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**Arnone et al.**(10) **Pub. No.: US 2015/0111637 A1**(43) **Pub. Date: Apr. 23, 2015**(54) **MARKET BASED INTERLEAVED WAGERING SYSTEM**(52) **U.S. Cl.**CPC ..... **A63F 13/822** (2014.09)(71) Applicant: **Gamblit Gaming, LLC**, Glendale, CA (US)(72) Inventors: **Miles Arnone**, Sherborn, MA (US);  
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**Caitlyn Ross**, Watertown, MA (US)(21) Appl. No.: **14/521,338**(22) Filed: **Oct. 22, 2014****Related U.S. Application Data**

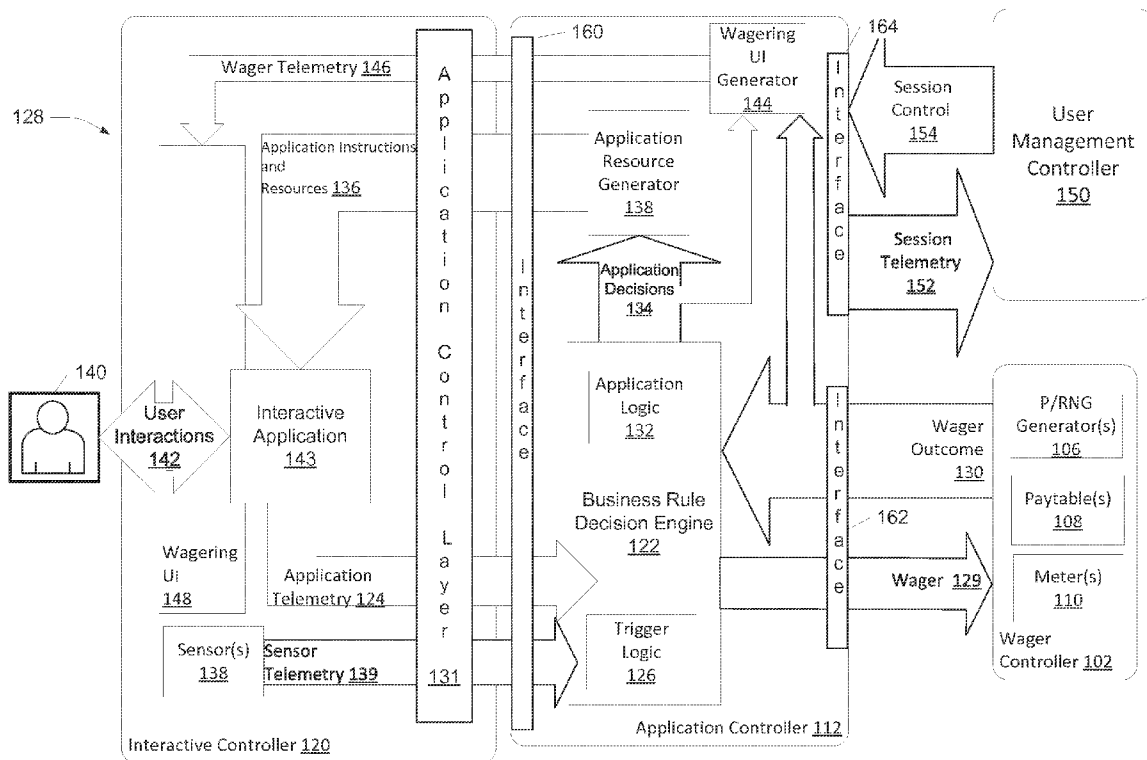
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(2006.01)

(57) **ABSTRACT**

A market based interleaved wagering system is disclosed. The system includes an interactive controller constructed to: provide an interactive application; receive an identification of one or more application generated stocks; communicate the stock identification and application telemetry; and receive a wager outcome and an application resource based on the identified stocks and application telemetry. The system also includes a wager controller constructed to: receive a wager request and the stock identification; communicate a request for stock information associated with the stock identification; receive stock information associated with the stock identification; generate a wager outcome based on the stock information; and communicate the wager outcome. The system also includes the application controller constructed to: receive the stock identification and application telemetry; communicate the wager request and stock identification, based on the application telemetry; receive the wager outcome; and communicate application resources and application instructions based on the wager outcome.



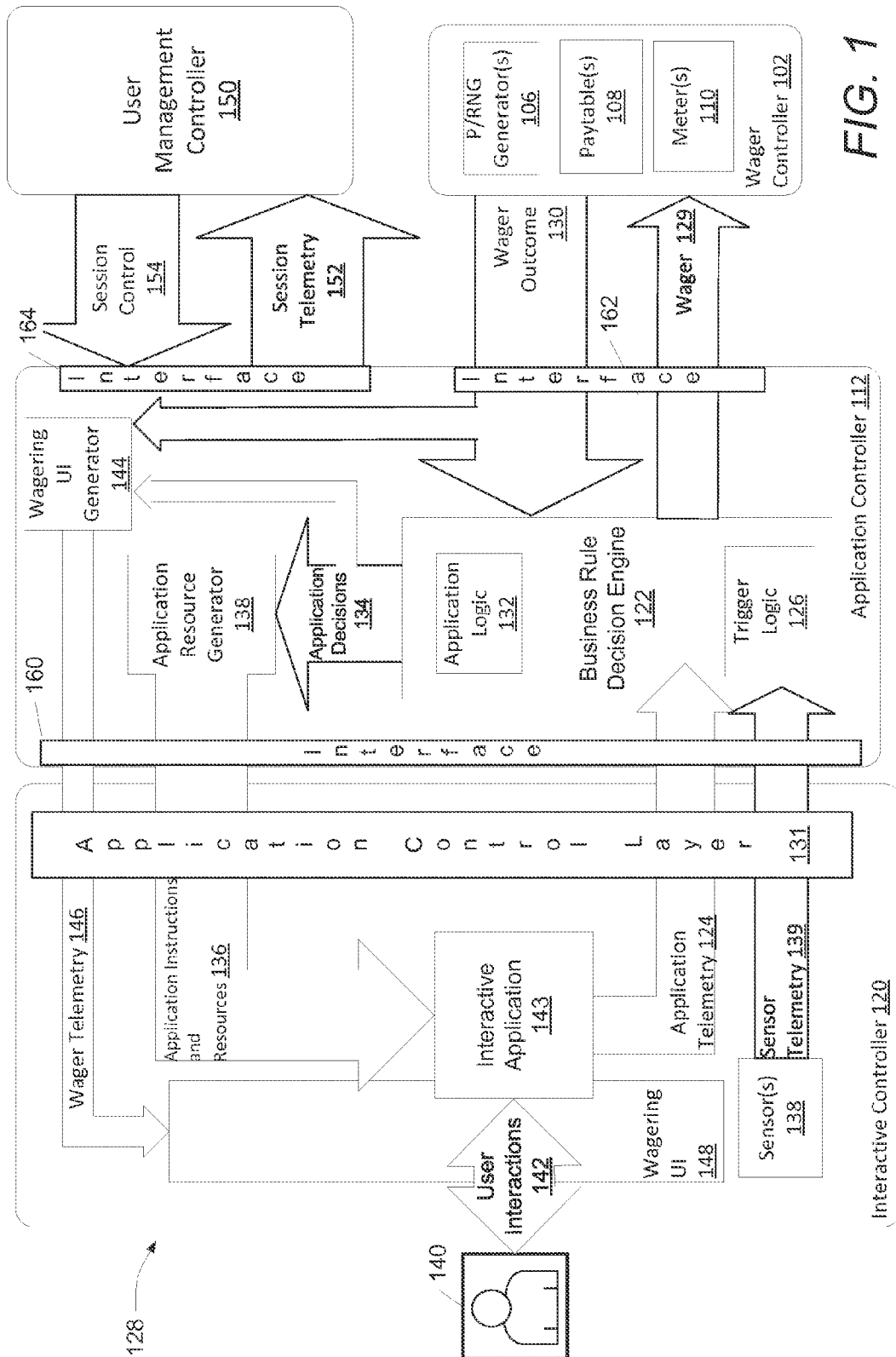
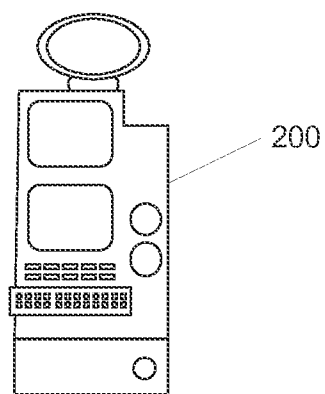
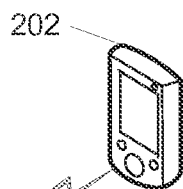


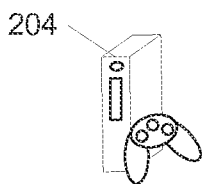
FIG. 1



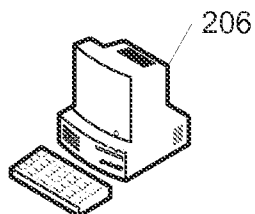
**FIG. 2A**



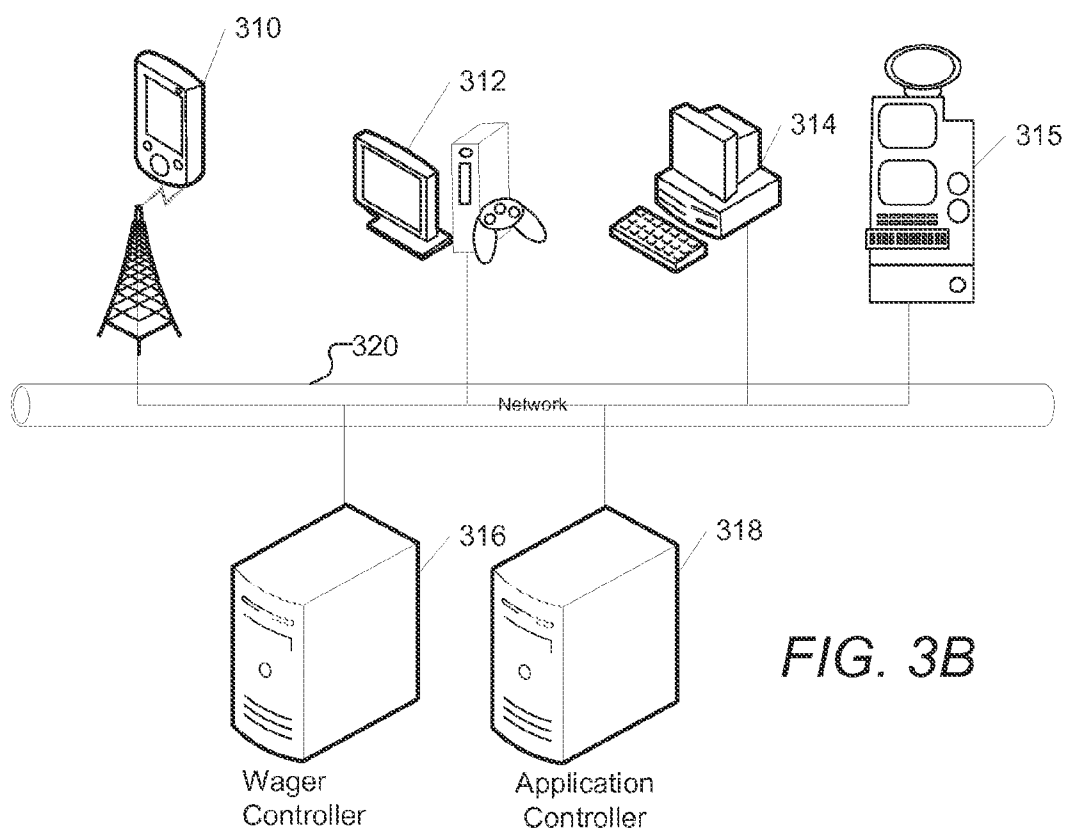
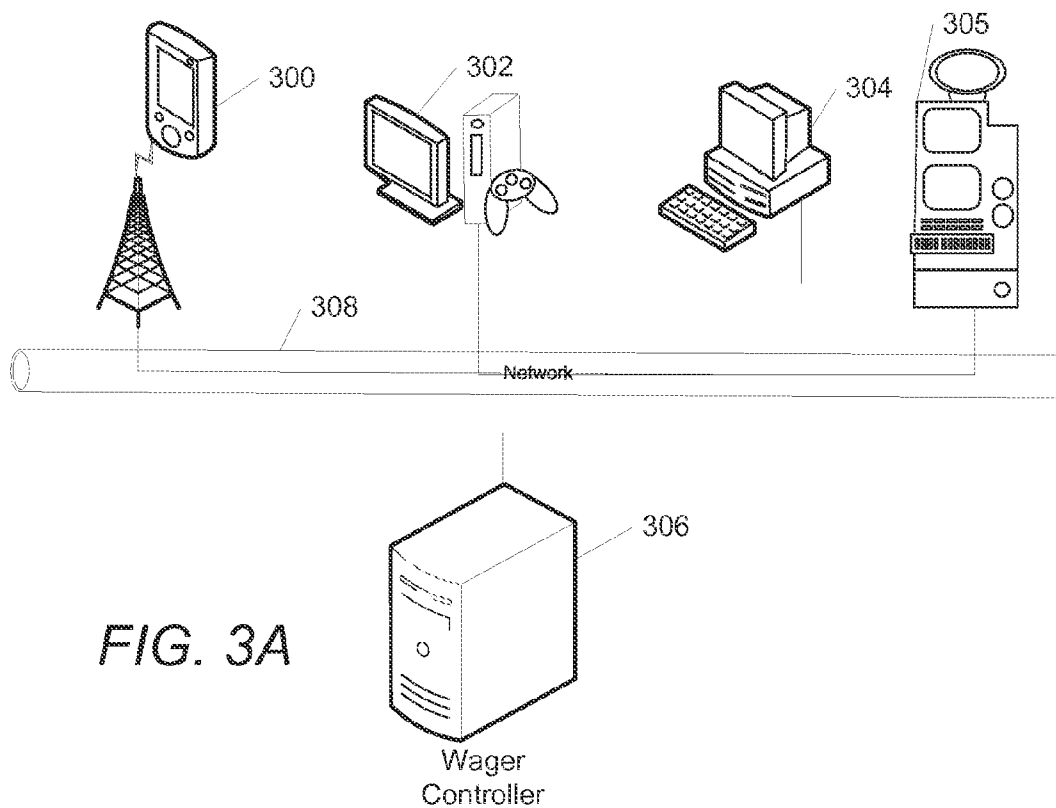
**FIG. 2B**



