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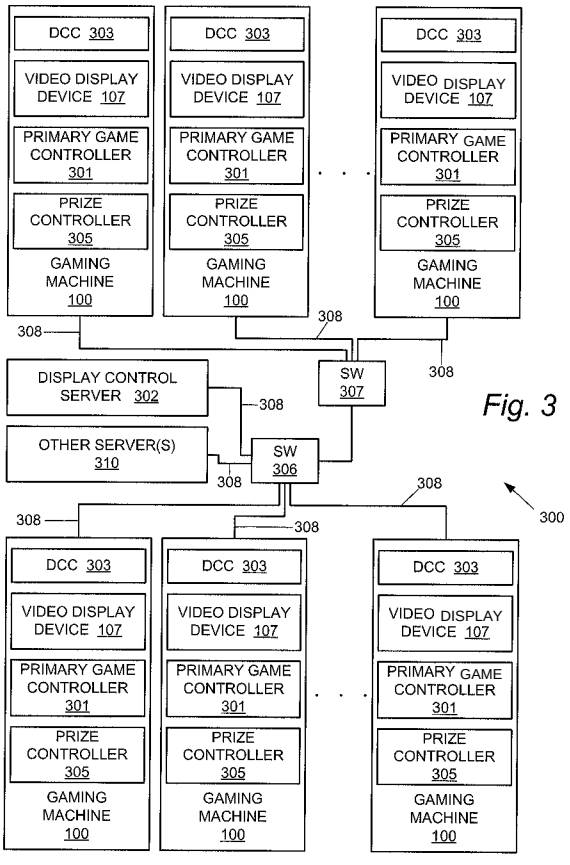

Fig. 3

(57) Abstract: An apparatus for producing shared image games includes a number of gaming machines (100), with each gaming machine having a respective video display device (107). The apparatus also includes a shared image display control arrangement (302) and a shared image prize controller (305). The shared image display control arrangement (302) controls the respective video display device (107) associated with each gaming machine (100) in the number of gaming machines (100) to produce a shared image graphic effect such as a multi-segmented prize reel that appears to extend across the different video display devices (107). The shared image prize controller (305) operates to award a shared image prize for at least one of the gaming machines (100). This shared image prize corresponds to a prize represented at least in part by a respective one of the reel segments displayed at the video display device (107) of the respective gaming machine (100) when the reel segments appear to come to a stop. For example, a given reel segment may show a prize value that is awarded to the player at the particular gaming machine (100), or may show a multiplier value that is applied to some value accumulated for the player at the particular gaming machine.

WO 2009/062148 A1

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METHOD, APPARATUS, AND PROGRAM PRODUCT FOR PRODUCING AND APPLYING A GRAPHIC SIMULATION ACROSS MULTIPLE GAMING MACHINES

TECHNICAL FIELD OF THE INVENTION

The present invention is directed to a system which provides a graphic effect across multiple gaming machines to display results in a wagering game. The invention encompasses both methods and apparatus for producing multiple gaming machine graphic effects and awarding prizes indicated by the graphic effect. The invention further encompasses program products for producing multiple gaming machine graphic effects and awarding corresponding prizes.

BACKGROUND OF THE INVENTION

Many different types of gaming machines have been developed to provide various formats and graphic presentations for conducting games and presenting game results. For example, numerous mechanical reel-type gaming machines, also known as slot machines, have been developed with different reel configurations, reel symbols, and paylines. More recently, gaming machines have been developed with video monitors that are used to produce simulations of mechanical spinning reels. These video-based gaming machines may use one or more video monitors to provide a wide variety of graphic effects in addition to simulated spinning reels, and may also provide secondary/bonus games using entirely different graphics. Video-based gaming machines may also be used to show card games or various types of competitions such as simulated horse races in which wagers may be placed. Game manufacturers are continuously pressed to develop new game presentations, formats, and game graphics in an attempt to provide high entertainment value for players and thereby attract and keep players.

U.S. Patent No. 7,008,324 discloses a gaming system in which a bonus result at a gaming machine included in a group of gaming machines may be displayed to the winning

player through a multi-screen video presentation. However, the multi-screen presentation disclosed in U.S. Patent No. 7,008,324 is limited in how it shows results for multiple players concurrently. In order to show awards for multiple players, the system disclosed in U.S. Patent No. 7,008,324 relies in part on a video display device separate from any of the gaming machines. The separate video display device must be visible to all of the players for which award in the multi-screen presentation is to be displayed. This arrangement limits the ability to provide presentations that generate excitement and interest across large numbers of gaming machines, and gaming machines arranged in diverse physical orientations.

SUMMARY OF THE INVENTION

The present invention provides a gaming system which produces a shared image game in which one or more common graphic elements are shown at multiple gaming machines to produce a graphic effect, such as an animation across the multiple gaming machines, and in which a prize for the game is at least partially indicated for a given gaming machine by the respective graphic element displayed at that gaming machine at a point in time. The graphic effect using common graphic elements across multiple gaming machines will be referred to herein as a "shared image graphic effect."

A first form of the present invention includes an apparatus having a number of gaming machines, with each gaming machine having a respective player control arrangement which enables a player to make inputs through the respective gaming machine, and also having a respective video display device. The apparatus in this first form of the invention also includes a shared image display control arrangement and a shared image prize controller. The shared image display control arrangement operates to control the respective video display device associated with each gaming machine in the number of gaming machines to produce a shared image graphic effect that appears to extend across the different video display devices. One preferred shared image graphic effect includes a simulation of a multi-segmented prize reel in which the various prize reel segments appear to travel across each respective video display device in a rotation direction and then ultimately reach a stopped (static) condition to display a respective reel segment at the respective video display device of each respective gaming machine. The prize reel segments together represent a series of distinct graphic elements which appear to

sequentially travel in unison (that is, as if physically interconnected in a fixed physical relationship) across each respective video display device in the rotation direction and then stop so that a respective distinct graphic element is displayed at each of the video display devices. The shared image prize controller operates to award a shared image prize for at least one of the gaming machines. This shared image prize corresponds to a prize represented at least in part by a respective one of the reel segments displayed at the video display device of the at least one gaming machine when the reel segments appear to come to a stop. For example, a given reel segment may show a prize value that is awarded to the player at the particular gaming machine, or may show a multiplier value that is applied to some value accumulated for the player at the particular gaming machine.

In the first form of the invention the shared image display control arrangement may include a respective client component located at each gaming machine and a display control server component that may be located remotely from any of the gaming machines. The display control server component functions to cause various commands (client commands) to be communicated to each of the gaming machines in order to help produce the shared image graphic effect. For example, each respective client component in one implementation is responsive to the receipt of a client command comprising a start command to cause the video display device of the respective gaming machine to begin displaying a respective single machine component of the shared image graphic effect. The single machine component of the shared image graphic effect comprises the series of graphic images produced at the video display device of a single one of the gaming machines in order to produce the part of the shared image graphic effect shown at that given gaming machine. Each respective gaming machine cooperating to produce the shared image graphic effect will produce a respective single machine component of the overall shared image graphic effect.

Alternatively to the client/server network arrangement for controlling the video display device at each respective gaming machine in the first form of the invention, an apparatus according to the present invention may include a shared image display control arrangement that is connected to each video display device to directly provide a respective video drive signal to each respective video display device.

One preferred method according to the first form of the invention includes detecting a triggering event and responsive to detecting the triggering event, controlling a number of

video display devices to produce a shared image graphic effect such as the above-described prize reel simulation. This method further includes awarding a shared image prize for a first one of the gaming machines. The shared image prize corresponds to a prize represented at least in part by a respective one of the graphic elements displayed at the video display device of the first one of the gaming machines when the series of graphic elements appear to stop (such as when the simulated reel stops spinning for example).

In this method according to the first form of the invention, the step of controlling each video display device may include communicating one or more client commands from the display control server to each of the gaming machines over a local area network. The respective client command or commands to each respective gaming machine may include a start location in video image data stored at the respective gaming machine and an end location in the video image data, and perhaps other information that may be necessary or desirable for allowing the respective gaming machine to display the desired single machine component of the shared image graphic effect.

Some preferred methods according to the first form of the invention include detecting an ineligible condition at one or more of the gaming machines. In response to detecting the ineligible condition at a given gaming machine, the method may include modifying the single machine component of the shared image graphic effect at that gaming machine to indicate that the respective gaming machine is not eligible for the shared image prize. This modification of the single machine component of the shared image graphic effect may include reducing the brightness of the single machine component of the shared image graphic effect, changing colors included in the single component of the shared image effect, and/or making some other suitable modification in the single machine component of the shared image graphic effect.

The invention also encompasses a program product stored in one or more computer readable devices. A program product according to the first form of the invention includes shared image display program code and shared image award program code. The shared image display program code is executable for controlling the video display device associated with each gaming machine in the number of gaming machines to produce the shared image graphic effect, such as the prize reel simulation described above. The shared image award program code is executable for awarding the shared image prize for at least one of the gaming machines. The shared image prize corresponds to a prize represented by

a respective one of the graphic elements displayed at the video display device of one of the gaming machines when the series of graphic elements appear to stop.

In one preferred program product according to the first form of the invention, the shared image display program code includes respective display control client program code executed at a respective processing device located at each respective gaming machine, and display control server program code that may be executed at a processing device at a location separate from any of the gaming machines. The display control server program code is executable for causing a respective client command(s) to be communicated to each respective gaming machine for coordinating the different gaming machines to produce the desired shared image graphic effect. The respective display control client program code located at each respective gaming machine is executable for causing the video display device of the respective gaming machine to display the respective single machine component of the shared image graphic effect.

A second form of the invention includes a number of gaming machines with each respective gaming machine having a respective video display device and a respective player control arrangement similarly to the previously described embodiment. In this second form of the invention a shared image display control arrangement selectively controls the video display device associated with each gaming machine in the number of gaming machines to produce a shared image graphic effect, but the shared image graphic effect need not be a series of physically interconnected graphic elements such as a simulation of a segmented prize reel. Rather, the shared image graphic effect in this second form of the invention includes one or more distinct prize-indicating graphic elements which appear at selected ones of the video display devices. A shared image result controller in this second form of the invention awards a shared image prize for each gaming machine displaying one of the prize-indicating graphic elements at a one or more points in the shared image graphic effect, such as a conclusion of the shared image graphic effect for example. The shared image prize corresponds to a prize represented at least in part by the respective one of the prize-indicating graphic elements displayed at the video display device of the respective gaming machine at the one or more points in the shared image graphic effect.

A program product according to this second form of the invention includes shared image display program code. The shared image display program code is executable for

controlling the video display device associated with each gaming machine in the number of gaming machines to produce the shared image graphic effect including one or more distinct prize-indicating graphic elements which appear at selected ones of the video display devices. The program product in this second form of the invention also includes shared image award program code executable for awarding a shared image prize for each gaming machine displaying one of the prize-indicating graphic elements at the one or more points of the shared image graphic effect.

These and other advantages and features of the invention will be apparent from the following description of the preferred embodiments, considered along with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a view in front perspective of a gaming machine which may be used in a gaming system embodying the principles of the present invention.

Figure 2 is a diagrammatic representation showing various electronic components of the gaming machine shown in Figure 1.

Figure 3 is a diagrammatic representation of a gaming apparatus for implementing shared image games according to one preferred form of the present invention.

Figure 4 is a front view of four gaming machines at a first instant in time during a shared image graphic effect according to one preferred form of the invention.

Figure 5 is a front view of the four gaming machines shown in Figure 4, but at a second instant in time during the particular shared image graphic effect.

Figure 6 is a front view of the four gaming machines shown in Figure 4, but at a third instant in time during the particular shared image graphic effect.

Figure 7 is a front view of five gaming machines at a first instant in time during a shared image graphic effect comprising a prize reel simulation according to one preferred form of the invention.

Figure 8 is a front view of the five gaming machines shown in Figure 7, but at a second instant in time during the particular prize reel simulation.

Figure 9 is a front view of the five gaming machines shown in Figure 7, but at a third instant in time during the particular prize reel simulation.

Figure 10 is a flow chart showing a process of providing a shared image graphic effect according to one preferred form of the invention.

Figure 11 is a flow chart showing a shared image game process performed at a display control server component.

Figure 12 is a diagrammatic representation of a portion of a gaming facility floor.

Figure 13 is a front view of four gaming machines at a first instant in time during a shared image graphic effect according to another preferred form of the invention.

Figure 14 is a front view of the four gaming machines shown in Figure 13, but at a second instant in time during the particular shared image graphic effect.

Figure 15 is a front view of the four gaming machines shown in Figure 13, but at a third instant in time during the particular shared image graphic effect.

DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 shows a gaming machine 100 that may be used together with other gaming machines to produce a shared image graphic effect according to the present invention. The block diagram of Figure 2 shows further details of gaming machine 100.

Referring to Figure 1, gaming machine 100 includes a cabinet 101 having a front side generally shown at reference numeral 102. A primary video display device 104 is mounted in a central portion of front side 102, with a ledge 106 positioned below the primary video display device and projecting forwardly from the plane of the primary video display device. In addition to primary video display device 104, the illustrated gaming machine 100 includes a secondary video display device 107 positioned above the primary video display device. Gaming machine 100 also includes two additional smaller auxiliary display devices, an upper auxiliary display device 108 and a lower auxiliary display device 109.

For purposes of describing the present invention, it will be assumed that primary video display device 104 is employed to produce graphics for a primary game that may be played through gaming machine 100, and that secondary video display device 107 is employed in a shared image game according to the present invention. In particular, it will be assumed that secondary video display device 107 is used to produce the single machine component of a shared image graphic effect according to the present invention. Upper and lower auxiliary display devices, 108 and 109, may be used in connection with either the primary game or the shared image game, or both games. It should be borne in mind, however, that shared image games according to the present invention may be produced using any video display device included in a gaming machine. That is, the single machine component of a shared image graphic effect may be produced using a primary video display device of a gaming machine, such as primary video display device 104. Also small auxiliary display devices such as either of display devices 108 and 109 may be used to produce a single machine component of a shared image game. Also, although the single machine component of a shared image game may be produced using the same display device at each gaming machine that participates in shared image game, different video display devices may be used in one or more participating gaming machines. For example, where two gaming machines 100 participate in a shared image game according to the invention, the single machine component of the shared image graphic effect may be

produced using primary video display device 104 at one of the gaming machines and may be produced using secondary video display device 107 of the other gaming machine. Furthermore, where a gaming machine includes multiple video display devices such as gaming machine 100, multiple video display devices at the gaming machine may be used to produce the single machine component of the shared image graphic effect either showing adjacent graphic elements in the sequence of images used to produce the shared image graphic effect (adjacent reel segments, for example) or together showing a single graphic element of the sequence of images (a single reel segment, for example).

Gaming machine 100 illustrated in Figure 1, also includes a number of mechanical control buttons 110 mounted on ledge 106. These control buttons 110 may allow a player to select a bet level in the primary game, select a type of primary game or game feature, and actually start a play in a primary game. Other forms of gaming machines according to the invention may include switches, joysticks, or other mechanical input devices, and/or virtual buttons and other controls implemented on a suitable touch screen video display. For example, primary video display device 104 in gaming machine 100 provides a convenient display device for implementing touch screen controls.

Control buttons 110 or other mechanical or virtual controls at gaming machine 100 may also be involved in a shared image game according to the present invention. For example, one or more of the control buttons 110 may be required in placing a bet necessary to make the particular gaming machine eligible for a given shared image game. Eligibility for a shared image game will be discussed in detail below. For purposes of the present disclosure, mechanical buttons such as buttons 110 in Figure 1, any touch screen implemented buttons/controls and any other user input arrangement that may be used in a given gaming machine to enable a player to make an input in the play of any game through a given gaming machine will be referred to as a "player control." A player control that may be used by a player at a given gaming machine to place that gaming machine in an eligible state for a shared image game may be referred to herein as an "eligibility control." The phrases "player control" and "eligibility control" are not limited to any particular type of interface device or combination of interface devices.

It will be appreciated that gaming machines may also include a number of other player interface devices in addition to devices that are considered player controls for use in playing a particular game. Gaming machine 100 also includes a currency/voucher acceptor

having an input ramp 112, a player card reader having a player card input 114, and a voucher/receipt printer having a voucher/receipt output 115. Audio speakers 116 generate an audio output to enhance the user's playing experience. Numerous other types of devices may be included in gaming machines that may be used according to the present invention.

Gaming machine 100 shown in Figure 1 also includes a top light (sometimes referred to as a "candle light") 118 mounted on the top of the gaming machine cabinet 101. Top lights have historically been used in gaming machines to signal some event at the gaming machine, such as a high value prize win. A top light such as light 118 may also be used to signal for assistance at the gaming machine. As will be discussed further below, top light 118 may be used in a shared image game according to the present invention to indicate the position of a particular graphic element over the course of a given instance of a shared image game.

The present invention is by no means limited to implementation with a gaming machine having the configuration of gaming machine 100 shown in Figure 1. Rather, a shared image game may be conducted using any gaming machine that includes a player control for enabling a player to initiate a play in a game, some arrangement for obtaining a result in the game and causing the gaming machine to display the result in the game, and at least one video display device through which the gaming machine may produce the respective single machine component of a shared image graphic effect. Gaming machine 100 is merely shown as an example of a gaming machine through which the invention may be implemented. It should also be noted that the display device used to produce the desired single machine component of the shared image graphic effect may comprise any suitable display device including a cathode ray tube, liquid crystal display, plasma display, LED display, or any other type of display device currently known or that may be developed in the future.

