identified and eliminated these limits including reducing transaction latency and costs, micro payments that can be handled cost effectively, cracking
10 the limits to growth, being a stable and localized store of value, coexisting with multiple cryptocurrencies, ease of use by the masses, and enhancing criminal deterrents.

[045] What is clearly needed is a better system and method of executing cybercurrency transactions, especially for small transactions, to avoid such currency fluctuation risks and close transactions in a much shorter period of time.

15 [046] In some cases, a limited amount of crypto currency may be sent by a message in form of an attached smart contract or credentials for accessing a cloud-based bot program. Further, certain contracts can temporarily be blocked from being active, pending a dispute resolution. Additionally, as part of the right to mine the top level coins, users agree to transact for free services in the lower levels, and a third party may be tasked to inspect and audit and act as
20 an assurance entity for one or more regions of the crypto currency in return for a transaction fee in each region inspected and assured.

[047] In a system where payments are done using tokens representing a currency, these tokens may be transacted on a blockchain and sometimes moved among banks, possibly resulting in an imbalance of bank FIAT accounts. In such cases, from time to time one or
25 more banks may require a transfer on an RTGS system to correct an such an imbalance. In those cases where said RTGS system is not available during hours of non-operation, banks may move the RTGS transfer to a clearing house that is operational non-stop without any breaks, thus enabling settlements at any time of any day of the year. In some cases, to avoid complicated transfers of operations, such operations may always run via a clearing house.
30 Further, the transfers to the clearing house are operated using the block chain network, to

avoid any limitation of the RTGS time of operation. Additionally, should a particular bank's available balance on its FIAT account drop below a preset threshold, either the central bank or another pre-agreed partner will automatically launch an infusion of additional FIAT funds into the bank's account to maintain sufficient liquidity. Alternatively, rather than depending
5 on a preset threshold, an AI system may be used to calculate the level upon which such an infusion is made, and also to calculate the required size of the infusion to stabilize the bank. In all such cases, one or more persons or institutions are notified at or shortly before such an event.

[048] Fig. 1 (PRIOR ART) shows a typical blockchain system 100, as currently known in
10 the art. Nodes 101a-n typically hold the ledger of a blockchain transaction. Also, customer 102x has a wallet 103w. All of these entities—the customer, the wallet, and the ledger—require computing devices that have a processor, an operating system, and all the software and applications necessary to run blockchain or the wallet, respectively, and to execute the needed transactions. The details of these elements are not shown here, but they are detailed,
15 for example, at <https://en.wikipedia.org/wiki/Ethereum>, also at <https://en.wikipedia.org/wiki/Bitcoin>, further <http://www.coindesk.com/information/how-do-bitcoin-transactions-work/> and <https://venturebeat.com/2014/02/17/bitcoin-for-idiots-an-introductory-guide/>. They are also well known in the art. Examples of cybercurrency currently using such an approach are Bitcoin, which has the bitcoin as the principal unit of
20 currency and the satoshi, equal to 0.00000001 bitcoin. Another cybercurrency is the Ether (ETH), one of which is currently (mid July 2017) valued at approximately one-twelfth of a Bitcoin (BTC) and has approximately one million subunits. The problem, as mentioned above, is that it can take roughly half an hour to get a sufficient number of ledgers in a blockchain to execute a simple wallet transaction. For example, when a user wants to send an
25 amount from one wallet to another, he needs to point to the address where his wallet keeps the bitcoin that he has currently with his private pointer and take the amount in that location. He then points to the payee and pays the amount that he wants to send to the payee, retaining the rest for himself as the payor. The amount in that wallet location is split in two, with one amount sent to the payee and the remainder sent back to the payor. Such is the
30 transaction in the blockchain, which can be publicly inspected. When a sufficient number of ledgers in the blockchain community have accepted this transaction, it is considered fulfilled

and transacted. The problem is that most participants who make such transactions, often for a small amount of satoshi, use most of the capacity for mining new bitcoin, so that mining is becoming increasingly more expensive. As a result, with the growing size of the ledger, the time for this transaction, waiting in queue and then actually executing, grows exceedingly long, leaving the cybocurrency involved in the transaction vulnerable to currency fluctuations.

[049] Also, mixer service or mixer wallets are sometimes used to anonymize currency. Many approaches exist and are known in the art. See, for example, https://en.bitcoin.it/wiki/Mixing_service.

10 Detailed Description of Exemplary Aspects

[050] Fig. 2 shows an overview of an exemplary computing device 200. Components comprising device 200 include a bus 201, CPU 202; memory 203; nonvolatile memory (NVM) 204 for holding programs and start-up code, etc.; an I/O section 206; a mass storage device 209 that can hold additional codes such as operating systems, applications, data, etc.; and a network interface 213, which may accommodate any of three groups of interface types 214a-n, 215a-n, and 216a-n. Wired LAN types 1-n 214a-n may be any of various types, including, but not limited to, Ethernet, serial port, FireWire, Thunderbolt, etc. Wireless LAN types 1-n 215a-n may be any of various types, including, but not limited to, Wi-Fi, Bluetooth, ZigBee, ultra-wideband, etc. WAN types 1-n 216a-n may be any of various types, including, but not limited to, cellular network interfaces of various different types using various different bands. Device 200 may have a display 210. Data input may be accomplished via an input means 211, which may be a touch screen, a physical keyboard, or both. Pointing device 212 could be a mouse, a touch pad, a touch screen, a joy stick, or any combinations thereof, all connected to the I/O. Other I/O devices may include a speaker 208, a microphone 207, a camera (not shown), etc. Computing device 200 may be any of a wide variety of types, including, for example, a smart phone, a computer pad, a laptop, a desktop, a work station, server, etc.

[051] Fig. 3 shows an exemplary overview of a standard cloud computing infrastructure 300. Server 302 may be a single physical server or it may be a cluster 303 of many smaller servers 304a-n. These servers can contain multiple sets of codes 305a-n, including multiple

operating systems, on top of which may be multiple applications 306a-n and additional multiple data sets for storage 307a-n. Client computing devices 310 and 311, as well as desktop device 312, connect to server 302 via Internet 301. Functionally a desktop computer is very similar to a smart phone, except that the relationship between performance and display and operating system, etc. is different, and a desktop computer has typically a much larger display. Also, in server 302, whether a single server or a cluster, each node is just a specialized version of generic computing device 200. Cloud computer arrangement 300 enables applications to cooperate between one or more of the client devices and the cloud, where some functionality is performed in the cloud and some is on the device. Further, it may not always be clear what operations are being done where, and operation locations vary from situation to situation, as well as varying according the capabilities of the computing device used.

[052] Fig. 4 shows an exemplary enhanced cybocurrency transaction system 400, according to the system and method disclosed herein. In upper section 110 is a structure similar to cybocurrency transaction system 100, described in the discussion of Fig. 1, with transaction machines holding ledgers and mining currency. Below division line 111 are two exemplary regions 420 and 430. In reality, system 400 could contain many more such regions, but for reasons of clarity and simplicity, only two exemplary regions are shown here. Each region is connected to a node in system 100 via a gateway, in this case gateways 422 and 432, which, like the regions they connect, are exemplary only and could in reality consist of many more. In each region 420 and 430 are ledger processing machines 421a-x and 431a-x for processing local transactions. In these regions 420 and 430 only fractional currency, that is, currency that is a fraction of a whole currency unit, usually equivalent to coins, is available. The machines that process transactions in these regions can process only in their own region, and only fractional transactions. Also, because only fractional transactions of fractional currency occur in these regions, no currency mining can occur, because no mining is allowed in these regions. If a user wants to change the currency, the currency is reserved via gateways 422 and 432 and blocked into the ledger in the main region and transferred into the lower region and made available as fractional currency. A small portion of that coin is then allocated to the operators of the ledger machines in each region, to pay operating costs. With no mining occurring in the regions, and with the regions being regionally limited in range, the cost of

operation is much lower. Also, the local fractional currency could be, for example, bound to a local physical currency such as, for example, the U.S. dollar or the Euro, rather than to a cyberrcurrency such as Bitcoin or Ether, so there might be a local master currency available, issued by the conversion gateway, such as gateway 422 or 432, which would be paid for by
5 currency in the upper domain and then actually converted by the gateways into a local physical currency. Those gateways might act as central banks, rather than as gateways, issuing a fractional currency only, and further in these regions there cannot be mining. Thus the transactions are faster and less vulnerable to currency fluctuations. Additionally, the ledgers may be split by years, with the current ledgers containing only transaction for the current year
10 or two, and all previous transactions kept in archived ledgers, accessed only if a user has a wallet with an old balance. In such a case, as soon as the user wants to use the old balance, the wallet is retrieved from the archive, updated, and removed from the archive. Thus archived wallets may take a little longer to transact, but current wallets are much faster, because the ledger is kept current only in the ledger currency. Because the ledgers are
15 regionalized, they can be much smaller and thus process transactions much more quickly. However, being regionalized does not mean a ledger is limited to one country. For example, in North America, each region could contain a piece of Canada, the United States, and Mexico. Thus, including multiple jurisdictions could avoid putting a region under the control of just one country. Wallets could simultaneously contain the physical currency of multiple
20 regions, such as, for example, Euros, dollars, and yen. Most people spend currency in their home region, so merchants could execute transactions much more cheaply, because of the reduced risk of currency fluctuations in most cases.

[053] Further, in some cases, when liquidity runs below a certain level, due to large outflow, a program or an AI module in the system can take at least one of several countermeasures: a)
25 it can change exchange rate to reduce outflow, b) it can offer an interest for delaying a conversion, or c) it makes a cash call on certain members of a reserve group to allow a larger reserve to be built up quickly and thus maintain liquidity. This process can be triggered in an automated way by software and or an AI supervisory module (not shown) running as part of the management software of the system on at least one of the servers or as part of the EVM
30 system (or similar) or both.

[054] Various embodiments of the present disclosure may be implemented in computer hardware, firmware, software, and/or combinations thereof. Methods of the present disclosure can be implemented via a computer program instructions stored on one or more non-transitory computer-readable storage devices for execution by a processor. Likewise, various processes (or portions thereof) of the present disclosure can be performed by a processor executing computer program instructions. Embodiments of the present disclosure may be implemented via one or more computer programs that are executable on a computer system including at least one processor coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Each computer program can be implemented in any suitable manner, including via a high-level procedural or object-oriented programming language and/or via assembly or machine language. Systems of the present disclosure may include, by way of example, both general and special purpose microprocessors which may retrieve instructions and data to and from various types of volatile and/or non-volatile memory. Computer systems operating in conjunction with the embodiments of the present disclosure may include one or more mass storage devices for storing data files, which may include: magnetic disks, such as internal hard disks and removable disks; magneto-optical disks; and optical disks. Storage devices suitable for tangibly embodying computer program instructions and data (also called the “non-transitory computer-readable storage media”) include all forms of non-volatile memory, including by way of example semiconductor memory devices, such as EPROM, EEPROM, and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and CD-ROM disks. Any of the foregoing can be supplemented by, or incorporated in, ASICs (application-specific integrated circuits) and other forms of hardware.

[055] In some cases, a cryptocurrency system may include one or more demarcated sections, or areas, in which transactions are limited to those of a lesser denomination, with a limited number of ledger transacting nodes and a limited number of gateways interacting between the general area of unlimited currency and the demarcated area. Such areas may have a limited-time active ledger, and older transactions are moved to an archive to speed up new transactions. In such cases, old wallet entries are then transferred at the time of use to a new section of a new ledger. Also, in that demarcated area, no mining is allowed.

[056] Further, in this area, a central issuer, or bank, with a reserve, may stabilize the currency, and currency in this area may be traded at a fixed rate to another currency in the same area, which may be a real currency rather on a major cryptocurrency. Additionally, in such areas, so called mixer wallets may be blocked or confiscated to avoid misuse of funds
 5 for illegitimate purposes.

Demarcated Block Sections

[057] According to an aspect, there are two methods for closing an active section of a blockchain. One is a proactive, complete close; the other is an “on the fly, as you go” type close, performed asynchronously, as needed. Both are discussed below.

10 [058] Fig. 5 shows a proactive, complete close block diagram 500. In the proactive, complete close, a similar approach is taken to closing books or ledgers in an accounting system at the end of a record keeping period. All the wallets 503a-n are reconciled, and their totals are moved (A3 to A4, B5 to B6 etc.) into a newly started blockchain 502, as all transactions in the old blockchain 501 are consolidated and closed out. The old one is the
 15 archived and kept for future inspections.

[059] Fig. 6 shows an “on the fly, as you go” type close flowchart 600 showing two wallets, wallet 1 603a and wallet 2 603b. In the “on the fly, as you go” type close, which is performed asynchronously as needed by wallet or other activity, the old blockchain 601 is kept open but archived. Whenever an activity involves an entry in the old blockchain, for example wallet 1
 20 603a is used, at that moment, it is consolidated and closed out from the old blockchain 601 and immediately transferred via arrow 2 into the new blockchain 602. Over time the old blockchain will eventually fully be consolidated and closed out. Inspections may take a bit longer, but closing is a minor effort.

Two-Tier Coinage

25 [060] Fig. 7 shows a two-tier coin system 700 as used in embodiments of the present invention. The first, or “top tier,” coin 701 is a generated coin—there will only be a limited number ever minted. It is the primary vehicle for monetary exchange and these coins contain all of the value in the system, except what is contained in the locally-valued second Tier coins 702a-n. These second Tier coins 702a-n are also generated and are created when money

moves into a local currency, and are “destroyed” or invalidated when the money exits the system to the first Tier 701 or is cashed out of the system.

[061] The second Tier coin 702a-n is also backed by a local agency or bank to stabilize the value of the second Tier country-specific currency. In order to incentivize the local agencies, they will be allowed (under strict guidelines) to hold a portion of the funds in first Tier coinage 701 or utilize a portion of the funds for other activities. They will also have the option of insuring the value of the currency tied to second Tier coin 702a-n and charge a fee to the users for that insurance.

Fees and Revenue

[062] The present invention may charge a small fee every time a coin is moved. Figs. 8 and 9 are exchange flow diagrams 800, 900 indicating where fees may be charged. Referring to Fig. 8, fees may be incurred during purchase of first Tier coin 801, sale of first tier coin 802, and transferring funds from one wallet to another 803. Referring now to Fig. 9, fees may also be incurred when transferring external funds to a wallet 901, and redemption of second Tier coins 902.

Single-Use Cryptocurrency

[063] Single-use coin in the second Tier coins enables the control and tracking of currency in a public blockchain with no storage of value. These single use coins are created then destroyed after redemption, unlike classic cryptocurrency where coins have an infinite lifespan. They are also used for other one-time transactions or other applications where value is held on a one time basis or time-limited. For example, a company may provide “expiring cash offers,” where a specific amount of currency is credited to a specific individual but expires at a specific time or because of a specific event. No equivalent of this function exists within current cryptocurrency solutions. Destruction of these coins via Smart Contracts and directly via the blockchain yields significantly enhanced security to this cryptocurrency solution.

Single-Use Cryptocurrency

[064] To provide single-use cryptocurrency capability, the present invention includes an expanded address space so it is effectively infinite, which allows this functionality to work for hundreds of years without running out of capacity.

5 [065] Fig. 10 is a block diagram of an extended address space 1000 as used in embodiments of the invention. The current Ethereum, Bitcoin, and other cryptocurrencies utilize a SHA 256-bit address space 901. This is adequate for their applications, but is fundamentally a catastrophic limit if new elements are rapidly created and added to the blockchain then destroyed or invalidated. While their record in the blockchain is critical, they will soon
10 saturate a block chain, degrading its performance, and eventually render the blockchain useless. This problem may be solved via both an address extension 902, and effective demarcation as previously described. Extension 902 encapsulates both an extension prefix 904, and a descriptive address header 903 into the total address space, driving the address space effectively to infinity.