**FIG. 2C**



**FIG. 2D**



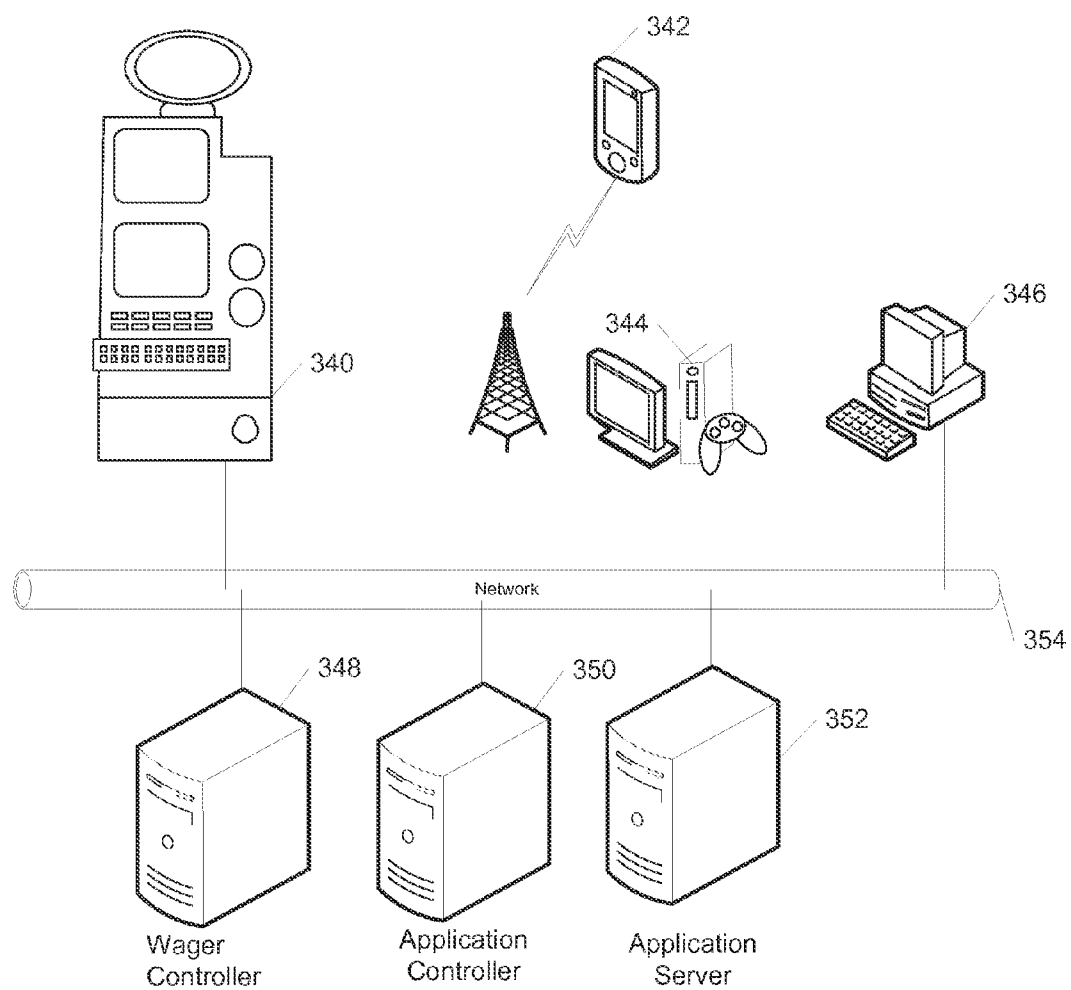


FIG. 3C

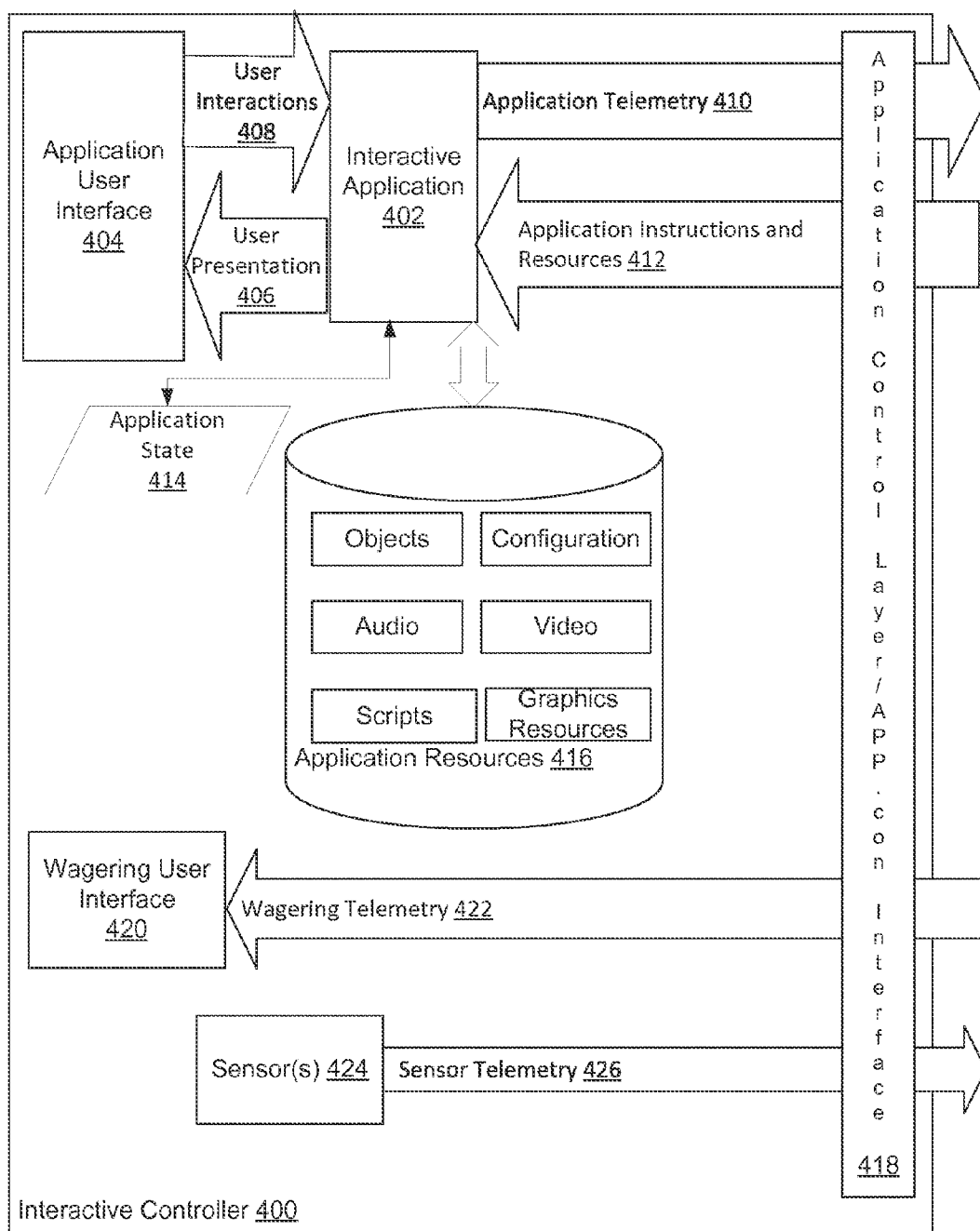


FIG. 4A

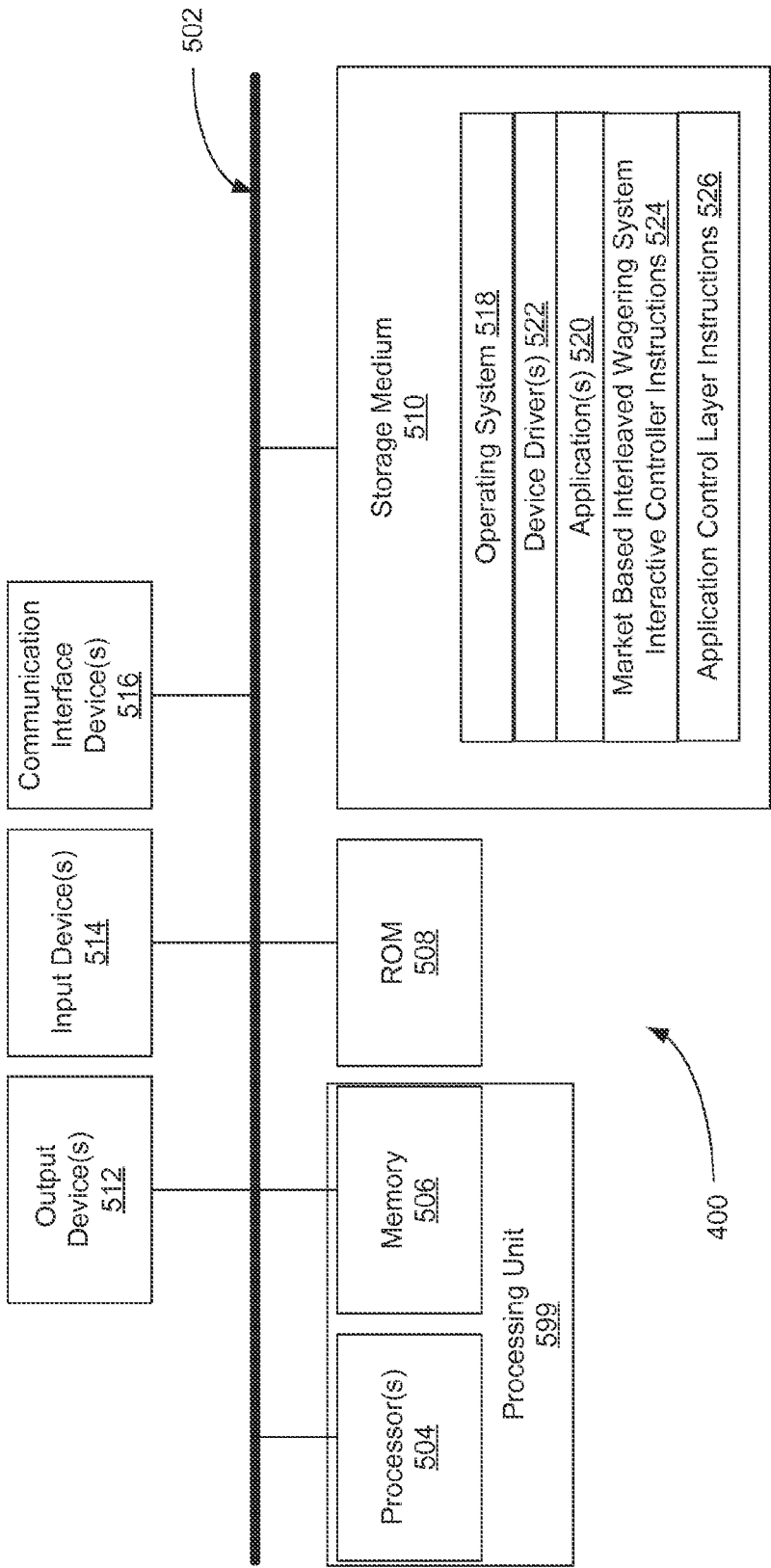


FIG. 4B

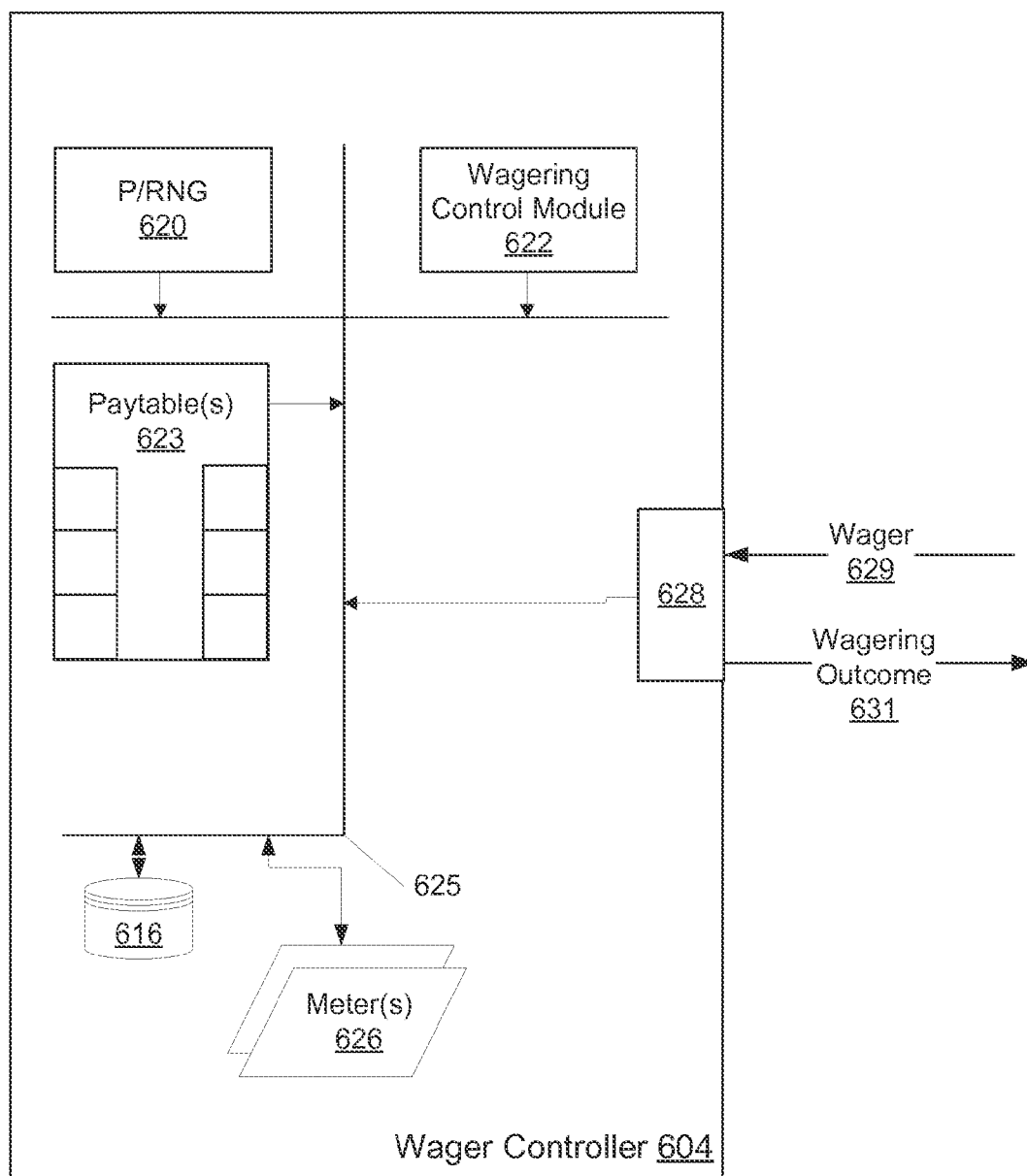


FIG. 5A



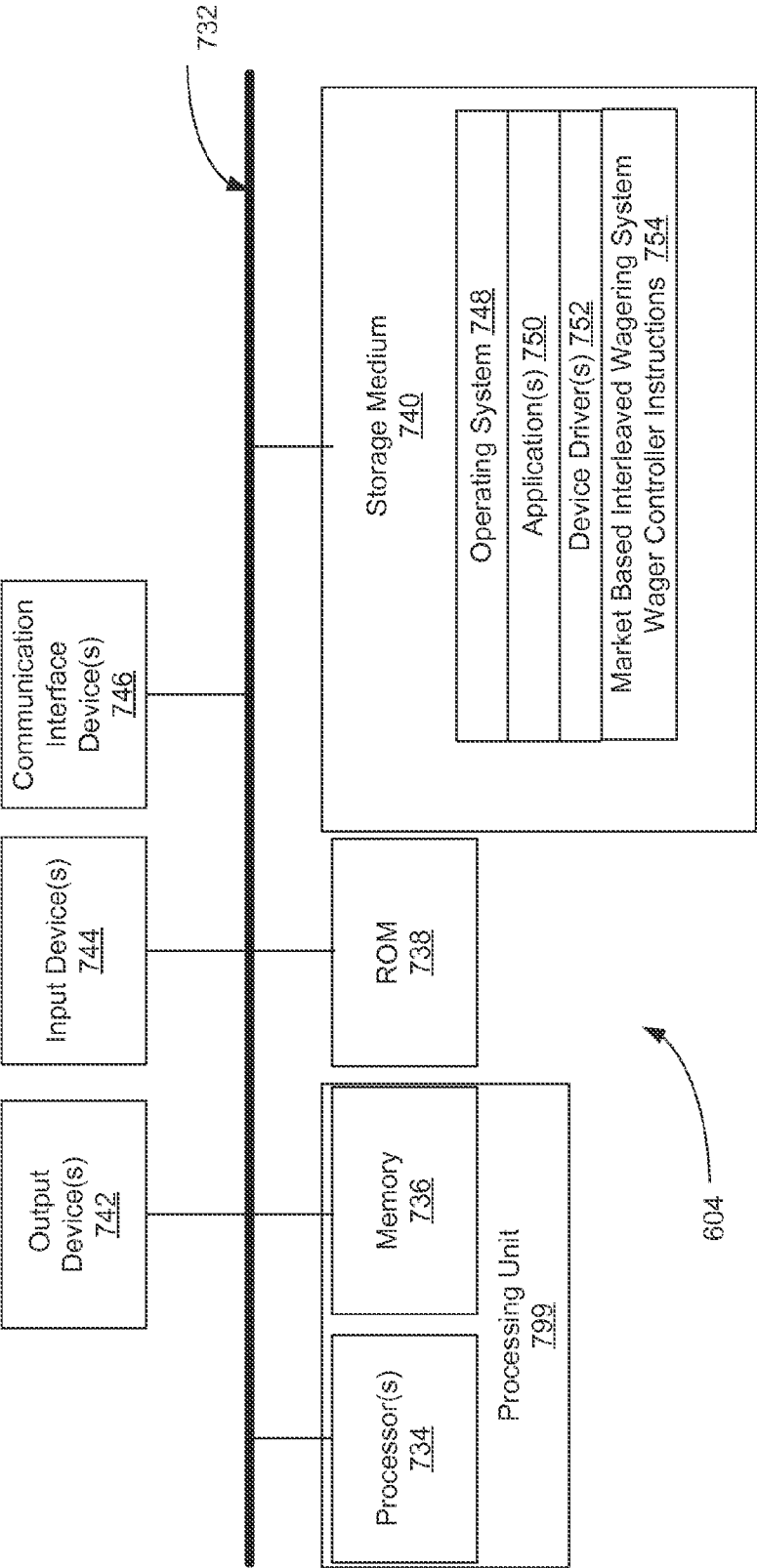


FIG. 5B

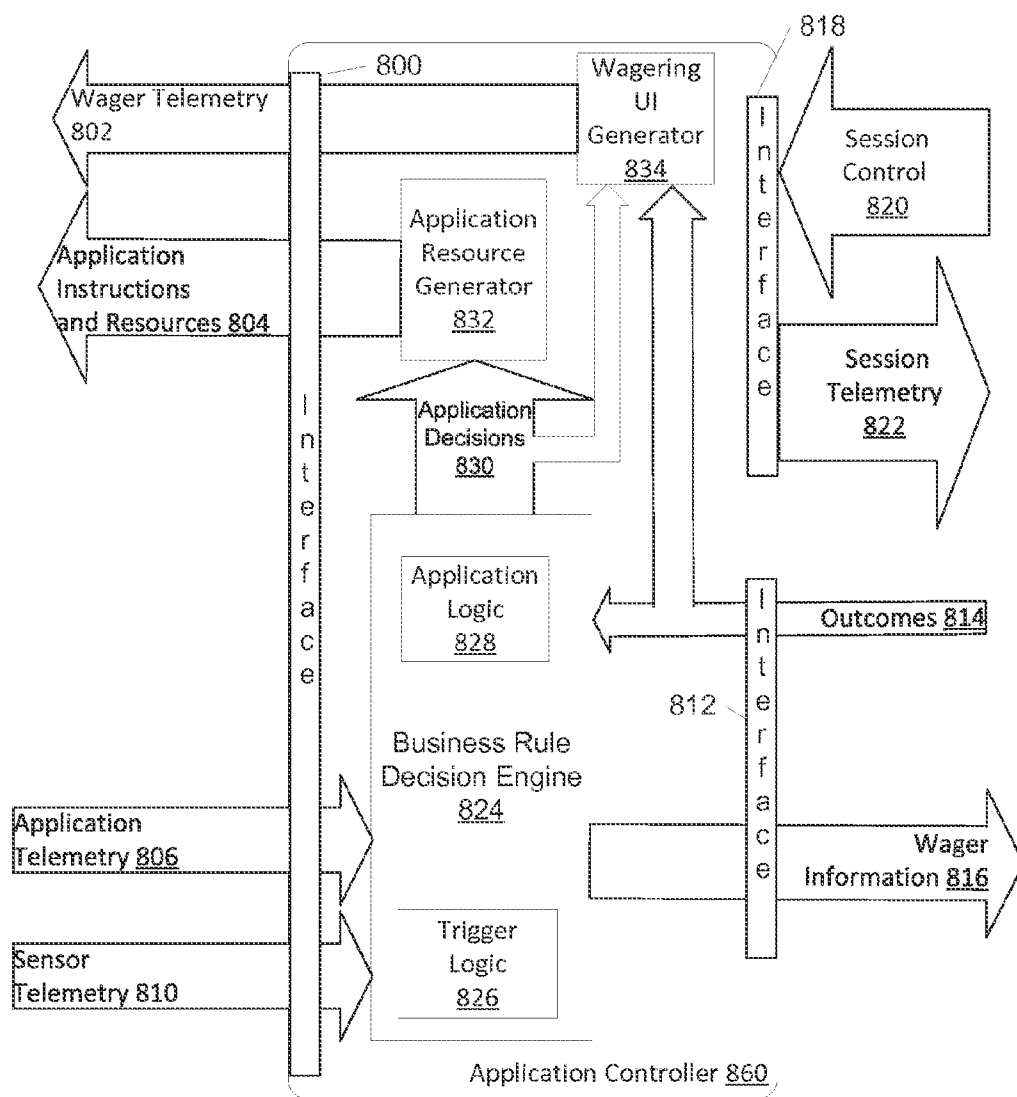


FIG. 6A

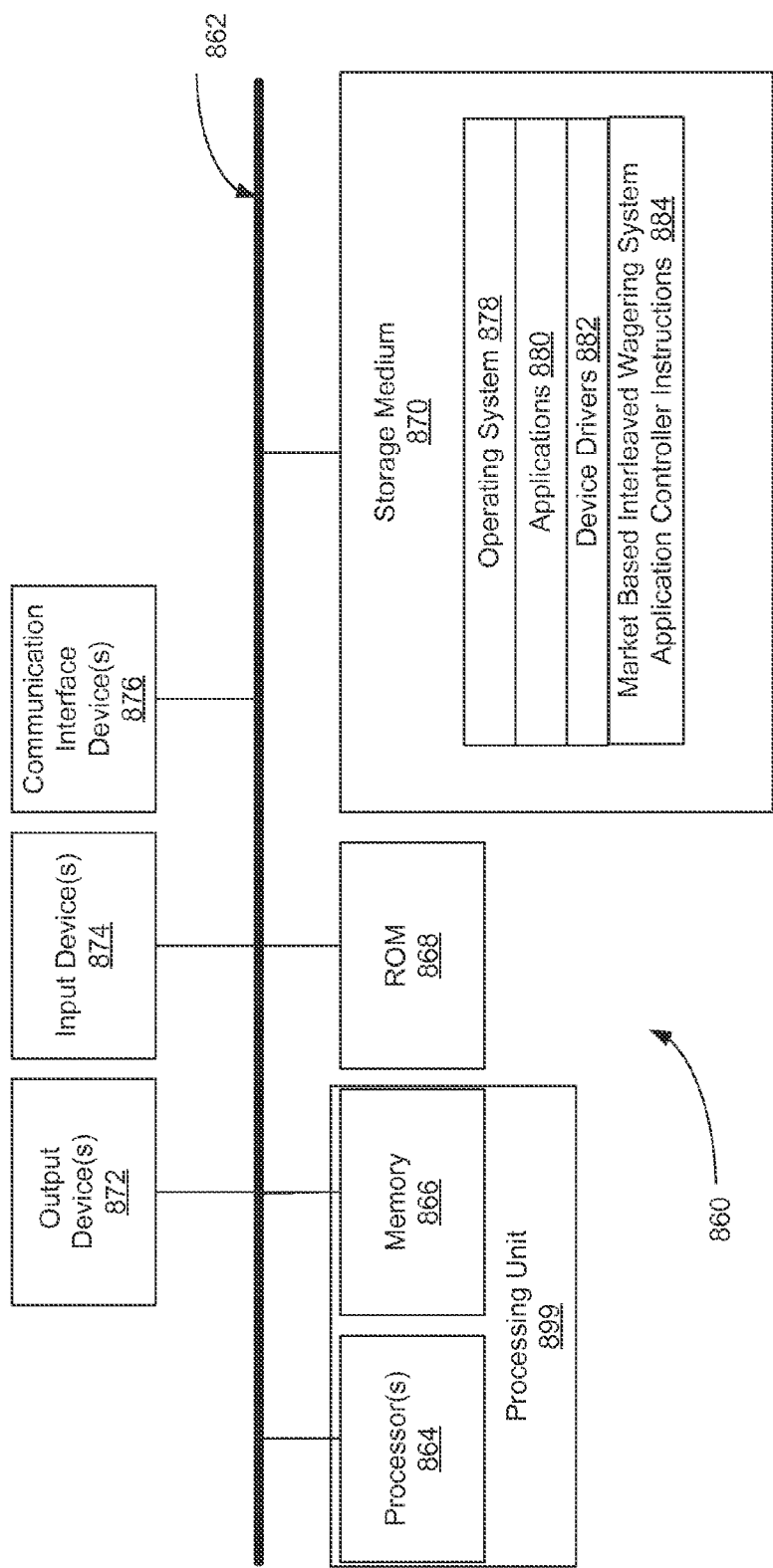


FIG. 6B

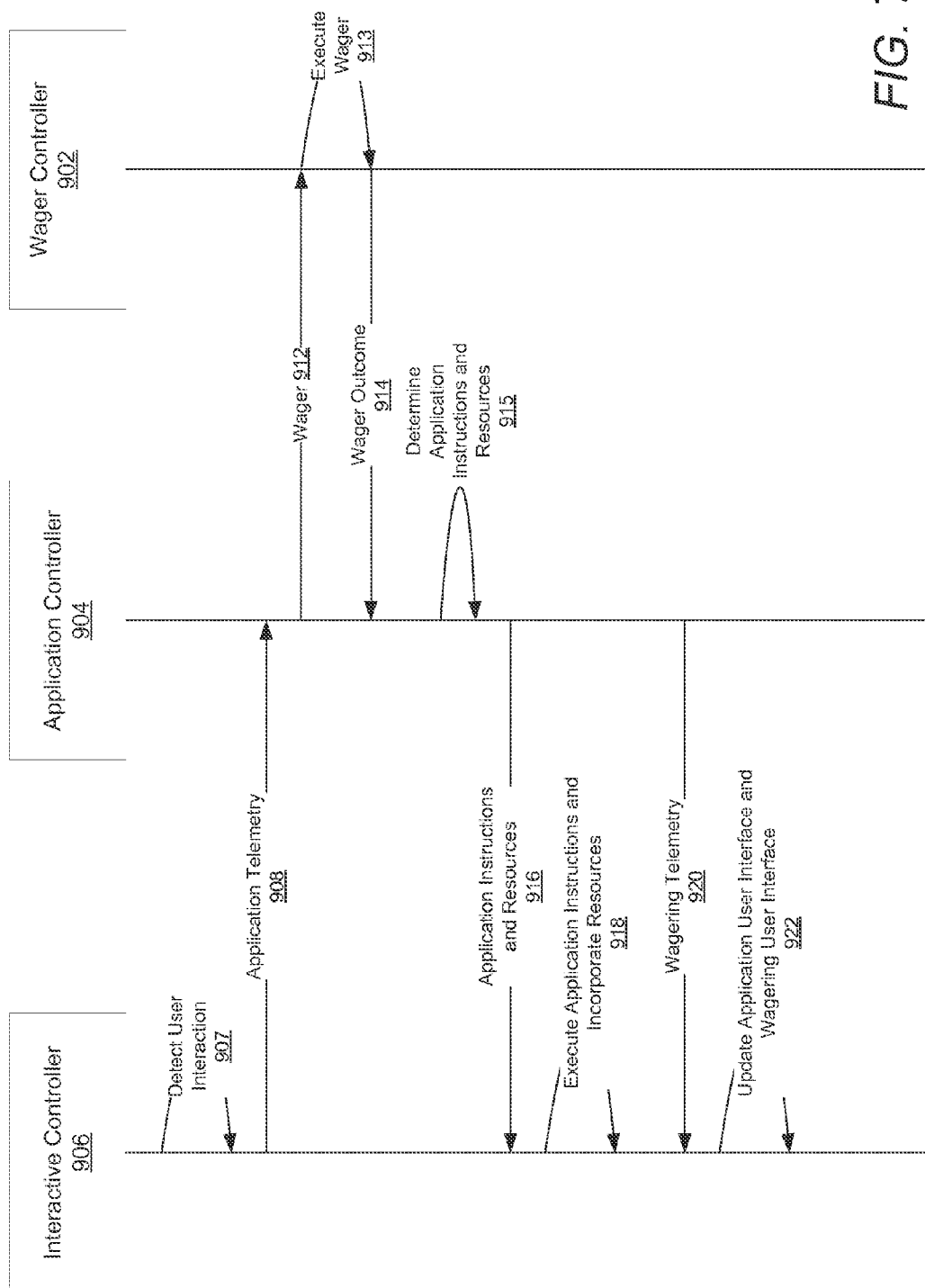


FIG. 7

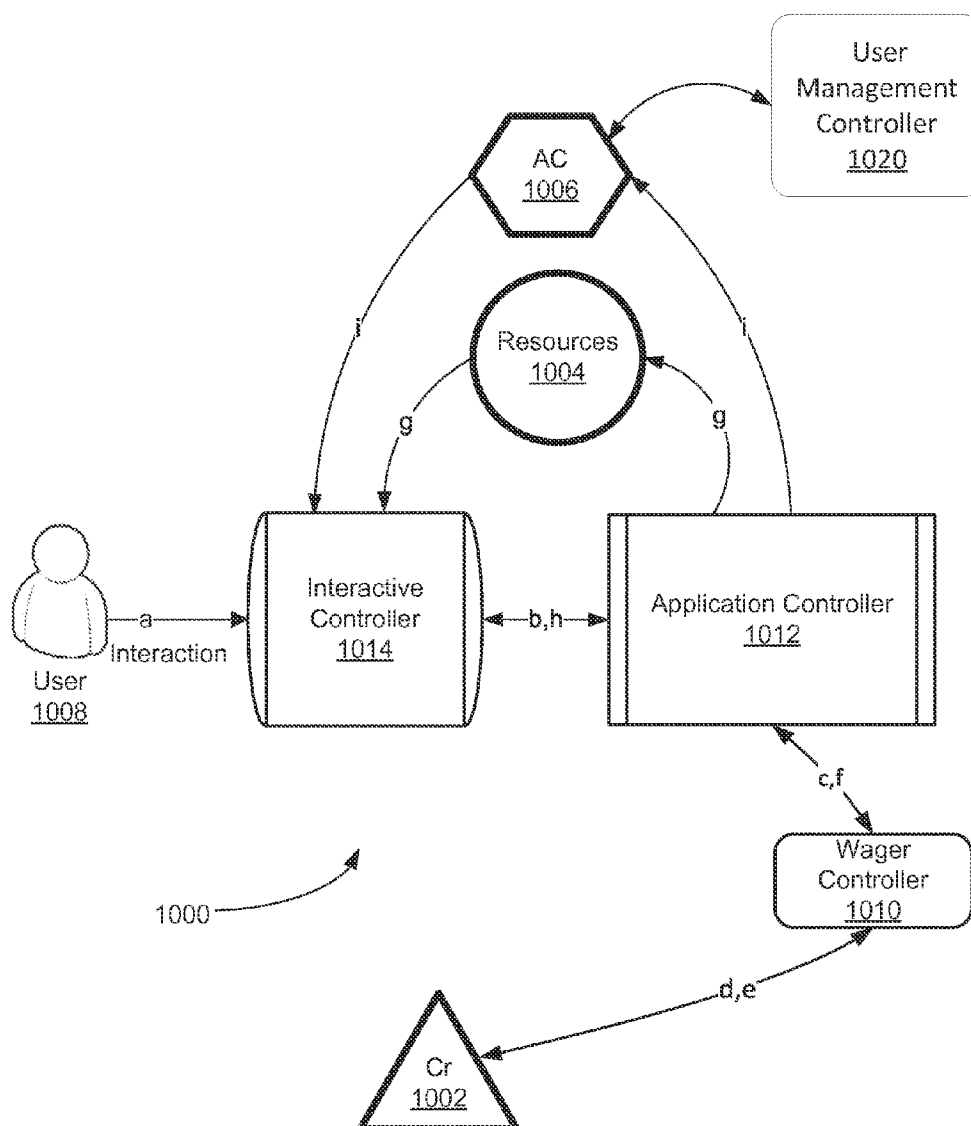


FIG. 8

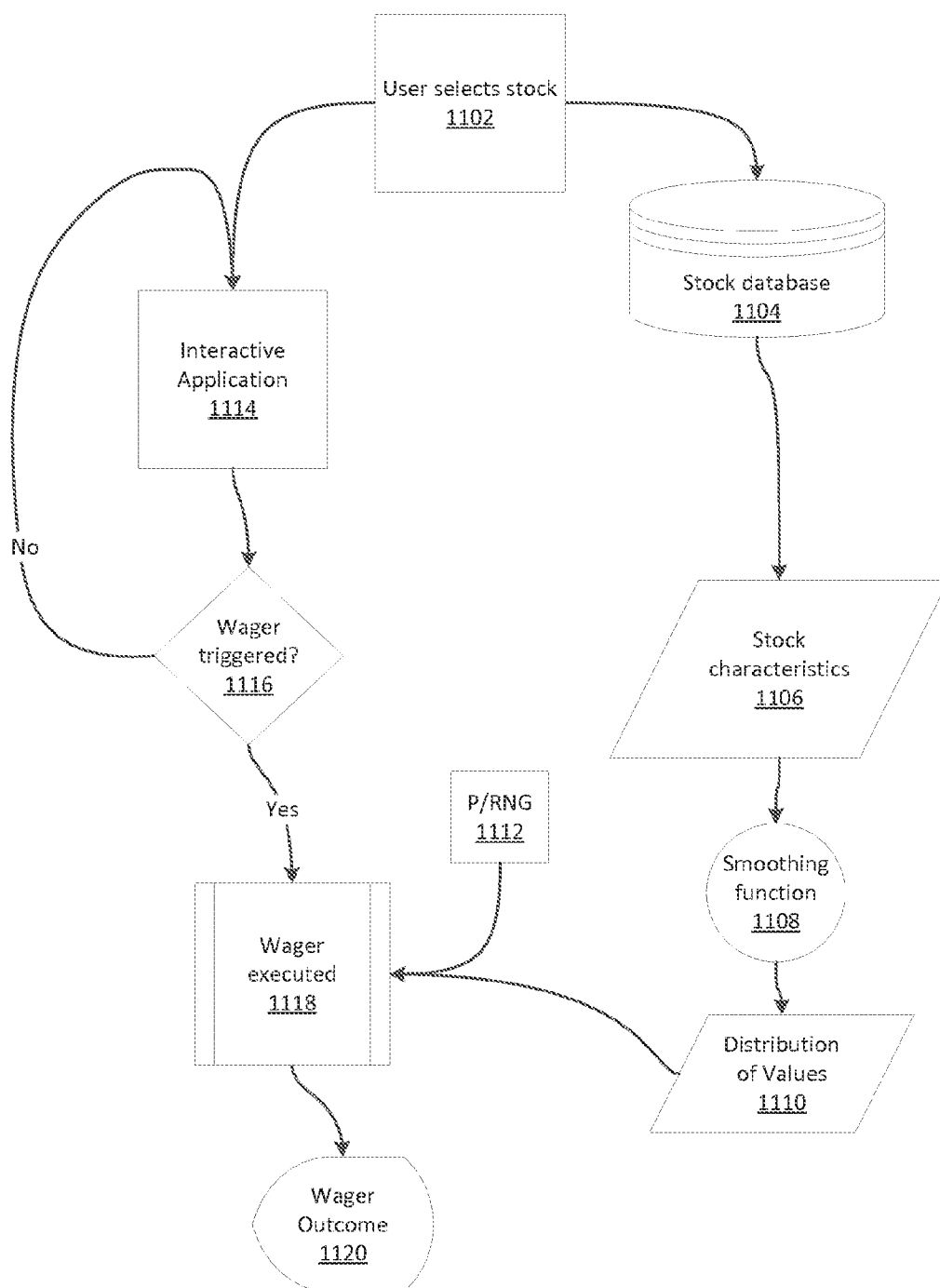


FIG. 9

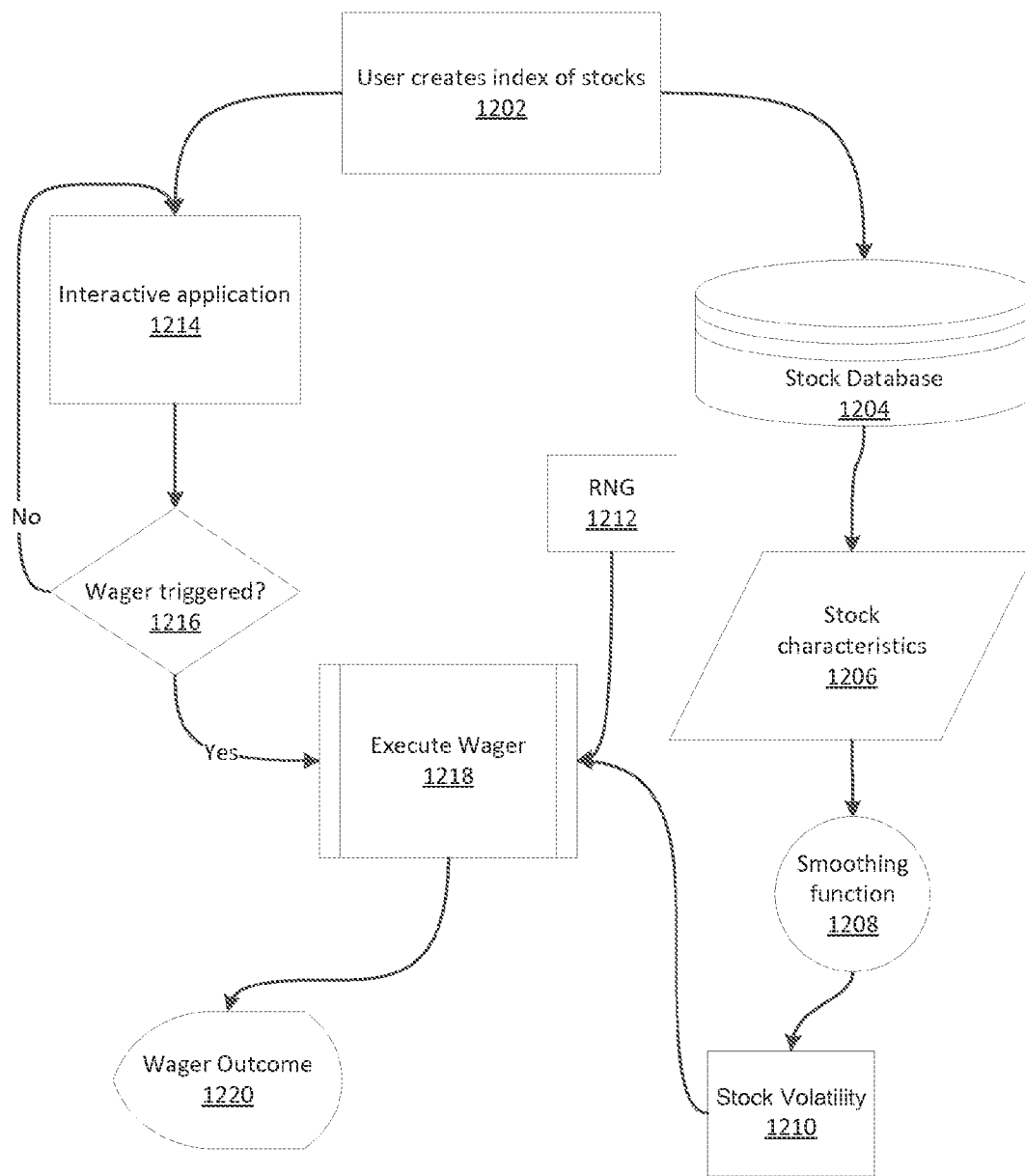


FIG. 10

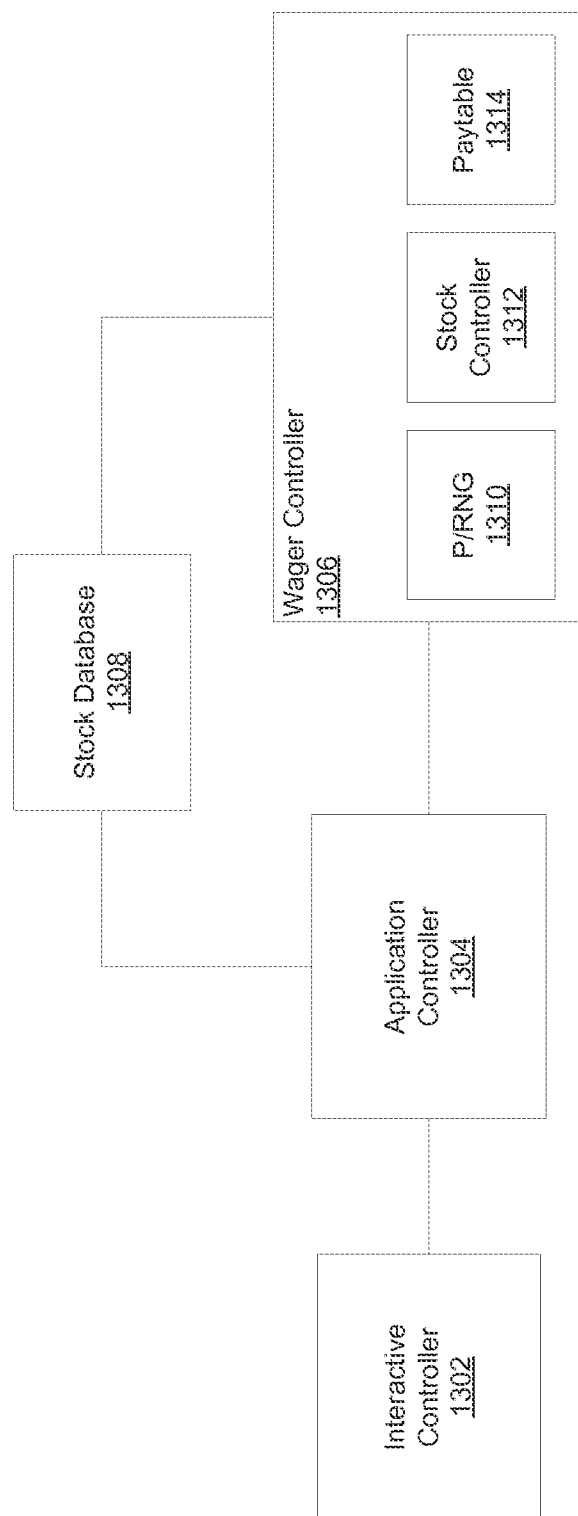


FIG. 11