The present invention relies on a number of different gaming machines used together to produce the shared image graphic effect such as the multi-segmented prize reel simulation. Each different gaming machine represents a different station at which a player may participate in a shared image game. Although Figure 1 and Figures 4-9 described below depict the gaming machines as being separate devices each having their own housing, it is possible within the scope of the present invention for different gaming machines to share a common housing and perhaps share certain other components. A

gaming machine having an entirely separate housing from any other gaming machine such as that shown in Figure 1 will be referred to herein as a "separate gaming machine" to distinguish it from a gaming machine that may share a common housing with another gaming machine, that is, another station at which a player may participate in a shared image game.

Figure 2 provides a block diagram showing various electronic components of gaming machine 100. In particular, Figure 2 shows that gaming machine 100 includes a central processing unit (CPU) 205 along with random access memory (RAM) 206 and nonvolatile memory or storage device 207. All of these devices are connected on a system bus 208 with an audio interface device 209, a network interface 210, and a serial interface 211. A graphics processor 215 is also connected on bus 208 and is connected to drive the primary video display device 104 and secondary video display device 107 (both mounted on cabinet 101 as shown in Figure 1). A second graphics processor 216 is connected on bus 208 and is connected to drive the two auxiliary display devices 108 and 109 also shown in Figure 1. As shown in Figure 2, gaming machine 100 also includes a touch screen controller 217 connected to system bus 208. Touch screen controller 217 is also connected via signal path 218 to receive signals from a touch screen element associated with primary video display device 104. It will be appreciated that the touch screen element itself may comprise either a thin film that is secured over the display surface of primary video display device 104 or some other device for producing a signal indicating the location at which the display surface is touched. The touch screen element itself is not illustrated or referenced separately in the figures.

Those familiar with data processing devices and systems will appreciate that other basic electronic components will be included in gaming machine 100 such as a power supply, cooling devices for the various system components, audio amplifiers, and other devices that are common in gaming machines. These additional devices are omitted from the drawings so as not to obscure the present invention in unnecessary detail.

All of the elements 205, 206, 207, 208, 209, 210, and 211 shown in Figure 2 are elements commonly associated with a personal computer. These elements are preferably mounted on a standard personal computer chassis and housed in a standard personal computer housing which is itself mounted in cabinet 101 shown in Figure 1. Alternatively, the various electronic components may be mounted on one or more circuit boards housed

within cabinet 101 without a separate enclosure such as those found in personal computers. Those familiar with data processing systems and the various data processing elements shown in Figure 2 will appreciate that many variations on this illustrated structure may be used within the scope of the present invention. For example, since serial communications are commonly employed to communicate with a touch screen controller such as touch screen controller 217, the touch screen controller may not be connected on system bus 208, but instead include a serial communications line to serial interface 211, which may be a USB controller or a IEEE 1394 controller for example. It will also be appreciated that some of the devices shown in Figure 2 as being connected directly on system bus 208 may in fact communicate with the other system components through a suitable expansion bus. Audio interface 209, for example, may be connected to the system via a PCI or PCIe bus. Numerous other variations in the gaming machine internal structure and system may be used without departing from the principles of the present invention.

Graphics processors such as graphics processors 215 and 216 are also commonly a part of modern personal computer systems. Although separate graphics processor 215 is shown for controlling primary video display device 104 and secondary video display device 107, and graphics processor 216 is shown for controlling both auxiliary display devices 108 and 109, it will be appreciated that CPU 205 may control all of the display devices directly without any intermediate graphics processor, or the responsibilities of graphic processors 215 and 216 may be divided up differently. The invention is not limited to any particular arrangement of processing devices for controlling the video display devices included with the gaming machine 100.

In the illustrated gaming machine 100, CPU 205 executes software which ultimately controls the entire gaming machine including the receipt of player inputs and the presentation of the graphic symbols displayed according to the invention through display devices 104, 107, 108, and 109 associated with the gaming machine. As will be discussed further below, CPU 205 either alone or in combination with graphics processor 215 may implement a display control client component for performing functions associated with a shared image game according to the present invention. CPU 205 also executes software related to communications handled through network interface 210, and software related to various peripheral devices such as those connected to the system through audio interface 209, serial interface 211, and touch screen controller 217. CPU 205 may also execute

software to implement a primary game controller for generating, receiving, or otherwise obtaining a result in a primary game played through gaming machine 100 and cause the gaming machine to display the result in the primary game. CPU 205 may further execute software to perform accounting functions associated with game play. Random access memory 206 provides memory for use by CPU 205 in executing its various software programs while the nonvolatile memory or storage device 207 may comprise a hard drive or other mass storage device providing storage for programs not in use or for other data generated or used in the course of gaming machine operation. Network interface 210 provides an interface to other components of a gaming system such as the servers discussed below in connection with Figure 3.

The invention is not limited to gaming machines employing the personal computer-type arrangement of processing devices and interfaces shown in example gaming machine 100. Other gaming machines may include one or more special purpose processing devices to perform the various processing steps for implementing the present invention. Unlike general purpose processing devices such as CPU 205, these special purpose processing devices may not employ operational program code to direct the various processing steps.

The invention is not limited to gaming machines including only video display devices for displaying results in a primary game. It is only necessary that the gaming machine include one video display device that is capable of producing the single machine component of a shared image graphic effect according to the invention. For example, a gaming machine suitable for use in the invention may include a mechanical reel-type display rather than a video display device for displaying results in a primary game. Thus, a gaming machine suitable for use in the present invention may have a structure similar to that shown for gaming machine 100 in Figure 1, but with a mechanical reel-type display replacing primary video display device 104.

Referring now to Figure 3, an apparatus 300 embodying one preferred form of the present invention includes a number of separate gaming machines, each comprising a gaming machine 100 (Figures 1 and 2) in this example implementation. For purposes of describing apparatus 300, each gaming machine 100 in Figure 3 is shown as including a video display device 107. Although not shown in Figure 3, it will be appreciated from Figures 1 and 2 that each gaming machine also includes an arrangement of player controls that may include buttons, switches, or other physical controls and/or touch screen controls.

Each gaming machine 100 shown in Figure 3 further includes a respective primary game controller 301 and a respective display control client component 303 (abbreviated "DCC" in Figure 3). Apparatus 300 further includes a display control server 302. In the form of the invention shown in Figure 3 display control server 302 and the display control client components 303 combine to implement a shared image display control arrangement. Each gaming machine 100 in apparatus 300 also includes a respective shared image prize controller 305 (abbreviated "prize controller" in Figure 3). Gaming machines 100 and display control server 302 are connected in a network communication arrangement including first and second network switches 306 and 307, connected together through various connecting media, all shown as lines 308 in Figure 3.

Each gaming machine 100, and particularly the player control arrangement associated with each gaming machine, allows a player to initiate a play in a primary game. Initiating a play in a primary game may include placing a wager for the game (which may be a game separate from a shared image game) and/or placing a separate wager for a shared image game according to the present invention. The video display devices 107 associated with the different gaming machines 100 are used according to the invention to produce the shared image graphic effect. Each respective video display device 107 displays a respective single machine component of the shared image graphic effect as will be discussed further below.

The shared image display control arrangement made up of display control server 302 and the various shared image display control client components 303 functions to selectively control the video display devices 107 to produce the shared image graphic effect. Various characteristics of a shared image graphic effect according to the invention will be described below in connection with the examples of Figures 4-9 and Figures 13-15. Each respective shared image prize controller 305 is responsible for awarding shared image prizes for the respective gaming machine 100 in the embodiment illustrated in Figure 3. Preferably at least one of the shared image prize controllers awards a shared image prize for its respective gaming machine 100 for each shared image game that is conducted. Any such shared image prize corresponds to a prize represented at least in part by a respective graphic element displayed at video display device 107 of the particular gaming machine at a prize identifying point of the particular shared image graphic effect, which may be at a conclusion of the shared image graphic effect for example. Further details and alternatives

regarding awarding shared image prizes will be described below in connection with Figure 10.

The present invention requires various communications between display control server 302 and the various gaming machines 100 included in apparatus 300. The network arrangement made up of network switches 306 and 307, and the various communication lines 308 shown in Figure 3 is illustrated merely as an example of a suitable communications arrangement. The present invention is not limited to any particular communications arrangement for facilitating communications between display control server 302 and various gaming machines 100. Any wired or wireless communication arrangement employing any suitable communications protocols (such as TCP/IP for example) may be used in an apparatus according to the invention.

Figure 3 shows other server(s) 310 included in the network. This illustrated "other server(s)" element 310 may include one or more processing devices for performing various functions related to shared image games conducted through apparatus 300 and any other games that may be available to players through gaming machines 100. For example, apparatus 300 may provide support for cashless gaming or various forms of mixed cash/cashless gaming through the various gaming machines 100. In this example, one more other servers 310 may be included in apparatus 300 for supporting these types of wagering and payout systems. As another example, primary game played through a gaming machine 100 may rely on a result identified at or in cooperation with a device that is remote from the gaming machine. In this example, another server 310 may be included in the system for identifying results for a primary game that may be played though the various gaming machines 100 and causing the results to be communicated to the various gaming machines as necessary for processing by the respective primary game controller 301. Generally, the other server(s) 310 shown in Figure 3 are shown only to indicate that numerous other components may be included along with a gaming apparatus that provides shared image games according to the present invention. Record keeping, player tracking, and player club functions are other functions that could be performed by a respective other server 310 included in apparatus 300.

Figure 3 shows display control server 302 as a separate processing system connected in a communications network with other servers 310 and gaming machines 100. In this arrangement, display control server 302 may comprise a suitable computer having

sufficient processing capacity to perform the functions described below particularly in connection with Figure 11. The computer representing display control server 302 may have a personal computer configuration with a suitable processor, volatile and nonvolatile memory, and an appropriate network interface. Although not shown in Figure 3, it will be appreciated that a suitable operator interface such as a monitor, keyboard, and pointing device may be operatively associated with display control server 302 to facilitate operator inputs such as inputs to configuration changes for the shared image games.

Although Figure 3 shows the primary game controller 301 and shared image prize controller 305 as separate devices at each gaming machine, this representation is shown merely to conveniently describe different functionality at the respective gaming machine 100. In the form of gaming machine 100 illustrated in Figures 1 and 2, the primary game controller 301 and shared image prize controller 305 for the respective gaming machine 100 may be implemented by a common processing device such as CPU 205 shown in Figure 2. Alternatively, the functions of the primary game controller 301 and shared image prize controller 305 for a given gaming machine may be performed by two or more separate general purpose or special purpose processing devices.

Figures 4 through 6 may be used to describe an example of a shared image game produced according to the invention using an apparatus such as apparatus 300 shown in Figure 3. Referring first to Figure 4, four gaming machines 100a-d are shown arranged side-by-side, each gaming machine having the structure of gaming machine 100 described above in connection with Figures 1 and 2. Each gaming machine 100a-d uses the respective upper display device 107 to display a single machine component of a shared image graphic effect. The designation 1IMAGEl is shown in Figure 4 to represent a graphic image that may be displayed through the respective video display device 107 for first gaming machine 100a at time TO during one preferred shared image graphic effect according to the invention. At this same point in time during the shared image graphic effect, video display device 107 of gaming machine 100b displays 2IMAGE2, whereas gaming machine 100c displays 3IMAGE3, and gaming machine lOOd displays 4IMAGE4. In one form of the invention, the graphic images, 1IMAGEl, 2IMAGE2, 3IMAGE3, and 4IMAGE4 shown in Figure 4 are each distinct graphic elements of a simulation in which the distinct graphic elements appear to sequentially travel in unison across each respective video display device 107 in a rotation direction as if the graphic elements were physically

interconnected. For example, 11MAGE1, 2IMAGE2, 3IMAGE3, and 4IMAGE4 shown in Figure 4 may comprise images representing individual segments of a multi-segmented, rotatable prize reel oriented to rotate about a vertical axis, and in which the various segments of the reel include symbols indicating different prizes, multipliers, or other results. Some of the segments 1IMAGEl , 2IMAGE2, 3IMAGE3, and 4IMAGE4 may indicate a respective prize and others may indicate no prize. Where a prize is indicated by the respective segment, the prize may be some fixed prize (in terms of cash, credits, or merchandise), a multiplier, or perhaps an indicator for a progressive prize. Time TO may be a starting time for the prize wheel simulation with the respective segments 1IMAGEl, 2IMAGE2, 3IMAGE3, and 4IMAGE4 representing the reel segment shown at the respective gaming machine 100a-d before the simulated prize wheel begins to rotate.

Figure 5 shows the state of the wheel segments represented by 1IMAGEl, 2IMAGE2, 3IMAGE3, and 4IMAGE4 displayed by the different gaming machines 100a-d at a different point in time T1 after beginning to rotate the simulated prize reel representing the shared image graphic effect. It is apparent that each of the reel segment representations 1IMAGEl, 2IMAGE2, 3IMAGE3, and 4IMAGE4 have moved to the right in the orientation of the figure so that part of a new reel segment representation, *nlMAGEn* is shown at gaming machine 100a, along with part of 1IMAGE 1. The remaining part of 1IMAGEl is now shown at video display device 107 of gaming machine 100b together with the left portion of 2IMAGE2. The remainder of 2IMAGE2 is shown at video display device 107 of gaming machine 100c together with a left portion of 3IMAGE3. The remainder of 3IMAGE3 is shown at video display device 107 of gaming machine lOOd together with the left portion of 4IMAGE4.

Figure 6 shows the state of the prize reel simulation at a point in time T2 after time T1. At time T2, the new image nlMAGEn is shown in a position at a central position on video display device 107 of gaming machine 100a. Similarly, 1IMAGEl is shown at a central position on video display device 107 of gaming machine 100b, 2IMAGE2 is shown at a central position on video display device 107 of gaming machine 100c, and 3IMAGE3 is shown at a central position on video display device 107 of gaming machine 10Od. 4IMAGE4 is no longer visible at any of the illustrated gaming machines, but would be shown at a video display device of the next gaming machine participating in the shared image graphic effect. It will be appreciated by comparing Figures 4, 5, and 6 that the

movement of wheel segment representations 1IMAGEl, 2IMAGE2, etc. across different video display devices 107 in the prize reel simulation is conducted such that the reel segment representations appear to retain a fixed relationship to one another in terms of location on the simulated prize reel. Thus the images making up the reel segment representations appear to an observer from the perspective of Figures 4-6 to all be connected together, that is, interconnected in a fixed relationship. The displacement of one image in the direction of movement (rotation) is accompanied by the same degree of displacement of each other image in the example. However, since the images are merely video image representations with no physical interconnection, there may be some slight deviation in displacement of the various images without detracting from the simulation, that is, without being readily apparent to an observer.

Because the images shown on the various gaming machines to produce the shared image graphic effect are visible generally from the front of each gaming machine, a player at one gaming machine will not necessarily be in position to see an image of the shared image graphic effect shown at another gaming machine. However, it may be desirable in some instances to give all of the players some indication of the location of a particular image as it makes its way around the different gaming machines. In the prize reel simulation for example, it may be desirable to show the position of a reel segment having a high value prize indicator as the reel segment appears to rotate through the various gaming machines. Each respective gaming machine may therefore include a separate indicator such as top light 118 located on the top of the respective gaming machine which is used to indicate the location of a particular image of the shared image. Specifically, top light 118 of a given gaming machine 100 participating to produce the shared image graphic effect may be illuminated when a particular image (a high value prize indication for example) is shown at the given gaming machine. This use of the gaming machine top light 118 may generate considerable excitement among the participating players as they observe the position of the particular image as it moves through the various gaming machines over the course of a shared image graphic effect for an instance of the shared image game. The control of top light 118 in this fashion may be accomplished with image sequence data as will be described below in connection with Figure 10.

In addition to the use of the shared image graphic effect in the conduct of a shared image game, the shared image graphic effect may be used to attract players to the shared

image game. For example, periodically between shared image games the gaming machines may be controlled to show an example shared image graphic effect to attract players. In the prize reel example, the simulated prize reel may be shown slowly rotating through the various gaming machines to show the various prizes available in the shared image game. The shared image graphic effect may be modified in this attract mode to provide the players with other information on the shared image game. Also, information shown at another video display device at each gaming machine may be coordinated with the attract mode shared image graphic effect to show players the features of the shared image game.

The appearance of motion in the shared image graphic effect with images appearing to move from one position to the next involves producing a number of images or frames displayed rapidly one after the other at the respective video display device. That is, the simulation is produced by each gaming machine producing a respective sequence of images or frames (hereinafter "images/frames") which vary slightly from one to the next to give the appearance that the images are moving across the respective display device 107. The rate at which the image positions change may be used to represent the speed at which the simulated prize reel rotates. The images themselves may also be modified (blurred for example) to simulate the appearance of motion. The manner in which the image/frame sequences may be generated at the various gaming machines will be described further below in connection with Figures 10 and 11. However, it is noted here that to simulate the rotation of a prize reel, the images are shown to move quickly across video display devices 107 in a first part of the simulation, and then the simulation shows the movement gradually slowing down until the symbols each appear to stop at a respective gaming machine video display device 107. Although not indicated in Figures 4-6, the start of the simulated prize reel rotation may be accompanied by a small amount of rotation in the opposite direction to better simulate the complete movement of a prize reel that is manually spun.

According to the present invention, a shared image prize is awarded for the respective gaming machine at which a particular prize-indicating image stops at a prize indicating point of the shared image graphic effect. The prize indicating point in the simulated prize reel embodiment of the invention comprises a point in which the simulated reel has come to rest. This stationary position of the simulated prize reel may be at a conclusion of the shared image game. In some implementations of the invention, however,

a simulated prize reel may stop two or more different times over the course of the shared image game, with the multiple stopping points combining for a shared image prize.