15 Leveraging Standardized Contracts

[066] The present invention includes support for what is known as “Smart Contract” functionality, which may be found in core Ethereum, but will also be released with a number of standardized contract to provide baseline support of some key functionality including coupons, timed escrow (pay after N days), key-based escrow, and other related functions.

20 [067] Providing a set of standardized contracts will mitigate the problem of an exploding world of poorly-written Smart Contracts in the same way careful design and engineering is required to effectively use stored procedures in modern databases.

In-Transaction Messaging

[068] The present invention includes support for carefully limited anonymous messaging in
25 the block chain. It is used to send basic messages between both parties as well as messages to Smart Contracts. It exists only as a text field and cannot be executed directly. This is done in order to eliminate a potential security hole where links and code (such as JavaScript) can be incorporated in messages for nefarious purposes.

Wallet Integrations and Ease-of-Use

[069] The present invention may integrate first Tier and second Tier coin within many coin wallets, and included an enhanced wallet that allows coin value to be moved from first Tier and various denominations of second Tier coins. In addition, the enhanced will allow users to see the value of their stored coinage in their native coin value or normalized to the wallet's default currency based on current market prices for coin.

[070] Fig. 15 shows an overview of an exemplary high-performance scalability test configuration, according to one aspect of the system and method disclosed herein. Typically, a cluster would run on a cloud system, for example Amazon Web Service (AWS), so the effort is minimal. By launching a command, all the instances are automatically created. Next, the user gets access to a control console, such as window 1500. There he can set the number of nodes $N(m)$ by setting value M in the box B (top right) – the system then adjusts the number of nodes appearing on the screen accordingly. Value M is limited to a “reasonable, feasible” range (cost, performance) in this example. Also, the number of clients $C(r)$ may, for a typical test, range from 5-13, but that number can be adjusted by changing value R in the box (top right) within a range beyond that. Each client adds a certain demand on the network, resulting in a system total transaction throughput that may be measured, for example, by a performance gauge (not shown here), which gauge should be like a speedometer showing millions of transactions per second (MTPS). If a node is taken off line by a user, or connections are shut off, clients on that node are moved to other nodes to keep the system load the same. Users can mouse over a node such as, for example, node 1509 and see a panel with details, allowing a user or tester to shut down a node or turn it back on. The same approach may be applied for clients 1505 and links 1502c.

[071] Further, while looking at details of a node, such as node 1509, a user can click a login information link and open a new window 1506 to see what is happening in detail inside the node, for example on the blockchain 1507a-n. An analogous approach for clients 1505 would result in multiple additional terminal windows.

[072] Fig. 16 shows an exemplary testing system 1600, according to one aspect of the system and method disclosed herein. System 1600, in this case, encompasses a single local token area 1601, using, in this example, Euro tokens 1604. Further, system 1600 is based on pre-

generated accounts (wallets) W1 1602 and W2 1603, and is has a set of pre-generated transactions (not shown) to operate on. According to the article “Cryptocurrency Wallet Guide: A Step-By-Step Tutorial,” at <https://blockgeeks.com/guides/cryptocurrency-wallet-guide/>, “A cryptocurrency wallet is a software program that stores private and public keys

5 and interacts with various blockchain to enable users to send and receive digital currency and monitor their balance. If you want to use Bitcoin or any other cryptocurrency, you will need to have a digital wallet.”

[073] For the infrastructure and pre-generated datasets, there would be, for example, five nodes, at a minimum, in a private Ethereum-based network in the AWS cloud. Pre-generated and re-usable datasets could comprise 10,000 accounts (wallets), where each wallet holds a random number of tokens between 10 and 1000. In a simplified view such as Fig. 16, for example, several wallets such as, for example, exemplary wallets W1 1602 and W2 1603 are shown in a region 1601 that contains EUR type tokens 1604. The proof of scope concept border 1601 is limited to that area, and would, in this example, not include Global tokens 1605, USD tokens 1606 or other instrument tokens such as VISA or MC tokens 1607, etc. Wallet A (for example W1) could have N tokens. For each set of 1,000,000 transactions, the system would transfer N tokens from wallet A (W1) to wallet B W2 or similar via arrow 1608, but not amongst different token areas initially.

[074] In the implementation phases, the goal for each phase is to measure performance.

20 Performance may be defined as N transactions/seconds (TPS), with the TPS stable after M seconds.

[075] In phase one of building such a system, a minimum five-node Ethereum network is established on AWS. Then datasets are pregenerated in a database, such as, for example, Mongo database. Programs to generate accounts and wallets with tokens in Ethereum and to pre-load transactions in Ethereum queues without executing them are created. Transaction in out-of-box Ethereum are executed, and performance is measured. The test run may be stopped after the TPS becomes stable. Then the test run and measurements are repeated using a 15-node Ethereum network.

[076] In phase two, users would decrease the Ethereum block time to six seconds, run

30 transactions, and measure performance. Testing would be repeated, decreasing the Ethereum

block time further, running transactions, and measuring performance, until the minimum viable block time is established.

[077] It is expected that Phase 1 and 2 should be completed in 2 weeks from start.

[078] Phase three runs in parallel to phases one and two. In phase three, the crypto puzzle is replaced with alternative puzzles such as a trust puzzle that is much simpler and faster, enabling the TPS to increase dramatically. Transactions are run in iterations, and performance is measured.

[079] Phase four requires additional implementation of demarcated blockchains. Again, this phase runs in parallel to phases one and two. Transactions are run in iterations, and performance is measured.

[080] Phase five comprises establishment of shared blockchains. Again, this phase runs in parallel to phases one, two, and three. Transactions are run in iterations, and performance is measured.

[081] Fig. 17 shows a simplified version of an exemplary typical in-country network 1700, according to one aspect of the system and method known to inventors. Network 1700 includes in-country (or regional) private blockchain network 1709, which is connected to multiple banks 1701a-n. Network 1709 may, in some cases, be a virtual network. It also shows an exemplary national bank (NB) 1712 (or regional lead bank), at least one (in some cases more) auditor company or institution (ACI) 1715, and a preferred system provider (PSP) 1705. In some cases, the owner of the master key can give different auditors different rights, such as limited-read only rights, limited sections, limited scope or time audits, etc. In the example shown in Fig. 17, each bank has at least one primary server 1702a-n. Similarly, PSP 1705 has server 1706, NB 1712 has server 1713, and ACI 1715 has server 1716. All these servers are connected to private blockchain network 1709. Gateways, such as 1717, 1714, and 1704a-n, connect to public Internet 1710, as does gateway 1707, which enables the general public to interact with the banks and auditor ACI. Not shown in detail are all the internal firewalls, backups, and additional servers that typically exist. Also, often a bank may have facilities in multiple locations, and in larger countries or regions banks may have multiple servers in different areas connected in separate locations to the network for redundancy (also not shown for simplicity). In some cases, the NB may not want initially to start to become

active in the currency system, so the PSP may initially hold the master key for security of the network. In other cases, for legal reasons, the ACI may hold this key, as a legal, local entity. Once the NB feels comfortable taking on a leading role, it can request or legally demand the master key and house it on their servers henceforth. Additionally, upper network 1711 is for international transactions. It has separate gateways 1703a-n in each bank, as well as gateway 1708 for preferred provider 1705. In this example, national bank 1712 and auditor 1715 do not have a connection to upper network 1711, since they don't engage in international transactions on network 1711 for the upper level token. In other cases, they may participate as well.

[082] Fig. 18 shows an exemplary network 1800, according to one aspect of the system and method disclosed herein. In addition to the national and international networks shown in Fig. 17, described above, an exemplary classic network is present, comprising clouds 1801a-n, such as existing IBAN, ACH, SWIFT, and other existing international transfer networks for interbank transfers, both national and international, typically so called real time gross settlement (RTGS) networks. These RTGS networks can be integrated into such a system, so they can complement the money flow.

[083] Further, digital (token) wallets for this multi-bank retail blockchain (not shown) can enable, via API, integration of existing banking apps and wallet apps, so a user can operate all his accounts and transactions from one location.

[084] Fig. 19 shows an exemplary system 1900 connecting banks, customers, and clearing houses, according to one aspect of the system and method disclosed herein. Banks 1901a through 1901n are connected to a Real Time Gross Settlement (RTGS) network 1910 that is connected, in this example, to central bank 1911 but other RTGS systems may also exist and may be connected to those and other banks. Central bank 1911 may have attached nostro/vostro accounts 1912a-n. Each bank may have a connection to blockchain 1906, to which may be attached to customer handsets 1904a through 1904n via connections 1903a through 1903n. Further, each handset may contain software 1905aa-n through 1905na-n. In this example, this software includes an operating system, other applications, and the application to operate the bank account on the blockchain, for the purpose of making transfers and other money-management operations.

[085] As money is moved among various different banks on the blockchain, typically by users transacting on the above-mentioned handsets acting as mobile wallets, money between the FIAT pools 1902a through 1902n needs to be moved between banks periodically to reflect the motion of tokens on the blockchain, either because the difference between tokens and FIAT between banks has grown too large, during or at the end of the day. Such moves are typically done through the RTGS network 1910. However, currently in the United States, the federal reserve shuts down such activities at night, during the weekend, and on holidays. In many other countries RTGS systems shut down in similar manner as in the United States. Thus, during such periods of enforced inactivity, a large imbalance may occur, and there is even the theoretical possibility of a bank becoming illiquid because more money has gone out than the bank owns. As an alternative solution, central bank 1911 may keep an account, such as account 1913, open at all times, 24/7/365, as well as operate at least part of RTGS 1910 accordingly. Or, if the bank is unwilling to operate around the clock, the central bank may hold the FIAT money in accounts such as account 1913, during hours of inactivity, and update the FIAT pools correctly at the next instance of activity based on the status reported from blockchain. Alternatively, at least one clearing house, such as clearing house 1921 (only one shown), may keep a special account, such as account 1222 (only one shown), open during the hours when banks are not open, that is, nights, weekends, holidays, or as a normal transaction vehicle for FIAT transactions among banks. In that case, banks would transfer, for example, all their balances every 10 or 15 minutes, or even every 5 minutes, depending on their volume, frequency of transactions, imbalances, and other triggers as desired or required, into or from the clearing house. Thus the clearing house plays the role of a trusted third party, similar to the central bank, as the clearing house has relationships with most, if not all, banks, and is a trusted, licensed player in the banking system. A clearing house can take over this role easily, and most clearing houses today operate 24/7/365, because they have this transaction capability for the stock exchanges. Hence, they can offer, for a small fee, to do FIAT transactions for the banks. These transactions can be done in a single account or they could be done as subaccounts for each bank, in which case the clearing could happen locally. Thus the balances could be always reflected correctly, 24/7, and FIAT balances could be operated correctly, no matter whether the central bank is available or not. In places where there is no central bank and no clearing houses, a third party could be used to provide

clearing bank services. In some cases, these FIAT transaction could be operated over the blockchain network rather than over the regular RTGS network.

[086] In some cases, banks linked in a private network, which in some cases may be a virtual private network, may participate in transactions made on behalf of their retail customers on a retail-oriented blockchain. In addition, a supervisory bank or agency may participate in this private network, so that in certain cases this supervisory party may exert its supervisory power under a contractual agreement. These banks may also participate in a second private network for blockchain transactions, which network may be used for interbank and international transactions. Furthermore, a preferred Internet provider may be connected to the banks' private network. This provider may hold the master security certificate for operating the private network, or it may transfer the master security certificate to the supervisory bank or agency, thus making the recipient of the master certificate the future provider of the master security certificate. In other cases, a non-transacting auditor may also connected to the private network. The holder of the master key may be located in the private network, linked with its own computing device on the blockchain, enabling auditors to have various levels of access rights, including but not limited to section-limited, read-only limited, time- or time-period limited, etc. access to the blockchain via certificate and network access for audit and review purposes under a contractual agreement.

[087] In a system where payments are done using tokens representing a currency, these tokens may be transacted on a blockchain and sometimes moved among banks, possibly resulting in an imbalance of bank FIAT accounts. In such cases, from time to time one or more banks may require a transfer on an RTGS system to correct a such an imbalance. In those cases where said RTGS system is not available during hours of non-operation, banks may move the RTGS transfer to a clearing house that is operational non-stop without any breaks, thus enabling settlements at any time of any day of the year. In some cases, to avoid complicated transfers of operations, such operations may always run via a clearing house. Further, the transfers to the clearing house are operated using the block chain network, to avoid any limitation of the RTGS time of operation. Additionally, should a particular bank's available balance on its FIAT account drop below a preset threshold, either the central bank or another pre-agreed partner will automatically launch an infusion of additional FIAT funds into the bank's account to maintain sufficient liquidity. Alternatively, rather than depending

on a preset threshold, an AI system may be used to calculate the level upon which such an infusion is made, and also to calculate the required size of the infusion to stabilize the bank. In all such cases, one or more persons or institutions are notified at or shortly before such an event.

5 [088] In various aspects, functionality for implementing systems or methods of various aspects may be distributed among any number of client and/or server components. For example, various software modules may be implemented for performing various functions in connection with the system of any particular aspect, and such modules may be variously implemented to run on server and/or client components.

10 [089] Referring generally to Fig. 20, in which an enhanced system and method of conducting international trading transactions is shown, and comparing to the example described in the Background section, a new example analogous to example 1 will illustrate the benefits of a novel aspect. In this case, the issue is trading spot US\$ and Liqueeq Global tokens (LG; note this is exemplary, and other crypto tokens could be traded according to the
15 aspect) to euros (€), as a spread with only 1 bid/ask:

1---Trader A sells US\$ and buys L-US\$ 1to1 no bid/ask crossed

2&3---Trader A Sells L-US\$ & buys LG and as part of the same trade with the same counterparty sells LG and buys L-euro (L€), all as one spread trade.

[090] In the example, The LGs either net out as they trade, or they act as a hedge of the L
20 currencies at the same price for the buy and sell. Any “know your customer” (KYC) or other regulatory certificates are added as necessary into the transaction.

[091] In those cases where there are regulatory issues with the LGs needing to be actually transferred rather than netted, traders would need to inventory a small amount of LG to facilitate these spread trades.

25 [092] In this system for transacting multiple payment tokens on a blockchain, it has at least one processor, but typically many more, often in the cloud, or in different location for redundancy and security. Application software running on that system (meaning on at least one of the processors) allows one to perform the steps of a transaction consisting of listing a first trader buying an intermediary token with a first currency with the intent to buy a second
30 currency, finding at least one second trader willing to sell a matching amount of said second

currency sought by first trader against said intermediary token, and once a price has been agreed upon, a transaction is closed. Further, in some cases, the step of the intermediary token is explicit. Furthermore, in other cases the step of the intermediary token is eliminated after the regulatory needs have been met. In yet other cases after the transaction closes the intermediary token is immediately re-used in a new transaction thereafter.

Hardware Architecture

[093] Generally, the techniques disclosed herein may be implemented on hardware or a combination of software and hardware. For example, they may be implemented in an operating system kernel, in a separate user process, in a library package bound into network applications, on a specially constructed machine, on an application-specific integrated circuit (ASIC), or on a network interface card.