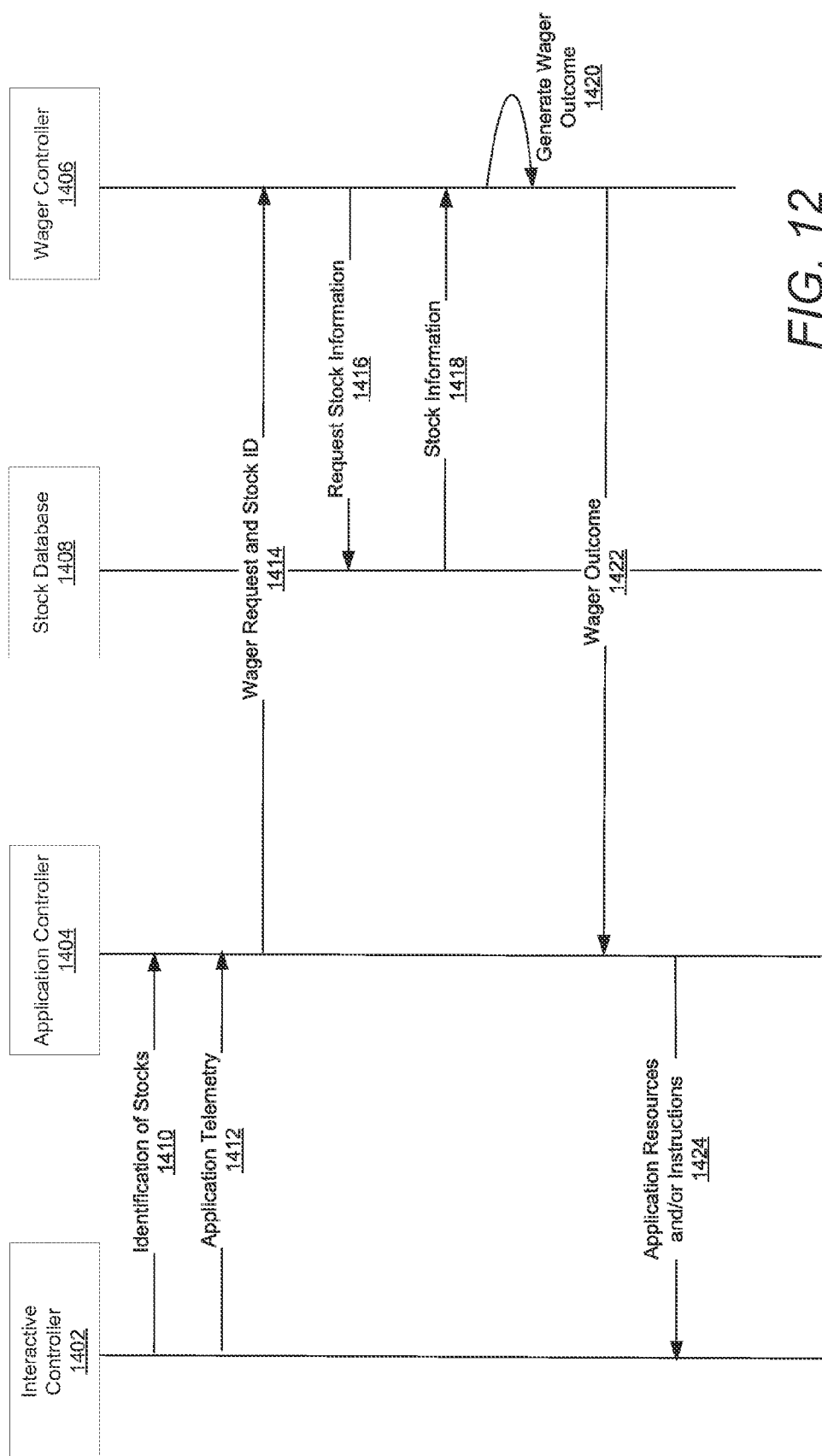
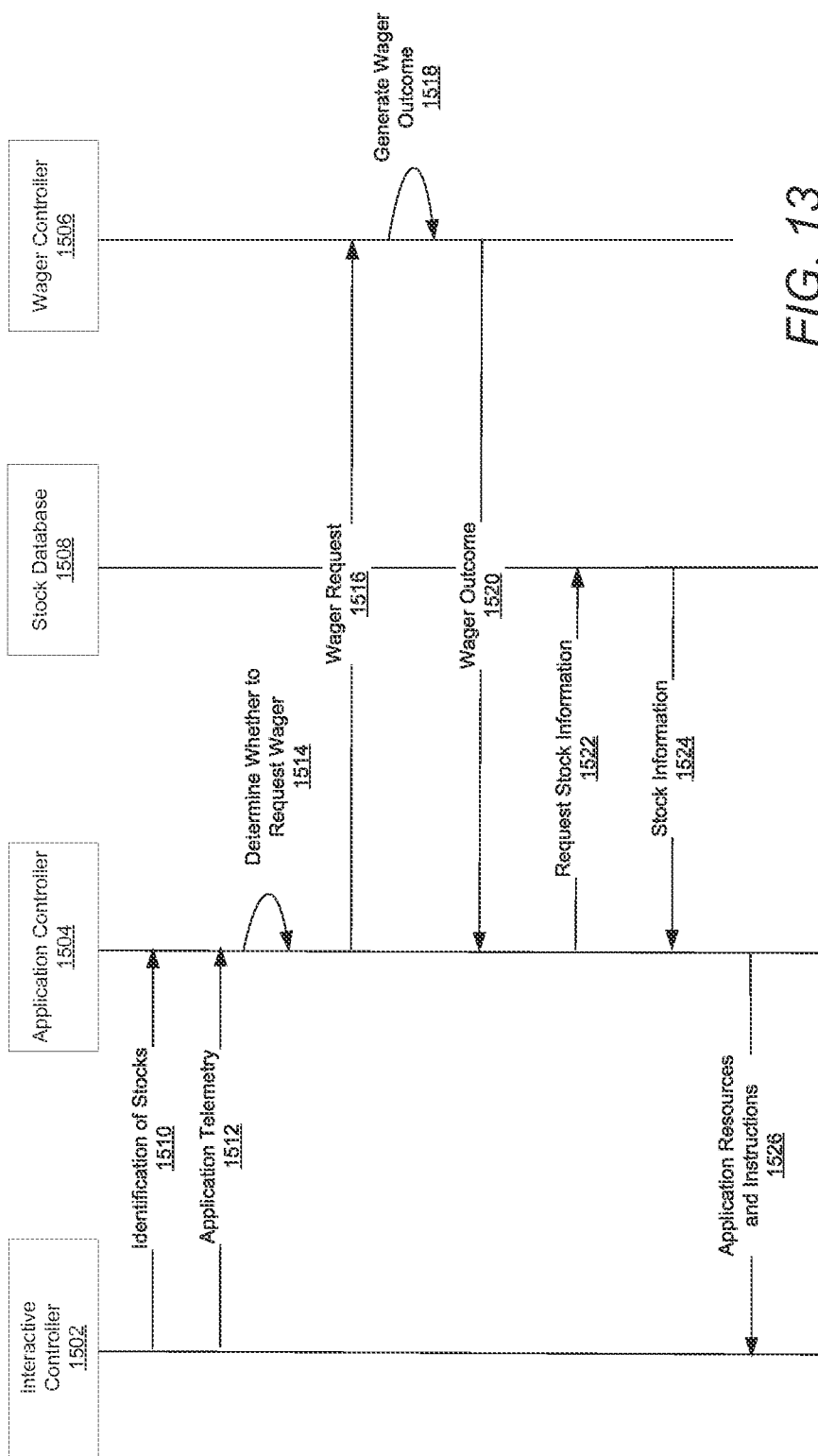


FIG. 12



## MARKET BASED INTERLEAVED WAGERING SYSTEM

### CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 61/894,654, filed Oct. 23, 2013, the disclosure of which is incorporated by reference herein in its entirety.

[0002] This application references Patent Cooperation Treaty Application No. PCT/US11/26768, filed Mar. 1, 2011, Patent Cooperation Treaty Application No. PCT/US11/63587, filed Dec. 6, 2011, and Patent Cooperation Treaty Application No. PCT/US12/58156, filed Sep. 29, 2012, the contents of each of which are hereby incorporated by reference.