In the embodiment of the invention shown in Figure 3, it is the shared image prize controller 305 for the respective gaming machine 100 that functions to award the appropriate shared image prize. For example, 1IMAGEl shown in Figures 4 through 6 may indicate a particular prize. If the position of 1IMAGEl shown in Figure 6 represented the position of that prize-indicating image at a stopping point in the shared image graphic effect, the shared image prize controller 305 (Figure 3) associated with gaming machine 100b would award the shared image prize indicated by that particular image for gaming machine 100b. This shared image prize would be paid to the particular player participating in the shared image game through gaming machine 100b. Any prize indicated by 2IMAGE2 would be awarded for gaming machine 100c, and any prize indicated by 3IMAGE3 would be awarded for gaming machine 10Od. The award of shared image prizes may be contingent upon gaming machine eligibility as will be described below.

It will be noted that in the simulated prize reel graphic effect, (and subject to eligibility requirements discussed below) a prize is awarded for any gaming machine displaying a prize indicating symbol at the given prize indicating point of the simulation. Where the simulated prize reel includes multiple symbols that indicate a prize, multiple prizes may be awarded for any given shared image game. In some forms of the prize reel simulation form of shared image game, some of the reel symbols will not indicate a prize, other symbols will indicate relatively low level prizes, and a relatively few symbols will indicate some larger prize.

In one preferred form of the invention, the prizes awarded for the shared image game are based partially on a multiplier symbol and partially on a value that has been accumulated or generated in the play of a primary game through the given gaming machine. Figures 7 through 9 show an example of a prize reel simulation in which one or more of the prize reel segments 701 include a multiplier symbol. Each of Figures 7 through 9 show the same five gaming machines, 700f-j, each including a respective video display device 707 at a top portion of the respective gaming machine. Each gaming machine 700f-j also includes a respective primary display device 704 in a central portion of the respective gaming machine and a respective additional video display device 708 located between the respective video display device 707 and respective primary display device 704. It will be

noted that the respective primary display device 704 of each of the three gaming machines 700h-j on the right of each of Figures 7 through 9 is a video display device. The respective primary display device 704 of each of the two leftmost gaming machines 70Of and 70Og is a mechanical reel arrangement. Each of the gaming machines 700f-j provide a different primary game but, aside from the different primary display devices 704 and specific hardware that may be necessary to drive the respective primary display, may have an internal structure similar to that shown for gaming machine 100 in Figures 1 and 2.

In the example prize reel simulation indicated by Figures 7 through 9, each figure shows gaming machines at a different time in the simulation. Figure 7 shows the state of each respective video display device 707 at time TO, with each respective video display device 707 showing a respective reel segment 701 including a multiplier value, such as 9Ox for gaming machine 70Of for example. Figure 8 shows the state of each respective video display device 707 at a later time Tl during the simulated prize reel spin. At time Tl, the respective video display devices 707 have all been controlled so that all of the reel segments 701 appear to have moved to the right sufficiently to show part of each reel segment on one video display device 707 and part of each reel segment is shown on another. For example, Figure 8 shows that part of the reel segment 701 showing the 9Ox symbol is shown at gaming machine 70Of and the other part of that reel segment is shown at gaming machine 70Og. Figure 9 shows the state of each respective video display device 707 at a later time T2 at which point each simulated reel segment 701 appears to have moved further to the right so that each reel segment symbol appears one gaming machine over to the right with respect to the state shown in Figure 7. Again, it will be appreciated that Figures 7 through 9 each represent a snapshot in time during a prize reel spin simulation and that the complete simulation would typically show a starting position with each respective gaming machine showing a respective reel segment, and then a simulation of rapid rotation with each image at a respective video display device 707 changing rapidly. The simulation would then show the reel segments 701 gradually slowing down and ultimately coming to a stop with a respective reel segment displayed at each separate gaming machine. As with the example of Figures 4 through 6, the simulation is produced by controlling each respective video display device 707 to show a single machine component of the overall simulation.

In the example of Figures 7 through 9, the prize awarded for the play of the shared image game for the player participating at that respective gaming machine comprises some value accumulated or generated for the player multiplied by the multiplier value. In one preferred form of the invention, the value to which the multiplier is applied is accumulated by achieving certain results in a primary game offered at the gaming machine. For example, for each play in a reel-type primary game at the gaming machine (or each eligible play where there are eligibility requirements) a player may be awarded a certain value for the occurrence of a special symbol on one of the reels when the reels have stopped for the play of the primary game. Continuing with this example, the reel-type primary game may be a three reel game and a first special symbol appearing anywhere on the first reel at the conclusion of the play in the primary game may be worth a first numeric value, a second special symbol appearing anywhere on the second reel for the given play may be worth a second numeric value, and a third special symbol appearing anywhere on the third reel for the given play may be worth a third numeric value. Over the course of play at the gaming machine before the gaming machine participates in the shared image/simulated prize reel game, the player may accumulate a value from hitting the first, second, and third special symbols in individual plays of the primary reel-type game. The multiplier aligned with the gaming machine at the conclusion of the shared image/simulated prize reel game is applied to the accumulated numeric value to produce the overall shared image game prize to be awarded to the player at the gaming machine. The resulting numeric value may be a cash value, credit value, or any other sort of numeric value.

In the above example, the presence of an accumulated numerical value for the player at the gaming machine may represent an eligibility requirement for participating in the shared image game. That is, if the player has not accumulated a numeric value, they will not win a prize for the shared image game even if a multiplier symbol aligns with the player's gaming machine at the conclusion of the shared image game (the result of applying the multiplier to a zero value would be zero). Also, this particular embodiment of the invention may require a certain bet level in order for the player to qualify for accumulating values from the special reel symbols. For example, in order for the numeric value associated with a special symbol to be accrued to the player for a given play of the primary game, the player may be required to place a maximum bet in the primary game or a maximum bet plus an additional side bet. This additional side bet may be used to fund all

prizes awarded in the shared image game. The accumulated value at a given gaming machine may or may not reset to zero or some other value after a given instance of the shared image/prize reel game (for example, after completion of a given simulated spin of the prize reel). In some forms of the invention the accumulated value may only reset after a player has received some prize for the shared image/prize reel game.

The above example for accumulating a numeric value to which a prize wheel multiplier value is applied is but one preferred form of the invention using a simulated prize reel, and many alternatives to this particular embodiment are possible within the scope of the invention. For example, numeric prize values may be shown at the various prize reel segments and the value accumulated from play of the primary game may be applied as a multiplier for a value shown on a prize reel segment aligned with the given gaming machine. Furthermore, the shared image game prize may be simply a value or other prize indicated by the symbol appearing at the given simulated prize reel segment. Also, it will be appreciated that the various simulated prize reel segments may indicate different types of prizes in a single instance of the shared image/prize reel game. Some segments may indicate multiplier values while other segments may indicate straight prize values. Other simulated prize reel segments may include symbols indicating other types of prizes such as merchandise, player club points, vouchers for meals or services, etc. Some prize reel segments may be associated with no prize or a zero multiplier.

Further details of operation of gaming apparatus 300 and the various components shown in Figure 3 may be described with reference to the flow diagrams of Figures 10 and 11. Figure 10 shows an overall process 1000 according to one preferred form of the invention, and indicates the relationship between processes performed at display control server 302 and functions performed at each respective gaming machine 100 producing the given shared image graphic effect. Figure 11 shows further detail of the functions performed by display control server 302. It should be noted that the references in the following discussion of Figures 10 and 11 to the gaming machines 100, gaming machine components (such as video display device 107 and shared image controller 305), and display control server 302, are references to those elements shown in Figure 3.

Referring now to Figure 10, after the display control server functions are performed and appropriate client commands are sent from display control server 302 to the respective gaming machine 100 as indicated at process block 1001, the overall process 1000 includes

a number of processes which may be performed at each respective gaming machine 100. These gaming machine processes included in producing the shared image graphic effect are shown in dashed box 1002 in Figure 10 and are performed concurrently at each gaming machine 100 cooperating to produce the shared image graphic effect (such as the prize reel simulation described above, for example). The processes include producing a single machine component of the shared image graphic effect at the respective gaming machine 100 according to the received client commands as shown at process block 1004. A decision is then made, as indicated by decision block 1005, whether a prize is indicated for the particular single gaming machine for which the single machine component is produced. If no prize is indicated, the process proceeds preferably to process block 1006 and the respective gaming machine 100 notifies display control server 302 that the shared image game is complete for that particular gaming machine. In the event a prize is indicated by a positive result at decision block 1005, the respective gaming machine 100 awards the indicated shared image prize as shown at process block 1008, and then the process proceeds to block 1006 for notifying the display control server 302 that the shared image game is complete for that gaming machine. From process block 1006 the process loops back to perform the functions of display control server 302 for the next instance of the shared image game.

The process of producing the single machine component at the respective gaming machine according to the received client command or commands as indicated at process block 1004 includes rapidly producing a series of images at the respective video display device 107 to produce the portion of the shared image graphic effect required at that respective gaming machine 100. In the example shown in Figures 4 through 9, producing the single machine component for a given gaming machine 100 includes producing the series of images sequentially one after the other which together produce the appearance of distinct graphic elements moving in a rotation direction sequentially across the area of the particular video display device 107. In order to produce the respective single machine component at each respective gaming machine to simulate a prize reel which appears to rotate through each gaming machine, each single machine component will start at a different image/frame in the series of images and also end on a different image/frame in the series of images. However, assuming a realistic simulation of a spinning prize reel is desired, the relative order in which the various images are shown will be the same for each

gaming machine 100, just out of phase to show the different starting and stopping points. Also, the prize reel simulation requires that each single machine component must start at substantially the same time, and then progress at a common simulated rotation speed throughout the different single machine components. That is, and referring back to the example of Figures 4 through 6, at least for adjacent gaming machines 100a and 100b, the speed at which the image appears to move across the respective video display device 107 for gaming machine 100a should be essentially the same as the speed at which the respective image moves across video display device 107 of gaming machine 100b. This synchronization is critical for a shared image graphic effect which is intended to realistically simulate a rotating prize reel showing a series of distinct graphic elements which sequentially travel across each respective video display device in a rotation direction as if the graphic elements are physically interconnected, and ultimately stop to display a respective distinct graphic element at each respective video display device 107.

The present invention encompasses a number of different ways in which the various gaming machines 100 may operate to produce the desired single machine component of a given shared image graphic effect. In the simulated prize reel graphic effects described above with reference to Figures 4 through 6 and Figures 7 through 9, one preferred arrangement employs a sequence of images/frames stored in suitable memory at each gaming machine 100. The sequence of images/frames is preferably the same for each gaming machine 100, as is the instantaneous (refresh) rate at which the images/frames are displayed, but a start image/frame and an end image/frame will be different for each gaming machine. The respective gaming machine 100 produces its single machine component of the respective shared image graphic effect by displaying the stored sequence of images/frames according to the defined display rates over the course of the simulation, starting at a given one of the images/frames and ending at a given one of the images/frames. Storing the sequence of images/frames in this fashion at each gaming machine in memory (such as RAM 206, or RAM associated with graphics processor 215 in Figure 2) allows the gaming machines 100 to produce the required single machine components in response to only minimal data in a client command communicated from display control server 302. Further details on the client commands from display control server 302 will be described below in connection with process block 1005 of Figure 10 and in connection with process block 1108 of Figure 11.

In forms of the invention using a series of digitally defined images/frames stored in a suitable data storage device at each respective gaming machine 100, the process of producing a single machine component as shown at process block 1004 in Figure 10 requires certain processing at the gaming machine. In one form of the present invention, a processor (such as CPU 205 in Figure 2) at the gaming machine utilizes information on the image/frame starting point for a given reel spin simulation to select the stored images/frames to be displayed in the simulation. For example, assume an image/frame data file includes data for 1500 images/frames to be displayed in order to produce one complete reel revolution for a single machine component of a given reel spinning simulation. The starting point information for a first gaming machine 100 participating in the simulation may indicate that the simulation should start with image/frame 500 in the sequence of image/frames 1 to 1500. In order to show the desired single machine component, the processing device selects image/frame 500 and additional images from the sequence to produce the desired video effect for the given reel rotations speeds to be simulated. Alternatively, the reel and reel spinning parameters (speed, time, and starting point) may be stored at the gaming machine and the suitable gaming machine processor may generate all of the image/frame data for a given reel spin simulation based on the stored reel and reel spinning parameters and data for a reel start location. Intermediate to these alternative are arrangements in which portions of the image/frame data for a single machine component of a simulation are saved at the gaming machine and a processing device uses reel and reel spinning parameters to select data for some stored images/frames and generate data for other images/frames to be displayed in the simulation. Although these represent examples of preferred processes for generating the respective single machine component at a respective gaming machine 100, other suitable processes maybe used within the scope of the invention.

It should be noted that the client command(s) received from display control server 302 may not indicate a start image/frame for a given single machine component of the shared image graphic effect in some implementations. Rather, the start image/frame for a given single machine component of a shared image graphic effect comprising a reel spinning simulation may be dictated by the stop image/frame for the immediately preceding shared image graphic effect. The client command(s) for the given single machine component in this case would dictate a stop image/frame for that single machine

component, and the process at the gaming machine would include the processing steps required to produce the sequence of images necessary to show the portion of the simulation produced at that gaming machine and ultimately stop to show the stop image/frame.

In implementations of the invention in which a top light 118 is used to indicate the position of one or more graphic elements across the gaming machines participating in the shared image game, the process at block 1004 in Figure 10 also includes producing signals to control the top light for the respective gaming machine 100. In one preferred arrangement an identifier for each image/frame to be accompanied by illuminating the top light for the gaming machine is stored in suitable memory at the gaming machine. Each time a given image is displayed at the gaming machine, a suitable processing device compares the displayed image identifier with a stored identifier. A positive outcome of this comparison causes the gaming machine to produce a control signal to illuminate the top light for a desired period of time.

The present invention also encompasses a number of different ways in which a prize may be indicated for the purposes of decision block 1005 in Figure 10. In one form of the invention, a client command communicated from display control server 302 to the respective gaming machine 100 will include a separate data element providing an indication of any prize for the respective gaming machine for the particular shared image game for which the command was sent. This separate prize indicating data element may be accompanied by a definition of the start point (image/frame) for the single machine component for that gaming machine and a definition of the stop point (image/frame) for that single machine component. Alternatively, the gaming machine (that is, the shared image prize controller for the gaming machine) may be operable to determine whether a prize is to be awarded from the image/frame representing the stop image/frame for the graphic. That is, gaming machine 100 may be capable of determining if the stop image/frame specified for the single machine component indicates a prize or not. One way to provide this functionality is for the gaming machine to store a lookup table in which the various images/frames in the series of images/frames are each correlated with a prize value or prize indicator. The gaming machine may perform a lookup in this table for the given stop image/frame and read the correlated prize value or prize indicator in order to determine if a prize is to be awarded for the given shared image graphic effect.

The decision indicated at process block 1005 in Figure 10 may also include determining if the respective gaming machine is in an eligible state to receive a shared image prize. That is, some forms of the invention require that the respective gaming machine be in an eligible state in order to produce a positive result at process block 1005. The determination as to whether the given gaming machine is eligible for a shared image prize may include evaluating an eligibility time value at the gaming machine, evaluating a register maintained at the gaming machine for a wager value or some other accumulated value, and/or evaluating some other condition at the gaming machine. Example eligibility requirements will be described further below. Evaluating eligibility may be a function performed by shared image prize controller 305 for the respective gaming machine.

The step of awarding a respective shared image prize as shown at process block 1008 in Figure 10 is also preferably performed by the respective shared image prize controller 305 for the given gaming machine 100. Awarding the respective prize may include crediting the account of the player using that particular gaming machine, printing a voucher which may be redeemed for the prize, awarding cash, coins, or tokens for the prize or any other action suitable for awarding the respective prize. In one preferred form of the invention, the shared image prizes are determined by the application of a multiplier indicated by the shared image graphic effect to a wager or accumulated value which has made the given gaming machine 100 eligible to participate in the shared image game. Awarding the respective shared image prize in that case includes determining the total prize by multiplying the wager (potentially a side bet) or the accumulated value by the multiplier value indicated by the distinct graphic element shown at the respective gaming machine 100 at the conclusion or other prize indicating point of the shared image graphic effect, and crediting or otherwise paying the player that amount. Particularly in cashless gaming systems, the shared image prize may be awarded by adding a shared image prize credit amount to the gaming credits for that player as represented by a credit display produced at the respective gaming machine 100. The player may then use those credits for further wagering in the shared image game or other games available through the respective gaming machine 100, or may cash out at the gaming machine in some fashion.

Although preferred forms of the invention include the notifying step indicated a process block 1006 in Figure 10, some forms of the invention may not require such notification. In some forms of the invention, display control server 302 may be

programmed or otherwise operated to assume that a given instance of the shared image game is complete after a particular time has elapsed after the shared image game is commenced according to the client command(s). In other forms of the invention, only some of the gaming machines may provide a notification as shown at process block 1006. In particular only gaming machines through which a shared image prize is awarded may provide such notification since it may be assumed that these gaming machines will be the last to complete their component of the shared image game, award the respective shared image prize, and then be ready for another shared image game.

Figure 11 shows a preferred process 1100 performed at display control server 302 shown in Figure 3. According to the preferred process 1100 shown in Figure 11, it is display control server 302 that is responsible for determining that a shared image game is to be conducted. Thus a shared image game determination step is shown at process block 1101 in Figure 11. If it is determined that a new shared image game is not to be conducted as indicated by a negative outcome at decision block 1102, the process returns to perform the determination step again. If a new shared image game is to be conducted as indicated by a positive outcome at decision block 1102, the process proceeds to suspend further determinations as shown at process block 1104. The process then selects a shared image graphic effect to produce for the shared image game as shown at process block 1106. Display control server 302 next builds client commands as necessary for each gaming machine 100 as indicated at process block 1108, and causes the client commands to be communicated to each gaming machine. Display control server 302 then waits to receive game completion indications from the various gaming machines 100 as indicated in the process block 1110. Once all of the game completion indications are received as indicated by a positive outcome at decision block 1112, the process proceeds to check for and execute configuration changes as indicated at process block 1114 and then returns to process block 1101 to make another determination as to whether a new shared image game is to be conducted.