[094] Software/hardware hybrid implementations of at least some of the aspects disclosed herein may be implemented on a programmable network-resident machine (which should be understood to include intermittently connected network-aware machines) selectively activated or reconfigured by a computer program stored in memory. Such network devices may have multiple network interfaces that may be configured or designed to utilize different types of network communication protocols. A general architecture for some of these machines may be described herein in order to illustrate one or more exemplary means by which a given unit of functionality may be implemented. According to specific aspects, at least some of the features or functionalities of the various aspects disclosed herein may be implemented on one or more general-purpose computers associated with one or more networks, such as for example an end-user computer system, a client computer, a network server or other server system, a mobile computing device (e.g., tablet computing device, mobile phone, smartphone, laptop, or other appropriate computing device), a consumer electronic device, a music player, or any other suitable electronic device, router, switch, or other suitable device, or any combination thereof. In at least some aspects, at least some of the features or functionalities of the various aspects disclosed herein may be implemented in one or more virtualized computing environments (e.g., network computing clouds, virtual machines hosted on one or more physical computing machines, or other appropriate virtual environments).

[095] Referring now to Fig. 11, there is shown a block diagram depicting an exemplary computing device 10 suitable for implementing at least a portion of the features or functionalities disclosed herein. Computing device 10 may be, for example, any one of the computing machines listed in the previous paragraph, or indeed any other electronic device capable of executing software- or hardware-based instructions according to one or more programs stored in memory. Computing device 10 may be configured to communicate with a plurality of other computing devices, such as clients or servers, over communications networks such as a wide area network a metropolitan area network, a local area network, a wireless network, the Internet, or any other network, using known protocols for such communication, whether wireless or wired.

[096] In one aspect, computing device 10 includes one or more central processing units (CPU) 12, one or more interfaces 15, and one or more busses 14 (such as a peripheral component interconnect (PCI) bus). When acting under the control of appropriate software or firmware, CPU 12 may be responsible for implementing specific functions associated with the functions of a specifically configured computing device or machine. For example, in at least one aspect, a computing device 10 may be configured or designed to function as a server system utilizing CPU 12, local memory 11 and/or remote memory 16, and interface(s) 15. In at least one aspect, CPU 12 may be caused to perform one or more of the different types of functions and/or operations under the control of software modules or components, which for example, may include an operating system and any appropriate applications software, drivers, and the like.

[097] CPU 12 may include one or more processors 13 such as, for example, a processor from one of the Intel, ARM, Qualcomm, and AMD families of microprocessors. In some aspects, processors 13 may include specially designed hardware such as application-specific integrated circuits (ASICs), electrically erasable programmable read-only memories (EEPROMs), field-programmable gate arrays (FPGAs), and so forth, for controlling operations of computing device 10. In a particular aspect, a local memory 11 (such as non-volatile random access memory (RAM) and/or read-only memory (ROM), including for example one or more levels of cached memory) may also form part of CPU 12. However, there are many different ways in which memory may be coupled to system 10. Memory 11 may be used for a variety of purposes such as, for example, caching and/or storing data,

programming instructions, and the like. It should be further appreciated that CPU 12 may be one of a variety of system-on-a-chip (SOC) type hardware that may include additional hardware such as memory or graphics processing chips, such as a QUALCOMM SNAPDRAGON™ or SAMSUNG EXYNOS™ CPU as are becoming increasingly common in the art, such as for use in mobile devices or integrated devices.

[098] As used herein, the term “processor” is not limited merely to those integrated circuits referred to in the art as a processor, a mobile processor, or a microprocessor, but broadly refers to a microcontroller, a microcomputer, a programmable logic controller, an application-specific integrated circuit, and any other programmable circuit.

[099] In one aspect, interfaces 15 are provided as network interface cards (NICs). Generally, NICs control the sending and receiving of data packets over a computer network; other types of interfaces 15 may for example support other peripherals used with computing device 10. Among the interfaces that may be provided are Ethernet interfaces, frame relay interfaces, cable interfaces, DSL interfaces, token ring interfaces, graphics interfaces, and the like. In addition, various types of interfaces may be provided such as, for example, universal serial bus (USB), Serial, Ethernet, FIREWIRE™, THUNDERBOLT™, PCI, parallel, radio frequency (RF), BLUETOOTH™, near-field communications (e.g., using near-field magnetics), 802.11 (WiFi), frame relay, TCP/IP, ISDN, fast Ethernet interfaces, Gigabit Ethernet interfaces, Serial ATA (SATA) or external SATA (ESATA) interfaces, high-definition multimedia interface (HDMI), digital visual interface (DVI), analog or digital audio interfaces, asynchronous transfer mode (ATM) interfaces, high-speed serial interface (HSSI) interfaces, Point of Sale (POS) interfaces, fiber data distributed interfaces (FDDIs), and the like. Generally, such interfaces 15 may include physical ports appropriate for communication with appropriate media. In some cases, they may also include an independent processor (such as a dedicated audio or video processor, as is common in the art for high-fidelity A/V hardware interfaces) and, in some instances, volatile and/or non-volatile memory (e.g., RAM).

[100] Although the system shown in Fig. 11 illustrates one specific architecture for a computing device 10 for implementing one or more of the aspects described herein, it is by no means the only device architecture on which at least a portion of the features and techniques described herein may be implemented. For example, architectures having one or

any number of processors 13 may be used, and such processors 13 may be present in a single device or distributed among any number of devices. In one aspect, a single processor 13 handles communications as well as routing computations, while in other aspects a separate dedicated communications processor may be provided. In various aspects, different types of features or functionalities may be implemented in a system according to the aspect that includes a client device (such as a tablet device or smartphone running client software) and server systems (such as a server system described in more detail below).

[101] Regardless of network device configuration, the system of an aspect may employ one or more memories or memory modules (such as, for example, remote memory block 16 and local memory 11) configured to store data, program instructions for the general-purpose network operations, or other information relating to the functionality of the aspects described herein (or any combinations of the above). Program instructions may control execution of or comprise an operating system and/or one or more applications, for example. Memory 16 or memories 11, 16 may also be configured to store data structures, configuration data, encryption data, historical system operations information, or any other specific or generic non-program information described herein.

[102] Because such information and program instructions may be employed to implement one or more systems or methods described herein, at least some network device aspects may include nontransitory machine-readable storage media, which, for example, may be configured or designed to store program instructions, state information, and the like for performing various operations described herein. Examples of such nontransitory machine-readable storage media include, but are not limited to, magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD-ROM disks; magneto-optical media such as optical disks, and hardware devices that are specially configured to store and perform program instructions, such as read-only memory devices (ROM), flash memory (as is common in mobile devices and integrated systems), solid state drives (SSD) and “hybrid SSD” storage drives that may combine physical components of solid state and hard disk drives in a single hardware device (as are becoming increasingly common in the art with regard to personal computers), memristor memory, random access memory (RAM), and the like. It should be appreciated that such storage means may be integral and non-removable (such as RAM hardware modules that may be soldered onto a motherboard or otherwise

integrated into an electronic device), or they may be removable such as swappable flash memory modules (such as “thumb drives” or other removable media designed for rapidly exchanging physical storage devices), “hot-swappable” hard disk drives or solid state drives, removable optical storage discs, or other such removable media, and that such integral and removable storage media may be utilized interchangeably. Examples of program instructions include both object code, such as may be produced by a compiler, machine code, such as may be produced by an assembler or a linker, byte code, such as may be generated by for example a JAVA™ compiler and may be executed using a Java virtual machine or equivalent, or files containing higher level code that may be executed by the computer using an interpreter (for example, scripts written in Python, Perl, Ruby, Groovy, or any other scripting language).

[103] In some aspects, systems may be implemented on a standalone computing system. Referring now to Fig. 12, there is shown a block diagram depicting a typical exemplary architecture of one or more aspects or components thereof on a standalone computing system. Computing device 20 includes processors 21 that may run software that carry out one or more functions or applications of aspects, such as for example a client application 24. Processors 21 may carry out computing instructions under control of an operating system 22 such as, for example, a version of MICROSOFT WINDOWS™ operating system, APPLE macOS™ or iOS™ operating systems, some variety of the Linux operating system, ANDROID™ operating system, or the like. In many cases, one or more shared services 23 may be operable in system 20, and may be useful for providing common services to client applications 24. Services 23 may for example be WINDOWSTM services, user-space common services in a Linux environment, or any other type of common service architecture used with operating system 21. Input devices 28 may be of any type suitable for receiving user input, including for example a keyboard, touchscreen, microphone (for example, for voice input), mouse, touchpad, trackball, or any combination thereof. Output devices 27 may be of any type suitable for providing output to one or more users, whether remote or local to system 20, and may include for example one or more screens for visual output, speakers, printers, or any combination thereof. Memory 25 may be random-access memory having any structure and architecture known in the art, for use by processors 21, for example to run software. Storage devices 26 may be any magnetic, optical, mechanical, memristor, or electrical storage

device for storage of data in digital form (such as those described above, referring to Fig. 11). Examples of storage devices 26 include flash memory, magnetic hard drive, CD-ROM, and/or the like.

[104] In some aspects, systems may be implemented on a distributed computing network, such as one having any number of clients and/or servers. Referring now to Fig. 13, there is shown a block diagram depicting an exemplary architecture 30 for implementing at least a portion of a system according to one aspect on a distributed computing network. According to the aspect, any number of clients 33 may be provided. Each client 33 may run software for implementing client-side portions of a system; clients may comprise a system 20 such as that illustrated in Fig. 12. In addition, any number of servers 32 may be provided for handling requests received from one or more clients 33. Clients 33 and servers 32 may communicate with one another via one or more electronic networks 31, which may be in various aspects any of the Internet, a wide area network, a mobile telephony network (such as CDMA or GSM cellular networks), a wireless network (such as WiFi, WiMAX, LTE, and so forth), or a local area network (or indeed any network topology known in the art; the aspect does not prefer any one network topology over any other). Networks 31 may be implemented using any known network protocols, including for example wired and/or wireless protocols.

[105] In addition, in some aspects, servers 32 may call external services 37 when needed to obtain additional information, or to refer to additional data concerning a particular call. Communications with external services 37 may take place, for example, via one or more networks 31. In various aspects, external services 37 may comprise web-enabled services or functionality related to or installed on the hardware device itself. For example, in one aspect where client applications 24 are implemented on a smartphone or other electronic device, client applications 24 may obtain information stored in a server system 32 in the cloud or on an external service 37 deployed on one or more of a particular enterprise's or user's premises.

[106] In some aspects, clients 33 or servers 32 (or both) may make use of one or more specialized services or appliances that may be deployed locally or remotely across one or more networks 31. For example, one or more databases 34 may be used or referred to by one or more aspects. It should be understood by one having ordinary skill in the art that

databases 34 may be arranged in a wide variety of architectures and using a wide variety of data access and manipulation means. For example, in various aspects one or more databases 34 may comprise a relational database system using a structured query language (SQL), while others may comprise an alternative data storage technology such as those referred to in the art as “NoSQL” (for example, HADOOP CASSANDRA™, GOOGLE BIGTABLE™, and so forth). In some aspects, variant database architectures such as column-oriented databases, in-memory databases, clustered databases, distributed databases, or even flat file data repositories may be used according to the aspect. It will be appreciated by one having ordinary skill in the art that any combination of known or future database technologies may be used as appropriate, unless a specific database technology or a specific arrangement of components is specified for a particular aspect described herein. Moreover, it should be appreciated that the term “database” as used herein may refer to a physical database machine, a cluster of machines acting as a single database system, or a logical database within an overall database management system. Unless a specific meaning is specified for a given use of the term “database”, it should be construed to mean any of these senses of the word, all of which are understood as a plain meaning of the term “database” by those having ordinary skill in the art.

[107] Similarly, some aspects may make use of one or more security systems 36 and configuration systems 35. Security and configuration management are common information technology (IT) and web functions, and some amount of each are generally associated with any IT or web systems. It should be understood by one having ordinary skill in the art that any configuration or security subsystems known in the art now or in the future may be used in conjunction with aspects without limitation, unless a specific security 36 or configuration system 35 or approach is specifically required by the description of any specific aspect.

[108] Fig. 14 shows an exemplary overview of a computer system 40 as may be used in any of the various locations throughout the system. It is exemplary of any computer that may execute code to process data. Various modifications and changes may be made to computer system 40 without departing from the broader scope of the system and method disclosed herein. Central processor unit (CPU) 41 is connected to bus 42, to which bus is also connected memory 43, nonvolatile memory 44, display 47, input/output (I/O) unit 48, and network interface card (NIC) 53. I/O unit 48 may, typically, be connected to keyboard 49,

pointing device 50, hard disk 52, and real-time clock 51. NIC 53 connects to network 54, which may be the Internet or a local network, which local network may or may not have connections to the Internet. Also shown as part of system 40 is power supply unit 45 connected, in this example, to a main alternating current (AC) supply 46. Not shown are
5 batteries that could be present, and many other devices and modifications that are well known but are not applicable to the specific novel functions of the current system and method disclosed herein. It should be appreciated that some or all components illustrated may be combined, such as in various integrated applications, for example Qualcomm or Samsung system-on-a-chip (SOC) devices, or whenever it may be appropriate to combine
10 multiple capabilities or functions into a single hardware device (for instance, in mobile devices such as smartphones, video game consoles, in-vehicle computer systems such as navigation or multimedia systems in automobiles, or other integrated hardware devices).

[109] In some cases, countries may have export industries, often but not exclusively related to mineral commodities that overshadow the rest of the economy, and can created undesired
15 appreciation of the domestic currency. That makes it difficult to export other goods and services, as they are often not related to those commodities, but cannot be competitively priced due to the currency issues. By isolating the commodity business with a separate, internationally tradeable crypto coin or token, in some cases also mineable coin, the effect of the commodity on the rest of the economy can be minimized, as only a part of the profits
20 need to be re-patriated, where as the rest can be invested globally without affecting the local economy in a negative way.

[110] In some specific cases, an exporter country may create an additional currency as a weighted basket targeting its two or three primary export market countries' currencies as the main weight, such stabilizing the prize of its commodity for its customers, and maybe adding
25 the currency of a main supplier country or two for capital equipment for extraction or processing that export item as well.

[111] In some cases, a system may have a multitude of nodes, each of which is capable of processing and managing a demarcated and sharded, or subdivided, blockchain. Each node would be in constant communication with at least four more nodes with the same or similar
30 capabilities, one of which claims to be the lead node of the blockchain. Also, each node

could add transactions and confirm the lead's transactions on the current demarcation subblock or shard. In case of loss of connectivity to the lead node, one of the remaining nodes could immediately take over as new leadnode based on a CDMA/CD type protocol and be recognized by vote as the new lead by all remaining nodes. Further, after a certain
5 subblock size is reached, a new subblock is started. Likewise, after a certain shard size is reached, a new shard is started. At a later time, older sub-blocks or shards could be consolidated according to rules into complete blocks and closed off after a vote.

[112] In various aspects, functionality for implementing systems or methods of various aspects may be distributed among any number of client and/or server components. For
10 example, various software modules may be implemented for performing various functions in connection with the system of any particular aspect, and such modules may be variously implemented to run on server and/or client components.

[113] The skilled person will be aware of a range of possible modifications of the various aspects described above. Accordingly, the present invention is defined by the claims and
15 their equivalents.