### FIELD OF THE INVENTION

[0003] Embodiments of the present invention are generally related to communications within data processing systems. More particularly, the present invention relates to the communication and processing of wagering data.

### BACKGROUND

[0004] The gaming industry has traditionally developed electronic gaming machines that present simple wagering games to a user. The communication and processing needs for these simple wagering games are easily met using conventional processing systems. However, more complicated wagering games need communication and processing systems that are better suited for implementing these more complicated wagering games. Various aspects of embodiments of the present invention meet such a need.

### SUMMARY OF THE INVENTION

[0005] Systems and methods in accordance with embodiments of the invention provide a communication and data processing system constructed for a market based interleaved wagering system.

[0006] One embodiment includes a market based interleaved wagering system, including: an interactive controller constructed to: provide an interactive application; receive, from a user, an identification of one or more application generated stocks; communicate, to an application controller, the identification of the application generated stocks and application telemetry; and receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry; a wager controller constructed to: receive, from the application controller, a wager request and the identification of the application generated stocks; communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks; receive, from the stock database, stock information associated with the received identification of the application generated stocks; generate a wager outcome based on the received stock information; and communicate, to the application controller, the wager outcome; and the application controller operatively connected to the interactive controller and the wager controller, wherein the application controller is constructed to: receive, from the interactive controller, the identification of the application generated stocks and application telemetry; communicate, to the wager controller, the wager

request and identification of the application generated stocks, based on the application telemetry; receive, from the wager controller, the wager outcome; and communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.

[0007] In a further embodiment, the interactive controller and the application controller are constructed from the same device, and the application controller is operatively connected to the wager controller by a network.

[0008] In a further embodiment, the wager controller and the application controller are constructed from the same device, and the application controller is operatively connected to the interactive controller by a network.

[0009] In a further embodiment, generating the wager outcome comprises: generating a random result using a random number generator; using a key value based on the received stock information; and determining the wager outcome based on the random result.

[0010] In a further embodiment, the key value is based on the least significant digit of a stock value, wherein the received stock information comprises stock value.

[0011] In a further embodiment, generating the wager outcome comprises: generating a random result using a random number generator; determining the wager outcome based on the random result and a payable, the payable being chosen from a plurality of paytables based on the received stock information.

[0012] In a further embodiment, the payable is chosen if the received stock information indicates a downward trend in stock value

[0013] In a further embodiment, the payable is chosen if the received stock information indicates an upward trend in stock value.

[0014] In a further embodiment, the wager controller is constructed to apply a smoothing function to the stock information, and the wager outcome is generated based on the result of applying the smoothing function to the stock information.

[0015] One embodiment includes an application controller of a market based interleaved wagering system, comprising: an interactive controller interface operatively connecting the application controller to an interactive controller, wherein the interactive controller is constructed to: provide an interactive application, receive, from a user, an identification of one or more application generated stocks, communicate, to an application controller, the identification of the application generated stocks and application telemetry, and receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry; a wager controller interface operatively connecting the application controller to a wager controller, wherein the wager controller is constructed to: receive, from the application controller, a wager request and the identification of the application generated stocks, communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks, receive, from the stock database, stock information associated with the received identification of the application generated stocks, generate a wager outcome based on the received stock information, and communicate, to the application controller, the wager outcome; and one or more processing units constructed to: receive, from the interactive controller, the identification of the application generated stocks and application telemetry; communicate, to the

wager controller, the wager request and identification of the application generated stocks, based on the application telemetry; receive, from the wager controller, the wager outcome; and communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.

**[0016]** One embodiment includes a market based interleaved wagering system, comprising: a wager controller of a market based interleaved wagering system, wherein the wager controller is constructed to: receive, from an application controller, a wager request and an identification of application generated stocks, wherein the identification is received from a user, via an interactive controller; communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks; receive, from the stock database, stock information associated with the received identification of the application generated stocks; generate a wager outcome based on the received stock information; and communicate, to the application controller, the wager outcome; and the application controller of the market based interleaved wagering system operatively connecting the wager controller to an interactive controller by a network, wherein the application controller is constructed to: receive, from the interactive controller, the identification of the application generated stocks and application telemetry; communicate, to the wager controller, the wager request and identification of the application generated stocks, based on the application telemetry; receive, from the wager controller, the wager outcome; and communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.

**[0017]** One embodiment includes a market based interleaved wagering system, comprising: an interactive controller of a market based interleaved wagering system, wherein the interactive controller is constructed to: provide an interactive application; receive, from a user, an identification of one or more application generated stocks; communicate, to an application controller, the identification of the application generated stocks and application telemetry; and receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry; and the application controller of the market based interleaved wagering system operatively connecting the interactive controller to a wager controller, wherein the application controller is constructed to: receive, from the interactive controller, the identification of the application generated stocks and application telemetry; communicate, to a wager controller, a wager request and identification of the application generated stocks, based on the application telemetry; receive, from the wager controller, a wager outcome, wherein the wager outcome is generated based on stock information received from a stock database and associated with the identified application generated stocks; and communicate, to the interactive controller, application resources and application instructions based on the received wager outcome

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0018]** FIG. 1 is a diagram of a structure of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0019]** FIGS. 2A, 2B, 2C, and 2D are illustrations of interactive controllers of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0020]** FIGS. 3A, 3B and 3C are network diagrams of distributed market based interleaved wagering systems in accordance with various embodiments of the invention.

**[0021]** FIGS. 4A and 4B are diagrams of a structure of an interactive controller of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0022]** FIGS. 5A and 5B are diagrams of a structure of a wager controller of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0023]** FIGS. 6A and 6B are diagrams of a structure of an application controller of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0024]** FIG. 7 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0025]** FIG. 8 is a collaboration diagram for components of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0026]** FIG. 9 is a diagram of interactions between various components of the system and processes in accordance with various embodiments of the invention.

**[0027]** FIG. 10 is a diagram of interactions between various components of the system and processes in accordance with various embodiments of the invention.

**[0028]** FIG. 11 is a diagram of the structure of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0029]** FIG. 12 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention.

**[0030]** FIG. 13 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention.

#### DETAILED DESCRIPTION

**[0031]** A market based interleaved wagering system interleaves wagering with non-wagering activities. In some embodiments of a market based interleaved wagering system an interactive application executed by an interactive controller provides non-wagering components of the market based interleaved wagering system. The interactive controller is operatively connected to an application controller that manages and configures the interactive application of the interactive controller and determines when wagers should be interleaved with the operations of the interactive application. The application controller is further operatively connected to a wager controller that provides one or more wagering propositions for one or more wagers.

**[0032]** In some embodiments, the interactive controller also includes a wagering user interface that is used to display data about a wagering process, including but not limited to a wager outcome of a wager made in accordance with a wagering proposition. The content of the wagering user interface is

controlled by the application controller and includes content provided by the wager controller.

**[0033]** In several embodiments, a user or user interactions are represented in a market based interleaved wagering system by the electronic representation of interactions between the user and the interactive application, typically received via a user interface of the interactive application, and a user profile of the market based interleaved wagering system associated with the user.

**[0034]** Many different types of interactive applications may be utilized with the market based interleaved wagering system. In some embodiments, the interactive application reacts to the physical activity of the user. In these embodiments, the user interacts with the interactive application through one or more sensors that monitor the user's physical activities. Such sensors may include, but are not limited to, physiological sensors that monitor the physiology of the user, environmental sensors that monitor the physical environment of the user, accelerometers that monitor changes in motion of the user, and location sensors that monitor the location of the user such as global positioning sensors.

**[0035]** In some embodiments, the interactive application is a skill-based interactive game that is played by the user.

**[0036]** In some embodiments, the interactive application is a tool used by the user to achieve some useful goal.

**[0037]** In operation, a user interacts with the interactive application using various types of elements of the interactive application in an interactive application environment. Elements are interactive application resources utilized by the user within the interactive application environment to provide an interactive experience for the user. Wagers of credits are made in accordance with a wagering proposition as triggered by the user's use of one or more of the elements of the interactive application. Wager outcomes of wagers of credits made in accordance with the wagering proposition can cause consumption, loss or accrual of credits.

**[0038]** In accordance with some embodiments, wager outcomes of wagering events can influence elements in the interactive application such as, but not limited to, providing one or more new elements, restoring one or more consumed elements, causing the loss of one or more elements, and restoration or placement of one or more fixed elements.

**[0039]** In various embodiments, the wagers may be made using one or more credits (Cr).

**[0040]** In some embodiments, Cr can be one or more credits that are purchased using, and redeemed in, a real world currency having a real world value.

**[0041]** In many embodiments, Cr can be one or more credits in a virtual currency. Virtual currency is an alternate currency that can be acquired, purchased or transferred by or to a user, but does not necessarily directly correlate to a real world currency. In many such embodiments, Cr in a virtual currency are allowed to be purchased using a real world currency but are prevented from being redeemed in a real world currency having a real world value.

**[0042]** In several embodiments, during interaction with the interactive application using the elements, a user can optionally consume and/or accrue application environment credit (AC) within the interactive application as a result of the user's use of the interactive application. AC can be in the form of, but is not limited to, application environment credits, experience points, and points generally.

**[0043]** In various embodiments, when the interactive application is a skill-based interactive game, AC is awarded to a

player of the skill-based interactive game on the basis of the player's skillful play of the skill-based interactive game. In such embodiments, AC may be analogous to the score in a typical video game. The skill-based interactive game can have one or more scoring criteria, embedded within an application controller and/or an interactive controller that provides the skill-based interactive game, that reflect user performance against one or more goals of the skill-based interactive game.

**[0044]** In many embodiments, AC can be used to purchase in-application items, including but not limited to, application elements that have particular properties, power ups for existing items, and other item enhancements.

**[0045]** In some embodiments, AC may be used to earn entrance into a sweepstakes drawing, to earn entrance in a tournament with prizes, to score in the tournament, and/or to participate and/or score in any other game event.

**[0046]** In several embodiments, AC can be stored on a user-tracking card or in a network-based user tracking system where the AC is attributed to a specific user.

**[0047]** In many embodiments, a wagering proposition includes a wager of AC for a wager outcome of a randomly generated payout of interactive application AC, elements, and/or objects in accordance with a wagering proposition.

**[0048]** In a number of embodiments, a wager of an amount of Cr results in a wager outcome of a payout of AC, elements, and/or objects that have an Cr value if cashed out.

**[0049]** In some embodiments, in a case that an interactive application is a skill-based interactive game, interactive application objects include in-application objects that may be used by a player of the skill-based interactive game to enhance the player's gameplay of the skill-based interactive game. Such objects include, but are not limited to, power-ups, enhanced in-application items, and the like. In some embodiments, the interactive application objects include objects that are detrimental to the player's play of the skill-based interactive game such as, but not limited to, obstructions in the game space, a temporary player handicap, an enhanced opponent, and the like.

**[0050]** In some embodiments, elements in an interactive application include, but are not limited to, enabling elements (EE) that are interactive application environment resources utilized during the user's use of the interactive application and whose utilization by the user while using the interactive application triggers execution of a wager in accordance with a wagering proposition. In another embodiment, elements in an interactive application include, but are not limited to, a reserve enabling element (REE), that is an element that converts into one or more enabling elements upon occurrence of a release event during an interactive session. In yet another embodiment, elements in an interactive application include, but are not limited to, an actionable element (AE) that is an element that is acted upon during use of the interactive application to trigger a wager in accordance with a wagering proposition and may or may not be restorable during normal play of the interactive application. In yet another embodiment, elements in an interactive application include, but are not limited to, a common enabling element (CEE) that is an element that may be shared by two or more users and causes a wagering event and associated wager to be triggered in accordance with the wagering proposition when used by one of the users during use of the interactive application. In some embodiments, in progressing through interactive application use, a user can utilize elements during interactions with a

controlled entity (CE). A CE is a character, entity, inanimate object, device or other object under control of a user.

**[0051]** In accordance with some embodiments of a market based interleaved wagering system, the triggering of the wagering event and/or wager can be dependent upon an interactive application environment variable such as, but not limited to, a required object (RO), a required environmental condition (REC), or a controlled entity characteristic (CEC). A RO is a specific interactive application object in an interactive application acted upon for an AE to be completed. A non-limiting example of an RO is a specific key needed to open a door. An REC is an interactive application state present within an interactive application for an AE to be completed. A non-limiting example of an REC is daylight whose presence enables a character to walk through woods. A CEC is a status of the CE within an interactive application for an AE to be completed. A non-limiting example of a CEC is requirement that a CE have full health points before entering battle. Although various interactive application resources such as, but not limited to, the types of interactive application elements as discussed herein may be used to trigger a wager in accordance with a wagering proposition, one skilled in the art will recognize that any interactive application resource can be utilized in a market based interleaved wagering system to trigger of a wager as appropriate to the specification of a specific application in accordance with various embodiments of the invention.

**[0052]** In several embodiments, a market based interleaved wagering system can utilize an application controller to monitor use of the interactive application executed by an interactive controller for detecting a trigger of a wagering event. The trigger for the wagering event can be detected by the application controller from the utilization of the interactive application in accordance with at least one wagering event occurrence rule. The trigger of the wagering event can be communicated to a wager controller. In response to notification of the trigger, the wager controller executes a wager in accordance with a wagering proposition. In addition, use of an interactive application in a market based interleaved wagering system can be modified by the application controller based upon the wager outcome.

**[0053]** In several embodiments, a wagering event occurrence can be determined from one or more application environment variables within an interactive application that are used to trigger a wager and/or associated wager in accordance with a wagering proposition. Application environment variables can include, but are not limited to, passage of a period of time during market based interleaved wagering system interactive application use, a result from a market based interleaved wagering system interactive application session (such as, but not limited to, achieving a goal or a particular score), a user action that is a consumption of an element, or a user action that achieves a combination of elements to be associated with a user profile.

**[0054]** In numerous embodiments, an interactive application instruction is an instruction to an interactive controller and/or an interactive application to modify an interactive application state or modify one or more interactive application resources. In some embodiments, the interactive application instructions may be based upon one or more of a wager outcome and application environment variables. An interactive application instruction can modify any aspect of an interactive application, such as, but not limited to, an addition of a period of time available for a current interactive application

session for the interactive application of market based interleaved wagering system, an addition of a period of time available for a future market based interleaved wagering system interactive application session or any other modification to the interactive application elements that can be utilized during interactive application use. In some embodiments, an interactive application instruction can modify a type of element whose consumption triggers a wagering event occurrence. In many embodiments, an interactive application instruction can modify a type of element whose consumption is not required in a wagering event occurrence.

**[0055]** In a number of embodiments, a user interface can be utilized that depicts a status of the interactive application in the market based interleaved wagering system. A user interface can depict any aspect of an interactive application including, but not limited to, an illustration of market based interleaved wagering system interactive application use advancement as a user uses the market based interleaved wagering system.

**[0056]** In some embodiments, a market based interleaved wagering system including an application controller operatively connected to a wager controller and operatively connected to an interactive controller may provide for interleaving entertainment content from an interactive application. The market based interleaved wagering system provides for random wager outcomes in accordance with the wagering proposition that are independent of user skill while providing an interactive experience to the user that may be shaped by the user's skill.

**[0057]** In several embodiments, an application controller of a market based interleaved wagering system may provide for a communications interface for asynchronous communications between a wager controller and an interactive application provided by an interactive controller, by operatively connecting the interactive controller, and thus the interactive controller's interactive application, with the wager controller. In some embodiments, asynchronous communications provided for by a market based interleaved wagering system may reduce an amount of idle waiting time by an interactive controller of the market based interleaved wagering system, thus increasing an amount of processing resources that the interactive controller may provide to an interactive application or other processes of the interactive controller. In many embodiments, asynchronous communications provided for by a market based interleaved wagering system reduces an amount of idle waiting time by a wager controller, thus increasing an amount of processing resources that the wager controller may provide to execution of wagers to determine wager outcomes, and other processes provided by the wager controller. In some embodiments, a wager controller of a market based interleaved wagering system may be operatively connected to a plurality of interactive controllers through one or more application controllers and the asynchronous communications provided for by the one or more application controllers allows the wager controller to operate more efficiently and provide wager outcomes to a larger number of interactive controllers than would be achievable without the one or more application controllers of the market based interleaved wagering system.

**[0058]** In some embodiments, a market based interleaved wagering system including an application controller operatively connected to a wager controller and operatively connected to an interactive controller may provide for simplified communication protocols for communications of the interactive controller as the interactive controller may communicate

user interactions with an interactive application provided by the interactive controller to the application controller without regard to a nature of a wagering proposition to be interleaved with processes of the interactive application.

**[0059]** In various embodiments, a market based interleaved wagering system including an application controller operatively connected to a wager controller and operatively connected to an interactive controller may provide for simplified communication protocols for communications of the wager controller as the wager controller may receive wager requests and communicate wager outcomes without regard to a nature of an interactive application provided by the interactive controller.

**[0060]** Various types interleaved wagering systems are discussed in Patent Cooperation Treaty Application No. PCT/US11/26768, filed Mar. 1, 2011, Patent Cooperation Treaty Application No. PCT/US11/63587, filed Dec. 6, 2011, and Patent Cooperation Treaty Application No. PCT/US12/58156, filed Sep. 29, 2012, the contents of each of which are hereby incorporated by reference in their entirety.

#### Market Based Wagering Interleaved Systems

**[0061]** FIG. 1 is a diagram of a structure of a market based interleaved wagering system in accordance with various embodiments of the invention. The market based interleaved wagering system 128 includes an interactive controller 120, an application controller 112, and a wager controller 102. The interactive controller 120 is operatively connected to, and communicates with, the application controller 112. The application controller 112 is also operatively connected to, and communicates with, the wager controller 102.

**[0062]** In several embodiments, the wager controller 102 is a controller for providing one or more wagering propositions provided by the market based interleaved wagering system 128 and executes wagers in accordance with the wagering propositions. Types of value of a wager can be one or more of several different types. Types of value of a wager can include, but are not limited to, a wager of an amount of Cr corresponding to a real currency or a virtual currency, a wager of an amount of AC earned by the player through use of an interactive application, a wager of an amount of elements of an interactive application, and a wager of an amount of objects used in an interactive application. A wager outcome determined for a wager in accordance with a wagering proposition can increase or decrease an amount of the type of value used in the wager, such as, but not limited to, increasing an amount of Cr for a wager of Cr. In various embodiments, a wager outcome determined for a wager in accordance with a wagering proposition can increase or decrease an amount of a type of value that is different than a type of value of the wager, such as, but not limited to, increasing an amount of an object of an interactive application for a wager of Cr.

**[0063]** In many embodiments, the wager controller 120 includes one or more pseudo random or random number generators (P/RNG) 106 for generating random results, one or more paytables 108 for determining a wager outcome from the random results, and one or more credit or value meters 110 for storing amounts of wagered and won credits.

**[0064]** The one or more P/RNG generators 106 execute processes that can generate random or pseudo random results. The one or more paytables 108 are tables that can be used in conjunction with the random or pseudo random results to determine a wager outcome including an amount of Cr, AC, elements or objects won as a function of market based inter-

leaved wagering system use. There can be one or more paytables 108 in the wager controller 102. The paytables 108 are used to implement one or more wagering propositions in conjunction with a random output of the random or pseudo random results.

**[0065]** In some embodiments, selection of a payable to use to execute a wager can be based on factors including, but not limited to, interactive application progress a user has achieved through use of the interactive application, user identification, and eligibility of the user for bonus rounds.

**[0066]** In various embodiments, the interactive controller 120 provides an interactive application 143 and provides human input devices (HIDs) and output devices for interacting with the user 140. The interactive controller 120 provides for user interactions 142 with the interactive application 143 by receiving input from a user through the HIDs and providing outputs such as video, audio and/or other sensory output to the user using the output devices.

**[0067]** The interactive controller 120 is operatively connected to, and communicates with, the application controller 112. The interactive controller communicates application telemetry data 124 to the application controller 112 and receives application instructions and resources 136 from the application controller 112. Via the communication of application instructions and resources 136, the application controller 112 can communicate certain interactive application resources including control parameters to the interactive application 143 to affect the interactive application's execution by the interactive controller 120. In various embodiments, these interactive application control parameters can be based on a wager outcome of a wager that was triggered by an element in the interactive application being utilized or acted upon by the user.

**[0068]** In some embodiments, execution of the interactive application by the interactive controller 120 communicates user interactions with the interactive application to the application controller 112. The application telemetry data 124 includes, but is not limited to, the user's utilization of the elements in the interactive application.

**[0069]** In some embodiments, the interactive application 143 is a skill-based interactive game. In such embodiments, execution of the skill-based interactive game by the interactive controller 120 is based on the user's skillful play of the skill-based interactive game. The interactive controller 120 can also communicate user choices made in the skill-based interactive game to the application controller 112 included in the application telemetry data 124 such as, but not limited to, the user's utilization of the elements of the skill-based interactive game during the user's skillful play of the skill-based interactive game. In such an embodiment, the application controller is interfaced to the interactive controller 120 in order to allow the coupling of the skill-based interactive game to wagers made in accordance with a wagering proposition.

**[0070]** In some embodiments, the interactive controller 120 includes one or more sensors 138 that sense various aspects of the physical environment of the interactive controller 120. Examples of sensors include, but are not limited to: global positioning sensors (GPSs) for sensing communications from a GPS system to determine a position or location of the interactive controller; temperature sensors; accelerometers; pressure sensors; and the like. Sensor telemetry data 128 is communicated by the interactive controller to the application

controller 112. The application controller 112 receives the sensor telemetry data 128 and uses the sensory telemetry data to make wager decisions.

[0071] In many embodiments, the interactive controller includes a wagering user interface 148 used to display wagering data to the user.

[0072] In various embodiments, an application control layer 131 resident in the interactive controller 120 provides an interface between the interactive controller 120 and the application controller 112.

[0073] In many embodiments, application controller 112 provides an interface between the interactive application 143 provided by the interactive controller 120 and a wagering proposition provided by the wager controller 102.

[0074] In some embodiments, the application controller 112 includes an interactive controller interface 160 to an interactive controller. The interactive controller interface 160 provides for the communication of data between the interactive controller and the application controller, including but not limited to wager telemetry data 146, application instructions and resources 136, application telemetry data 124, and sensor telemetry data 128.