The determination indicated at process block 1101 in Figure 11 may be performed in any suitable fashion within the scope of the present invention. In one preferred process for determining when a shared image game is to be conducted, display control server 302 produces a random or pseudo random number (referred to herein as an "apparent random number") within a certain range of numbers once every set time period and then compares

the generated apparent random number with one or more target numbers in the range. A match between the generated apparent random number and a target number results in a determination that the shared image game is to be conducted at that point in time. If there is no match between the generated apparent random number and a target number from the range of numbers, no shared image game is to be conducted at that time. For example, display control server 302 may generate an apparent random number in a predefined range of numbers (between 1 and 10,000, for example) every one-sixth of a second and compare that generated apparent random number with a predefined number or set of numbers in the range (the numbers 5000 and 5002, for example).

The invention is not limited to the above-described apparent random number generation and comparison process for determining when a shared image game is to be conducted. Other forms of the invention may develop a schedule of shared image games to be conducted over a certain period of time, store the schedule in some fashion, and then conduct games according to that schedule. For example, display control server 302 or some other component may produce a schedule of shared image games to be conducted over a given hour or day. In this case, a determination as to whether a shared image game is to be conducted may include comparing the current time to the time schedule to determine if a shared image game is scheduled for the current time. Alternatively there is no determination by display control server 302, and the display control server is simply programmed or otherwise operated to start the process beginning at process block 1106 in Figure 11 according to the desired time schedule.

In some preferred forms of the invention, the determination performed by display control server 302 as indicated at process block 1101 is performed to ensure some average number of plays in a primary game at a gaming machine between shared image games. The average number of primary game plays K between shared image games is given by the equation K=1/(N*P*E), where N is the number of times each second that display controller 302 checks for the trigger condition, P is the percentage chance of triggering the bonus on a given check, and E is the number of seconds of eligibility for each eligibility side bet (assuming the implementation provides a certain eligibility time per side bet). Where the preferred number of primary game plays per shared image game is 80 (K=80) and E=6 seconds for example, the equation reduces to N*P=l/480. Any combination on N and P

which satisfies this relationship is mathematically acceptable. For example, if N is set to 10 then the corresponding value of P would need to be set to 1/4800.

The above described arrangement in which an apparent random number is generated every set time period may require that the determination process at block 1101 be suspended in the event a shared image game is to be conducted. The suspension step shown at process block 1104 in Figure 11 prevents the determination process at block 1101 from potentially determining that a new shared image game is to be conducted while a prior shared image game is still being conducted and is not yet complete. Techniques that may be employed other than actually suspending the process at process block 1101 include merely ignoring any positive determination for a new shared image game until the current shared image game is complete. In other forms of the invention, for example, the time scheduling form of the invention described above, no determination suspension may be required given that each game could be scheduled to begin only when the previous shared image game is presumed to be complete. A shared image game scheduling component may, for example, only schedule a new shared image game for a time that is over some minimum time period after a previous shared image game is started to ensure that the previous shared image game is complete before the new shared image game is started.

The steps performed for selecting a shared image graphic effect to be produced for a given instance of a shared image game as indicated at process block 1106 will depend on the nature of the shared image graphic effect being produced. Where the shared image graphic effect is a simulation of a prize reel for example, selecting the specific shared image graphic effect may include selecting a stop position for the simulated reel and/or a spinning characteristic (time and simulated speed over time). Other types of shared image graphic effects may require a determination of the particular gaming machines 100 at which certain graphic images will be displayed over the course of the shared image game. In some forms of the invention, display control server 302 may store or have access to data defining different shared image graphic effects or different aspects of a shared image graphic effect and may select a particular effect or portions of the effect from this data.

It will be appreciated that selecting a shared image graphic effect to be produced for a given instance of a shared image game may have the effect of selecting the prize-indicating graphic elements that are displayed at the various gaming machines 100 at the conclusion or other prize indicating point in the shared image game. For example, where

the shared graphic effect is a simulation of a spinning prize reel, selecting the simulation effectively selects the prize reel segments that will ultimately be displayed at the various gaming machines when the simulated reel comes to a stop. Depending upon any eligibility requirements for the gaming machines to qualify for a shared image prize, selecting the shared image graphic effect may effectively identify which gaming machine or gaming machines are to win a shared image prize and the amount of the prize.

The shared image prize selection process at block 1106 is also preferably randomized to the extent possible to evenly distribute the various shared image prizes that may be available. Where the shared image graphic effect produces a simulation of a prize reel, the simulation may be conducted so that prize wheel segments and prize indicating symbols included with the prize reel segments may be modified to add, remove, and/or move one or more prize indicating values that appear on the prize reel. Any such modification of symbols shown by the simulated prize reel may be performed while the prize reel is portrayed at rest before a simulated spin, and thus the modification of symbols may be apparent to the players at gaming machines 100 and to those observing the game. Alternatively, the invention may take advantage of the time that the reel is shown spinning rapidly to change the various distinct graphic images/symbols shown on the simulated reel so that the modification of symbols is not apparent to the players or observers.

The process of building the client command or commands necessary for each gaming machine as shown at process block 1108 may vary significantly within the scope of the present invention. Some forms of the invention may build a start command for each gaming machine 100 that will cooperate in producing the shared image graphic effect. Other forms of the invention may build a ready command for each gaming machine and also a start command for each gaming machine. The nature of the client commands may also vary significantly. In some forms of the invention, a start command includes a future start time at which each gaming machine 100 is to begin producing the respective single machine component of the shared image graphic effect. Alternatively, a start command produced at process block 1108 may dictate that the receiving gaming machine 100 start the respective single machine component of the shared image graphic effect immediately upon receipt of the command or after a certain time after receipt of the command. Whether a start command dictates an immediate start or a start at some time in the future, a separate ready command may be used to prompt each gaming machine 100 to display some

indication such as a countdown timer indicating that a shared image game is about to commence. This countdown timer or other display to be shown at any display device associated with the respective gaming machine, for example one of the auxiliary display devices 108 or 109 of gaming machine 100 (in Figure 1), as will be described further below. Also, prior to the time that the respective gaming machine is to start displaying its single machine component of a shared image graphic effect, the gaming machine may receive a sequence command that provides information necessary for the gaming machine to conduct initial processing that may be necessary in order to display the single machine component such as selecting or generating images/frames to be displayed as discussed above in connection with process block 1004 in Figure 10.

As discussed above in connection with process block 1004 in Figure 10, the content of various types of client commands may very significantly depending upon specifically how the client component of the shared image display control arrangement produces the respective single machine component for the given gaming machine. For example, a client command produced as indicated at process block 1108 in Figure 11 may have the following content.

> [start time], [time sync], [start frame], [stop frame], [prize], [run time], [reel definition]

The start time is included at least in implementations in which the various gaming machines 100 operate to begin producing their respective single machine component of the shared image graphic effect at a particular time. This time may be taken as some fixed time after it is determined that a shared image game is to be conducted for example. It will be appreciated that in these forms of the invention for producing a shared image graphic effect in which the series of distinct graphic images appear to travel across each video display device (such as 107 in Figure 1) as if physically interconnected, the start times for the different gaming machines must be synchronized in order for the group of gaming machines to produce the desired shared image graphic effect. The invention encompasses any suitable arrangement for producing this synchronization. For example, display control server 302 or some other network component may be responsible for issuing time synchronization commands periodically, either according to some schedule or perhaps a certain time before a given shared image graphic effect is to start. As indicated in the above example client command content, the client command itself may include a time

synchronization (time sync) command to which the gaming machine responds by synchronizing the time maintained at that gaming machine to some common time definition. Of course a start time and time synchronization are not needed in the event the gaming machines react to a start command by immediately (or after a certain delay) beginning the respective single machine component of the shared image graphic effect.

The start frame element in the above example client command indicates the image/frame in the given sequence of images/frames at which the receiving gaming machine is to start its single machine component of the shared image graphic. This start frame element may comprise simply a sequence number or other identifier to identify a given image/frame in a sequence of images/frames stored at the receiving gaming machine 100. As discussed above in connection with Figure 10, some forms of the invention use the stop image/frame from the previous shared image graphic effect as the start image/frame for the next shared image graphic effect and thus the start frame element may be omitted from the client command in some implementations.

The stop frame element in the above example client command specifies the image/frame in the given series of images/frames to be shown at the conclusion of the single machine component of the shared image graphic effect for the respective gaming machine. Where such a data element is used in a client command, it may comprise a sequence number or other data element identifying a certain image/frame in the sequence of images/frames used to produce the shared image graphic effect. Some forms of the invention may specify this stop image/frame indirectly by specifying a run time as will be discussed further below. However, the stop frame identifying data may still be included in a client command for error checking purposes even if it is not used by the gaming machine to control the single component of the shared image graphic effect.

The prize element of the above example client command may be included to directly identify the shared image prize to be awarded for the respective gaming machine 100 receiving the command. However, since the prize is related to the distinct graphic image displayed at the gaming machine 100 at the conclusion of the shared image graphic effect, the stop image/frame at least partially identifies the prize to be awarded (or multiple prizes to be awarded as the case may be). Although the prize element need not be included in a client command, it may be included to avoid the table lookup at the respective gaming

machine (as discussed above in connection with decision block 1005 and/or for error checking or verification purposes.

The run time data element included in the example client command shown above may be included to dictate the time that the graphic simulation will be run. It may be necessary to use different run times in order to ensure the desired apparent randomness in the prize indicating point of the shared image graphic effect (for example, apparent randomness of the stopping point in the reel simulation embodiment). However, at least in the prize reel simulation, part of the reel rotation may show the rotation so fast that the individual images are not apparent to an observer and thus the simulated reel may be shifted in this portion of the simulation to cause the simulated reel to stop at the desired position even though the spin time appears to be the same from one simulation to the next. Thus the run time element may be omitted from a client command in some forms of the invention.

The reel definition element shown in the above example client command may be included to define the particular graphic simulation that is to be produced in the event that the apparatus according to the invention supports multiple simulations. For example, some forms of the invention may support simulations with multiple different simulated prize reels or other devices, having different graphic elements and perhaps different available prizes. In order to accommodate this use of different graphic simulations, one simulated prize reel may be shown disappearing from the video display devices after a given simulation is complete. The video display device may then show some other graphic either related to the shared image game or another game available at the respective gaming machine 100. Ultimately the graphic images to be used for the next shared image game will then be displayed at the various gaming machines to start the next shared image game using the different graphics. For example, the reel definition data element shown above may identify a particular image/frame series file stored at the respective gaming machine 100 and the gaming machine may access this file to generate commands for the respective video display device to produce the desired single machine component of the shared image graphic effect.

The client commands for each gaming machine 100 may be communicated to the gaming machines in any suitable fashion consistent with the communication arrangement included in the given gaming apparatus 300 shown in Figure 3. For example, apparatus

300 may support communications across a TCP/IP local area network and the start commands may be communicated from display control server 302 across this communications infrastructure. In one preferred form of the invention display control server 302 may, prior to communicating a start command to each respective gaming machine, cause a ready command to be communicated to each gaming machine that is to cooperate in producing the shared image graphic effect. The display control client 303 for the respective gaming machine 100 receiving the ready command may be required to respond to the ready command by causing a ready reply indicating that the gaming machine is ready to participate in executing the shared image graphic effect by executing the respective single machine component of the shared image graphic effect. If all of the participating gaming machines respond with a ready reply, display control server 302 may then cause a respective start command to be communicated to the various gaming machines. However, any gaming machine not ready to cooperate to produce the shared image graphic effect may cause an appropriate message to be communicated back to display control server 302, which may respond by suspending shared image games and produce and send a message to notify the system operator that there is a problem with the gaming machine reporting in as not ready.

Client commands and the information included in such commands may be divided up in any fashion suitable for the given shared image game implementation. For example, in one preferred implementation the processes performed at process block 1108 in Figure 11 may include building a sequence command for each gaming machine that includes information necessary for the respective gaming machine to select or generate the images/frames necessary to produce the desired single machine component and a separate or combined ready command that requests a response when the gaming machine is ready to produce the desired single machine component (that is, has done the processing necessary to at least start directing the respective video display device to produce the desired single machine component). Once all of the gaming machines have communicated back a message indicating they are each ready, the process performed at process block 1108 in Figure 11 may include producing and communicating a start command to each gaming machine to which the gaming machines respond by starting their single machine component at the time designated in the start command, after a certain delay after receipt of the start command, or immediately upon receipt of the start command.

The game complete signals may be received as described above in connection with Figure 10. Alternatively, some forms of the invention may eliminate the steps of receiving game complete signals as shown at process block 1110 and branching as indicated at decision block 1112. For example, display control server 302 (Figure 3) may simply assume a given shared image game is complete after a certain time has passed after sending start commands to the various gaming machines. Also where display control server 302 initiates shared image games according to some time schedule, no game complete signals may be required. However, even where the game complete signals are not required, such signals may be helpful for error checking and verification purposes. For example, if all game complete signals have not been received after a certain period of time, display control server 302 may produce and send an error message to alert the gaming apparatus operator.

The configuration checking process indicated at process block 1114 in Figure 11 comprises checking for configuration changes that have been entered by a system operator through a suitable operator interface for display control server 302 shown in Figure 3. The operator interface allows an operator to make configuration changes to the shared image game such as changes affecting the frequency of the shared image games, changes affecting the shared image graphic effect produced in the shared image games (that is, selecting a new graphic effect, such as a new simulated prize reel), and changes affecting the particular gaming machines that may participate in the shared image games, for example. The process shown in Figure 11 assumes that the operator may enter the configuration changes through the available interface and then the changes become effective for the next shared image game. However, it will be appreciated that configuration changes may be entered and made effective at other points of the process shown in Figure 11.

Another function that may be performed by display control server 302 or some other component of the shared image gaming system 300 is the collection and storage of data for each instance of the shared image game. The information collected and stored may include information identifying all gaming machines participating in the shared image graphic game, information identifying all gaming machines eligible for receiving shared images prizes for a given instance of the game, and data on the events or actions that placed the gaming machine in the eligible condition. Other information that may be collected and stored is information on the graphic used in the game, the client commands built and communicated to the gaming machines for the game, the prizes actually awarded for the

shared image game, and any other information relevant to the configuration and play of the shared image game. Because this data may be collected at many different places in the process, no additional data collection and storage step is shown in Figure 11. However, it will be appreciated that data collection and storage may be performed at any suitable point or points in the process shown in Figure 11.

As mentioned above, in addition to producing shared image games in which prizes are awarded to participating players, apparatus 300 is preferably adapted to produce shared image graphic effects in between shared image games to attract players to participate in shared image games. In one form of the invention, display control server 302 is adapted to build client commands and cause the commands to be communicated to the gaming machines according to some desired schedule between shared image games. The attract shared image graphic effects may run continuously after completion of a given shared image game and until the next shared image game is to be started. Alternatively, display control server 302 may initiate an attract shared image graphic effect after a certain period of time passes after completion of a given shared image game.

Figure 12 may be used to describe variations in the manner in which the distinct graphic elements comprising simulated rotating reel segments may advance through various gaming machines in a gaming establishment. Figure 12 shows three different areas of a gaming establishment designated areas A, B, and C. These three gaming areas may be widely spaced apart on the casino floor, and could be in different rooms or in different levels of the casino. Area A includes a bank of gaming machines arranged back-to-back including gaming machines 100-Al through 100-An and 100-Al' through 100-An'. Area B includes a row of gaming machines designated gaming machines 100-Bl through 100-Bn and area C includes gaming machines designated gaming machines 100-Cl through 100-Cn. In the form of the invention in which distinct graphic elements sequentially travel in unison as if physically interconnected such as to simulate the rotation of a prize reel through each gaming machine, the series of distinct graphic elements may proceed in any suitable fashion through the various gaming machines. For example, a given reel segment in the series of segments used to portray segments of a prize reel may start out at gaming machine 100-Al and then travel down the line through 100-A2 and ultimately 100-An, and then may be displayed at gaming machine 100-An' and then back in the opposite direction ultimately to gaming machine 100-Al'. The simulation may include only this back-to-back

group of gaming machines. However, the invention encompasses producing a shared image graphic effect through a large number of gaming machines that may be spaced apart in different areas of the casino. In the prize reel simulation example, a given segment of the prize reel may start out at gaming machine 100-Al in a given shared image game, proceed down the line of game machines 100-A2 through 100-An and then skip over to gaming machine 100-Bl . That reel segment may appear to move on through gaming machines 100-B2 through 100-Bn and then skip to gaming machine 100-Cn in area C, and then appear to move down that row of gaming machines ultimately to gaming machine 100-Cl. That reel segment may then appear at gaming machine 100-An' and move down the row ultimately to gaming machine 100-Al' and then move again to gaming machine 100-Al to complete a single rotation of the simulated prize reel. It will be apparent from this example that the gaming machines do not need to be spaced closely together or in a circular arrangement or any other arrangement in order to provide the desired shared image graphic effect. However, particularly in the simulated prize reel system, preferred forms of the invention control the shared image graphic effect so that in the course of each simulated prize reel spin, each segment of the prize reel travels across each gaming machine participating in the simulation.