What is claimed is:

1. A system for transacting multiple payment token on a blockchain, having at least one processor with memory, non-volatile storage for storing software including but not limited to operating system, applications, drivers etc., input/output devices, user interfaces,
5 communication and network devices of all types etc.; the application software allowing to perform the steps of a transaction consisting of listing a first trader buying an intermediary token with a first currency with the intent to buy a second currency, finding at least one second trader willing to sell a matching amount of said second currency sought by first trader against said intermediary token, and once a price has been agreed upon, a transaction is
10 closed.
2. As in claim 1, wherein the step of the intermediary token is explicit.
3. As in claim 1 wherein the step of the intermediary token is eliminated after the regulatory
15 needs have been met.
4. As in claim 1 and 2, wherein after the transaction closes the intermediary token in immediately re-used in a new transaction thereafter.
- 20 5. A system for handling cybercurrency transactions, comprising:
a cybercurrency transaction system comprising at least a processor, a memory, and a plurality of programming instructions stored in the memory and operating on the processor, wherein the programming instructions, when operating on the processor, cause the processor to:
25 process a payment using a token, wherein the token represents a currency, wherein the token is transacted using a blockchain; and
move a token from a first bank to a second bank, resulting in an imbalance of fiat accounts between said two banks, said two banks requiring a transfer on an RTGS system to balance said imbalance from time to time; however in those cases where said RTGS
30 system is not available during hours of non-operation, said banks move the RTGS transfer

to a clearing house that is operational non-stop without any breaks, thus enabling settlements at any time of any day of the year.

6. The system of claim 5, wherein to avoid complicated transfers of operations, said
5 operations are always running via a clearing house.
7. The system of claim 6, wherein the transfers to the clearing house are operated using the block chain network, to avoid any limitation of the RTGS time of operation.
- 10 8. The system of claim 7, wherein the central bank operates a reduced RTGS without interruptions.
9. The system of claim 7, wherein the central bank, after short interruptions, immediately reconciles the accounts and restarts operations.
- 15 10. The system of claim 9, wherein based on a preset threshold, should a particular bank's available balance on its FIAT account drop below said preset threshold, either the central bank or another pre-agreed partner will automatically launch an infusion of additional FIAT funds into said account to maintain sufficient liquidity.
- 20 11. The system of claim 10, wherein rather than a preset threshold, an AI system is used to calculate the level upon which such an infusion is made.
12. The system of claim 11, wherein said AI also calculates the required size of the infusion to
25 stabilize said bank.
13. The system of claim 12, wherein one or more persons or institutions are notified at or shortly before such an event.
- 30 14. A method for handling cybercurrency transactions, comprising the steps of:

processing a payment using a token, wherein the token represents a currency, wherein the token is transacted using a blockchain; and

- moving a token from a first bank to a second bank, resulting in an imbalance of fiat accounts between said two banks, said two banks requiring a transfer on an RTGS system to
- 5 balance said imbalance from time to time; however in those cases where said RTGS system is not available during hours of non-operation, said banks move the RTGS transfer to a clearing house that is operational non-stop without any breaks, thus enabling settlements at any time of any day of the year.