[0075] In various embodiments, the application controller 112 includes a wager controller interface 162 to a wager controller. The wager controller interface 162 provides for communication of data between the application controller 112 and the wager controller, including but not limited to wager outcome data 130 and wager data 129.

[0076] In some embodiments, the application controller 112 includes a user management controller interface 164 to a user management controller. The user management controller interface 164 provides for communication of data between the application controller 112 and the user management controller, including but not limited to session control data 154 and session telemetry data 152.

[0077] The application controller 112 includes a business rule decision engine 122 that receives telemetry data, such as application telemetry data 124 and sensor telemetry data 128, from the interactive controller 120. The business rule decision engine 122 uses the telemetry data, along with trigger logic 126 to generate wager data 129 used to trigger a wager in the wager controller 102.

[0078] In some embodiments, the application telemetry data 124 includes, but is not limited to, application environment variables that indicate the state of the interactive application 143 being used by a user 140, interactive controller data indicating the state of the interactive controller, and user actions and interactions 142 between the user and the interactive application 143 provided by the interactive controller 120. The wagering and/or wager data 129 may include, but is not limited to, an amount and type of the wager, a trigger of the wager, and a selection of a payable 108 to be used when executing the wager.

[0079] In some embodiments, the business rule decision engine 122 also receives wager outcome data 130 from the wager controller 102. The decision engine 122 uses the wager outcome data 130, in conjunction with the telemetry data and application logic 132 to generate application decisions 134 communicated to an application resource generator 138. The application resource generator 138 receives the application decisions and uses the application decisions to generate application instructions and application resources 136 to be communicated to the interactive application 143.

[0080] In many embodiments, the application controller 112 includes a pseudo random or random result generator used to generate random results that are communicated to the application resource generator 138. The application resource generator 138 uses the random results to generate application instructions and application resources 136 to be communicated to the interactive application 143.

[0081] In various embodiments, the business rule decision engine 122 also determines an amount of AC to award to the user 140 based at least in part on the user's use of the interactive application of the market based interleaved wagering system as determined from the application telemetry data 124. In some embodiments, wager outcome data 130 may also be used to determine the amount of AC that should be awarded to the user.

[0082] In numerous embodiments, the interactive application is a skill-based interactive game and the AC is awarded to the user for the user's skillful play of the skill-based interactive game.

[0083] In some embodiments, the application decisions 134 and wager outcome data 130 are communicated to a wagering user interface generator 144. The wagering user interface generator 144 receives the application decisions 134 and wager outcome data 130 and generates wager telemetry data 146 describing the state of wagering and credit accumulation and loss for the market based interleaved wagering system. In some embodiments, the wager telemetry data 146 may include, but is not limited to, amounts of AC and elements earned, lost or accumulated by the user through use of the interactive application as determined from the application decisions, and Cr amounts won, lost or accumulated as determined from the wager outcome data 130 and the one or more meters 110.

[0084] In some embodiments, the wager outcome data 130 also includes data about one or more game states of a gambling game executed in accordance with a wagering proposition by the wager controller 102. In various such embodiments, the wagering user interface generator 144 generates a gambling game process display and/or gambling game state display using the one or more game states of the gambling game. The gambling game process display and/or gambling game state display is included in the wager telemetry data 146 that is communicated to the interactive controller 120. The gambling game process display and/or a gambling game state display is displayed by the wagering user interface 148 to the user 140. In other such embodiments, the one or more game states of the gambling game are communicated to the interactive controller 120 and the wagering user interface 148 generates the gambling game process display and/or gambling game state display using the one or more game states of the gambling game for display to the user 140.

[0085] The application controller 112 can further operatively connect to the wager controller 102 to determine an amount of credit or elements available and other wagering metrics of a wagering proposition. Thus, the application controller 112 may potentially affect an amount of Cr in play for participation in the wagering events of a wagering game provided by the wager controller 102 in some embodiments. The application controller 112 may additionally include various audit logs and activity meters. In some embodiments, the application controller 112 can also couple to a centralized server for exchanging various data related to the user and the activities of the user during game play of a market based interleaved wagering system.



[0086] In many embodiments, one or more users can be engaged in using the interactive application executed by the interactive controller 120. In various embodiments, a market based interleaved wagering system can include an interactive application that provides a skill-based interactive game that includes head-to-head play between a single user and a computing device, between two or more users against one another, or multiple users playing against a computer device and/or each other. In some embodiments, the interactive application can be a skill-based interactive game where the user is not skillfully playing against the computer or any other user such as skill-based interactive games where the user is effectively skillfully playing against himself or herself.

[0087] In some embodiments, the operation of the application controller 112 does not affect the provision of a wagering proposition by the wager controller 102 except for user choice parameters that are allowable in accordance with the wagering proposition. Examples of user choice parameters include, but are not limited to: wager terms such as but not limited to a wager amount; speed of game play (for example, by pressing a button or pulling a handle of a slot machine); and/or agreement to wager into a bonus round.

[0088] In various embodiments, wager outcome data 130 communicated from the wager controller 102 can also be used to convey a status operation of the wager controller 102.

[0089] In a number of embodiments, communication of the wager data 129 between the wager controller 102 and the application controller 112 can further be used to communicate various wagering control factors that the wager controller 102 uses as input. Examples of wagering control factors include, but are not limited to, an amount of Cr, AC, elements, or objects consumed per wagering event, and/or the user's election to enter a jackpot round.

[0090] In some embodiments, the application controller 112 utilizes the wagering user interface 148 to communicate certain interactive application data to the user, including but not limited to, club points, user status, control of the selection of choices, and messages which a user can find useful in order to adjust the interactive application experience or understand the wagering status of the user in accordance with the wagering proposition in the wager controller 102.

[0091] In some embodiments, the application controller 112 utilizes the wagering user interface 148 to communicate aspects of a wagering proposition to the user including, but not limited to, odds of certain wager outcomes, amount of Cr, AC, elements, or objects in play, and amounts of Cr, AC, elements, or objects available.

[0092] In a number of embodiments, the wager controller 102 can accept wager proposition factors including, but not limited to, modifications in the amount of Cr, AC, elements, or objects wagered on each individual wagering event, a number of wagering events per minute the wager controller 102 can resolve, entrance into a bonus round, and other factors. An example of a varying wager amount that the user can choose can include, but is not limited to, using a more difficult interactive application level associated with an amount of a wager. These factors can increase or decrease an amount wagered per individual wagering proposition in the same manner that a standard slot machine player can decide to wager more or less credits for each pull of the handle. In several embodiments, the wager controller 102 can communicate a number of factors back and forth to the application controller 112, via an interface, such that an increase/decrease in a wagered amount can be related to the change in

user profile of the user in the interactive application. In this manner, a user can control a wager amount per wagering event in accordance with the wagering proposition with the change mapping to a parameter or component that is applicable to the interactive application experience.

[0093] In some embodiments, a user management controller 150 is used to authorize a market based interleaved wagering system gaming session. The user management controller receives game session data 152, that may include, but is not limited to, user, interactive controller, application controller and wager controller data from the application controller 112. The user management controller 150 uses the user, interactive controller, application controller and wager controller data to regulate a market based interleaved wagering system gaming session. In some embodiments, the user management controller may also assert control of a market based interleaved wagering system game session 154. Such control may include, but is not limited to, ending a market based interleaved wagering system game session, initiating wagering in a market based interleaved wagering system game session, ending wagering in a market based interleaved wagering system game session but not ending a user's play of the interactive application portion of the market based interleaved wagering system game, and changing from real credit wagering in a market based interleaved wagering system to virtual credit wagering, or vice versa.

#### Market Based Interleaved Wagering System Controllers

[0094] FIGS. 2A, 2B, 2C, and 2D are illustrations of interactive controllers of a market based interleaved wagering system in accordance with various embodiments of the invention. An interactive controller, such as interactive controller 120 of FIG. 1, may be constructed using one or more processing devices configured to perform the operations of the interactive controller. An interactive controller may be constructed from an electronic gaming machine 200 as shown in FIG. 2A. The electronic gaming machine 200 may be physically located in various types of gaming establishments. An interactive controller may be constructed from a portable device 202 as shown in FIG. 2B. The portable device 202 is a device that may wirelessly connect to a network. Examples of portable devices include, but are not limited to, a tablet computer, a personal digital assistant, and a smartphone. An interactive controller may be constructed from a gaming console 204 as shown in FIG. 2C. An interactive controller may be constructed from a personal computer 206 as shown in FIG. 2D. Indeed, an interactive controller in a market based interleaved wagering system may be constructed from any processing device including sufficient processing and communication capabilities that may be configured to perform the processes of an interactive controller in accordance with various embodiments of the invention.

[0095] Some market based interleaved wagering systems in accordance with many embodiments of the invention can operate with their components being network connected or can communicate with other market based interleaved wagering systems. In many embodiments, operations associated with components of a market based interleaved wagering system can be performed on a single device or across multiple devices. These multiple devices can be constructed using a single server or a plurality of servers such that a market based interleaved wagering system is executed as a system in a virtualized space such as, but not limited to, where a wager controller and an application controller are large scale cen-

tralized servers in the cloud operatively connected to widely distributed interactive controllers via a wide area network such as the Internet or a local area network. In such embodiments, the components of a market based interleaved wagering system may communicate using a networking protocol or other type of device-to-device communications protocol.

**[0096]** In many embodiments, a centralized wager controller is operatively connected to, and communicates with, one or more application controllers via a network. The centralized wager controller can generate wager outcomes for wagers in accordance with one or more wagering propositions. The centralized wager controller can execute a number of simultaneous or pseudo-simultaneous wagers in order to generate wager outcomes for a variety of wagering propositions that one or more networked market based interleaved wagering systems can use.

**[0097]** In several embodiments, a centralized application controller is operatively connected to one or more interactive controllers and one or more wager controllers via a network. The centralized application controller can perform the functionality of an application controller across various market based interleaved wagering systems.

**[0098]** In a variety of embodiments, management of user profile data can be performed by a user management controller operatively connected to, and communicating with, one or more application controllers, wager controllers and interactive controllers via a network. A user management controller can manage data related to a user profile. The managed data in the user profile may include, but is not limited to, data concerning controlled entities (characters) in interactive application use, user performance metrics for a type or class of interactive application, interactive application elements acquired by a user; Cr and AC associated with a particular user, and tournament reservations.

**[0099]** Although a user management controller is discussed as being separate from an application controller server, a centralized application controller server may also perform the functions of a user management controller in some embodiments.

**[0100]** In a number of embodiments, an application controller of a market based interleaved wagering system can communicate data to a user management controller. The data communicated by the application controller to the user management controller may include, but is not limited to, AC and Cr used in an interactive application; user profile data; user interaction activity; profile data for users; synchronization data between a wager controller and an interactive application; and data about other aspects of a market based interleaved wagering system. In several embodiments, a user management controller can communicate user data to an application controller of a market based interleaved wagering system. The user data may include, but is not limited to, interactive application title and type; tournament data; special offers; character or profile setup and synchronization data between a wagering game and an interactive application; and data about any other aspect of a market based interleaved wagering system.

**[0101]** In numerous embodiments, an interactive application server provides a host for managing head-to-head play operating over a network of interactive controllers connected to the interactive application server via a network. The interactive application server provides an environment where users can compete directly with one another and interact with other users.

**[0102]** Processing devices connected via a network to construct market based interleaved wagering systems in accordance with many embodiments of the invention can communicate with each other to provide services utilized by a market based interleaved wagering system. In several embodiments, a wager controller can communicate with an application controller over a network. In some embodiments, the wager controller can communicate with an application controller to communicate any type of data as appropriate for a specific application. Examples of the data that may be communicated include, but are not limited to, data used to configure the various simultaneous or pseudo simultaneous wager controllers executing in parallel within the wager controller to accomplish market based interleaved wagering system functionalities; data used to determine metrics of wager controller performance such as wagers run and/or wager outcomes for tracking system performance; data used to perform audits and/or provide operator reports; and data used to request the results of a wager outcome for use in one or more function(s) operating within the application controller such as, but not limited to, automatic drawings for prizes that are a function of interactive controller performance.

**[0103]** In several embodiments, an application controller can communicate with an interactive application server via a network when the interactive application server is also communicating with one or more interactive controllers over a network. An application controller can communicate with an interactive application server to communicate any type of data as appropriate for a specific application. The data that may be communicated between an application controller and an interactive application server includes, but is not limited to, the data for management of an interactive application server by an application controller server during a market based interleaved wagering system tournament. In an example embodiment, an application controller may not be aware of the relationship of the application controller to the rest of a tournament since the actual tournament play may be managed by the interactive application server. Therefore, management of a market based interleaved wagering system can include, but is not limited to tasks including, but not limited to, conducting tournaments according to system programming that can be coordinated by an operator of the market based interleaved wagering system; allowing entry of a particular user into a tournament; communicating the number of users in a tournament; and the status of the tournament (such as, but not limited to the amount of surviving users, the status of each surviving user within the game, and time remaining on the tournament); communicating the performance of users within the tournament; communicating the scores of the various users in the tournament; and providing a synchronizing link to connect the application controllers in a tournament with their respective interactive controllers.

**[0104]** In several embodiments, an application controller can communicate with a user management controller via a network. An application controller can communicate with a user management controller to communicate any type of data as appropriate for a specific application. Examples of data communicated between an application controller and a user management controller include, but are not limited to, data for configuring tournaments according to system programming conducted by an operator of a market based interleaved wagering system; data for exchange of data used to link a user's user profile to an ability to participate in various forms of market based interleaved wagering system use (such as but

not limited to the difficulty of play set by the application controller server for an interactive application that is a skill-based interactive game); data for determining a user's ability to participate in a tournament as a function of a user's characteristics (such as but not limited to a user's prowess or other metrics used for tournament screening); data for configuring application controller and interactive controller performance to suit preferences of a user on a particular market based interleaved wagering system; and data for determining a user's use and wagering performance for the purposes of marketing intelligence; and data for logging secondary drawing awards, tournament prizes, Cr and/or AC into the user profile.

**[0105]** In many embodiments, the actual location of where various process are executed can be located either on a single device (wager controller, application controller, interactive controller), on servers (wager controller, application controller, or interactive application server), or a combination of both devices and servers. In a number of embodiments, certain functions of a wager controller, application controller, user management controller and/or interactive application server can operate on a local wager controller, application controller and/or interactive controller used to construct a market based interleaved wagering system being provided locally on a device. In some embodiments, a controller or server can be part of a server system including multiple servers, where applications can be run on one or more physical devices. Similarly, in particular embodiments, multiple servers can be combined on a single physical device.

**[0106]** Some market based interleaved wagering systems in accordance with many embodiments of the invention can be distributed across a network in various configurations. FIGS. 3A, 3B and 3C are network diagrams of networked market based interleaved wagering systems in accordance with various embodiments of the invention. Turning now to FIG. 3A, one or more interactive controllers of a networked market based interleaved wagering system, such as but not limited to, a mobile or wireless device 300, a gaming console 302, a personal computer 304, and an electronic gaming machine 305, are operatively connected with a wager controller 306 of a networked market based interleaved wagering system over a network 308. Network 308 is communications network that allows processing systems communicate with each other and to share data. Examples of the network 308 can include, but are not limited to, a Local Area Network (LAN) and a Wide Area Network (WAN). In some embodiments, one or more processes of an interactive controller and an application controller as described herein are executed on the individual interactive controllers 300, 302, 304 and 305 while one or more processes of a wager controller as described herein can be executed by the wager controller 306.

**[0107]** A networked market based interleaved wagering system in accordance with another embodiment of the invention is illustrated in FIG. 3B. As illustrated, one or more interactive controllers of a networked market based interleaved wagering system, such as but not limited to, a mobile or wireless device 310, a gaming console 312, a personal computer 314, and an electronic gaming machine 315, are operatively connected with a wager controller server 316 and an application controller 318 over a network 320. Network 320 is a communications network that allows processing systems to communicate and share data. Examples of the network 320 can include, but are not limited to, a Local Area Network (LAN) and a Wide Area Network (WAN). In some

embodiments, the processes of an interactive controller as described herein are executed on the individual interactive controllers 310, 312, 314 and 315. One or more processes of a wager controller as described herein are executed by the wager controller 316, and one or more processes of an application controller as described herein are executed by the application controller 318.

**[0108]** A networked market based interleaved wagering systems in accordance with still another embodiment of the invention is illustrated in FIG. 3C. As illustrated, one or more interactive controllers of a networked market based interleaved wagering system, such as but not limited to, a mobile device 342, a gaming console 344, a personal computer 346, and an electronic gaming machine 340 are operatively connected with a wager controller 348 and an application controller 350, and an interactive application server 352 over a network 354. Network 354 is a communications network that allows processing systems communicate and to share data. Examples of the network 354 can include, but are not limited to, a Local Area Network (LAN) and a Wide Area Network (WAN). In some embodiments, one or more processes of a display and user interface of an interactive controller as described herein are executed on the individual interactive controllers 340, 342, 344 and 346. One or more processes of a wager controller as described herein can be executed by the wager controller server 348. One or more processes of an application controller as described herein can be executed by the application controller server 350 and one or more processes of an interactive controller excluding the display and user interfaces can be executed by the interactive application server 352.

**[0109]** In various embodiments, a user management controller may be operatively connected to components of a market based interleaved wagering system via a network. In other embodiments, a number of other peripheral systems, such as a user management system, a gaming establishment management system, a regulatory system, and/or hosting servers are also operatively connected with the market based interleaved wagering systems over a network. Also, other servers can reside outside the bounds of a network within a firewall of the operator to provide additional services for network connected market based interleaved wagering systems.

**[0110]** Although various networked market based interleaved wagering systems are described herein, market based interleaved wagering systems can be networked in any configuration as appropriate to the specification of a specific application in accordance with embodiments of the invention. In some embodiments, components of a networked market based interleaved wagering system, such as an application controller, wager controller, interactive controller, or other servers that perform services for an application controller, wager controller and/or interactive controller, can be networked in different configurations for a specific networked market based interleaved wagering system application.

**[0111]** FIGS. 4A and 4B are diagrams of a structure of an interactive controller of a market based interleaved wagering system in accordance with various embodiments of the invention. An interactive controller may be constructed from one or more processing devices configured to perform the operations of the interactive controller. In many embodiments, an interactive controller can be constructed from various types of processing devices including, but not limited to, a mobile device such as a smartphone or the like, a personal digital

assistant, a wireless device such as a tablet computer or the like, an electronic gaming machine, a personal computer, a gaming console, a set-top box, a computing device, a controller, or the like.

[0112] Referring now to FIG. 4A, an interactive controller 400, suitable for use as interactive controller 120 of FIG. 1, provides an execution environment for an interactive application 402 of a market based interleaved wagering system. In several embodiments, an interactive controller 400 of a market based interleaved wagering system provides an interactive application 402 that generates an application user interface 404 for interaction with by a user. The interactive application 402 generates a user presentation 406 that is presented to the user through the application user interface 404. The user presentation 406 may include audio features, visual features or tactile features, or any combination of these features. The application user interface 404 further includes one or more human input devices (HIDs) interfaces that communicate with one or more HIDs (e.g., the input devices 514 of FIG. 4b) that the user can use to interact with the market based interleaved wagering system. The user's interactions 408 are included by the interactive application 402 in application telemetry data 410 that is communicated by interactive controller 400 to various other components of a market based interleaved wagering system as described herein. The interactive application 402 receives application instructions and resources 412 communicated from various other components of a market based interleaved wagering system as described herein.

[0113] In some embodiments, various components of the interactive application 402 can read data from an application state 414 in order to provide one or more features of the interactive application. In various embodiments, components of the interactive application 402 can include, but are not limited to, a physics engine, a rules engine, and/or a graphics engine. The physics engine is used to simulate physical interactions between virtual objects in the interactive application 402. The rules engine implements the rules of the interactive application and a P/RNG that may be used for influencing or determining certain variables and/or outcomes to provide a randomizing influence on the operations of the interactive application. The graphics engine is used to generate a visual representation of the interactive application state to the user. Furthermore, the components may also include an audio engine to generate audio outputs for the user interface.

[0114] During operation, the interactive application reads and writes application resources 416 stored on a data store of the interactive controller host. The application resources 416 may include objects having graphics and/or control logic used to provide application environment objects of the interactive application. In various embodiments, the resources may also include, but are not limited to, video files that are used to generate a portion of the user presentation 406; audio files used to generate music, sound effects, etc. within the interactive application; configuration files used to configure the features of the interactive application; scripts or other types of control code used to provide various features of the interactive application; and graphics resources such as textures, objects, etc. that are used by a graphics engine to render objects displayed in an interactive application.

[0115] In operation, components of the interactive application 402 read portions of the application state 414 and generate the user presentation 406 for the user that is presented to the user using the user interface 404. The user perceives the

user presentation and provides user interactions 408 using the HIDs. The corresponding user interactions are received as user actions or inputs by various components of the interactive application 402. The interactive application 402 translates the user actions into interactions with the virtual objects of the application environment stored in the application state 414. Components of the interactive application use the user interactions with the virtual objects of the interactive application and the interactive application state 414 to update the application state 414 and update the user presentation 406 presented to the user. The process loops continuously while the user interacts with the interactive application of the market based interleaved wagering system.

[0116] The interactive controller 400 provides one or more interfaces 418 between the interactive controller 400 and other components of a market based interleaved wagering system, such as, but not limited to, an application controller. The interactive controller 400 and the other market based interleaved wagering system components communicate with each other using the interfaces. The interface may be used to pass various types of data, and to communicate and receive messages, status data, commands and the like. In certain embodiments, the interactive controller 400 and an application controller communicate application instructions and environment resources 412 and application telemetry data 410. In some embodiments, the communications include requests by the application controller that the interactive controller 400 update the application state 414 using data provided by the application controller.