The arrangement of gaming machines shown in Figure 12 may include a variety of different types of gaming machines offering a wide variety of games (primary games) in addition to offering participation in shared image games. That is, all of the gaming machines used to produce a shared image graphic effect according to the invention need not be the same type of gaming machine. Preferred forms of the invention utilize a top video display device such as video display device 107 shown in Figure 1 for producing the single machine component of a given shared image graphic effect. Since the other display devices may not be involved in the shared image graphic effect they may include any type of display device. For example, some or all of the gaming machines shown in Figure 12 may include a mechanical reel arrangement rather than video display device 104 shown in Figure 1. Also, it is possible for displays in different positions to be used to produce a shared image graphic effect according to the invention. For example where a given bank of gaming machines such as gaming machines 100-Al through 100-An in Figure 12 are of the same type as gaming machine 100 shown in Figure 1, it is possible that the single machine component for a given game may be shown through video display device 107 for one

gaming machine and through video display device 104 for another one of the gaming machines. It is further possible for the single gaming machine component for a respective gaming machine to involve two or more video display devices of the gaming machine. For example, a prize reel image may appear to travel across both of displays 104 and 107 of gaming machine 100 simultaneously or may appear to move from display 107 to 104 and then on to another gaming machine.

In the case where different numbers of gaming machines are included in different shared image games, the series of images/frames used to produce the desired shared image graphic effect must be modified to accommodate the number of gaming machines used to produce the shared image graphic effect. Different image/frame files may be stored at the various gaming machines for this purpose or only portions of the images/frames available in a given image/frame file may be used where fewer than some maximum number of gaming machines are used for a given shared image graphic effect.

Figures 13, 14, and 15 maybe used to describe another form of the invention in which the shared image graphic effect does not simulate a series of distinct graphic elements which appear to sequentially travel through the various video display devices in a fixed relationship to one another as in a simulated prize reel. In this form of the invention, the shared image graphic effect includes one or more distinct prize-indicating graphic elements which appear at selected ones of the video display devices but do not necessarily progress in any sequence through the various video display devices. In this example it is again assumed that all the gaming machines 100a-d in Figures 13 through 15 are similar to the gaming machines shown in Figure 1. Each of the display devices 107 of the various gaming machines display a respective image of clouds and sky. The image may be such that during the shared image graphic effect the clouds appear to move from one display to the next to simulate the passage of time. A distinct prize-indicating graphic element in the form of a flying saucer 1301 is displayed at gaming machine 100a. Flying saucer 1301 displayed at gaming machine 100a appears to be moving upwardly to exit the area of video display device 107. In Figure 14, at a point in time after the snapshot appearing in Figure 13, flying saucer 1301 appears to be entering display device 107 of gaming machine 100c having skipped gaming machine 100b entirely. Flying saucer 1301 representing the prize-indicating graphic element may continue on through one or more gaming machine displays 107 or skip around to other gaming machine displays until the prize indicating point (e.g.

conclusion) of the shared image graphic effect at which point the flying saucer appears to stop at a particular gaming machine. In this form of the invention, the shared image result controller awards a shared image prize for the gaming machine displaying the prize-indicating graphic element at the conclusion of the shared image graphic effect. As in the previously described embodiment, the shared image prize corresponds to a prize represented at least in part by the prize-indicating graphic element. For example flying saucer 1301 may be defined as providing a IOOX multiplier for a player's last win at the gaming machine, or for a wager or accumulated value in a primary game conducted through the gaming machine, or may be defined as some fixed prize such as 100 gaming credits.

Although a single distinct prize-indicating graphic element comprising flying saucer 1301 is shown in the example of Figures 13 through 15, multiple prize-indicating graphic elements may be employed. In one form of the invention, graphic elements such as flying saucers, people, animals, or combinations of these or other graphic representations may appear to chase each other or otherwise move from one gaming machine display 107 to the next. The invention is not limited to any particular types of prize-indicating graphic elements, any number of such elements, or any graphic effects provided along with or by such elements.

Regardless of whether the shared image graphic effect produces a series of graphic images that appear to travel sequentially across the various video display devices as if interconnected in a fixed relationship (such as the prize reel example), or produces prize-indicating elements that do not appear to travel sequentially in any fixed order, an apparatus according to the present invention may place eligibility requirements on a gaming machine in order to allow shared image prizes to be awarded for the respective gaming machine. In one form of the invention, a player playing some primary game at a gaming machine 100 in Figure 3 may be required to place a side bet periodically in order to make that gaming machine eligible to award a shared image prize. This side bet may make the gaming machine eligible for some period of time or number of plays at the gaming machine, or for some combination of time and primary game plays at the gaming machine. For example, a given gaming machine may be eligible for a shared image game for some number of plays as long as plays are being made at least at some minimum rate. In cases where eligibility is measured at least partially by time, the time of remaining eligibility may

be displayed at the gaming machine using a suitable display device. Eligibility may also include bet level requirements in a primary game offered through the gaming machine. For example, a given gaming machine may be eligible for a shared image game only if a player at the gaming machine has made a maximum bet in a primary game within a certain time period. In the case where a side bet is required, the shared image prizes may comprise multipliers that are applied to the side bet level that has made the gaming machine eligible. As discussed previously, another preferred eligibility arrangement is based on the results from play of a primary game at the respective gaming machine. These results may accumulate a value for the player at the given gaming machine and this value is used together with a multiplier indicated by the shared image game to indicate the total prize for the shared image game for the player. Regardless of the specific eligibility requirements to qualify a given gaming machine for participation in the shared image game, the gaming machine may include an eligibility control to reduce the number of player controls that must be invoked to make the gaming machine eligible. For example, when a side bet is required in addition to a maximum bet in a primary game offered through the player station, an eligibility control may be available at the gaming machine that selects the maximum bet and side bet in a single operation of the control (a press of a mechanical or virtual button for example). In the embodiment described above in which eligibility is ultimately determined by an accumulated value from the result(s) of play of a primary game at the gaming machine, an eligibility control may be used to invoke a maximum bet (or other bet level in the primary game) and a side bet that may be necessary to have a chance of accumulating a value from a result for a given play of the primary game.

Gaming machine eligibility for shared image games is preferably controlled and tracked through the respective gaming machine. For example, a component of shared image prize controller 305 in Figure 3 may track gaming machine eligibility. Also, eligibility is preferably determined at the time the particular shared image game starts at the respective gaming machine according to a respective client command. In particular, one form of the invention makes the gaming machine eligible for a shared image game if the gaming machine is eligible at the time the respective shared image graphic effect starts at the gaming machine. Display control server 302 in Figure 3 or other component for performing the process shown in Figure 11 may or may not take into account gaming machine eligibility when determining whether a shared image game is to be played.

Where a given gaming machine is not eligible for a shared image game, the gaming machine preferably utilizes some graphic technique to indicate that lack of eligibility. For example, although the ineligible gaming machine may show its single machine component of a shared image graphic effect for a shared image game in which the gaming machine is not eligible, the images shown at the gaming machine may use muted colors or be otherwise modified to indicate the lack of eligibility. In other forms of the invention, a single machine component of a shared image graphic effect is displayed in normal colors regardless of eligibility up until the stop image/frame, at which point the image may be modified in some fashion to indicate that the gaming machine is ineligible for the shared image game and the player is not entitled to any award indicated by the image shown at the respective gaming machine. The fact that the shared image graphic effect may be displayed at the gaming machine even though it is ineligible may encourage the player to take the actions necessary to make the gaming machine eligible for future shared image games. Some forms of the invention may simply not show any portion of a shared image graphic effect at an ineligible gaming machine. In the prize reel simulation for example, ineligible gaming machines may simply be skipped so that the various reel segments skip over the ineligible machine and are shown only on the next eligible machine in the direction of movement of the reel segments.

One preferred form of the invention employs a separate video display device such as auxiliary video display device 108 or 109 in Figure 1 to provide the player at gaming machine 100 with information on the shared image game, including eligibility status. Video display device 108 may, for example, show an attract screen with information on how to become eligible for a shared image game prize. Video display device 108 may also show eligibility and/or a value such as a wager value or accumulated value described above which is used along with a prize- indicating symbol of the shared image graphic effect to define a prize for the player at the given gaming machine in the shared image game. Also, video display device 108 may be used to show a countdown timer to alert the player to an impending shared image graphic effect, and may direct the player to look at the appropriate video display device. Once the shared image game prize for the respective gaming machine has been determined, video display device 108 may be used to show that prize.

One advantage of the present invention is that the shared image games and shared image graphic effects may be displayed independent of any primary game that may be

played through the various gaming machines 100. That is, the shared image games may be conducted so as not to interfere with play in the primary game or games. Even while a shared image graphic effect is being produced for a given shared image game, players may continue to play the primary game or games while awaiting the shared image game results.

As discussed above, the present invention is not limited to the particular network arrangement shown particularly in Figure 3, and is not limited to the shared image display control arrangement utilizing display control server 302 and the various display control client components 303. Other shared image display control arrangements for causing the various gaming machines to produce the desired shared image graphic effect may employ much different architectures from that shown in Figure 3. One alternate form of the invention separates the shared image control arrangement from the network used for communications unrelated to the shared image games. In particular, an alternate shared image control arrangement may use a separate network with separate communication links from a display control server (such as server 302 in Figure 3) to the various gaming machines. Furthermore, some forms of the present invention may not use components at the respective gaming machines to generate the desired video display in response to client command(s) as described above. Rather, a display control server within the scope of the invention may be connected to each video display device to directly provide a respective video drive signal to each respective video display device. This video drive signal causes the respective video display device to display the desired graphic sequence at that particular gaming machine. Each different video display device in this alternate form of the invention receives a different video drive signal to produce the desired single machine component of the shared image graphic effect.

As used herein, the terms "comprising," "including," "carrying," "having," "containing," "involving," and the like are to be understood to be open-ended, that is, to mean including but not limited to. Any use of ordinal terms such as "first," "second," "third," etc., to refer to an element does not by itself connote any priority, precedence, or order of one element over another, or the temporal order in which acts of a method are performed. Rather, unless specifically stated otherwise, such ordinal terms are used merely as labels to distinguish one element having a certain name from another element having a same name (but for use of the ordinal term).

The above described preferred embodiments are intended to illustrate the principles of the invention, but not to limit the scope of the invention. Various other embodiments and modifications to these preferred embodiments may be made by those skilled in the art without departing from the scope of the present invention.

CLAIMS

1. An apparatus including:

(a) a number of gaming machines;

(b) each respective gaming machine including a respective video display device;

(c) each respective gaming machine including a respective primary game controller for obtaining a respective result in a primary game and causing the respective gaming machine to display the respective result in the primary game;

(d) a shared image display control arrangement for controlling the respective video display device associated with each gaming machine in the number of gaming machines to produce a simulation of a prize reel having a series of reel segments about its periphery, the series of reel segments being displayed by the video display devices over the course of the simulation so as to appear to travel sequentially across the video display devices in a rotation direction and ultimately stop to display a respective reel segment at each respective video display device; and

(e) a shared image prize controller for awarding a shared image prize for a first one of the gaming machines which is in an eligible state for the shared image prize, the shared image prize corresponding to a prize represented at least in part by the respective one of the reel segments displayed at the video display device of the first one of the gaming machines when the series of reel segments stop.

2. The apparatus of claim 1 wherein the respective video display device for the first one of the gaming machines comprises a secondary video display device for that gaming machine and wherein the first one of the gaming machines further includes a primary display device in addition to the secondary video display device, the primary display device for displaying the respective result in the primary game.

3. The apparatus of claim 2 wherein the respective one of the reel segments displayed at the video display device of the first one of the gaming machines when the series of reel segments stop includes a symbol for a multiplier value and the shared image prize comprises a value accumulated in the primary game for the first gaming machine multiplied by the multiplier value.

4. The apparatus of claim 1 wherein the shared image display control arrangement includes:

(a) a display control server component for causing a start command to be communicated to each of the gaming machines included in the number of gaming machines; and

(b) a respective client component located at each respective gaming machine for causing the video display device of the respective gaming machine to display a respective single machine component of the prize reel simulation.

5. The apparatus of claim 4 wherein the respective single machine component of the prize reel simulation to be displayed at each respective gaming machine is determined by an immediately preceding prize reel simulation.

6. The apparatus of claim 4 wherein the display control server component is also for causing a respective sequence command to be communicated to each of the gaming machines included in the number of gaming machines, and wherein the respective client component utilizes the respective sequence command to access image data stored at the respective gaming machine to identify a sequence of images to be displayed at the respective gaming machine to produce the respective single machine component of the prize reel simulation at that respective gaming machine.

7. The apparatus of claim 1 wherein the shared image prize controller comprises a component unique to the first one of the gaming machines and each other gaming machine in the number of gaming machines includes a respective shared image prize controller for awarding a respective shared image prize for the respective gaming machine with which the respective shared image prize controller is included

when that respective gaming machine is in an eligible state for the respective shared image prize, the respective shared image prize corresponding to a prize represented at least in part by the respective one of the reel segments displayed at the video display device of the respective gaming machine when the series of reel segments stop.

8. The apparatus of claim 1 wherein the first one of the gaming machines displays the respective result in the primary game with the video display device for that gaming machine.

9. A method including:

(a) at each of a number of gaming machines, receiving a respective wager in a primary game and obtaining a respective gaming result for the respective wager;

(b) displaying the respective gaming result at the respective gaming machine at which the respective wager was received;

(c) controlling a number of video display devices to produce a shared image graphic effect where each respective video display device is associated with a different one of the number of gaming machines, the shared image graphic effect including a simulation of a prize reel having a series of reel segments about its periphery, the series of reel segments being displayed by the video display devices over the course of the simulation so that the reel segments appear to travel sequentially across the video display devices in a rotation direction and ultimately stop to display a respective reel segment at each respective video display device; and

(d) awarding a shared image prize for a first one of the gaming machines which is in an eligible state for the shared image prize, the shared image prize corresponding to a prize represented at least in part by the respective one of the reel segments displayed at the video display device of the first one of the gaming machines when the series of reel segments stop.

10. The method of claim 9 wherein the respective video display device for each respective gaming machine comprises a secondary display device for that gaming machine and wherein the respective gaming result is displayed at the respective gaming machine through a respective primary display device of that gaming machine, the respective primary display device being separate from the respective secondary display device for that gaming machine.

11. The method of claim 9 wherein the respective one of the reel segments displayed at the video display device of the first one of the gaming machines when the series of reel segments stops includes a symbol for a multiplier value and method includes multiplying a value accumulated in the primary game for the first gaming machine by the multiplier value to arrive at the shared image prize.

12. The method of claim 9 wherein controlling a number of video display devices to produce a shared image graphic effect includes:

(a) communicating a respective start command to each of the gaming machines included in the number of gaming machines; and

(b) responding to the respective start command at each respective gaming machine by causing the video display device of the respective gaming machine to display a respective single machine component of the prize reel simulation.

13. The method of claim 12 further including determining a respective starting point for the respective single machine component of the prize reel simulation to be displayed at each respective gaming machine by an immediately preceding prize reel simulation.

14. The method of claim 9 further including:

(a) communicating a respective sequence command to each of the gaming machines included in the number of gaming machines; and

(b) at each respective gaming machine, determining the respective single machine component of the prize reel simulation to be displayed at the

respective gaming machine based on the respective sequence command communicated to the respective gaming machine.

15. The method of claim 9 further including:

(a) storing a video sequence at each respective gaming machine; and

(b) wherein the prize reel simulation is produced by displaying the video sequence through the respective video display device at each respective gaming machine, the video sequence starting at a different sequence location at each respective gaming machine.

16. The method of claim 9 further including detecting an ineligible condition at one of the gaming machines and modifying a single machine component of the prize reel simulation at that gaming machine to indicate that the respective gaming machine is not eligible for the shared image prize.

17. A program product stored in one or more computer readable devices, the program product including:

(a) for each different gaming machine in a number of gaming machines, respective primary game program code executable at the respective gaming machine for obtaining a respective result in a primary game for that gaming machine and causing the respective gaming machine to display the respective result in the primary game;

(b) shared image display program code executable for controlling a number of video display devices to produce a shared image graphic effect, each respective video display device being included in a respective gaming machine in the number of gaming machines, the shared image graphic effect including a simulation of a prize reel having a series of reel segments about its periphery, the series of reel segments being displayed by the video display devices over the course of the simulation so that the reel segments appear to travel sequentially across the video display devices in a rotation direction and ultimately stop to display a respective reel segment at each respective video display device; and

(c) shared image award program code executable for awarding a shared image prize for a first one of the gaming machines which is in an eligible state for the shared image prize, the shared image prize corresponding to a prize represented at least in part by the respective one of the reel segments displayed at the video display device of the first one of the gaming machines when the series of reel segments stop.

18. The program product of claim 17 wherein the shared image display program code includes:

(a) display control server program code executable for causing a respective start command to be communicated to each respective gaming machine; and

(b) respective display control client program code located at each respective gaming machine, the respective display control client program code being executable for responding to the respective start command by causing the video display device of the respective gaming machine to display a respective single machine component of the prize reel simulation.

19. The program product of claim 17 wherein the shared image display program code includes:

(a) display control server program code executable for causing a respective sequence command to be communicated to each of the gaming machines included in the number of gaming machines; and

(b) respective display control client program code located at each respective gaming machine, the respective display control client program code being executable for applying the respective sequence command received at the respective gaming machine to determine the respective single machine component of the prize reel simulation to be displayed at the respective gaming machine.

20. The program product of claim 17 wherein the shared image display program code includes respective display control client program code located at each respective gaming machine, the respective display control client program code being

executable for storing a video sequence at each respective gaming machine, and for causing the video sequence to be displayed through the respective video display device at each respective gaming machine to produce a respective single machine component of the prize reel simulation, the video sequence starting at a different sequence location at each respective gaming machine.

21. The program product of claim 20 wherein the shared image display program code is also executable for detecting an ineligible condition at one of the gaming machines and modifying a local component of the prize reel simulation to indicate that the respective gaming machine is not eligible for the shared image prize.