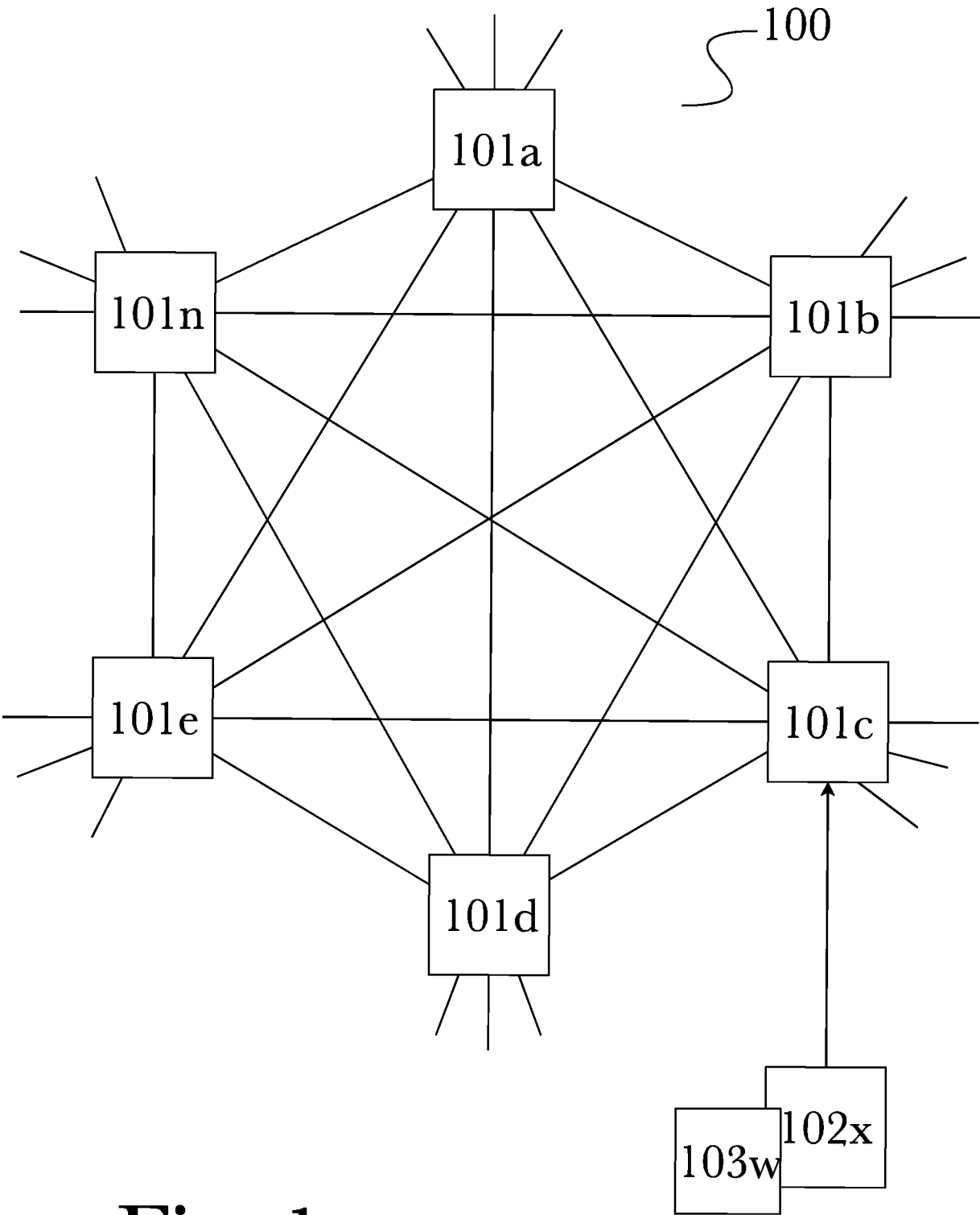


Fig. 1

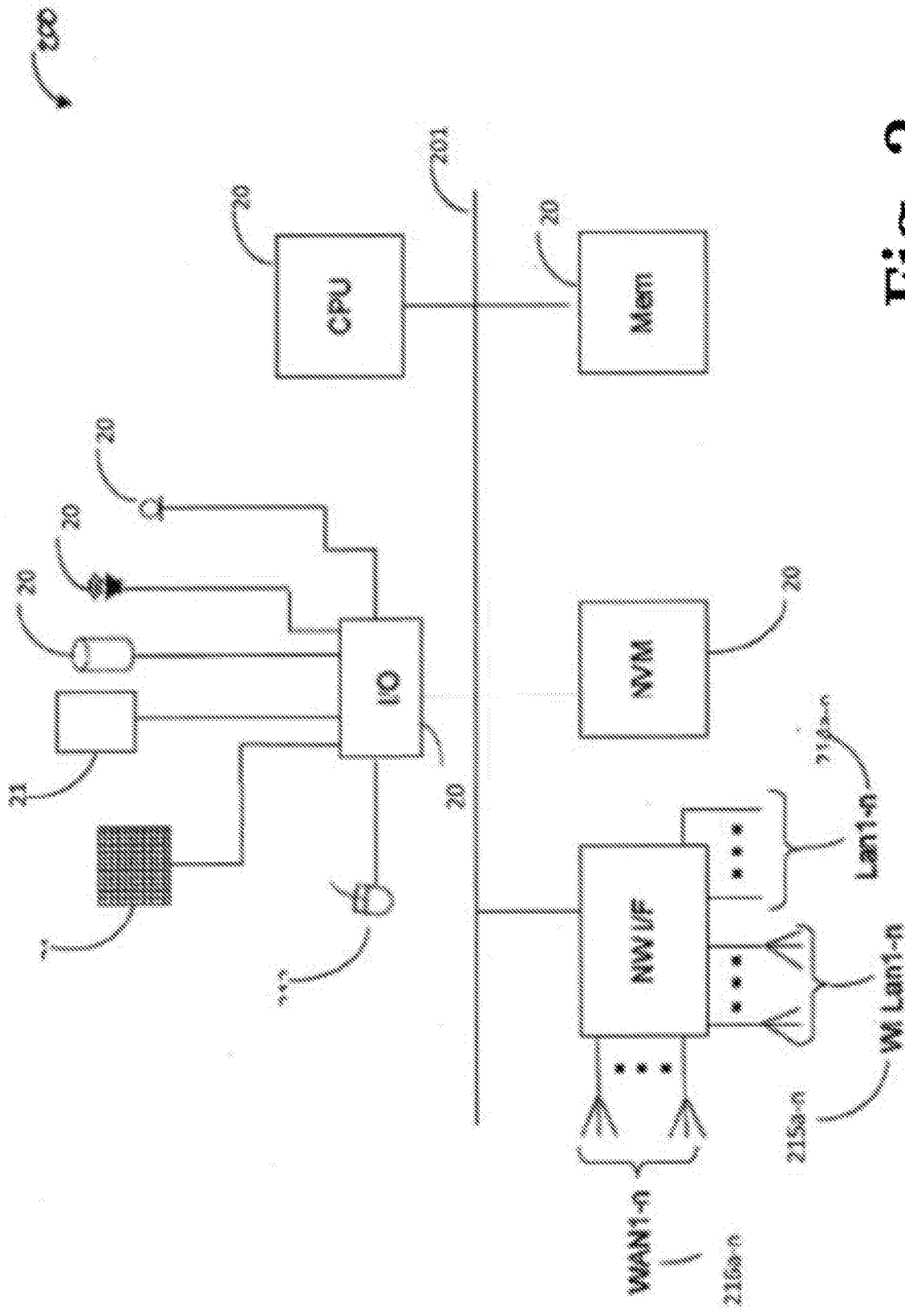


Fig. 2

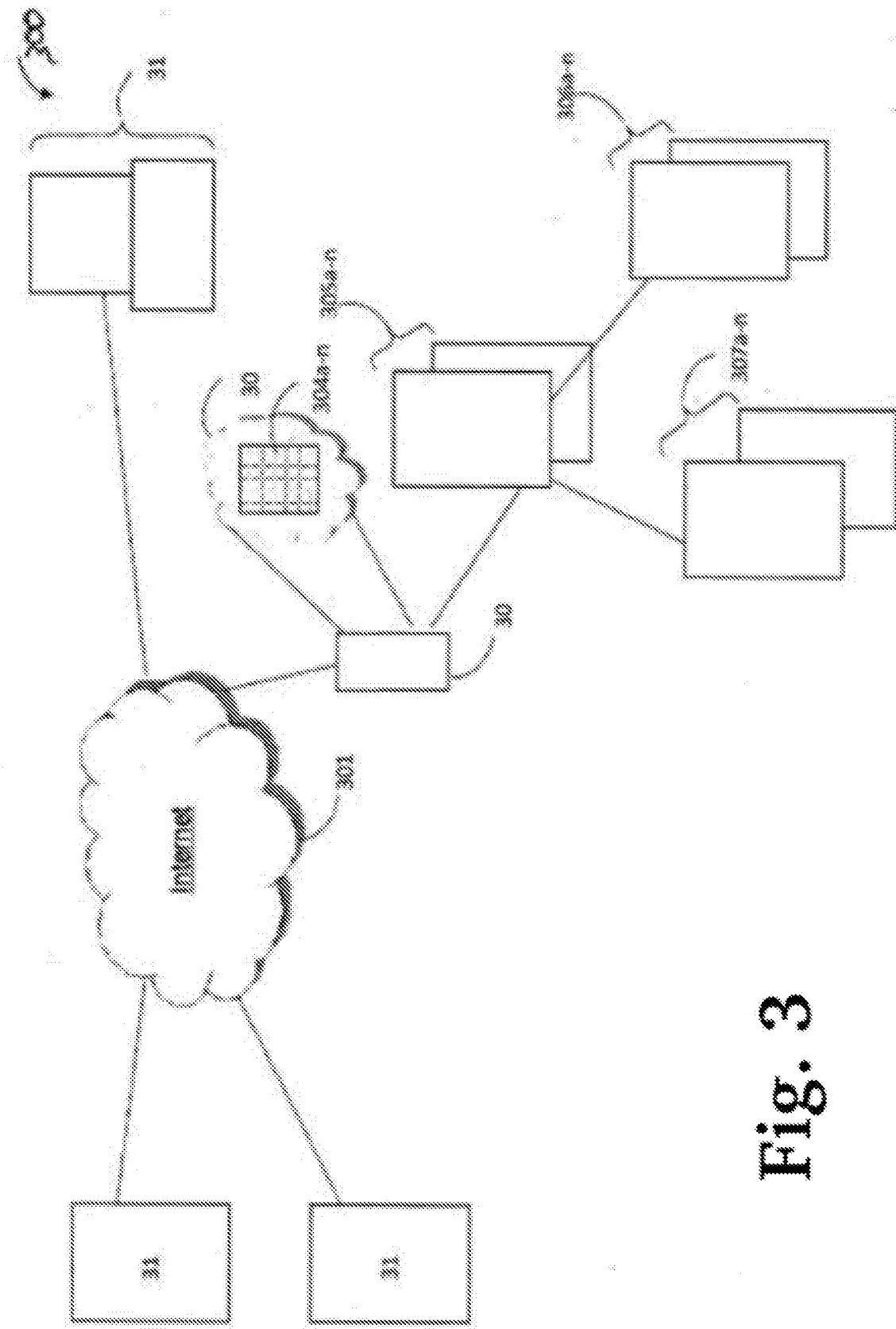


Fig. 3

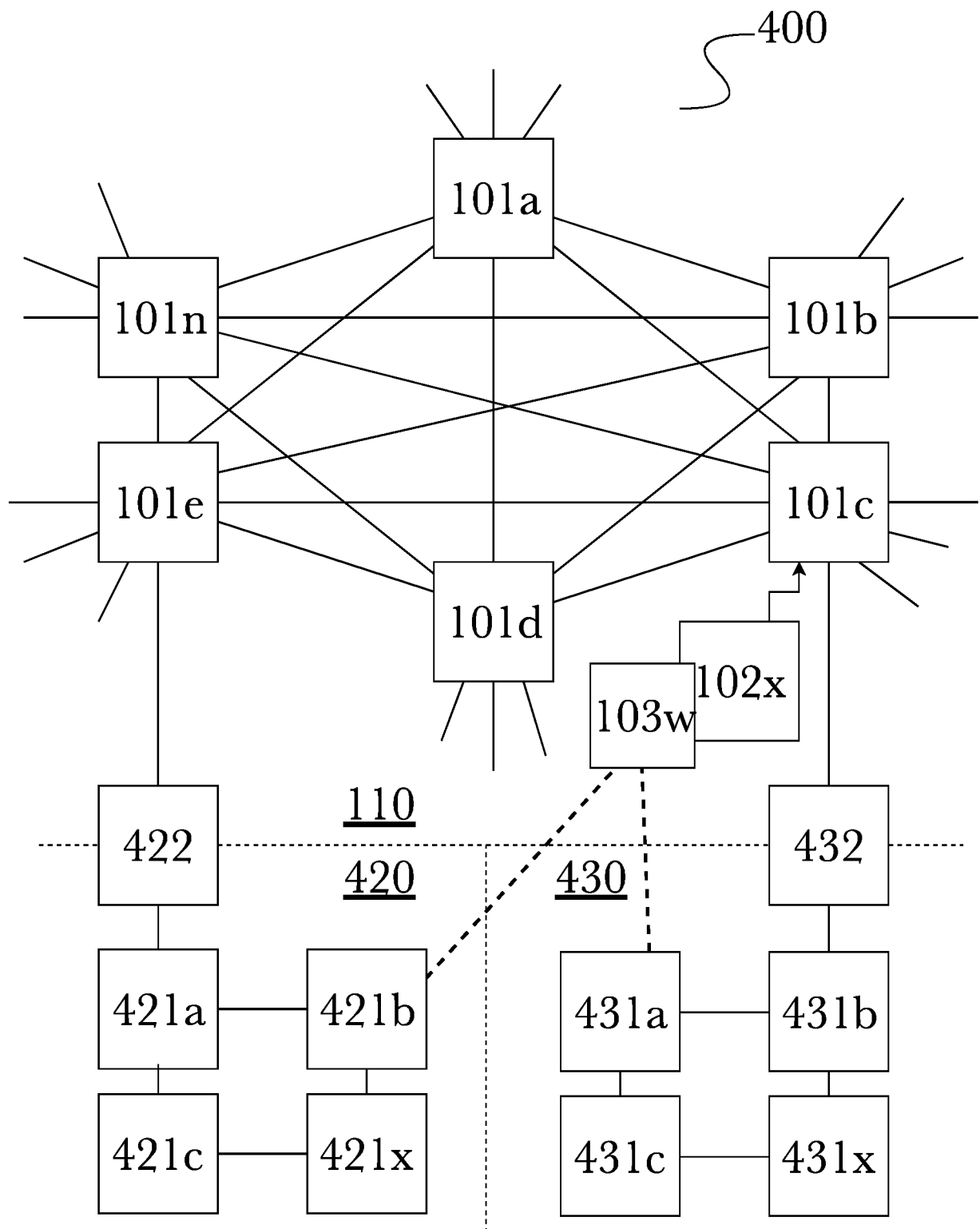


Fig. 4

DBS (Section closing, for example Year End Closing)

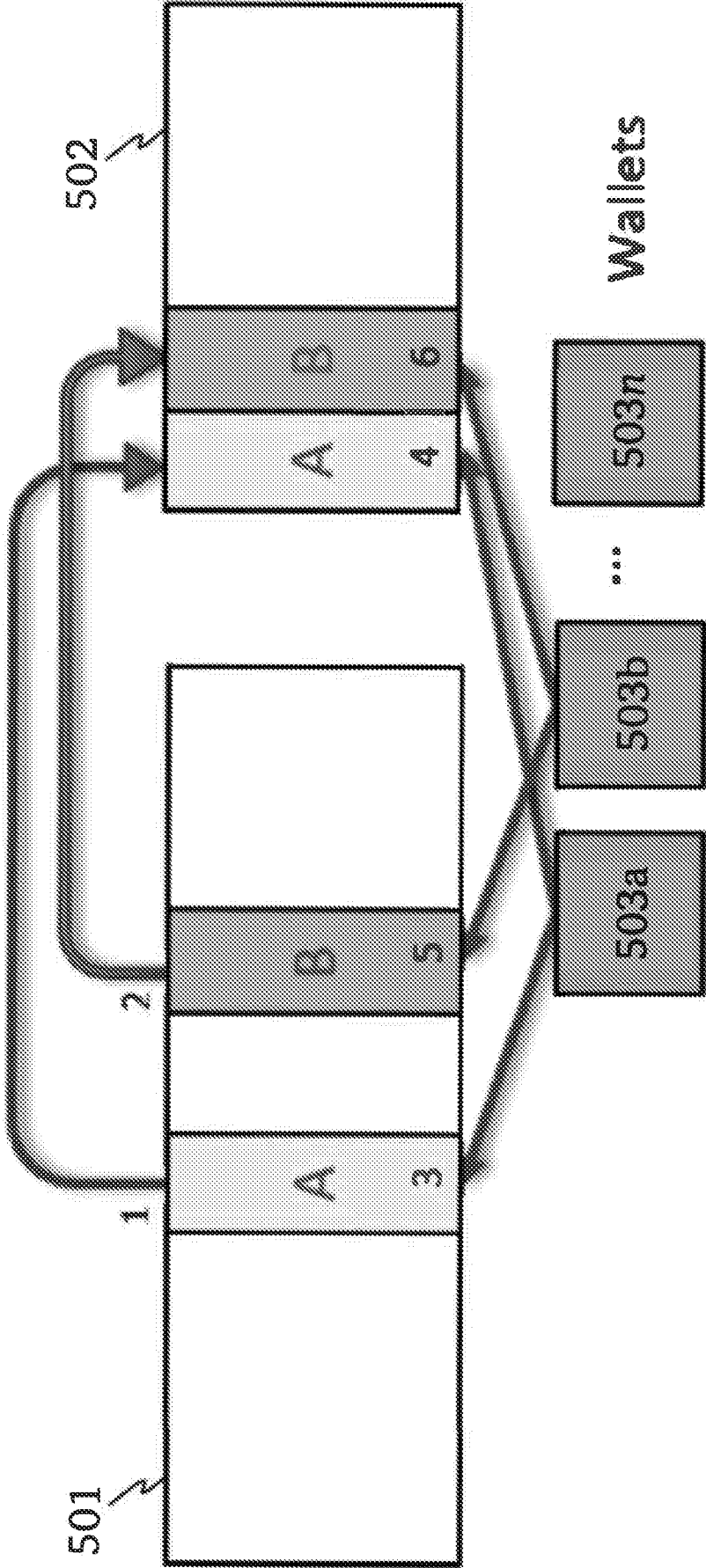


Fig. 5

DBS1 (Asynchronous Closing)