[0117] In many embodiments, a communication by an application controller includes a request that the interactive controller 400 update one or more resources 416 using data provided by the application controller. In a number of embodiments, the interactive controller 400 provides all or a portion of the application state to the application controller. In some embodiments, the interactive controller 400 may also provide data about one or more of the application resources 416 to the application controller. In some embodiments, the communication includes user interactions that the interactive controller 400 communicates to the application controller. The user interactions may be low level user interactions with the user interface 404, such as manipulation of a HID, or may be high level interactions with game objects as determined by the interactive application. The user interactions may also include resultant actions such as modifications to the application state 414 or game resources 416 resulting from the user's interactions taken in the market based interleaved wagering system interactive application. In some embodiments, user interactions include, but are not limited to, actions taken by entities such as non-player characters (NPC) of the interactive application that act on behalf of or under the control of the user.

[0118] In some embodiments, the interactive controller 400 includes a wagering user interface 420 used to communicate market based interleaved wagering system telemetry data 422 to and from the user. The market based interleaved wagering system telemetry data 422 from the market based interleaved wagering system include, but are not limited to, data used by the user to configure Cr, AC and element wagers, and data about the wagering game Cr, AC and element wagers such as, but not limited to, Cr, AC and element balances and Cr, AC and element amounts wagered.

[0119] In some embodiments, the interactive controller includes one or more sensors 424. Such sensors may include,

but are not limited to, physiological sensors that monitor the physiology of the user, environmental sensors that monitor the physical environment of the interactive controller, accelerometers that monitor changes in motion of the interactive controller, and location sensors that monitor the location of the interactive controller such as global positioning sensors (GPSs). The interactive controller **400** communicates sensor telemetry data **426** to one or more components of the market based interleaved wagering system.

[0120] Referring now to FIG. 4B, interactive controller **400** includes a bus **502** that provides an interface for one or more processing units **504**, random access memory (RAM) **506**, read only memory (ROM) **508**, machine-readable storage medium **510**, one or more user output devices **512**, one or more user input devices **514**, and one or more communication interface devices **516**.

[0121] The one or more processing units **504** may take many forms, such as, but not limited to: a central processing unit (CPU); a multi-processor unit (MPU); an ARM processor; a controller; a programmable logic device; or the like.

[0122] In the example embodiment, the one or more processors **504** and the random access memory (RAM) **506** form an interactive controller processing unit **599**. In some embodiments, the interactive controller processing unit includes one or more processors operatively connected to one or more of a RAM, ROM, and machine-readable storage medium; the one or more processors of the interactive controller processing unit receive instructions stored by the one or more of a RAM, ROM, and machine-readable storage medium via a bus; and the one or more processors execute the received instructions. In some embodiments, the interactive controller processing unit is an ASIC (Application-Specific Integrated Circuit). In some embodiments, the interactive controller processing unit is a SoC (System-on-Chip).

[0123] Examples of output devices **512** include, but are not limited to, display screens; light panels; and/or lighted displays. In accordance with particular embodiments, the one or more processing units **504** are operatively connected to audio output devices such as, but not limited to: speakers; and/or sound amplifiers. In accordance with many of these embodiments, the one or more processing units **504** are operatively connected to tactile output devices like vibrators, and/or manipulators.

[0124] Examples of user input devices **514** include, but are not limited to: tactile devices including but not limited to, keyboards, keypads, foot pads, touch screens, and/or trackballs; non-contact devices such as audio input devices; motion sensors and motion capture devices that the interactive controller can use to receive inputs from a user when the user interacts with the interactive controller; physiological sensors that monitor the physiology of the user; environmental sensors that monitor the physical environment of the interactive controller; accelerometers that monitor changes in motion of the interactive controller; and location sensors that monitor the location of the interactive controller such as global positioning sensors.

[0125] The one or more communication interface devices **516** provide one or more wired or wireless interfaces for communicating data and commands between the interactive controller **400** and other devices that may be included in a market based interleaved wagering system. Such wired and wireless interfaces include, but are not limited to: a Universal Serial Bus (USB) interface; a Bluetooth interface; a Wi-Fi interface; an Ethernet interface; a Near Field Communication

(NFC) interface; a plain old telephone system (POTS) interface, a cellular or satellite telephone network interface; and the like.

[0126] The machine-readable storage medium **510** stores machine-executable instructions for various components of the interactive controller, such as but not limited to: an operating system **518**; one or more device drivers **522**; one or more application programs **520** including but not limited to an interactive application; and market based interleaved wagering system interactive controller instructions **524** for use by the one or more processing units **504** to provide the features of an interactive controller as described herein. In some embodiments, the machine-executable instructions further include application control layer/application control interface instructions **526** for use by the one or more processing units **504** to provide the features of an application control layer/application control interface as described herein.

[0127] In various embodiments, the machine-readable storage medium **510** is one of a (or a combination of two or more of) a hard drive, a flash drive, a DVD, a CD, a flash storage, a solid state drive, a ROM, an EEPROM, and the like.

[0128] In operation, the machine-executable instructions are loaded into memory **506** from the machine-readable storage medium **510**, the ROM **508** or any other storage location. The respective machine-executable instructions are accessed by the one or more processing units **504** via the bus **502**, and then executed by the one or more processing units **504**. Data used by the one or more processing units **504** are also stored in memory **506**, and the one or more processing units **504** access such data during execution of the machine-executable instructions. Execution of the machine-executable instructions causes the one or more processing units **504** to control the interactive controller **400** to provide the features of a market based interleaved wagering system interactive controller as described herein.

[0129] Although the interactive controller is described herein as being constructed from one or more processing units and instructions stored and executed by hardware components, the interactive controller can be constructed of only hardware components in accordance with other embodiments. In addition, although the storage medium **510** is described as being operatively connected to the one or more processing units through a bus, those skilled in the art of interactive controllers will understand that the storage medium can include removable media such as, but not limited to, a USB memory device, an optical CD ROM, magnetic media such as tape and disks. In some embodiments, the storage medium **510** can be accessed by the one or more processing units **504** through one of the communication interface devices **516** or over a network. Furthermore, any of the user input devices or user output devices can be operatively connected to the one or more processing units **504** via one of the communication interface devices **516** or over a network.

[0130] In some embodiments, the interactive controller **400** can be distributed across a plurality of different devices. In many such embodiments, an interactive controller of a market based interleaved wagering system includes an interactive application server operatively connected to an interactive client over a network. The interactive application server and interactive application client cooperate to provide the features of an interactive controller as described herein.

[0131] In various embodiments, the interactive controller **400** may be used to construct other components of a market based interleaved wagering system as described herein.

**[0132]** In some embodiments, components of an interactive controller and an application controller of a market based wagering interleaved system may be constructed from a single device using processes that communicate using an interprocess communication protocol. In other such embodiments, the components of an interactive controller and an application controller of a market based wagering interleaved system may communicate by passing messages, parameters or the like.

**[0133]** In some embodiments, components of an interactive controller, an application controller and a wager controller of a market based wagering interleaved system may be constructed using a single device using processes that communicate using an interprocess communication protocol. In other such embodiments, the components of an interactive controller, an application controller and a wager controller of a market based wagering interleaved system may communicate by passing messages, parameters or the like.

**[0134]** FIGS. 5A and 5B are diagrams of a structure of a wager controller of a market based interleaved wagering system in accordance with various embodiments of the invention. A wager controller may be constructed from one or more processing devices configured to perform the operations of the wager controller. In many embodiments, a wager controller can be constructed from various types of processing devices including, but not limited to, a mobile device such as a smartphone or the like, a personal digital assistant, a wireless device such as a tablet computer or the like, an electronic gaming machine, a personal computer, a gaming console, a set-top box, a computing device, a controller, or the like.

**[0135]** Referring now to FIG. 5A, in various embodiments, a wager controller 604, suitable for use as wager controller 102 of FIG. 1, includes a pseudorandom or random number generator (P/RNG) 620 to produce random results or pseudo random results; one or more paytables 623 which includes a plurality of factors indexed by the random result to be multiplied with an amount of Cr, AC, elements, or objects committed in a wager; and a wagering control module 622 whose processes may include, but are not limited to, generating random results, looking up factors in the paytables, multiplying the factors by an amount of Cr, AC, elements, or objects wagered, and administering one or more Cr, AC, element, or object meters 626. The various wager controller components can interface with each other via an internal bus 625 and/or other appropriate communication mechanism.

**[0136]** An interface 628 allows the wager controller 604 to operatively connect to an external device, such as one or more application controllers as described herein. The interface 628 provides for receiving of wager data 629 from the external device that is used to specify wager parameters and/or trigger execution of a wager by the wager controller 604. The interface 628 may also provide for communicating wager outcome data 631 to an external device. In numerous embodiments, the interface between the wager controller 604 and other systems/devices may be a wide area network (WAN) such as the Internet. However, other methods of communication may be used including, but not limited to, a local area network (LAN), a universal serial bus (USB) interface, and/or some other method by which two electronic devices could communicate with each other.

**[0137]** In various embodiments, a wager controller 604 may use a P/RNG provided by an external system. The external system may be connected to the wager controller 604 by a suitable communication network such as a local area net-

work (LAN) or a wide area network (WAN). In some embodiments, the external P/RNG is a central deterministic system that provides random or pseudo random results to one or more connected wager controllers.

**[0138]** During operation of the wager controller, the external system communicates wager data 629 to the wager controller 604. The wager controller 604 receives the wager data and uses the wager data to trigger execution of a wager in accordance with a wagering proposition. The wager controller 604 executes the wager and determines a wager outcome for the wager. The wager controller communicates wager outcome data 631 of the wager outcome to the external system.

**[0139]** In some embodiments, the wager controller uses the wager data to select a payable 628 to use and/or an amount of Cr, AC, elements, or objects to wager.

**[0140]** In some embodiments, the wager outcome data may include, but is not limited to, an amount of Cr, AC, elements, or objects won in the wager.

**[0141]** In various embodiments, the wager outcome data may include, but is not limited to, an amount of Cr, AC, elements, or objects in the one or more meters 626.

**[0142]** In some embodiments, the wager outcome data includes state data for the wagering proposition of the executed wager. The state data may correspond to one or more game states of a gambling game that is associated with the wagering proposition. Examples of state data include, but are not limited to, reel strips in an operation state or a final state for a reel-based gambling game, one or more dice positions for a dice-based gambling game, positions of a roulette wheel and roulette ball, position of a wheel of fortune, or the like.

**[0143]** In various embodiments, the wagering control module 622 determines an amount of a wager and a payable to use from the one or more paytables 623. In such embodiments, in response to the wager data triggering execution of the wager, the wager control module 622 executes the wager by requesting a P/RNG result from the P/RNG 620; retrieving a payable from the one or more paytables 623; adjusting the one or more credit meters 626 for an amount of the wager; applying the P/RNG result to the retrieved payable; multiplying the resultant factor from the payable by an amount wagered to determine a wager outcome; updating the one or more meters 626 based on the wager outcome; and communicating the wager outcome to the external device.

**[0144]** In various embodiments, an external system communicates a request for a P/RNG result from the wager controller 604. In response, the wager controller 604 returns a P/RNG result as a function of an internal P/RNG or a P/RNG external to the external system to which the wager controller 604 is operatively connected.

**[0145]** In some embodiments, a communication exchange between the wager controller 604 and an external system relate to the external system support for coupling a P/RNG result to a particular payable contained in the wager controller 604. In such an exchange, the external system communicates to the wager controller 604 as to which of the one or more paytables 623 to use, and requests a result whereby the P/RNG result would be associated with the requested payable 623. The result of the coupling is returned to the external system. In such an exchange, no actual Cr, AC, element, or object wager is conducted, but might be useful in coupling certain non-value wagering interactive application behaviors and propositions to the same final resultant wagering return

which is understood for the market based interleaved wagering system to conduct wagering.

[0146] In some embodiments, the wager controller 604 may also include storage for statuses, wagers, wager outcomes, meters and other historical events in a storage device 616.

[0147] In some embodiments, an authorization access module provides a process to permit access and command exchange with the wager controller 604 and access to the one or more credit meters 626 for the amount of Cr, AC, elements, or objects being wagered by the user in the market based interleaved wagering system.

[0148] In numerous embodiments, communication occurs between various types of a wager controller and an external system 630, such as application controller. In some of these embodiments, the purpose of the wager controller is to allocate wagers to pools, detect occurrences of one or more events upon which the wagers were made, and determine the wager outcomes for each individual wager based on the number of winning wagers and the amount paid into the pool.

[0149] In some embodiments, the wager controller manages accounts for individual users wherein the users make deposits into the accounts, amounts are deducted from the accounts, and amounts are credited to the users' accounts based on the wager outcomes.

[0150] In some embodiments a wager controller is a pari-mutuel wagering system such as used for wagering on an events such as horse races, greyhound races, sporting events and the like. In a pari-mutuel wagering system, user's wagers on the outcome of an event are allocated to a pool. When the event occurs, wager outcomes are calculated by sharing the pool among all winning wagers.

[0151] In various embodiments, a wager controller is a central determination system, such as but not limited to a central determination system for a Class II wagering system or a wagering system in support of a "scratch off" style lottery. In such a wagering system, a player plays against other players and competes for a common prize. In a given set of wager outcomes, there are a certain number of wins and losses. Once a certain wager outcome has been determined, the same wager outcome cannot occur again until a new set of wager outcomes is generated.

[0152] In numerous embodiments, communication occurs between various components of a wager controller 604 and an external system, such as an application controller. In some of these embodiments, the purpose of the wager controller 604 is to manage wagering on wagering events and to provide random (or pseudo random) results from a P/RNG.

[0153] Referring now to FIG. 5B, wager controller 604 includes a bus 732 that provides an interface for one or more processing units 734, random access memory (RAM) 736, read only memory (ROM) 738, machine-readable storage medium 740, one or more user output devices 742, one or more user input devices 744, and one or more network interface devices 746.

[0154] The one or more processors 734 may take many forms, such as, but not limited to, a central processing unit (CPU), a multi-processor unit (MPU), an ARM processor, a controller, a programmable logic device, or the like.

[0155] In the example embodiment, the one or more processors 734 and the random access memory (RAM) 736 form a wager controller processing unit 799. In some embodiments, the wager controller processing unit includes one or more processors operatively connected to one or more of a

RAM, ROM, and machine-readable storage medium; the one or more processors of the wager controller processing unit receive instructions stored by the one or more of a RAM, ROM, and machine-readable storage medium via a bus; and the one or more processors execute the received instructions. In some embodiments, the wager controller processing unit is an ASIC (Application-Specific Integrated Circuit). In some embodiments, the wager controller processing unit is a SoC (System-on-Chip).

[0156] Examples of output devices 742 include, but are not limited to, display screens, light panels, and/or lighted displays. In accordance with particular embodiments, the one or more processing units 734 are operatively connected to audio output devices such as, but not limited to speakers, and/or sound amplifiers. In accordance with many of these embodiments, the one or more processing units 734 are operatively connected to tactile output devices like vibrators, and/or manipulators.

[0157] Examples of user input devices 734 include, but are not limited to, tactile devices including but not limited to, keyboards, keypads, touch screens, and/or trackballs; non-contact devices such as audio input devices; motion sensors and motion capture devices that the wager controller can use to receive inputs from a user when the user interacts with the wager controller 604.

[0158] The one or more network interface devices 746 provide one or more wired or wireless interfaces for exchanging data and commands between the wager controller 604 and other devices that may be included in a market based interleaved wagering system. Such wired and wireless interfaces include, but are not limited to: a Universal Serial Bus (USB) interface; a Bluetooth interface; a Wi-Fi interface; an Ethernet interface; a Near Field Communication (NFC) interface; a plain old telephone system (POTS) interface; a cellular or satellite telephone network interface; and the like.

[0159] The machine-readable storage medium 740 stores machine-executable instructions for various components of a wager controller, such as but not limited to: an operating system 748; one or more application programs 750; one or more device drivers 752; and market based interleaved wagering system wager controller instructions 754 for use by the one or more processing units 734 to provide the features of a market based interleaved wagering system wager controller as described herein.

[0160] In various embodiments, the machine-readable storage medium 740 is one of a (or a combination of two or more of) a hard drive, a flash drive, a DVD, a CD, a flash storage, a solid state drive, a ROM, an EEPROM, and the like.

[0161] In operation, the machine-executable instructions are loaded into memory 736 from the machine-readable storage medium 740, the ROM 738 or any other storage location. The respective machine-executable instructions are accessed by the one or more processing units 734 via the bus 732, and then executed by the one or more processing units 734. Data used by the one or more processing units 734 are also stored in memory 736, and the one or more processing units 734 access such data during execution of the machine-executable instructions. Execution of the machine-executable instructions causes the one or more processing units 734 to control the wager controller 604 to provide the features of a market based interleaved wagering system wager controller as described herein.

[0162] Although the wager controller 604 is described herein as being constructed from one or more processing



units and machine-executable instructions stored and executed by hardware components, the wager controller can be composed of only hardware components in accordance with other embodiments. In addition, although the storage medium **740** is described as being operatively connected to the one or more processing units through a bus, those skilled in the art of processing devices will understand that the storage medium can include removable media such as, but not limited to, a USB memory device, an optical CD ROM, magnetic media such as tape and disks. In some embodiments, the storage medium **740** can be accessed by the one or more processing units **734** through one of the interfaces or over a network. Furthermore, any of the user input devices or user output devices can be operatively connected to the one or more processing units **734** via one of the interfaces or over a network.

[0163] In various embodiments, the wager controller **604** may be used to construct other components of a market based interleaved wagering system as described herein.

[0164] In some embodiments, components of a wager controller and an application controller of a market based wagering interleaved system may be constructed from a single device using processes that communicate using an inter-process communication protocol. In other such embodiments, the components of a wager controller and an application controller of a market based wagering interleaved system may communicate by passing messages, parameters or the like.

[0165] It should be understood that there may be many embodiments of a wager controller **604** which could be possible, including forms where many modules and components of the wager controller are located in various servers and locations, so the foregoing is not meant to be exhaustive or all inclusive, but rather provide data on various embodiments of a wager controller **604**.

[0166] FIGS. 6A and 6B are diagrams of a structure of an application controller of a market based interleaved wagering system in accordance with various embodiments of the invention. An application controller may be constructed from one or more processing devices configured to perform the operations of the application controller. In many embodiments, an application controller can be constructed from various types of processing devices including, but not limited to, a mobile device such as a smartphone, a personal digital assistant, a wireless device such as a tablet computer or the like, an electronic gaming machine, a personal computer, a gaming console, a set-top box, a computing device, a controller, or the like.

[0167] Referring now to FIG. 6A, in many embodiments, an application controller **860**, suitable for use as application controller **112** of FIG. 1, manages operation of a market based interleaved wagering system, with a wager controller and an interactive controller being support units to the application controller **860**. The application controller **860** provides an interface between the interactive application, provided by an interactive controller, and a wagering proposition, provided by a wager controller.

[0168] In some embodiments, the application controller **860** includes an interactive controller interface **800** to an interactive controller. The interactive controller interface **800** provides for communication of data between an interactive controller and the application controller **860**, including but

not limited to wager telemetry data **802**, application instructions and resources **804**, application telemetry data **806**, and sensor telemetry data **810**.

[0169] In various embodiments, the application controller **860** includes a wager controller interface **812** to a wager controller. The wager controller interface **812** provides for communication of data between the application controller **860** and a wager controller, including but not limited to wager outcomes **814** and wager data **816**.

[0170] In some embodiments, the application controller **860** includes a user management controller interface **818** to a user management controller. The user management controller interface **818** provides for communication of data between the application controller **860** and a user management controller, including but not limited to session control data **820** and session telemetry data **822**.

[0171] The application controller **860** includes a business rule decision engine **824** that receives telemetry data, such as application telemetry data and sensor telemetry data, from an interactive controller. The business rule decision engine **824** uses the telemetry data, along with trigger logic **826** to generate wager data used to trigger a wager in a wager controller.

[0172] In some embodiments, the application telemetry data includes, but is not limited to, application environment variables that indicate the state of an interactive application being used by a user, interactive controller data indicating a state of an interactive controller, and user actions and interactions between a user and an interactive application provided by an interactive controller. The wagering and/or wager data may include, but is not limited to, an amount and type of the wager, a trigger of the wager, and a selection of a payable to be used when executing the wager.

[0173] In some embodiments, the business rule decision engine **824** also receives wager outcome data from a wager controller. The decision engine **824** uses the wager outcome data, in conjunction with telemetry data and application logic **828** to generate application decisions **830** communicated to an application resource generator **832**. The application resource generator **832** receives the application decisions and uses the application decisions to generate application instructions and application resources to be communicated to an interactive application.

[0174] In many embodiments, the application controller **860** includes a pseudo random or random result generator used to generate random results that are communicated to the application resource generator **832**. The application resource generator uses the random results to generate application instructions and application resources to be communicated to an interactive controller for use by an interactive application.

[0175] In various embodiments, the business rule decision engine **824** also determines an amount of AC to award to a user based at least in part on the user's use of an interactive application of the market based interleaved wagering system as determined from application telemetry data. In some embodiments, wager outcome data may also be used to determine the amount of AC that should be awarded to the user.

[0176] In numerous embodiments, an interactive application is a skill-based interactive game and the AC is awarded to the user for the user's skillful play of the skill-based interactive game.

[0177] In some embodiments, the application decisions and wager outcome data are communicated to a wagering user interface generator **834**. The wagering user interface generator **834** receives the application decisions and wager outcome



data and generates wager telemetry data describing the state of wagering and credit accumulation and loss for the market based interleaved wagering system. In some embodiments, the wager telemetry data **146** may include, but is not limited to, amounts of AC and elements earned, lost or accumulated by the user through use of the interactive application as determined from the application decisions, and Cr amounts won, lost or accumulated as determined from the wager outcome data and the one or more credit meters.

[0178] In some embodiments, the wager outcome data **814** also includes data about one or more game states of a gambling game executed in accordance with a wagering proposition by a wager controller. In various such embodiments, the wagering user interface generator **834** generates a gambling game process display and/or gambling game state display using the one or more game states of the gambling game. The gambling game process display and/or gambling game state display is included in wager telemetry data that is communicated to an interactive controller. The gambling game process display and/or a gambling game state display is displayed by a wagering user interface of the interactive controller to a user. In other such embodiments, the one or more game states of the gambling game are communicated to an interactive controller and a wagering user interface of the interactive controller generates a gambling game process display and/or gambling game state display using the one or more game states of the gambling game for display to a user.