22. An apparatus including:

(a) a number of gaming machines;

(b) each respective gaming machine including a respective player control arrangement for enabling player inputs at the respective gaming machine;

(c) each respective gaming machine including a respective video display device;

(d) each respective gaming machine including a respective primary game controller for obtaining a respective result in a primary game and causing the gaming machine to display the respective result in the primary game;

(e) a shared image display control arrangement for controlling the respective video display device associated with each gaming machine in the number of gaming machines to produce a shared image graphic effect, the shared image graphic effect including one or more distinct prize-conveying graphic elements which appear at selected ones of the video display devices; and

(f) a shared image prize controller for awarding a shared image prize for a first one of the gaming machines which is in an eligible state for the shared image prize, the shared image prize corresponding to a prize represented at least in part by a respective one of the distinct prize-conveying graphic elements displayed at the video display device of the first one of the gaming machines at a conclusion of the shared image graphic effect.

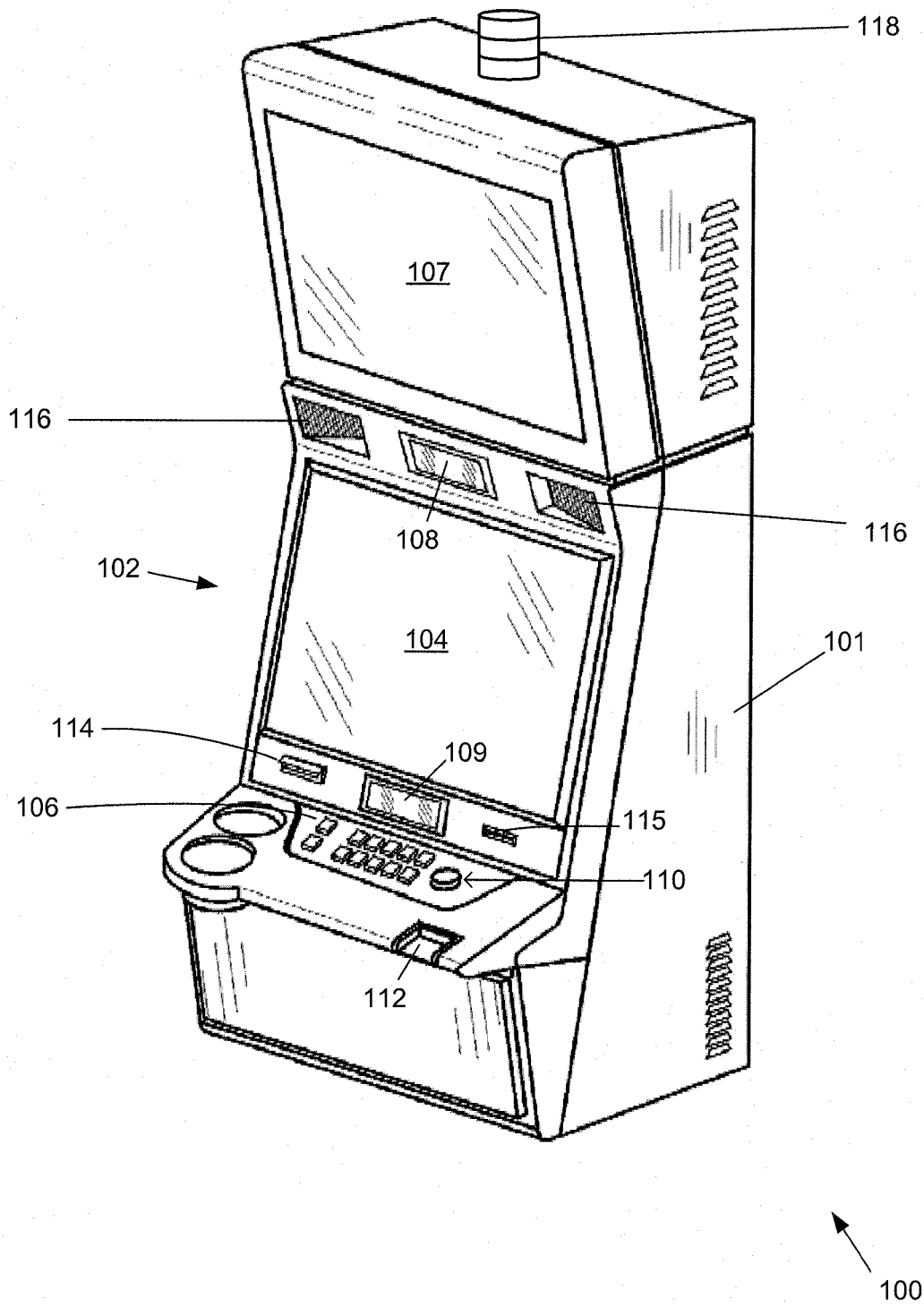

Fig. 1

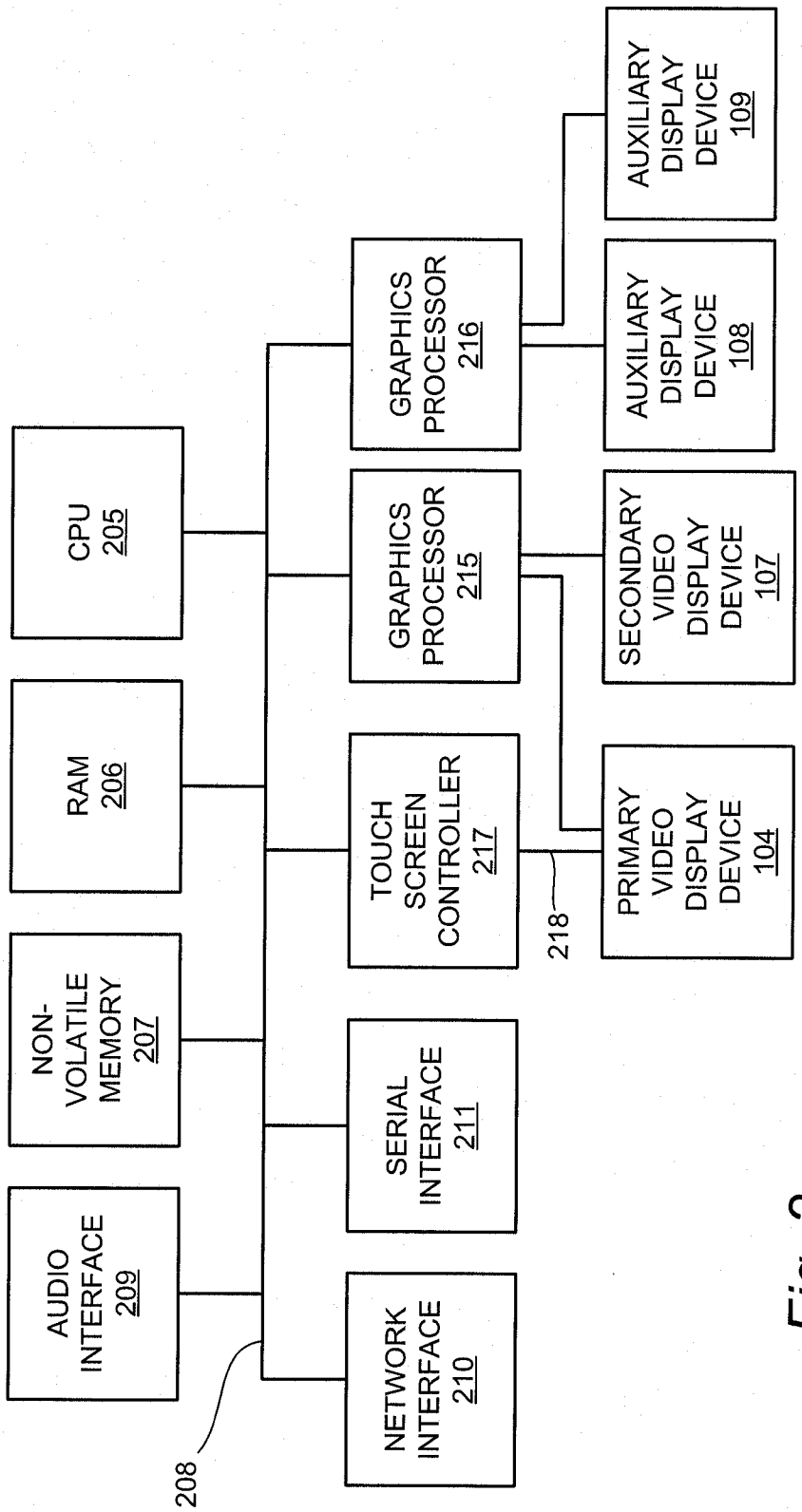
CPU 205
RAM 206
NON-VOLATILE MEMORY 207
AUDIO INTERFACE 209
NETWORK INTERFACE 210
SERIAL INTERFACE 211
208
TOUCH SCREEN CONTROLLER 217
218
GRAPHICS PROCESSOR 215
GRAPHICS PROCESSOR 216
PRIMARY VIDEO DISPLAY DEVICE 104
SECONDARY VIDEO DISPLAY DEVICE 107
AUXILIARY DISPLAY DEVICE 108
AUXILIARY DISPLAY DEVICE 109

Fig. 2

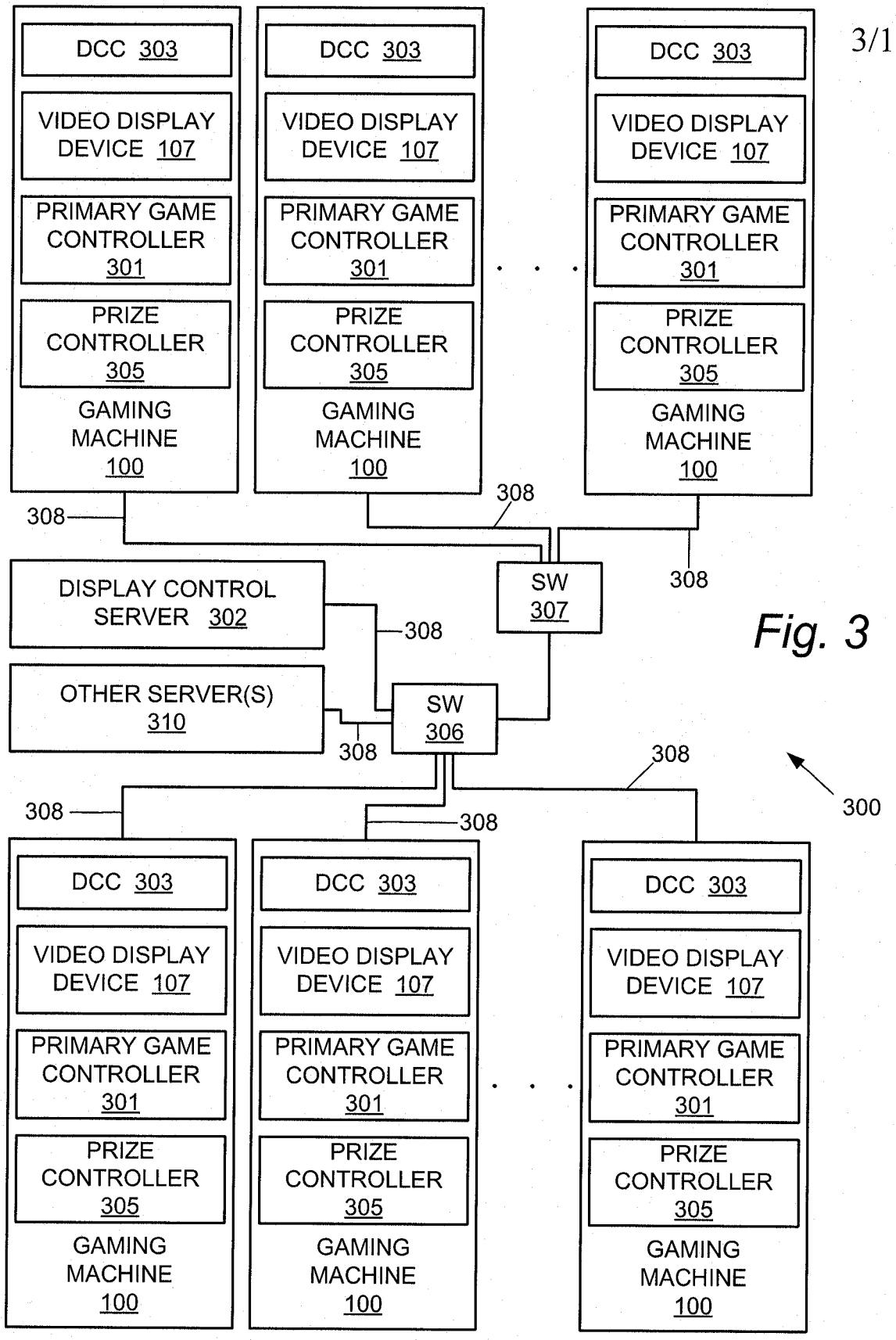
DCC 303
VIDEO DISPLAY DEVICE 107
PRIMARY GAME CONTROLLER 301
PRIZE CONTROLLER 305
GAMING MACHINE 100
308
DISPLAY CONTROL SERVER 302
OTHER SERVER(S) 310
SW 307
SW 306
300

Fig. 3

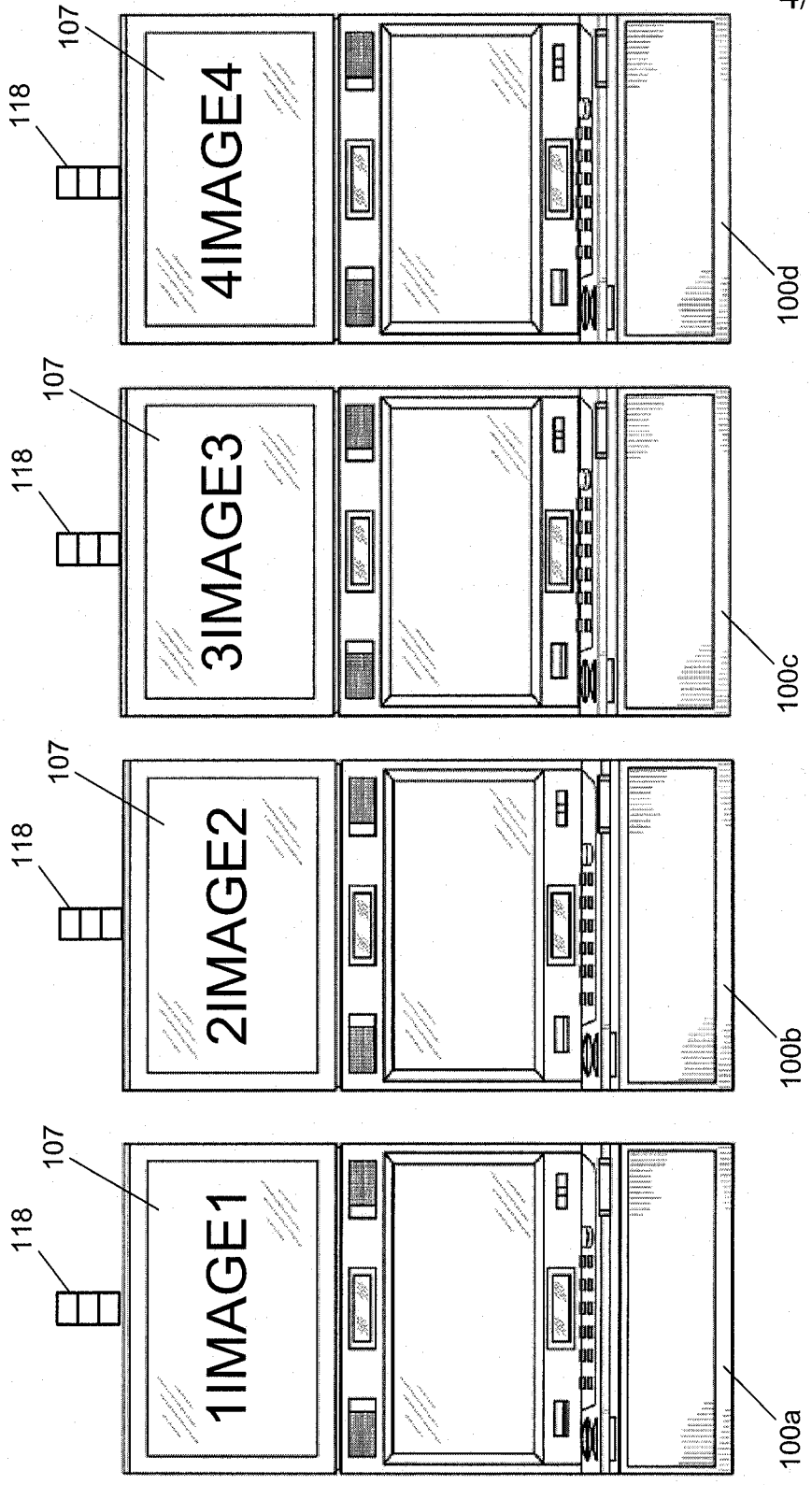
1IMAGE1
2IMAGE2
3IMAGE3
4IMAGE4
107
118
100a
100b
100c
100d