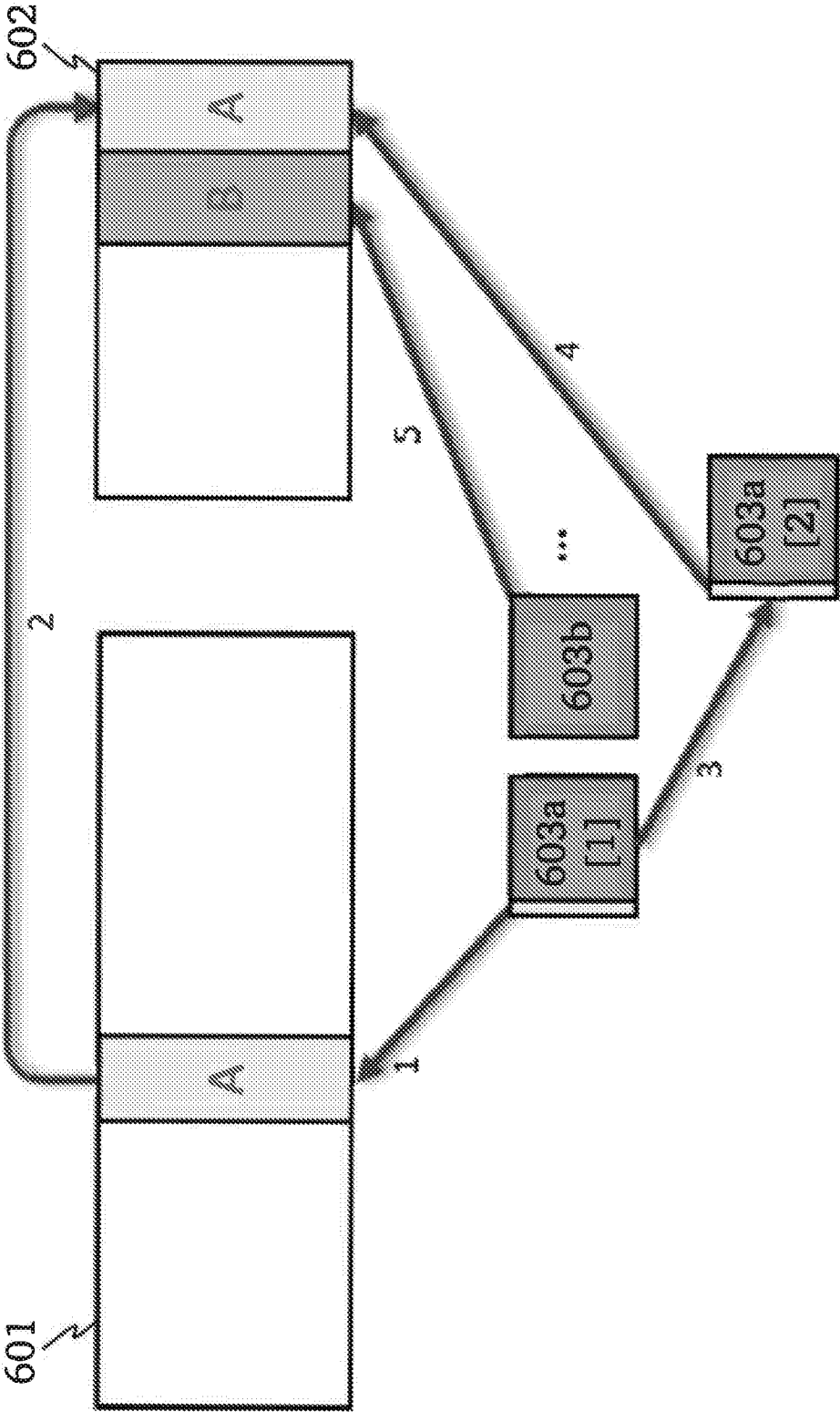


Fig. 6

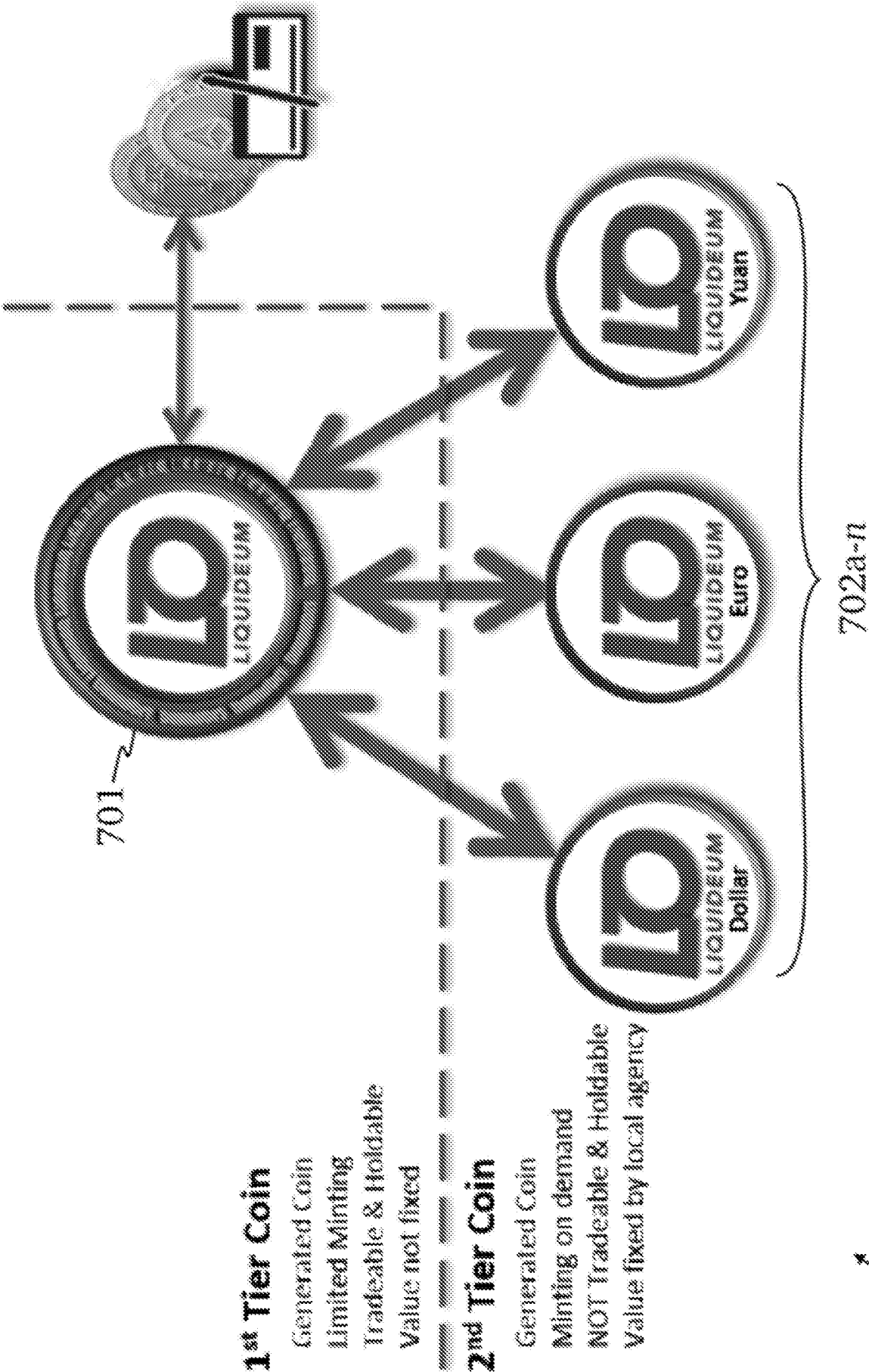


Fig. 7

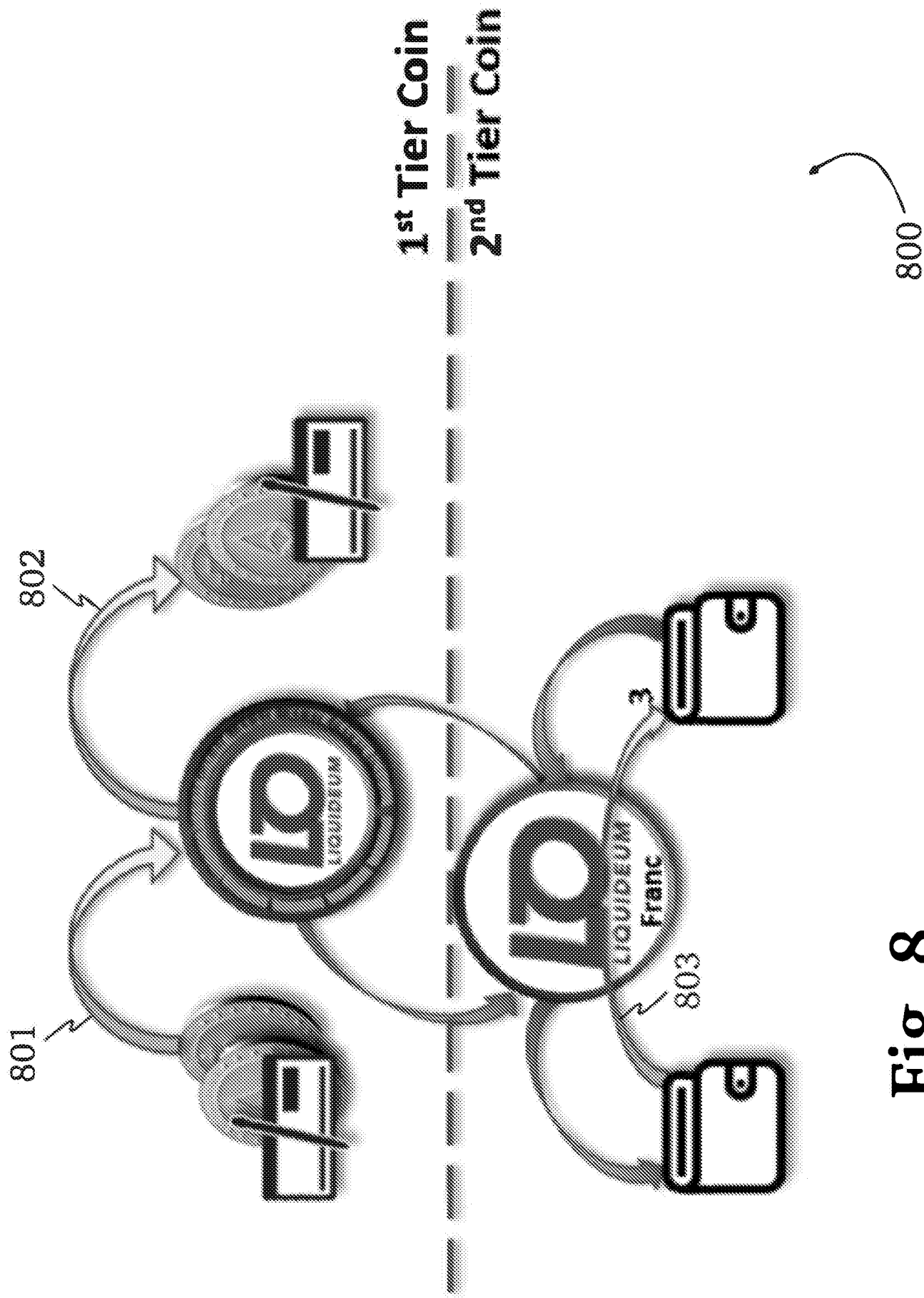


Fig. 8

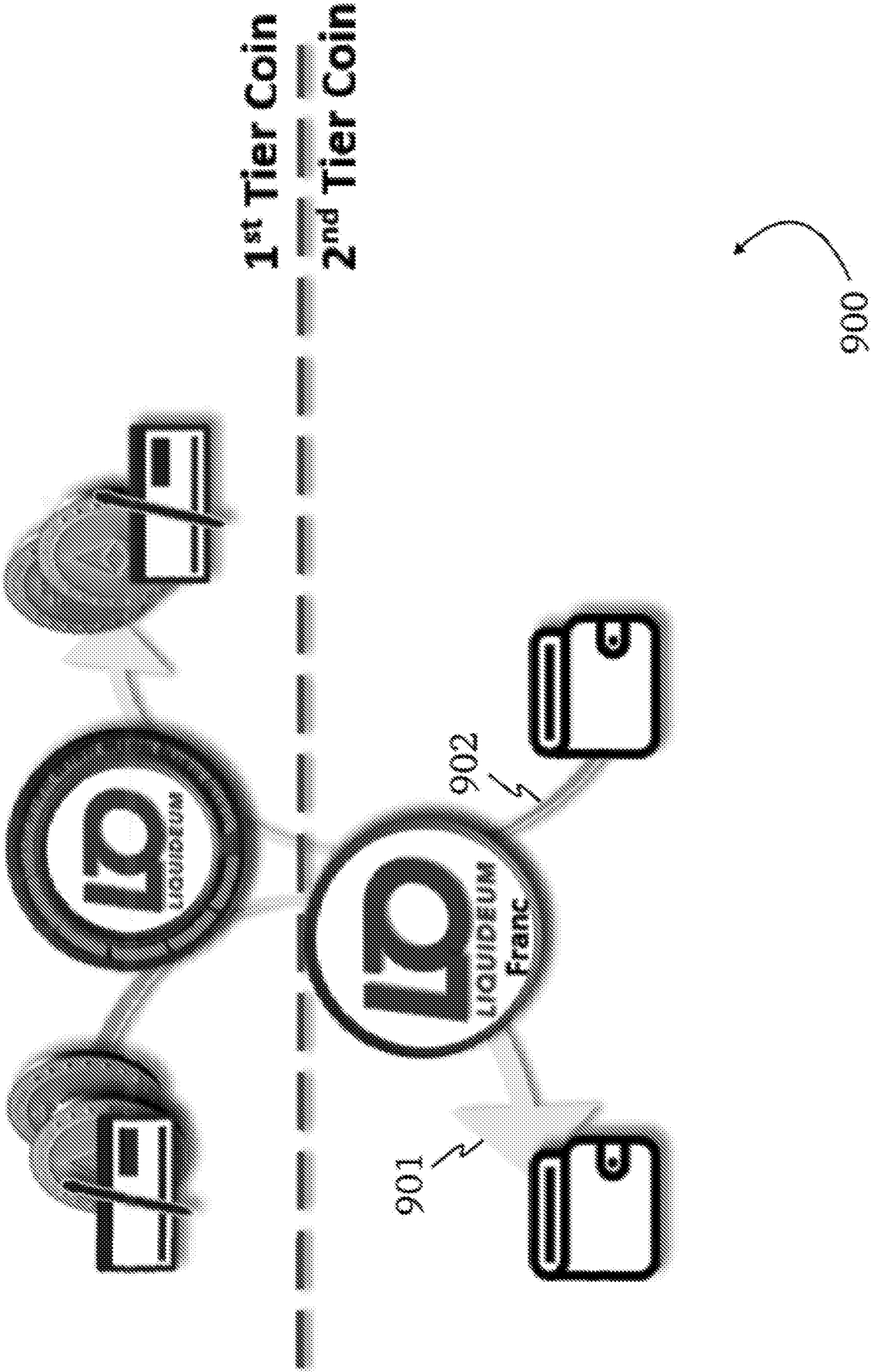


Fig. 9

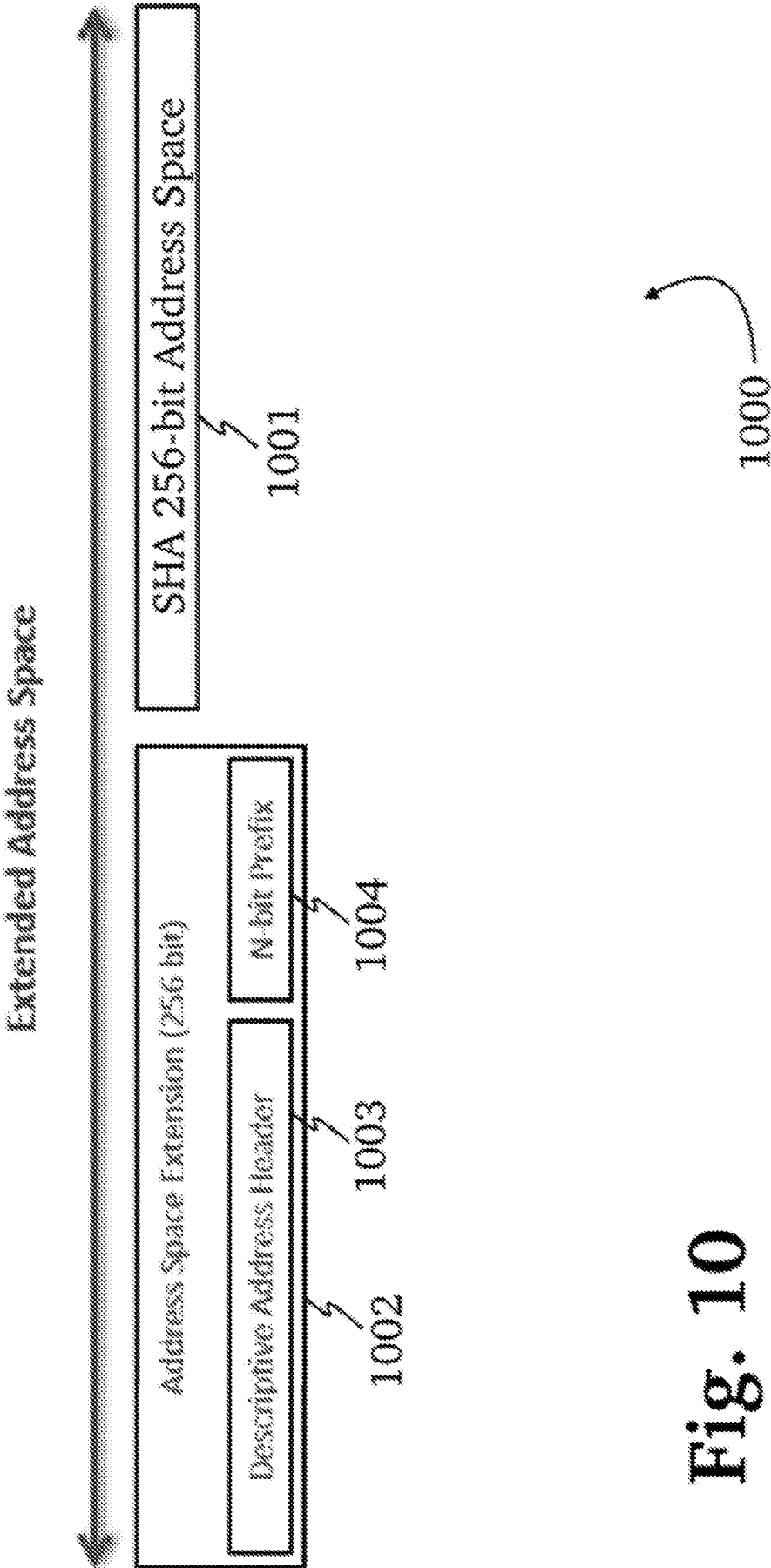


Fig. 10