[0179] The application controller **860** can further operatively connect to a wager controller to determine an amount of credit or elements available and other wagering metrics of a wagering proposition. Thus, the application controller **860** may potentially affect an amount of Cr in play for participation in the wagering events of a wagering game provided by the wager controller. The application controller **860** may additionally include various audit logs and activity meters. In some embodiments, the application controller **860** can also couple to a centralized server for exchanging various data related to the user and the activities of the user during game play of a market based interleaved wagering system.

[0180] In some embodiments, the operation of the application controller **860** does not affect the provision of a wagering proposition by a wager controller except for user choice parameters that are allowable in accordance with the wagering proposition. Examples of user choice parameters include, but are not limited to: wager terms such as but not limited to a wager amount; speed of game play (for example, by pressing a button or pulling a handle of a slot machine); and/or agreement to wager into a bonus round.

[0181] In a number of embodiments, communication of wager data between a wager controller and the application controller **860** can further be used to communicate various wagering control factors that the wager controller uses as input. Examples of wagering control factors include, but are not limited to, an amount of Cr, AC, elements, or objects consumed per wagering event, and/or the user's election to enter a jackpot round.

[0182] In some embodiments, the application controller **860** utilizes a wagering user interface to communicate certain interactive application data to the user, including but not limited to, club points, user status, control of the selection of user choices, and messages which a user can find useful in order to adjust the interactive application experience or understand the wagering status of the user in accordance with the wagering proposition in the wager controller.

[0183] In some embodiments, the application controller **860** utilizes a wagering user interface to communicate aspects of a wagering proposition to the user including, but not limited to, odds of certain wager outcomes, amount of Cr, AC, elements, or objects in play, and amounts of Cr, AC, elements, or objects available.

[0184] In a number of embodiments, a wager controller can accept wager proposition factors including, but not limited to, modifications in the amount of Cr, AC, elements, or objects wagered on each individual wagering event, a number of wagering events per minute the wager controller can resolve, entrance into a bonus round, and other factors. In several embodiments, the application controller **860** can communicate a number of factors back and forth to the wager controller, such that an increase/decrease in a wagered amount can be related to the change in user profile of the user in the interactive application. In this manner, a user can control a wager amount per wagering event in accordance with the wagering proposition with the change mapping to a parameter or component that is applicable to the interactive application experience.

[0185] Referring now to FIG. 6B, application controller **860** includes a bus **862** providing an interface for one or more processing units **864**, random access memory (RAM) **866**, read only memory (ROM) **868**, machine-readable storage medium **870**, one or more user output devices **872**, one or more user input devices **874**, and one or more network interface devices **876**.

[0186] The one or more processors **864** may take many forms, such as, but not limited to: a central processing unit (CPU); a multi-processor unit (MPU); an ARM processor; a programmable logic device; or the like.

[0187] Examples of output devices **872** include, include, but are not limited to: display screens; light panels; and/or lighted displays. In accordance with particular embodiments, the one or more processing units **864** are operatively connected to audio output devices such as, but not limited to: speakers; and/or sound amplifiers. In accordance with many of these embodiments, the one or more processing units **864** are operatively connected to tactile output devices like vibrators, and/or manipulators.

[0188] In the example embodiment, the one or more processors **864** and the random access memory (RAM) **866** form an application controller processing unit **899**. In some embodiments, the application controller processing unit includes one or more processors operatively connected to one or more of a RAM, ROM, and machine-readable storage medium; the one or more processors of the application controller processing unit receive instructions stored by the one or more of a RAM, ROM, and machine-readable storage medium via a bus; and the one or more processors execute the received instructions. In some embodiments, the application controller processing unit is an ASIC (Application-Specific Integrated Circuit). In some embodiments, the application controller processing unit is a SoC (System-on-Chip).

[0189] Examples of user input devices **874** include, but are not limited to: tactile devices including but not limited to, keyboards, keypads, foot pads, touch screens, and/or trackballs; non-contact devices such as audio input devices; motion sensors and motion capture devices that the application controller can use to receive inputs from a user when the user interacts with the application controller **860**.

[0190] The one or more network interface devices **876** provide one or more wired or wireless interfaces for exchanging

data and commands between the application controller **860** and other devices that may be included in a market based interleaved wagering system. Such wired and wireless interfaces include, but are not limited to: a Universal Serial Bus (USB) interface; a Bluetooth interface; a Wi-Fi interface; an Ethernet interface; a Near Field Communication (NFC) interface; a plain old telephone system (POTS), cellular, or satellite telephone network interface; and the like.

[0191] The machine-readable storage medium **870** stores machine-executable instructions for various components of the application controller **860** such as, but not limited to: an operating system **878**; one or more applications **880**; one or more device drivers **882**; and market based interleaved wagering system wager controller instructions **854** for use by the one or more processing units **864** to provide the features of a wager controller as described herein.

[0192] In various embodiments, the machine-readable storage medium **870** is one of a (or a combination of two or more of) a hard drive, a flash drive, a DVD, a CD, a flash storage, a solid state drive, a ROM, an EEPROM, and the like.

[0193] In operation, the machine-executable instructions are loaded into memory **866** from the machine-readable storage medium **870**, the ROM **868** or any other storage location. The respective machine-executable instructions are accessed by the one or more processing units **864** via the bus **862**, and then executed by the one or more processing units **864**. Data used by the one or more processing units **864** are also stored in memory **866**, and the one or more processing units **864** access such data during execution of the machine-executable instructions. Execution of the machine-executable instructions causes the one or more processing units **864** to control the application controller **860** to provide the features of a market based interleaved wagering system application controller as described herein.

[0194] Although the application controller **860** is described herein as being constructed from one or more processing units and instructions stored and executed by hardware components, the application controller can be composed of only hardware components in accordance with other embodiments. In addition, although the storage medium **870** is described as being operatively connected to the one or more processing units through a bus, those skilled in the art of application controllers will understand that the storage medium can include removable media such as, but not limited to, a USB memory device, an optical CD ROM, magnetic media such as tape and disks. Also, the storage medium **870** can be accessed by processor **864** through one of the interfaces or over a network. Furthermore, any of the user input devices or user output devices can be operatively connected to the one or more processing units **864** via one of the interfaces or over a network.

[0195] In various embodiments, the application controller **860** may be used to construct other components of a market based interleaved wagering system as described herein.

[0196] In some embodiments, components of wager controller and an application controller of a market based wagering interleaved system may be constructed using a single device using processes that communicate using an interprocess communication protocol. In other such embodiments, the components of a wager controller and an application controller of a market based wagering interleaved system may communicate by passing messages, parameters or the like.

[0197] In numerous embodiments, any of a wager controller, an application controller, or an interactive controller as described herein can be constructed using multiple processing devices, whether dedicated, shared, or distributed in any combination thereof, or can be constructed using a single processing device. In addition, while certain aspects and features of market based interleaved wagering system processes described herein have been attributed to a wager controller, an application controller, or an interactive controller, these aspects and features can be provided in a distributed form where any of the features or aspects can be provided by any of a wager controller, an application controller, and/or an interactive controller within a market based interleaved wagering system without deviating from the spirit of the invention.

[0198] Although various components of market based interleaved wagering systems are discussed herein, market based interleaved wagering systems can be configured with any component as appropriate to the specification of a specific application in accordance with embodiments of the invention. In certain embodiments, components of a market based interleaved wagering system, such as an application controller, a wager controller, and/or an interactive controller, can be configured in different ways for a specific market based interleaved wagering system.

#### Operation of Market Based Wagering Interleaved Systems

[0199] FIG. 7 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention. The components of the market based interleaved wagering system include a wager controller **902**, such as wager controller **102** of FIG. 1, an application controller **904**, such as application controller **112** of FIG. 1, and an interactive controller **906**, such as interactive controller **120** of FIG. 1. The process begins with the interactive controller **906** detecting a user performing a user interaction in a user interface of an interactive application provided by the interactive controller **906**. The interactive controller **906** communicates application telemetry data **908** to the application controller **904**. The application telemetry data includes, but is not limited to, the user interaction detected by the interactive controller **906**.

[0200] The application controller **904** receives the application telemetry data **908**. Upon determination by the application controller **904** that the user interaction indicates a wagering event, the application controller **904** communicates wager data **912** including a wager request to the wager controller **902**. The request for a wager event may include wager terms associated with a wagering proposition.

[0201] The wager controller receives the wager data and uses the wager data to execute (**913**) a wager in accordance with a wagering proposition. The wager controller **902** communicates a wager outcome **914** of the executed wager to the application controller **904**.

[0202] The application controller **904** receives the wager outcome and determines (**915**) interactive application instructions and resources **916** for the interactive application. The application controller **904** communicates the interactive application instructions and resources **916** to the interactive controller **906**. The application controller also communicates wagering telemetry data **920** including the wager outcome to the interactive controller **906**.

[0203] The interactive controller **906** receives the interactive application instructions and resources **916** and wagering telemetry data **918**. The interactive controller **906** incorpo-

rates the received interactive application resources and executes the received interactive application instructions (918). The interactive controller updates (922) an application user interface of the interactive application provided by the interactive controller using the interactive application instructions and the resources, and updates (922) a wagering user interface using the wagering telemetry data.

[0204] In several embodiments, a user can interact with a market based interleaved wagering system by using Cr for wagering in accordance with a wagering proposition along with AC and elements in interactions with an interactive application. Wagering can be executed by a wager controller while an interactive application can be executed by an interactive controller and managed with an application controller.

[0205] FIG. 8 is a collaboration diagram that illustrates how resources such as AC, Cr, elements, and objects are utilized in a market based interleaved wagering system in accordance with various embodiments of the invention. The collaboration diagram 1000 illustrates that Cr 1002, interactive application resources including elements and objects 1004 and AC 1006 can be utilized by a user 1008 in interactions with a wager controller 1010, such as wager controller 102 of FIG. 1, an application controller 1012, such as wager controller 112 of FIG. 1, and an interactive controller 1014, such as interactive controller 120 of FIG. 1, of a market based interleaved wagering system. The contribution of elements and objects such as included in resources 1004, can be linked to a user's access to credits, such as Cr 1002 and/or AC 1006. Electronic receipt of these credits can come via a smart card, voucher or other portable media, or as received over a network from a server. In some embodiments, these credits can be drawn on demand from a user profile located in a database locally on a market based interleaved wagering system or in a remote server.

[0206] A user's actions and/or decisions can affect an interactive application of interactive controller 1014 that consume and/or accumulate AC 1004 and/or resources 1004 in an interactive application executed by an interactive controller 1014, a wager controller 101 and an application controller 1012. The application controller 1012 can monitor the activities taking place within an interactive application executed by an interactive controller 1014 for wagering event occurrences. The application controller 1012 can also communicate the wagering event occurrences to the wager controller 1010 that triggers a wager of Cr 1002 in accordance with a wagering proposition executed by the wager controller 1010.

[0207] In several embodiments, the user commences interaction with the market based interleaved wagering system by contributing credit to a market based interleaved wagering system such as, but not limited to, Cr 1002 that may be credit in a real currency or may be credit in a virtual currency that is not fungible with a real currency, AC 1006 that may be application environment credits, and specified types of interactive application elements and/or objects 1004. One or more of these contributions may be provided directly as currency and/or transferred in electronically. Electronic transfer may come via a smart card, voucher or other portable media, or as transferred in over a network from a user data server or market based interleaved wagering system user management controller. In many embodiments, contributions may be drawn on demand from user accounts located in servers residing on the network or in the cloud on a real time basis as the credits, elements and/or object are committed or consumed by the market based interleaved wagering system. Generally, Cr is utilized and accounted for by the wager controller 1010; and

the resources 1004 and AC 1006 are utilized and accounted for by the application controller 1012 and/or the interactive controller 1014. The user interacts (a) with an interactive application provided by the interactive controller 1014 with the interaction representing an action by the user within the context of the interactive application. The interactive controller 1014 receives the user interaction and communicates (b) the interaction to the application controller 1012. The application controller 1012 receives the interaction and determines from the interaction whether or not a wager should be triggered. If a wager should be triggered, the application controller 1012 communicates (c) wager data about a wager in accordance with a wagering proposition associated with the interaction and thereby triggers a wager. The wager controller receives the wager data and executes the wager in accordance with the wagering proposition, and consumes (d) an appropriate amount of Cr 1002 for the wager. The wager controller 1010 adjusts (e) the Cr 1002 based upon a wager outcome of the wager and communicates (f) the wager outcome to the application controller 1012 as to the outcome of the wager triggered by the application controller 1012. The application controller 1012 receives the wager outcome. The application controller determines what resources 1004 should be provided to the interactive controller and communicates (g) the resources 1004 to the interactive controller. The interactive controller receives the resources from the application control and integrates them into the execution of the interactive application provided by the interactive controller 1014.

[0208] In some embodiments, the application controller 1012 communicates (h) data about the wager outcome to the interactive controller. The interactive controller receives the wager outcome and displays the wager outcome to the user 1008.

[0209] In some embodiments, the application controller 1012 determines what resources and instructions to provide to the interactive controller 1014 for use by the interactive application provided by the interactive controller 1014 partially on the basis of the wager outcome. In some such embodiments, resources are provided in a case that the wager was a winning wager for the user. In other such embodiments, fewer or no resources are provided in a case of a losing wager.

[0210] In some embodiments, the application controller 1012 determines what resources to provide based on internal logic of the application controller 1012. In some such embodiments, the application controller 1012 employs a random result generator, such as a P/RNG, to generate a random result and the random result is used to determine what resources are provided to the interactive controller 1014.

[0211] In several embodiments, the application controller 1012 determines an increment or a decrement of an amount of AC 1006 using the interactions received from the interactive controller. The increment or decremented amount is communicated (i) to the interactive controller for display to the user.

[0212] In some embodiments, the application controller 1012 executes a wager of Cr as a virtual currency, AC, elements or objects. In some such embodiments, the application controller 1012 employs a random result generator, such as a P/RNG, to generate a random result and the random result is used to determine a wager outcome in Cr as a virtual currency, AC, elements or objects.

[0213] The following is description of an embodiment of the described collaboration where an interactive application provided by an interactive controller of a market based interleaved wagering system is a first person shooter game. The

process begins by a user selecting a machine gun to use in the game and then fires a burst of bullets at an opponent. The interactive controller can communicate to the application controller of the user's choice of weapon, that a burst of bullets was fired, and/or the outcome of the burst. The application controller communicates to the wager controller that 3 credits (Cr) are to be wagered on the outcome of a wagering event to match the three bullets consumed. The wager controller then performs the wagering event and determines the result of the wager and may determine the winnings from a payable. The wager controller consumes 3 credits of Cr for the wager and executes the specified wager. By way of example, the wager controller may determine that the user hit a jackpot of 6 credits and returns the 6 credits to the Cr and communicates to the application controller that 3 net credits were won by the user.

**[0214]** The application controller communicates to the interactive controller to add 3 bullets to an ammunition clip. The interactive controller adds 3 bullets back to the ammo clip. The ammunition may be added by directly adding the ammunition to the clip or by allowing the user to find extra ammunition during use. The application controller logs the new user score (AC) in the game (as a function of the successful hit on the opponent) based on the interactive controller communication, and adds 2 extra points to the user score since a jackpot has been won. The application controller then adds 10 points to the user score (AC) given the success of the hit which in this example is worth 8 points, plus the 2 extra point. Note that this example is only intended to provide an illustration of how credits flow in a market based interleaved wagering system, but is not intended to be exhaustive and only lists only one of numerous possibilities of how a market based interleaved wagering system may be configured to manage its fundamental credits.

**[0215]** In many embodiments, user management controller **1020**, such as user management controller **150** of FIG. 1, of a market based interleaved wagering system is used to store AC for use of the user. In such an embodiment, AC is generated by the application controller based on the user's use of the market based interleaved wagering system and an amount of the AC is communicated to the user management controller **1020**. The user management controller stores the amount of AC between sessions. In some embodiments, the user management controller communicates an amount of AC to the application controller at the start of a session for use by the user during a session.

**[0216]** FIG. 9 is a diagram of interactions between various components of the system and processes in accordance with various embodiments of the invention. The market based interleaved wagering system includes an interactive application, as described herein. In some embodiments, the interactive application is an interactive game. In some embodiments, the interactive game is a skill-based interactive game. In some embodiments, the interactive game is a chance-based interactive game.

**[0217]** In some embodiments, the interactive game is a stock market simulation game. In the stock market simulation game, the user may be provided with a number of application generated stocks, which may be purchased by the user with credits, such as application credits or real world credits. In an example embodiment, the interactive application may generate any number of different fictitious stocks. Each stock may have an identifier and a value associated with the stock. The user may exchange credits for shares of the available appli-

cation generated stock (**1102**). In some embodiments, the user communicates the selection of stock to the interactive controller. Accordingly, the interactive controller receives the selection of stock from the user.

**[0218]** The application generated stock is not directly based on a real existing stock or the value of publicly available securities, when the application generated stock is the basis for awarding real world credits. That is, a particular application generated stock is not directly associated with a particular real existing stock, such that when a user purchases shares of the particular application generated stock with real world credits, the user is effectively receiving a real world credit benefit based on the performance of the real, existing stock. However, the value of the application generated stock may be based on real existing stock in that data associated with real existing stock may be used to create a simulation of the fluctuation of value of the application generated stock. As described herein, the data associated with real existing stock is processed in such a way that the data is effectively used a random value generation.

**[0219]** Upon the selection of application generated stock, a stock database **1104** is accessed. The stock database **1104** may be accessed by an application controller or a wager controller. The application controller or wager controller may communicate a request for stock information from the stock database **1104** and the stock database may receive the request for stock information from the application controller or the wager controller. The stock database **1104** may communicate stock information to the application controller or the wager controller, and the application controller or the wager controller may receive the stock information from the stock database **1104**.

**[0220]** The stock database **1104** includes data regarding application generated stock, including identification and values for the stock over time. The stock database **1104** may also include values and identifications of real existing stock. In some embodiments, the identifications of the real existing stock may not be stored in order to anonymize the stock. In some embodiments, data associated with a real existing stock may be associated with a category, in order to associate the data with an industry, and the identification of the company may not be stored.

**[0221]** Using the identification of the application generated stock provided by the user and stock information received from the stock database **1104**, stock characteristics are determined (**1106**). Stock characteristics are the aggregation of stock data. In some embodiments, the stock characteristics include the stock information associated with a real existing stock, and the real existing stock is associated with the identified application generated stock. In an example embodiment, real existing Stock A may be associated with application generated Stock X. Based on receiving an identification of Stock X, the stock information for real existing Stock A, including stock value information, over a time period T may be obtained from the stock database **1104**. Parameters such as time frame, type of financial instrument, and volatility may be provided to the stock database **1104** and used in generating stock characteristics. In some embodiments, the application controller or wager controller determines the stock characteristics. In order to retrieve the stock data from the stock database **1104**, the application controller or the wager controller communicates a request for stock information to the stock database **1104**. The stock database **1104** receives the request for the stock information from the application controller or

the wager controller. The stock database **1104** retrieves the stock information and communicates the retrieved stock information to the application controller or the wager controller. The application controller or the wager controller receives the stock information from the stock database **1104**.

[0222] In some embodiments, the stock characteristics include the stock information associated with more than one existing stock, and the more than one existing stock is associated with the identified application generated stock. In an example embodiment, real existing Stock B, Stock C, and Stock D may be associated with application generated Stock Y. Based on received an identification of Stock Y, the stock information for real existing Stock B and Stock C, including stock value information, over a time period T may be obtained from the stock database **1104**. In some embodiments, the application controller or wager controller determines the stock characteristics. In order to retrieve the stock data from the stock database **1104**, the application controller or the wager controller communicates a request for stock information to the stock database **1104**. The stock database **1104** receives the request for the stock information from the application controller or the wager controller. The stock database **1104** retrieves the stock information and communicates the retrieved stock information to the application controller or the wager controller. The application controller or the wager controller receives the stock information from the stock database **1104**.

[0223] When stock data for more than one real existing stock is used, a weighting may be applied to the data points of the different stocks. In an example embodiment, if application generated stock Y is associated with real existing stocks B, C, and D, the data for real existing stocks B, C, and D may be retrieved. Real existing stock B may be weighted more heavily and real existing stock D may be weighted less heavily. In some embodiments, the weighted values are aggregated and plotted to illustrate the performance of the stocks over time.

[0224] Once the data is obtained, a smoothing function may be applied to the data (**1108**). The smoothing function may be applied when the values of the stock characteristics have a wide variance. The function may be any smoothing function which results in a reduction of extreme values. The wager controller or the application controller may apply the smoothing function to the data.

[0225] The distribution of values in the stock characteristics is analyzed (**1110**). The wager controller or the application controller may perform this analysis. The stock characteristics may be used to establish the pay table to be used by the wager controller. In an example embodiment, if the stock characteristics generally trend upward, then Paytable A may be used, and if the stock characteristics generally trend downward, then Paytable B may be used. A range of acceptable bet amounts (e.g., a floor and/or ceiling on the amount that may be bet per instance of the gambling mechanic) may be established based on the expected value of the range of possible outcomes. The smoothing function applied may solve for a specific return to player (RTP).

[0226] In some embodiments, a fitted curve is generated by mathematically fitting a curve to the stock data, and then deviations of the stock data from the fitted curve are used to generate random results that are used to generate wager outcomes. In several such embodiments, characteristics of the fitted curve are also used to determine characteristics of a wagering proposition. In an example embodiment, linear

interpolation is used to fit a straight line through pricing data over time for a particular stock. The slope of the line is used to determine a payable for a wager outcome such that a positive slope, indicating a rising stock value over time, is used to determine a more favorable payable for the player, while a negative slope of the line, indicating a falling stock value, is used to determine a less favorable payable for the player.

[0227] Based on the stock characteristics and a Pseudo Random or Random Number Generator (P/RNG) **1112**, the wager is executed (**1118**). The P/RNG **1112** may be part of the wager controller, as described herein. In some embodiments, a seed value for the P/RNG **1112** may be generated based on the stock characteristics. In this way, the wager outcome is based on the stock characteristics, and in turn, based on real existing stock, but the wager outcome is not a proxy for buying and selling real existing stocks. Which payable to use during wager execution may be based on the stock characteristics. Again, in this way, the outcome of the wager is based on the stock characteristics, and in turn based on real existing stock, but the wager outcome is not a proxy for buying and selling stocks.