Fig. 4

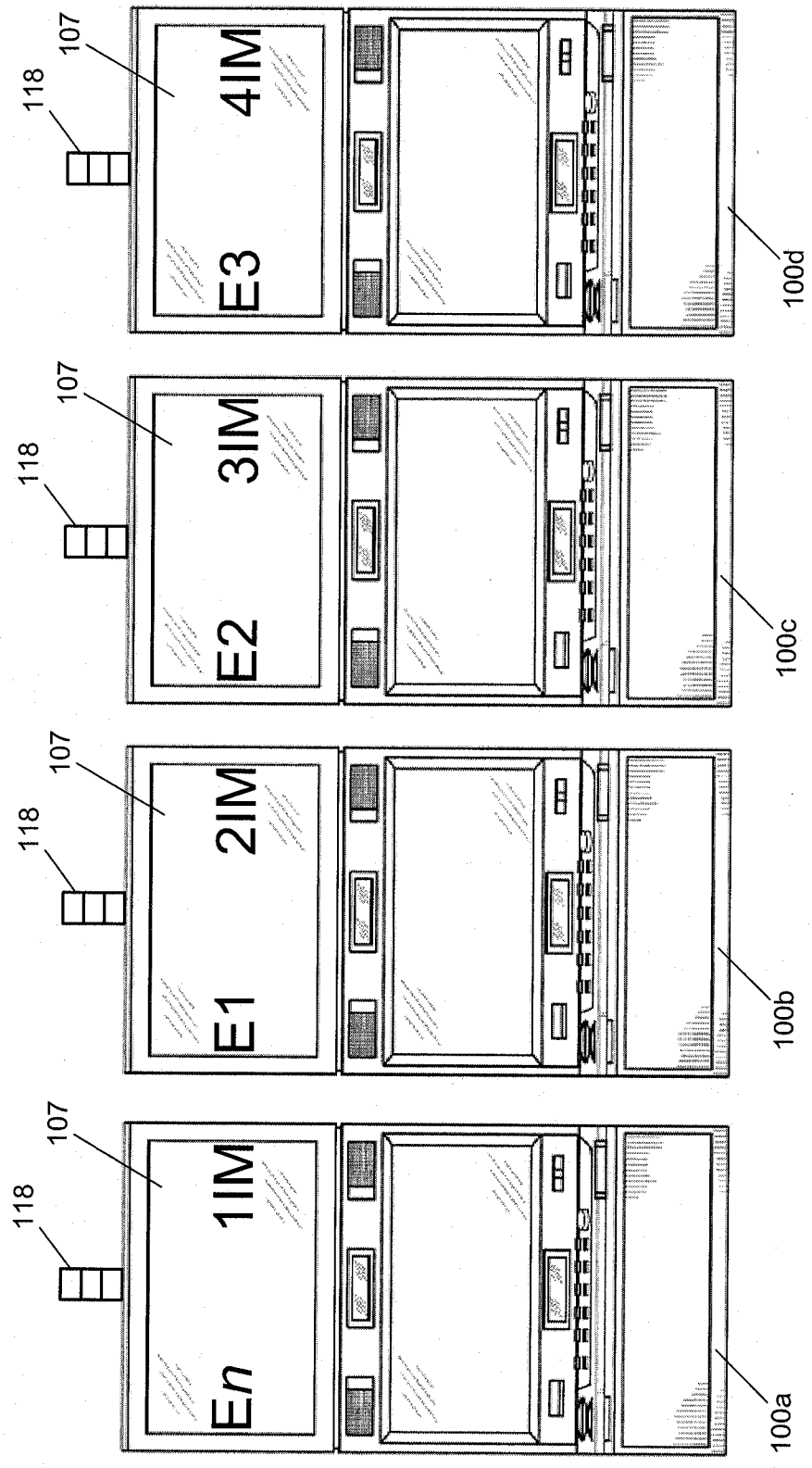

Fig. 5

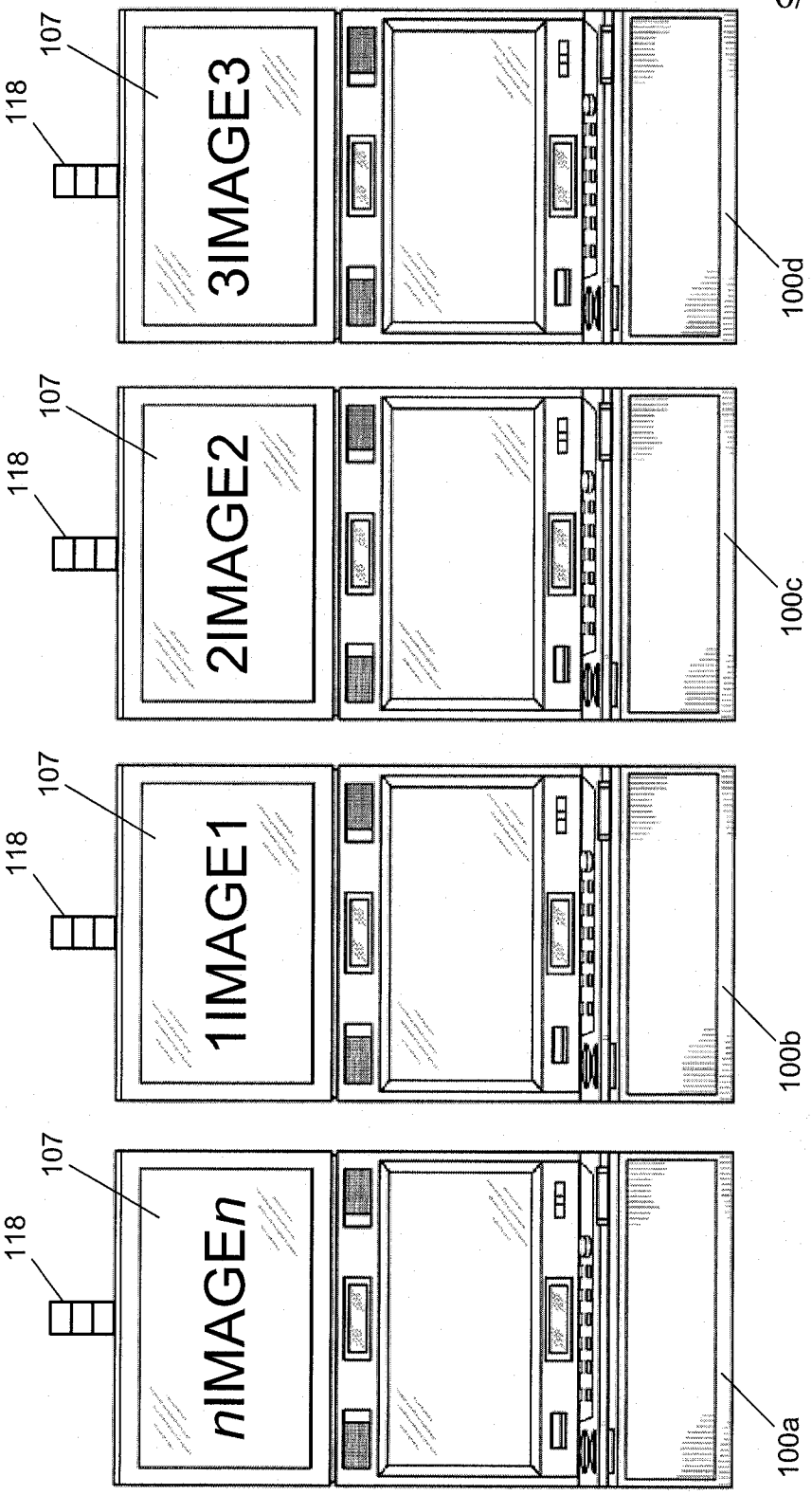
nIMAGEn
1IMAGE1
2IMAGE2
3IMAGE3
107
118
100a
100b
100c
100d

Fig. 6

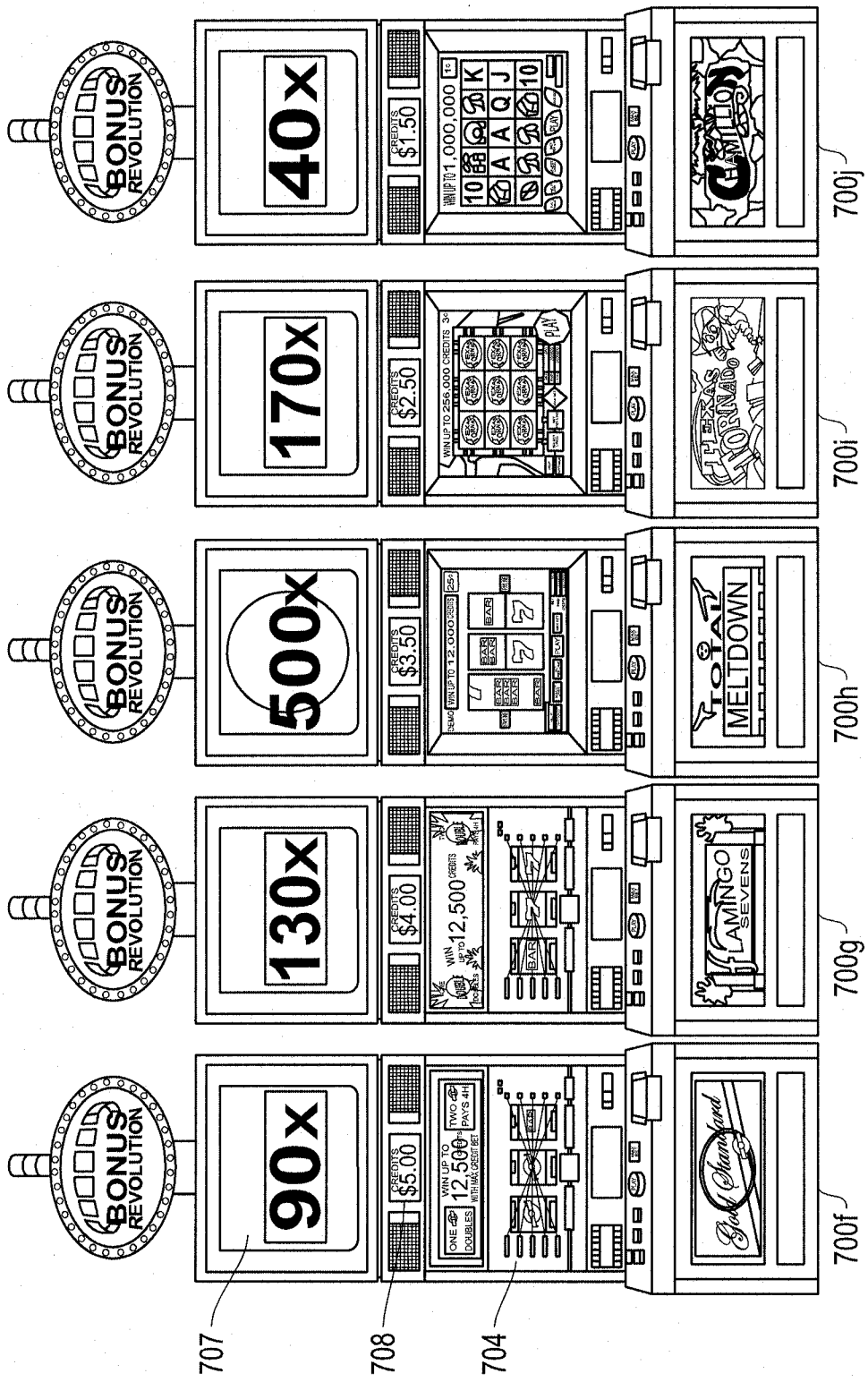
BONUS REVOLUTION
90x
130x
500x
170x
40x
CREDITS $5.00
CREDITS $4.00
CREDITS $3.50
CREDITS $2.50
CREDITS $1.50
WIN UP TO 12,500
WIN UP TO 1,000,000
WIN UP TO 256,000 CREDITS
TOTAL MELTDOWN
FLAMINGO SEVENS
TEXAS TORNADO
700f
700g
700h
700i
700j
707
708
704

Fig. 7

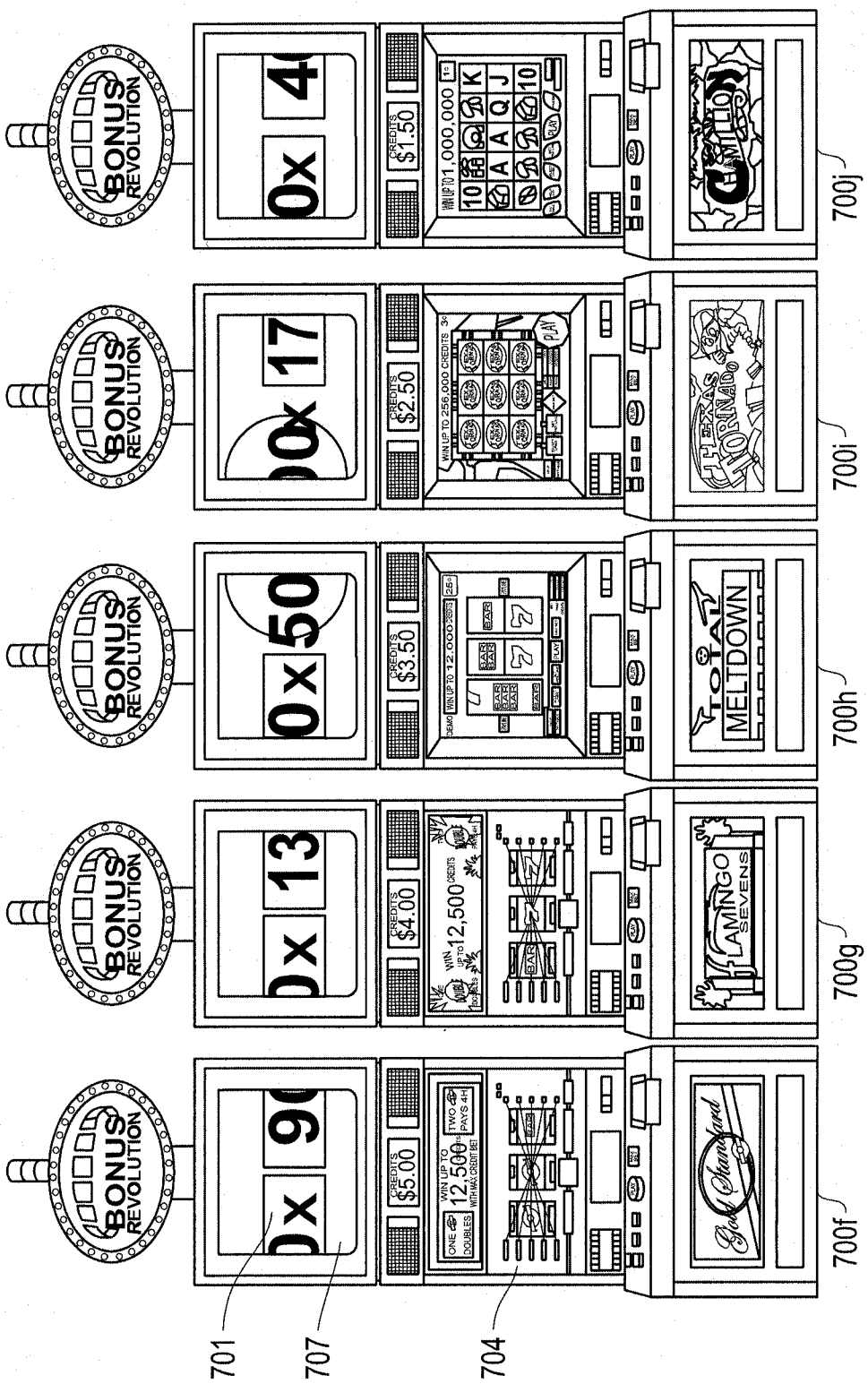
BONUS REVOLUTION
0x 90
CREDITS $5.00
WIN UP TO 12,500
ONE DOUBLES
TWO PAYS 4
WITH MAX CREDIT BET
700f
BONUS REVOLUTION
0x 13
CREDITS $4.00
WIN UP TO 12,500 CREDITS
700g
BONUS REVOLUTION
0x 50
CREDITS $3.50
WIN UP TO 12,000 CREDITS
700h
BONUS REVOLUTION
0x 17
CREDITS $2.50
WIN UP TO 256,000 CREDITS
700i
BONUS REVOLUTION
0x 4
CREDITS $1.50
WIN UP TO 1,000,000
700j
701
707
704

Fig. 8

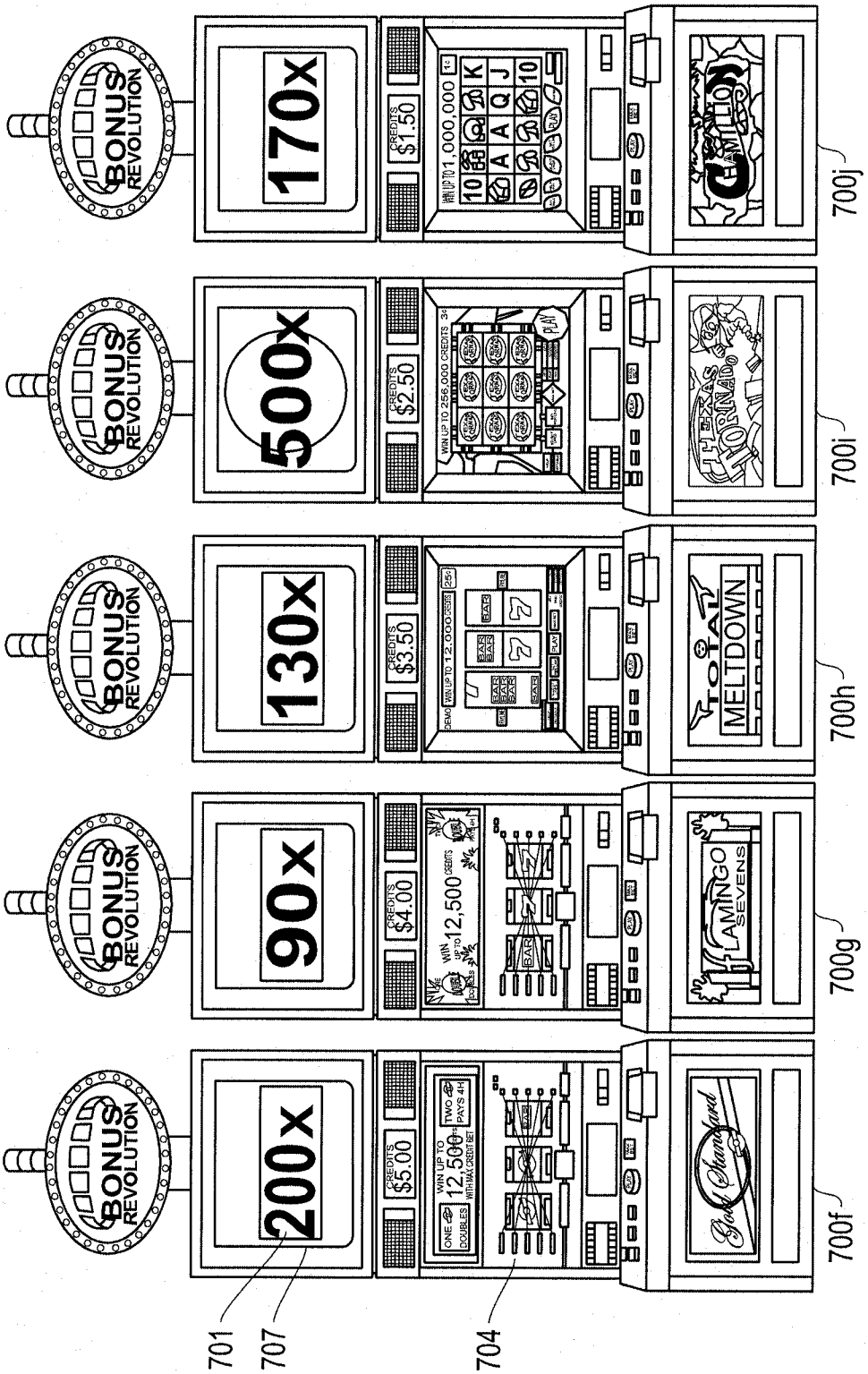
BONUS REVOLUTION
200x
90x
130x
500x
170x
CREDITS $5.00
CREDITS $4.00
CREDITS $3.50
CREDITS $2.50
CREDITS $1.50
WIN UP TO 12,500
WIN UP TO 1,000,000
WIN UP TO 256,000 CREDITS
MELTDOWN
LAMINGO SEVENS
TEXAS TORNADO
701
707
704
700f
700g
700h
700i
700j