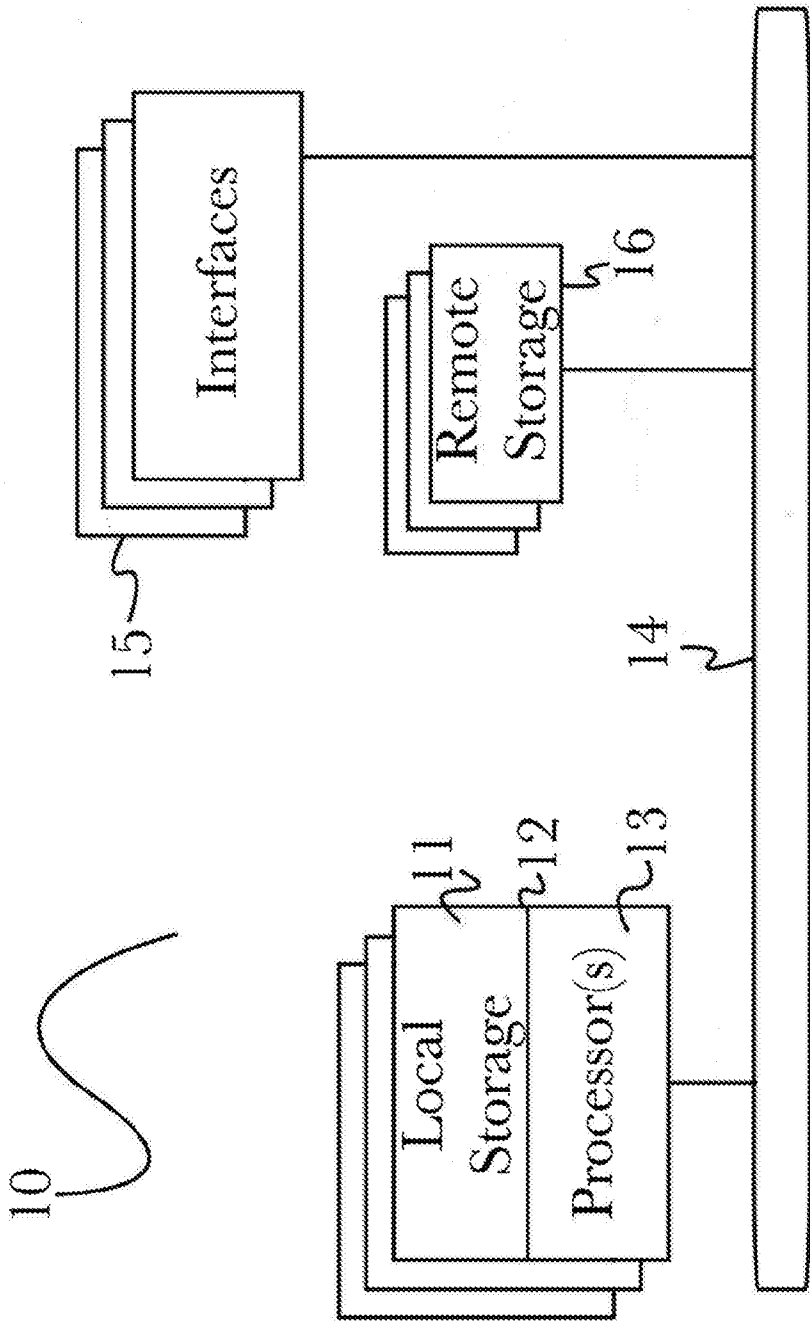


Fig. 11

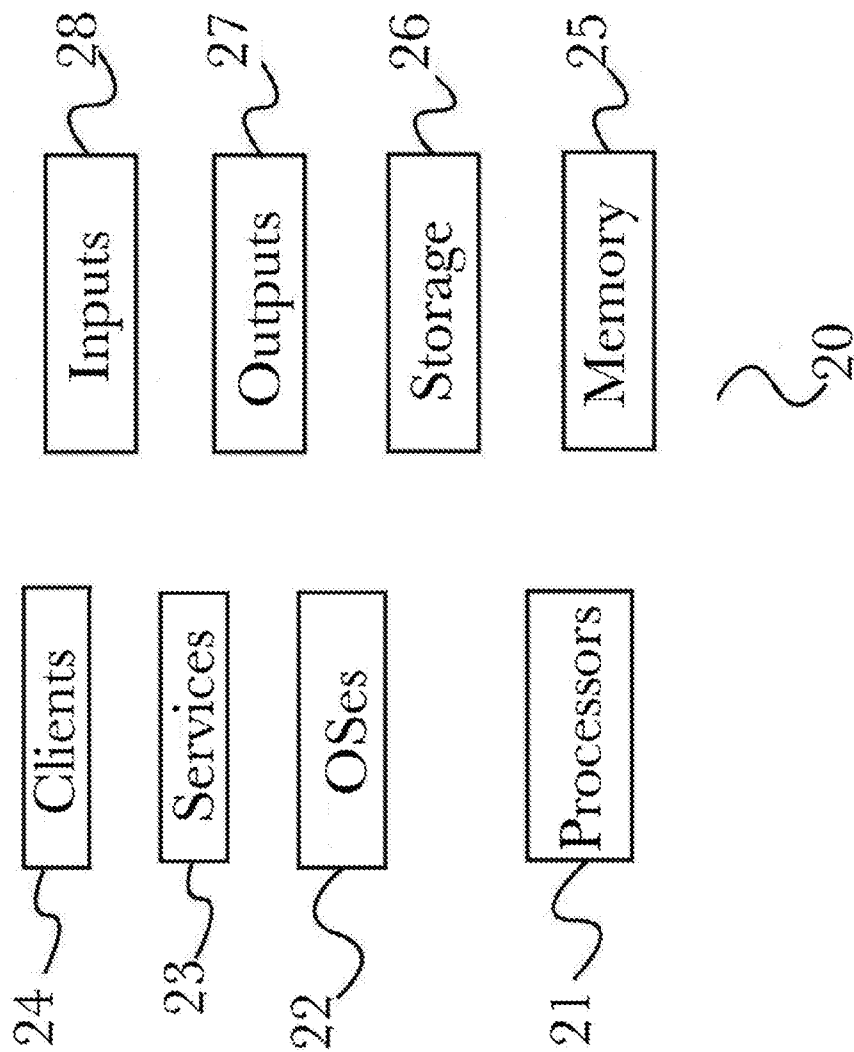


Fig. 12

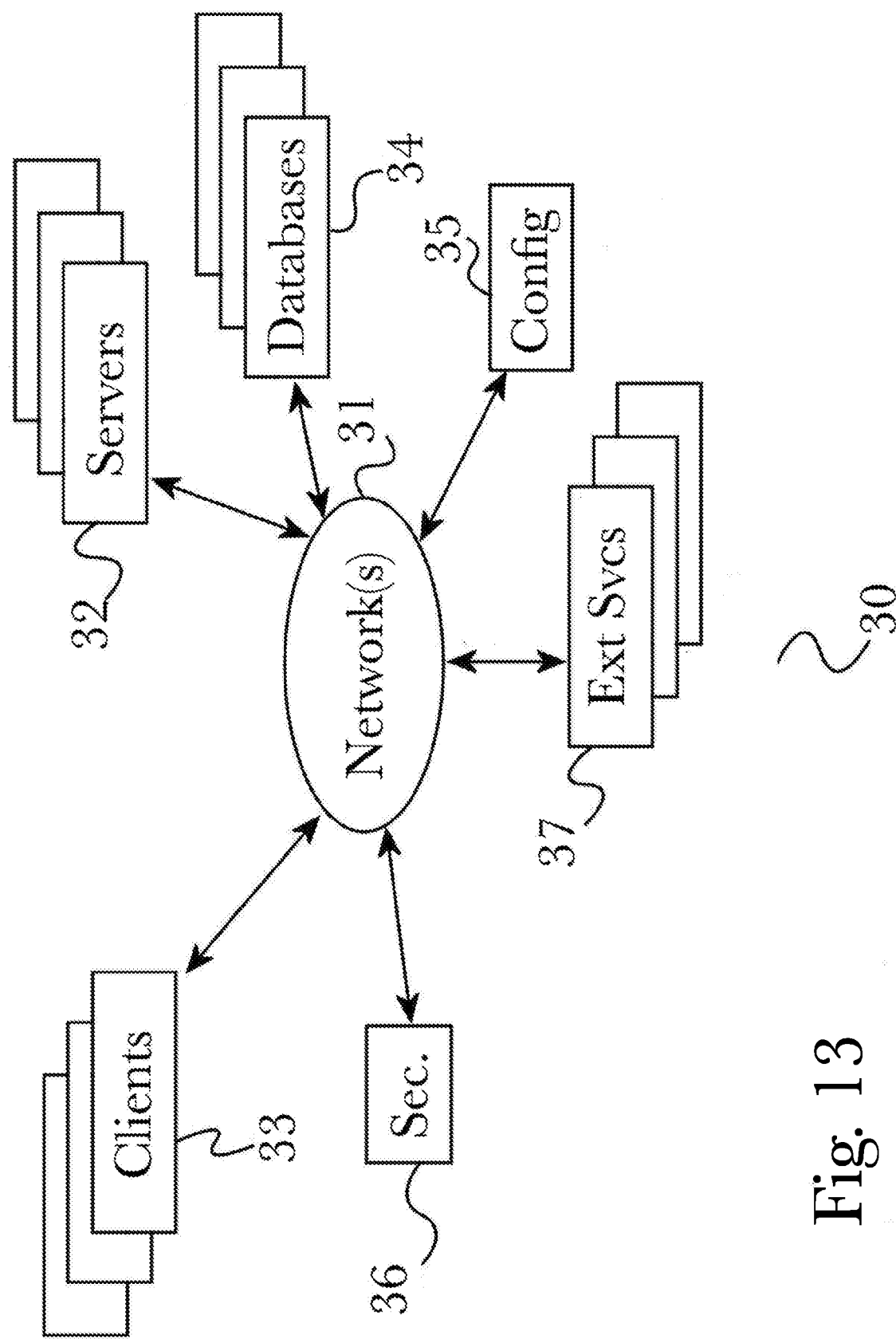


Fig. 13

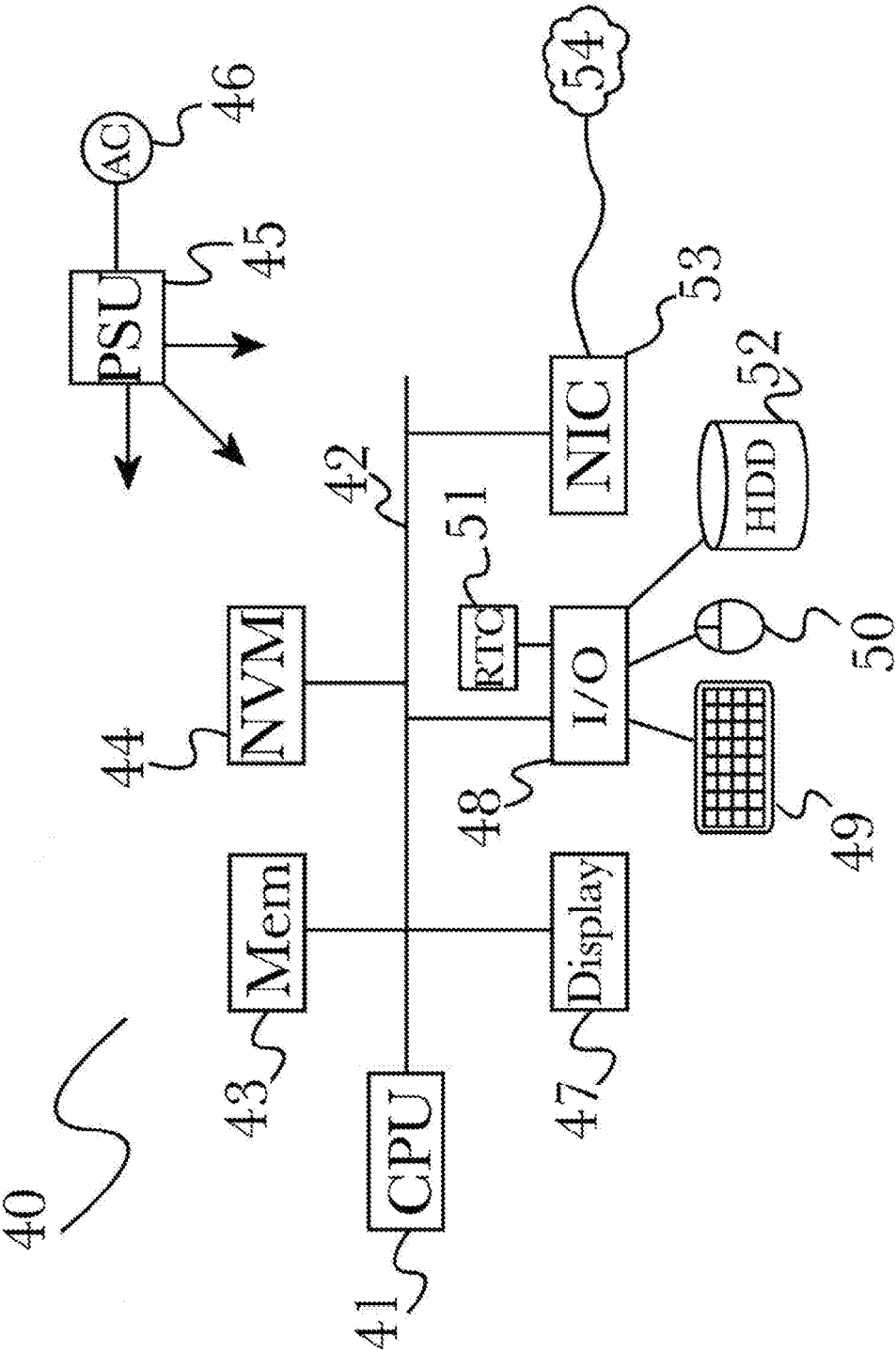


Fig. 14

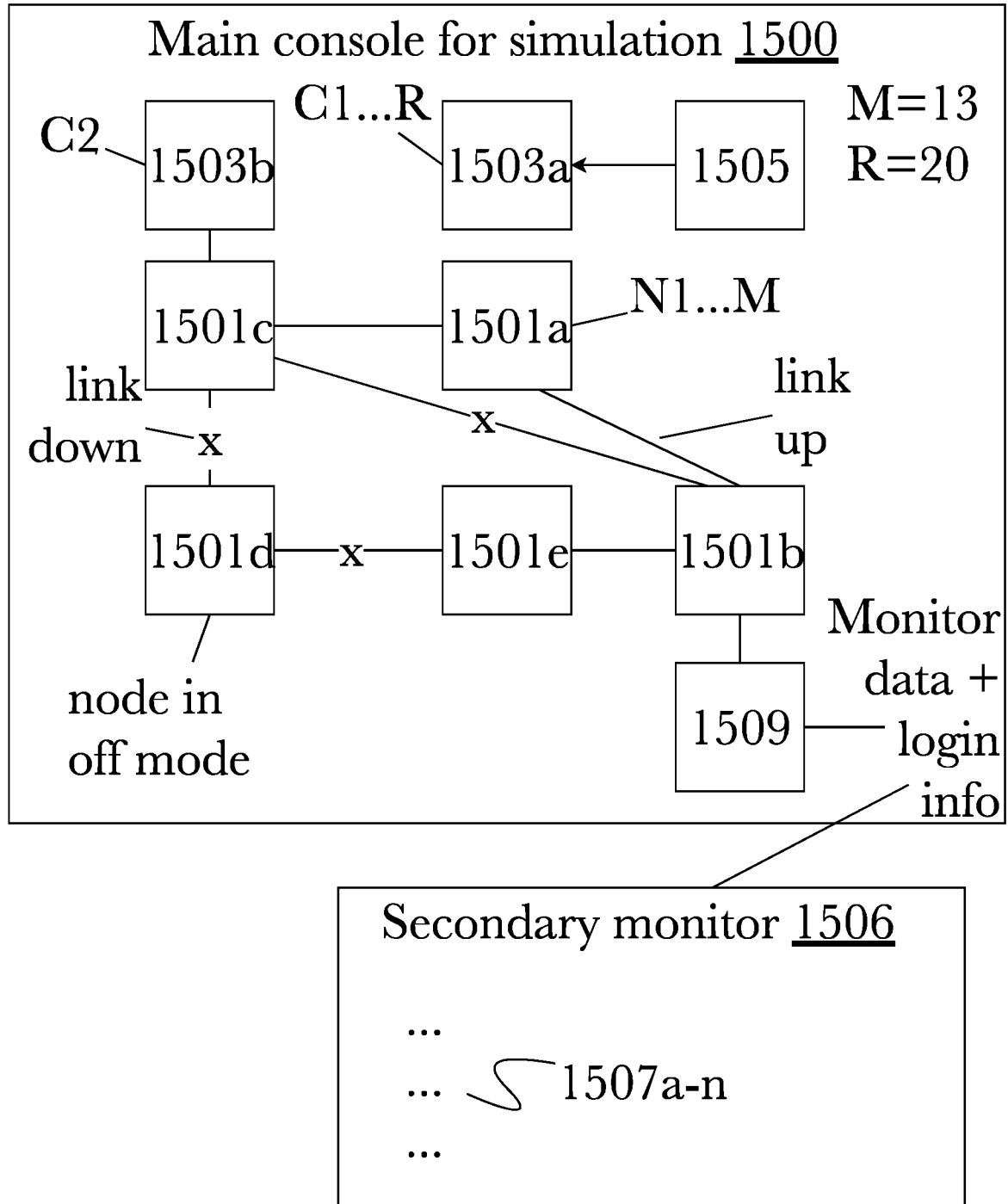


Fig. 15

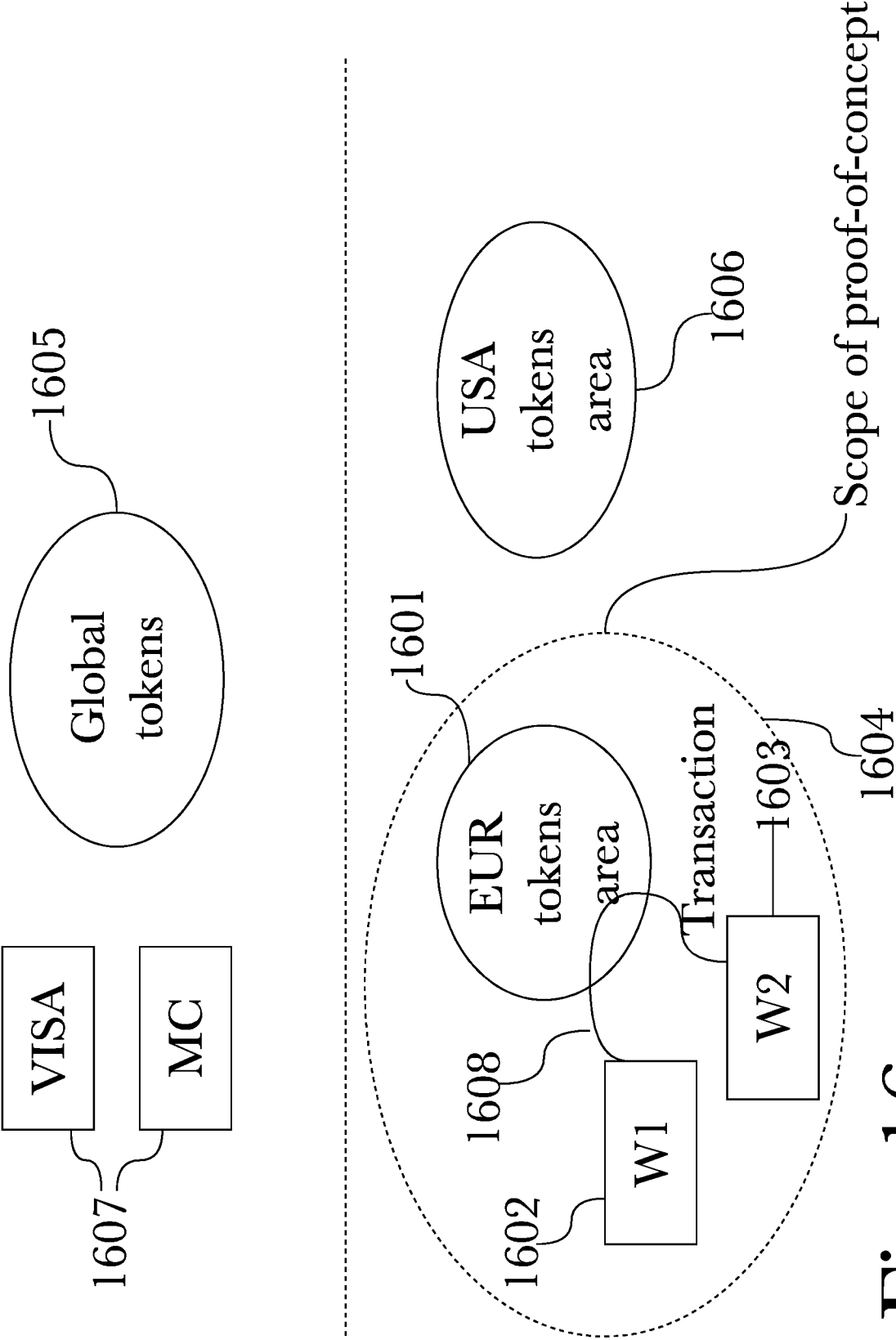