[0228] The user interacts with the interactive application, which is a part of a market based interleaved wagering system (**1114**). During execution of the market based interleaved wagering system, a wager may be triggered when the interactive controller communicates application telemetry to the application controller. The application controller receives the application telemetry from the interactive controller, and the application controller determines whether a wager is triggered (**1116**). When a wager is triggered, the application controller communicates a wager request to the wager controller. The wager controller receives the wager request from the application controller and the wager controller executes a wager (**1118**). The wager execution results in a wager outcome, which is communicated from the wager controller to the application controller (**1120**). The application controller receives the wager outcome from the wager controller and application credits and/or real world credits may be awarded accordingly.

[0229] In some embodiments, the user may select more than one application generated stock and create an index of application generated stocks. FIG. **10** is a diagram of interactions between various components of the system and processes in accordance with various embodiments of the invention illustrating an index of application generated stocks.

[0230] A user may create an index of application generated stocks (**1202**). In some embodiments, the user communicates the selection of stocks to the interactive controller. Accordingly, the interactive controller receives the selection of stock from the user.

[0231] Upon the selection of application generated stocks, a stock database **1204** is accessed. The stock database **1204** may be accessed by an application controller or a wager controller. The application controller or wager controller may communicate a request for stock information from the stock database **1204** and the stock database may receive the request for stock information from the application controller or the wager controller. The stock database **1204** may communicate stock information to the application controller or the wager controller, and the application controller or the wager controller may receive the stock information from the stock database **1204**. The stock database **1204** is as described herein.

[0232] Using the identification of the application generated stocks provided by the user and stock information received from the stock database 1204, stock characteristics are determined (1206). Stock characteristics are the aggregation of stock data. Each application generated stock provided by the user may be associated with one or more real existing stock. The stock information for all of the stocks associated with the identified application generated stocks in the index are obtained from the stock database 1204. In some embodiments, the application controller or wager controller determines the stock characteristics. In order to retrieve the stock data from the stock database 1204, the application controller or the wager controller communicates a request for stock information to the stock database 1204. The stock database 1204 receives the request for the stock information from the application controller or the wager controller. The stock database 1204 retrieves the stock information and communicates the retrieved stock information to the application controller or the wager controller. The application controller or the wager controller receives the stock information from the stock database 1204.

[0233] A weighting may be applied to the data points of the different application generated stocks of the index. In an example embodiment, the index may include application generated Stocks L, R, and F. The user may own 4 shares of L, 8 shares of R, and 15 shares of F. The real existing stocks associated with the stocks of the index may be weighted accordingly, and a single aggregated value for the index may be generated.

[0234] Once the data is obtained, a smoothing function may be applied to the data (1208). The smoothing function may be applied when the values of the stock characteristics have a wide variance. The function may be any smoothing function which results in a reduction of extreme values. The wager controller or the application controller may apply the smoothing function to the data.

[0235] The stock volatility in the stock characteristics is analyzed (1210). The wager controller or the application controller may perform this analysis. The stock volatility may be used to establish the pay table to be used by the wager controller. In an example embodiment, if the stocks are highly volatile, then Paytable A may be used, and if the stocks are not volatile, then Paytable B may be used. Volatility may be measured by establishing a particular variance value, and whether an index of stocks are highly volatile or not volatile may be based on a variance threshold value. A range of acceptable bet amounts (e.g., a floor and/or ceiling on the amount that may be bet per instance of the gambling mechanic) may be established based on the expected value of the range of possible outcomes. The smoothing function applied may solve for a specific return to player (RTP). Stock characteristics (as described in FIG. 9) may be used instead of or in addition to stock volatility when using a stock index.

[0236] Based on the stock volatility and a Pseudo Random or Random Number Generator (P/RNG) 1212, the wager is executed (1218). The P/RNG 1212 may be part of the wager controller, as described herein. A seed value for the P/RNG 1212 may be generated based on the stock volatility. In this way, the wager outcome is based on the stock volatility, and in turn, based on real existing stock, but the wager outcome is not a proxy for buying and selling stocks. Which payable to use during wager execution may be based on the stock volatility. Again, in this way, the wager outcome is based on the

stock volatility, and in turn based on real existing stock, but the wager outcome is not a proxy for buying and selling stocks.

[0237] The user interacts with the interactive application, which is a part of a market based interleaved wagering system (1214). During execution of the market based interleaved wagering system, a wager may be triggered when the interactive controller communicates application telemetry to the application controller. The application controller receives the application telemetry from the interactive controller, and the application controller determines whether a wager is triggered (1216). When a wager is triggered, the application controller communicates a wager request to the wager controller. The wager controller receives the wager request from the application controller and the wager controller executes a wager (1218). The wager execution results in a wager outcome, which is communicated from the wager controller to the application controller (1220). The application controller receives the wager outcome from the wager controller and application credits and/or real world credits may be awarded accordingly.

[0238] FIG. 11 is a diagram of the structure of a market based interleaved wagering system in accordance with various embodiments of the invention. The market based interleaved wagering system includes an interactive controller 1302, an application controller 1304, and a wager controller 1306, each as described herein. The market based interleaved wagering system further includes a stock database 1308. The stock database includes data regarding application generated stock, including identification and values for the stock over time. The stock database may also include values and identifications of real existing stock over time. In some embodiments, the identifications of the real existing stock may not be stored in order to anonymize the stock. In some embodiments, data associated with a real existing stock may be associated with a category, in order to associate the data with an industry, and the identification of the company may not be stored. In some embodiments, the user may specify which real existing stocks to associate with which application generated stocks.

[0239] The wager controller 1306 includes one or more pseudo random or random number generators (P/RNG) 1310, as described herein. The wager controller 1306 also includes one or more paytables 1314, as described herein. The wager controller 1306 also includes a stock controller 1312. The stock controller 1312 is responsible for using stock information received from the stock database 1308 and interacting with the P/RNG 1310 and/or the payable 1314 to generate wager outcomes using the received stock information.

[0240] The stock controller 1312 may provide an input to the P/RNG 1310 as a seed value. The P/RNG 1310 receives the input from the stock controller 1312. The P/RNG 1310 may then output a wager output based on the seed value. In some embodiments, the stock controller 1312 uses received stock information to generate a seed value for the P/RNG 1310. The stock controller 1312 may use the least significant digit of a particular real existing stock value at a given time as the seed value. In an example embodiment, the received stock information from the stock database 1308 may provide a value of \$48.15 for a particular real existing stock. The stock controller 1312 may take the least significant value, in this case 5, and use it as the basis for a seed value for the P/RNG 1310. The P/RNG 1310 generates a wager output using the seed value of 5. The process may be repeated continuously, with the P/RNG 1310 generating wager outputs using seed

values generated by the stock controller **1312** based on the value of the particular real existing stock at a given time. The least significant value may be used, as it is likely to result in the most random seed value.

[0241] The stock controller **1312** may determine which payable **1314** to use based on stock information received from the stock database **1308**. In an example embodiment, the wager controller **1306** may have two paytables, and the determination of which payable to use for the P/RNG **1310** output may be based on the stock information received from the stock database **1308**. In some embodiments, the stock controller **1312**, upon receiving an updated stock value for a particular real existing stock, determines which payable to use. In some embodiments, if the stock value has increased from the last time the value was obtained, a first payable may be used. Alternatively, if the stock value has decreased from the last time the value was obtained, a second payable may be used. In some embodiments, the second payable has more favorable returns to the user.

[0242] FIG. 12 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention. The market based interleaved wagering system includes an interactive controller **1402**, an application controller **1404**, a stock database **1408**, and a wager controller **1406**, each as described herein.

[0243] The interactive controller **1402** provides an interactive application. In some embodiments, the interactive application is an interactive game. In an example embodiment, the interactive game may be a virtual stock market themed game where the user's goal is to accumulate assets based on making investments in application generated stocks.

[0244] The interactive controller **1402** receives, from a user of the market based interleaved wagering system, an identification of stocks. The identified stocks may be application generated stocks, as described herein. In the example of the stock market themed game, the identified stocks may be stocks that the user owns. The interactive controller **1402** communicates, to the application controller **1404**, the identification of the stocks (**1410**). The application controller **1404** receives, from the interactive controller **1402**, the identification of the stocks (**1410**).

[0245] The interactive controller **1402** also communicates, to the application controller **1404**, application telemetry (**1412**). The application controller **1404** receives, from the interactive controller **1402**, the application telemetry (**1412**). In the example of the stock market themed game, the application telemetry may be an indication that the user would like to buy application generated stock or sell application generated stock.

[0246] The application controller **1404**, upon receiving the application telemetry, determines whether a wager should be triggered. When the application controller **1404** determines a wager should be triggered, the application controller **1404** communicates, to the wager controller **1406**, a wager request and the stock identification received from the interactive controller **1402** (**1414**). The wager controller **1406** receives, from the application controller **1404**, the wager request and the stock identification received from the interactive controller **1402** (**1414**).

[0247] Upon receiving the wager request, the wager controller **1404** communicates, to the stock database **1408**, a request for stock information for the identified stocks (**1416**). The stock database **1408** receives the request for stock infor-

mation for the identified stocks from the wager controller **1404** (**1416**). The stock database **1408** retrieves stock information associated with the identified application generated stocks. The stock database **1408** may also retrieve stock information for real existing stocks. The stock database **1408** communicates the retrieved stock information to the wager controller **1406** (**1418**). The wager controller **1406** receives, from the stock database **1408**, the retrieved stock information (**1418**).

[0248] The wager controller **1406** generates a wager outcome based on the received stock information (**1420**). In some embodiments, the wager outcome is generated using a P/RNG, one or more paytables, and a stock controller, as described herein. The stock controller may generate a seed value based on the received stock information. In some embodiments, the stock controller generates the seed value by extracting a particular value from the stock information, such as a least significant digit. In some embodiments, the stock controller generates the seed value by generating a hash value based on the received stock information. In some embodiments, the stock controller compares the received stock information with past stock information, and a particular payable is used by the wager controller **1406** based on the comparison of the stock information. In an example embodiment, if the received stock value of the stock information is higher than a previous stock value of previously received stock information, a first payable may be used to generate a wager outcome based on a value generated by the P/RNG. In this example, a second payable may be used when the received stock value is lower than a previous stock value. Based on the wager outcome, real world credits may be awarded to the user.

[0249] The wager controller **1406** communicates, to the application controller **1404**, a wager outcome (**1422**). The application controller **1404** receives, from the wager controller **1406**, the wager outcome (**1422**). Based on the wager outcome, the application controller **1404** determines whether application instructions and/or application resources should be communicated to the interactive controller **1402**. Upon determining application instructions and/or application resources are to be communicated to the interactive controller **1402**, the application controller **1404** communicates, to the interactive controller **1402**, application instructions and/or application resources (**1424**). The interactive controller **1402** receives the application instructions and/or application resources from the application controller **1404** (**1424**). In some embodiments, the stock information may be used to affect the application resource award amount. In an example embodiment, if the value of the application generated stock increases in value, an additional multiplier may be application the application resource award. If the application generated stock decreases in value, no multiplier may be applied to the application resource award.

[0250] FIG. 13 is a sequence diagram of interactions between components of a market based interleaved wagering system in accordance with various embodiments of the invention. The market based interleaved wagering system includes an interactive controller **1502**, an application controller **1504**, a stock database **1508**, and a wager controller **1506**, each as described herein.

[0251] The interactive controller **1502** provides an interactive application. In some embodiments, the interactive application is an interactive game. In an example embodiment, the interactive game may be a virtual stock market themed game



where the user's goal is to accumulate assets based on making investments in application generated stocks.

[0252] The interactive controller **1502** receives, from a user of the market based interleaved wagering system, an identification of stocks. The identified stocks may be application generated stocks, as described herein. In the example of the stock market themed game, the identified stocks may be stocks that the user owns. The interactive controller **1502** communicates, to the application controller **1504**, the identification of the stocks (**1510**). The application controller **1504** receives, from the interactive controller **1502**, the identification of the stocks (**1510**).

[0253] The interactive controller **1502** also communicates, to the application controller **1504**, application telemetry (**1512**). The application controller **1504** receives, from the interactive controller **1502**, the application telemetry (**1512**).

[0254] The application controller **1504**, upon receiving the application telemetry, determines whether a wager should be triggered (**1514**). When the application controller **1504** determines a wager should be triggered, the application controller **1504** communicates, to the wager controller **1506**, a wager request (**1516**). The wager controller **1506** receives, from the application controller **1504**, the wager request (**1516**).

[0255] The wager controller **1506** generates a wager outcome (**1518**). In some embodiments, the wager outcome generation is not based on stock information from the stock database **1508**. Once the wager outcome is generated, the wager controller **1506** communicates, to the application controller **1504**, the wager outcome (**1520**). The application controller **1504** receives, from the wager controller **1506**, the wager outcome (**1520**).

[0256] Upon receiving the wager outcome, the application controller **1504** communicates a request to the stock database **1508** for stock information (**1522**). The stock database **1508** receives the request for stock information from the application controller **1504** (**1522**). The request for stock information may include an identifier of one or more stocks. The stock database **1508** retrieves the stock information associated with the one or more stock identifiers.

[0257] The retrieved stock information is communicated from the stock database **1508** to the application controller **1504** (**1524**). The application controller **1504** receives the retrieved stock information from the stock database **1508** (**1524**). The application controller **1504**, using the received stock information, may award application resources and/or application credits to the user based on the wager outcome. In an example embodiment, if the wager outcome is a successful one, then the stock information may be amplified, so that a gain in value of the stocks is increased as a result of the wager. If the wager outcome is a failure, then the stock information may not be amplified, and a gain in the value of the stocks is not increased.

[0258] Once the application controller **1504** determines the application resources and/or application instructions to award the user, the application controller **1504** communicates, to the interactive controller **1502**, the application resources and/or instructions (**1526**). The interactive controller **1502** receives the application resources and/or instructions from the application controller **1504** (**1526**). Unlike the process illustrated in FIG. 12, the real world credits awarded based on a winning wager outcome are not based on real existing stocks. Only whether application credits are awarded is based on real existing stocks.

[0259] In various embodiments, markets other than a stock market may be used as the data source used in generating a wager outcome. In an example embodiment, a commodities market may be substituted for the stock market, specific commodities may be substituted for specific stocks, and an interactive application of the market based interleaved wagering system is a simulation of commodities trading.

[0260] While the above description may include many specific embodiments of the invention, these should not be construed as limitations on the scope of the invention, but rather as examples of embodiments thereof. It is therefore to be understood that the present invention can be practiced otherwise than specifically described, without departing from the scope and spirit of the present invention. Thus, embodiments of the present invention described herein should be considered in all respects as illustrative and not restrictive. In particular, though an exemplary interactive stock market game is illustrated herein, any interactive application, including any interactive game, may be used in the market based interleaved wagering system.

What is claimed:

1. A market based interleaved wagering system, comprising:
  - an interactive controller constructed to:
    - provide an interactive application;
    - receive, from a user, an identification of one or more application generated stocks;
    - communicate, to an application controller, the identification of the application generated stocks and application telemetry; and
    - receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry;
  - a wager controller constructed to:
    - receive, from the application controller, a wager request and the identification of the application generated stocks;
    - communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks;
    - receive, from the stock database, stock information associated with the received identification of the application generated stocks;
    - generate a wager outcome based on the received stock information; and
    - communicate, to the application controller, the wager outcome; and
  - the application controller operatively connected to the interactive controller and the wager controller, wherein the application controller is constructed to:
    - receive, from the interactive controller, the identification of the application generated stocks and application telemetry;
    - communicate, to the wager controller, the wager request and identification of the application generated stocks, based on the application telemetry;
    - receive, from the wager controller, the wager outcome; and
    - communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.
2. The market based interleaved wagering system of claim 1,



- wherein the interactive controller and the application controller are constructed from the same device, and wherein the application controller is operatively connected to the wager controller by a network.
3. The market based interleaved wagering system of claim 1,
- wherein the wager controller and the application controller are constructed from the same device, and wherein the application controller is operatively connected to the interactive controller by a network.
4. The market based interleaved wagering system of claim 1,
- wherein the generating the wager outcome comprises:
- generating a random result using a random number generator, using a key value based on the received stock information; and
  - determining the wager outcome based on the random result.
5. The market based interleaved wagering system of claim 4, wherein the key value is based on the least significant digit of a stock value, wherein the received stock information comprises stock value.
6. The market based interleaved wagering system of claim 1,
- wherein the generating the wager outcome comprises:
- generating a random result using a random number generator;
  - determining the wager outcome based on the random result and a payable, wherein the payable is chosen from a plurality of paytables based on the received stock information.
7. The market based interleaved wagering system of claim 6, wherein the payable is chosen if the received stock information indicates a downward trend in stock value.
8. The market based interleaved wagering system of claim 6, wherein the payable is chosen if the received stock information indicates an upward trend in stock value.
9. The market based interleaved wagering system of claim 1,
- wherein the wager controller is further constructed to apply a smoothing function to the stock information, and wherein the wager outcome is generated based on the result of applying the smoothing function to the stock information.
10. An application controller of a market based interleaved wagering system, comprising:
- an interactive controller interface operatively connecting the application controller to an interactive controller, wherein the interactive controller is constructed to:
    - provide an interactive application,
    - receive, from a user, an identification of one or more application generated stocks,
    - communicate, to an application controller, the identification of the application generated stocks and application telemetry, and
    - receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry;
  - a wager controller interface operatively connecting the application controller to a wager controller, wherein the wager controller is constructed to:
    - receive, from the application controller, a wager request and the identification of the application generated stocks,
    - communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks,
    - receive, from the stock database, stock information associated with the received identification of the application generated stocks,
    - generate a wager outcome based on the received stock information, and
    - communicate, to the application controller, the wager outcome; and
  - one or more processing units constructed to:
    - receive, from the interactive controller, the identification of the application generated stocks and application telemetry;
    - communicate, to the wager controller, the wager request and identification of the application generated stocks, based on the application telemetry;
    - receive, from the wager controller, the wager outcome; and
    - communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.
11. The market based interleaved wagering system of claim 10,
- wherein the interactive controller and the application controller are constructed from the same device, and wherein the application controller is operatively connected to the wager controller by a network.
12. The market based interleaved wagering system of claim 10,
- wherein the wager controller and the application controller are constructed from the same device, and wherein the application controller is operatively connected to the interactive controller by a network.
13. The market based interleaved wagering system of claim 10,
- wherein the application controller is operatively connected to the wager controller by a network, and wherein the application controller is operatively connected to the interactive controller by a network.
14. The market based interleaved wagering system of claim 10,
- wherein the generating the wager outcome comprises:
- generating a random result using a random number generator, using a key value based on the received stock information; and
  - determining the wager outcome based on the random result.
15. The market based interleaved wagering system of claim 14, wherein the key value is based on the least significant digit of a stock value, wherein the received stock information comprises stock value.
16. The market based interleaved wagering system of claim 10,
- wherein the generating the wager outcome comprises:
- generating a random result using a random number generator;
  - determining the wager outcome based on the random result and a payable, wherein the payable is chosen from a plurality of paytables based on the received stock information.

17. The market based interleaved wagering system of claim 16, wherein the payable is chosen if the received stock information indicates a downward trend in stock value.

18. The market based interleaved wagering system of claim 16, wherein the payable is chosen if the received stock information indicates an upward trend in stock value.

19. The market based interleaved wagering system of claim 10, wherein the wager controller is further constructed to apply a smoothing function to the stock information, and wherein the wager outcome is generated based on the result of applying the smoothing function to the stock information.

20. A market based interleaved wagering system, comprising:

a wager controller of a market based interleaved wagering system, wherein the wager controller is constructed to: receive, from an application controller, a wager request and an identification of application generated stocks, wherein the identification is received from a user, via an interactive controller;

communicate, to a stock database, a request for stock information associated with the received identification of the application generated stocks;

receive, from the stock database, stock information associated with the received identification of the application generated stocks;

generate a wager outcome based on the received stock information; and

communicate, to the application controller, the wager outcome; and

the application controller of the market based interleaved wagering system operatively connecting the wager controller to an interactive controller by a network, wherein the application controller is constructed to:

receive, from the interactive controller, the identification of the application generated stocks and application telemetry;

communicate, to the wager controller, the wager request and identification of the application generated stocks, based on the application telemetry;

receive, from the wager controller, the wager outcome; and

communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.

21. The market based interleaved wagering system of claim 20,

wherein the generating the wager outcome comprises:

generating a random result using a random number generator, using a key value based on the received stock information; and

determining the wager outcome based on the random result.

22. The market based interleaved wagering system of claim 21, wherein the key value is based on the least significant digit of a stock value, wherein the received stock information comprises stock value.

23. The market based interleaved wagering system of claim 20,

wherein the generating the wager outcome comprises:

generating a random result using a random number generator;

determining the wager outcome based on the random result and a payable, wherein the payable is chosen from a plurality of paytables based on the received stock information.

24. The market based interleaved wagering system of claim 23, wherein the payable is chosen if the received stock information indicates a downward trend in stock value.

25. The market based interleaved wagering system of claim 23, wherein the payable is chosen if the received stock information indicates an upward trend in stock value.

26. The market based interleaved wagering system of claim 20,

wherein the wager controller is further constructed to apply a smoothing function to the stock information, and

wherein the wager outcome is generated based on the result of applying the smoothing function to the stock information.

27. A market based interleaved wagering system, comprising:

an interactive controller of a market based interleaved wagering system, wherein the interactive controller is constructed to:

provide an interactive application;

receive, from a user, an identification of one or more application generated stocks;

communicate, to an application controller, the identification of the application generated stocks and application telemetry; and

receive, from the application controller, a wager outcome and an application resource based on the identified application generated stocks and application telemetry; and

the application controller of the market based interleaved wagering system operatively connecting the interactive controller to a wager controller, wherein the application controller is constructed to:

receive, from the interactive controller, the identification of the application generated stocks and application telemetry;

communicate, to a wager controller, a wager request and identification of the application generated stocks, based on the application telemetry;

receive, from the wager controller, a wager outcome, wherein the wager outcome is generated based on stock information received from a stock database and associated with the identified application generated stocks; and

communicate, to the interactive controller, application resources and application instructions based on the received wager outcome.

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