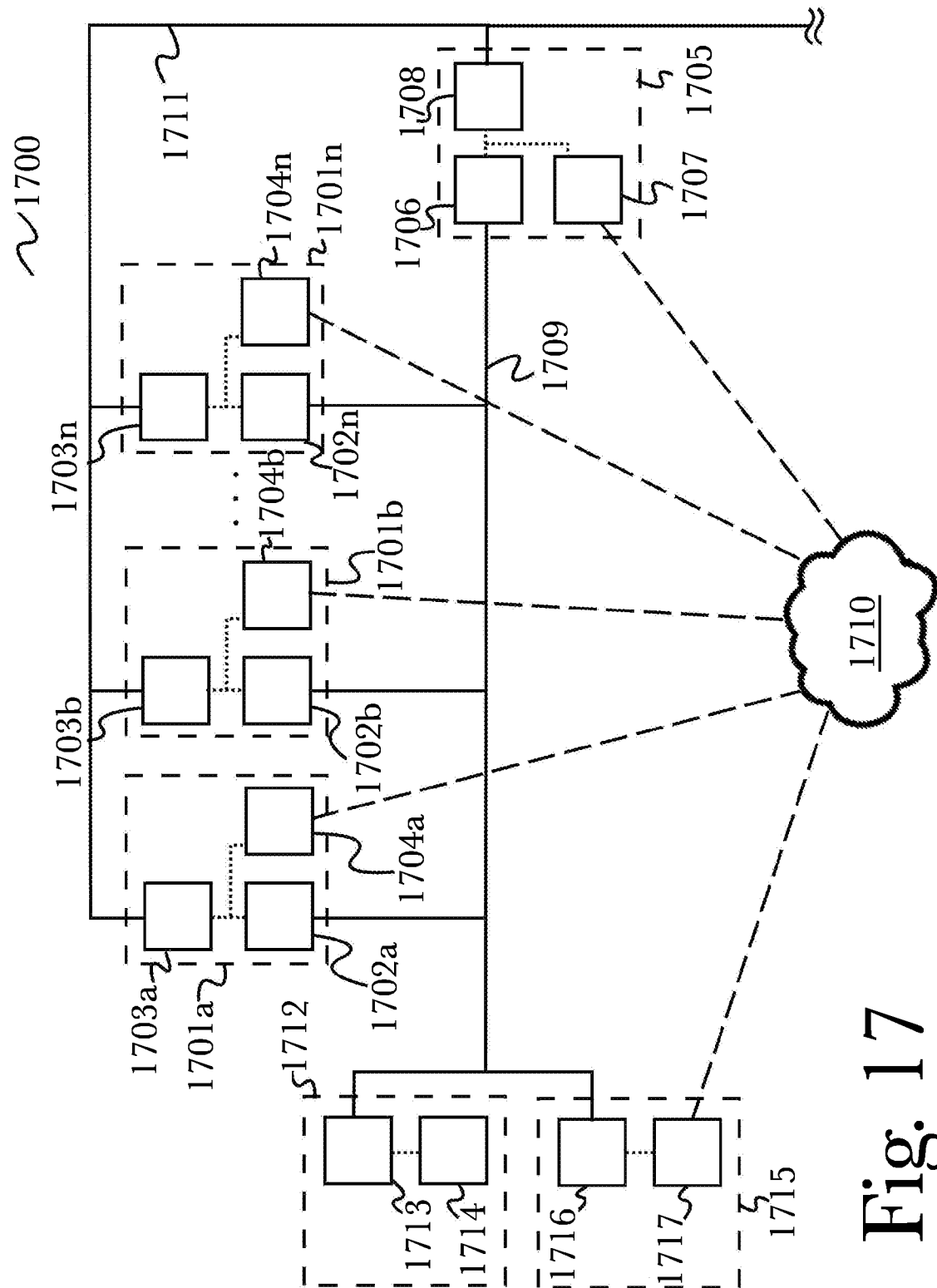


Fig. 16



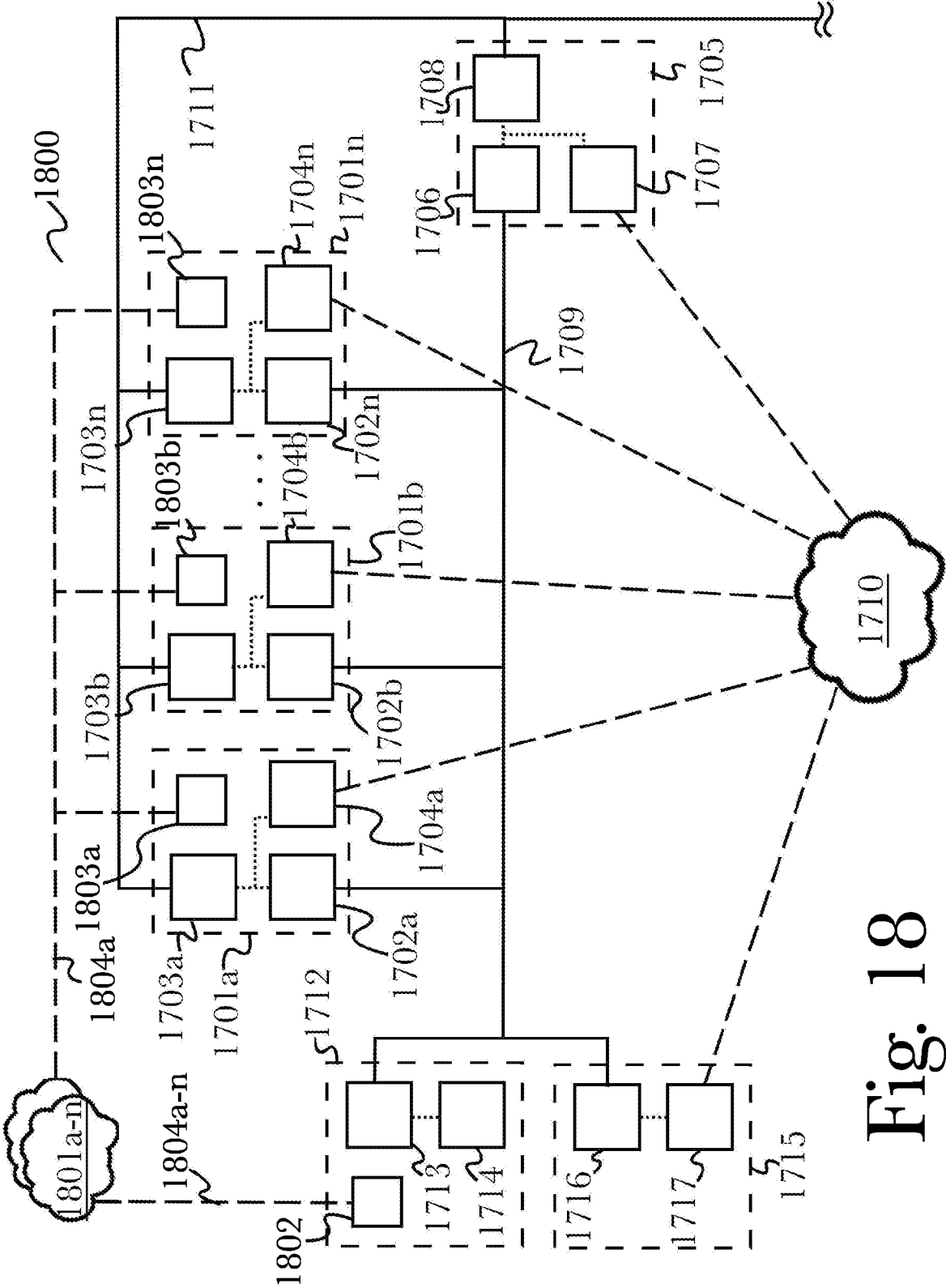


Fig. 18

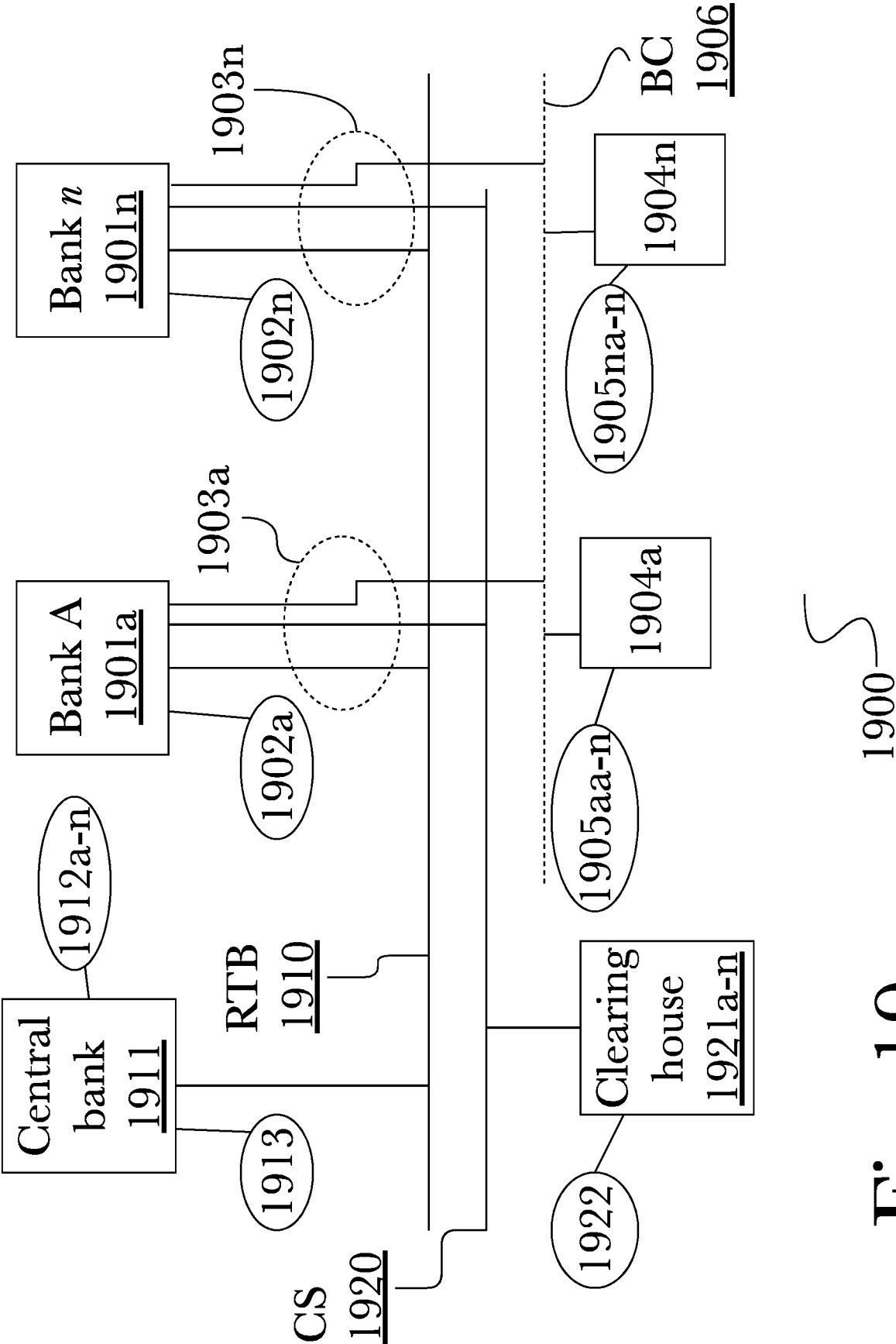


Fig. 19

International Payments with one bid/ask

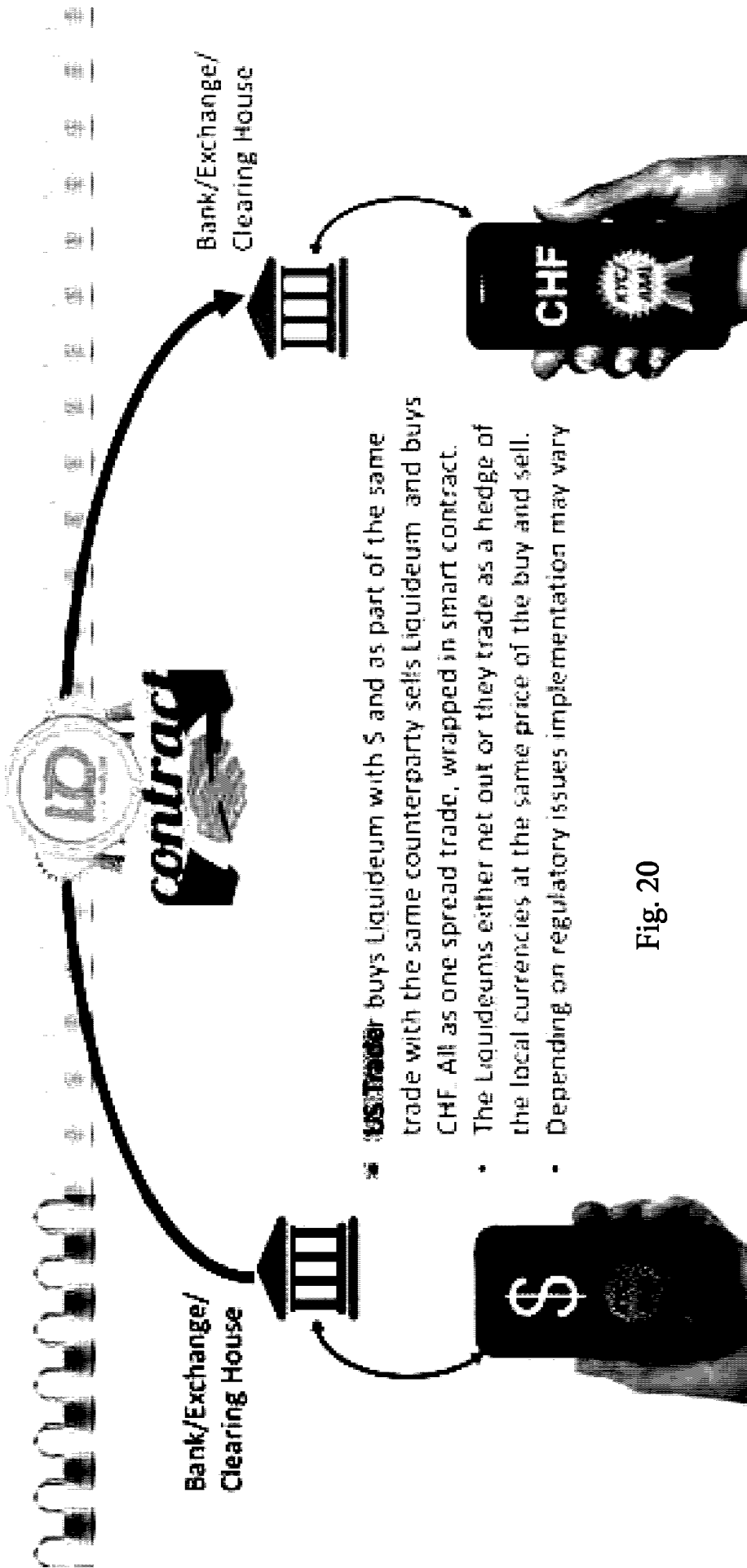


Fig. 20