Fig. 9

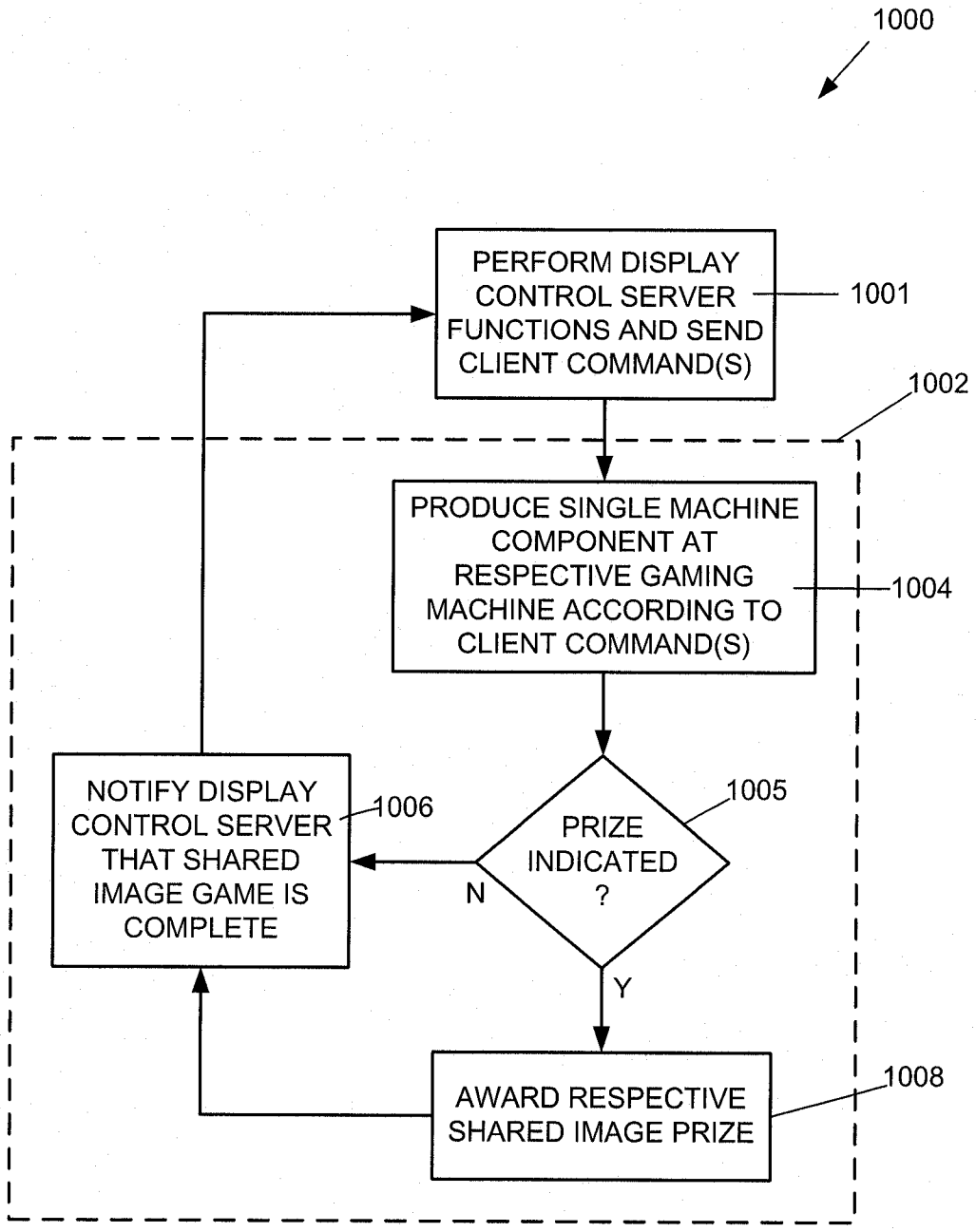
1000
PERFORM DISPLAY CONTROL SERVER FUNCTIONS AND SEND CLIENT COMMAND(S)
1001
1002
PRODUCE SINGLE MACHINE COMPONENT AT RESPECTIVE GAMING MACHINE ACCORDING TO CLIENT COMMAND(S)
1004
PRIZE INDICATED ?
1005
N
Y
NOTIFY DISPLAY CONTROL SERVER THAT SHARED IMAGE GAME IS COMPLETE
1006
AWARD RESPECTIVE SHARED IMAGE PRIZE
1008

Fig. 10

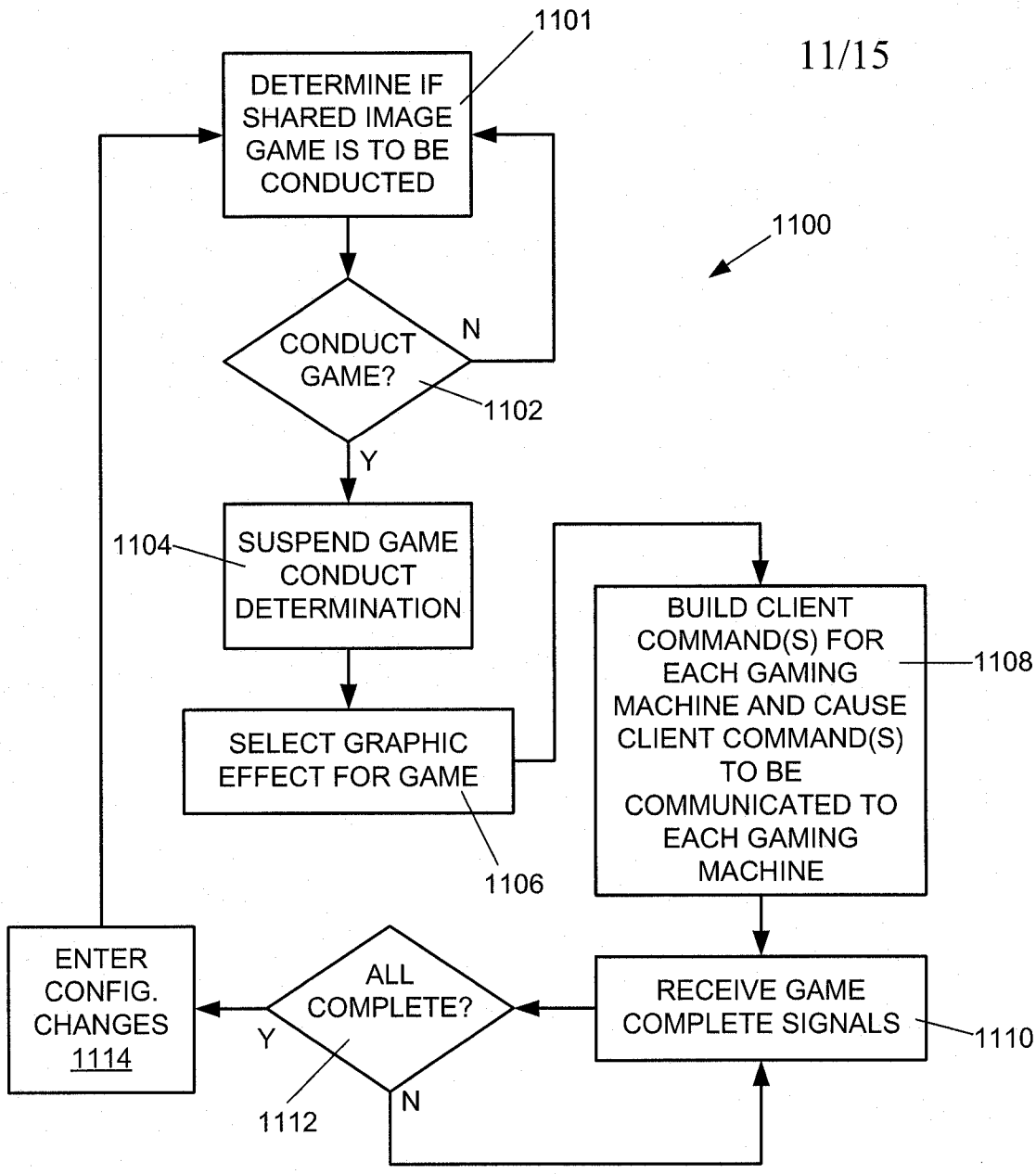
1101
DETERMINE IF SHARED IMAGE GAME IS TO BE CONDUCTED
1100
CONDUCT GAME?
N
1102
Y
1104
SUSPEND GAME CONDUCT DETERMINATION
SELECT GRAPHIC EFFECT FOR GAME
1106
BUILD CLIENT COMMAND(S) FOR EACH GAMING MACHINE AND CAUSE CLIENT COMMAND(S) TO BE COMMUNICATED TO EACH GAMING MACHINE
1108
RECEIVE GAME COMPLETE SIGNALS
1110
ALL COMPLETE?
Y
N
1112
ENTER CONFIG. CHANGES 1114

Fig. 11

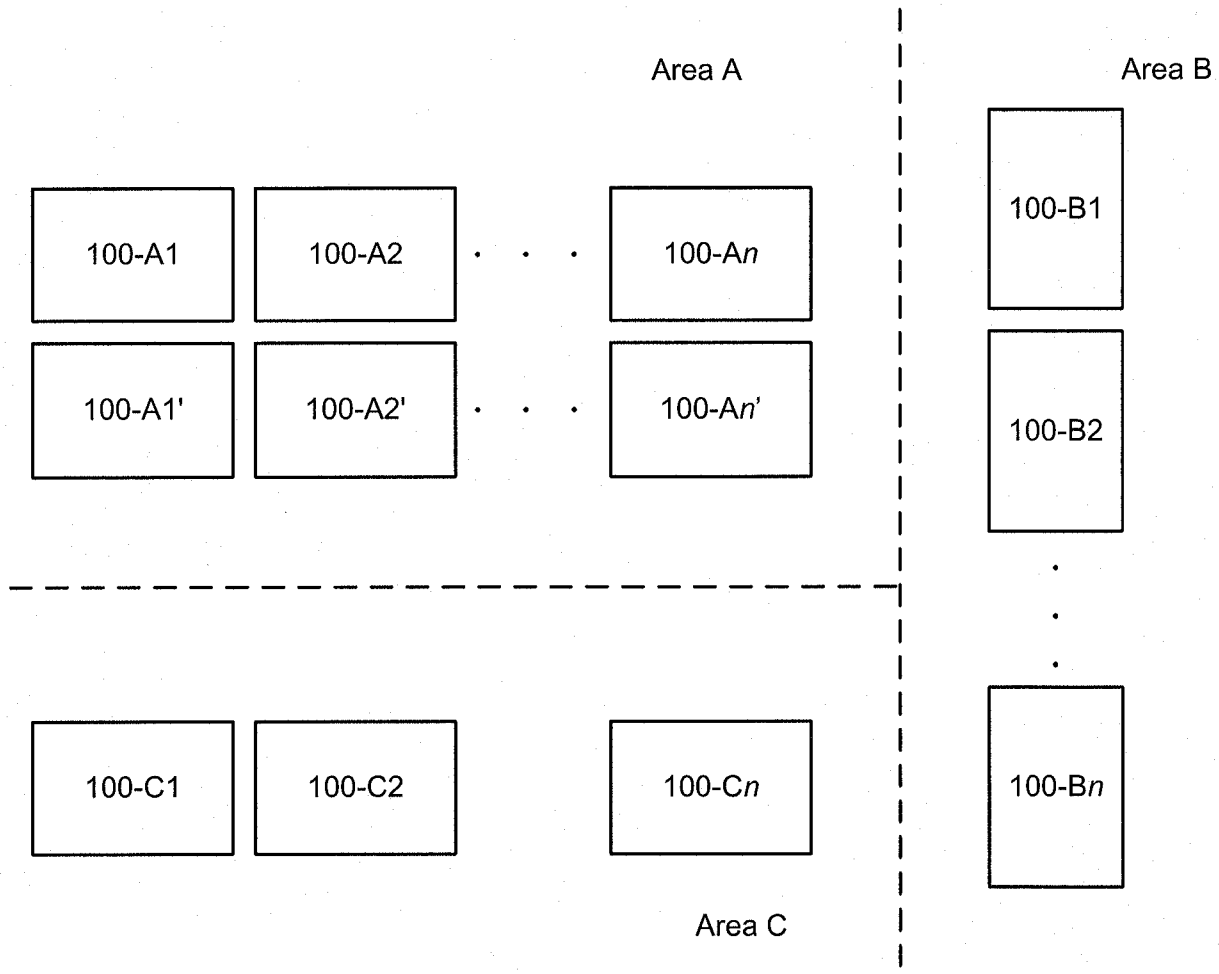
Area A
Area B
100-A1
100-A2
100-An
100-A1'
100-A2'
100-An'
100-B1
100-B2
100-Bn
100-C1
100-C2
100-Cn
Area C

Fig. 12

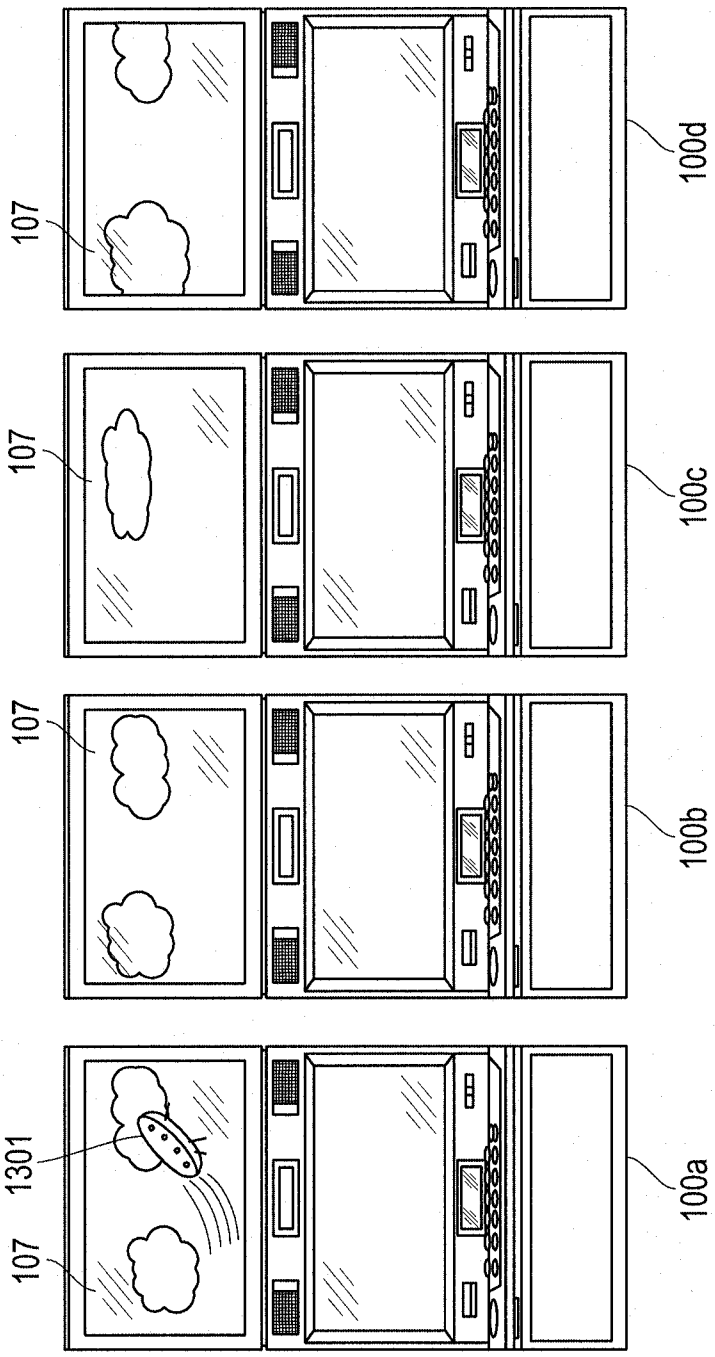

Fig. 13

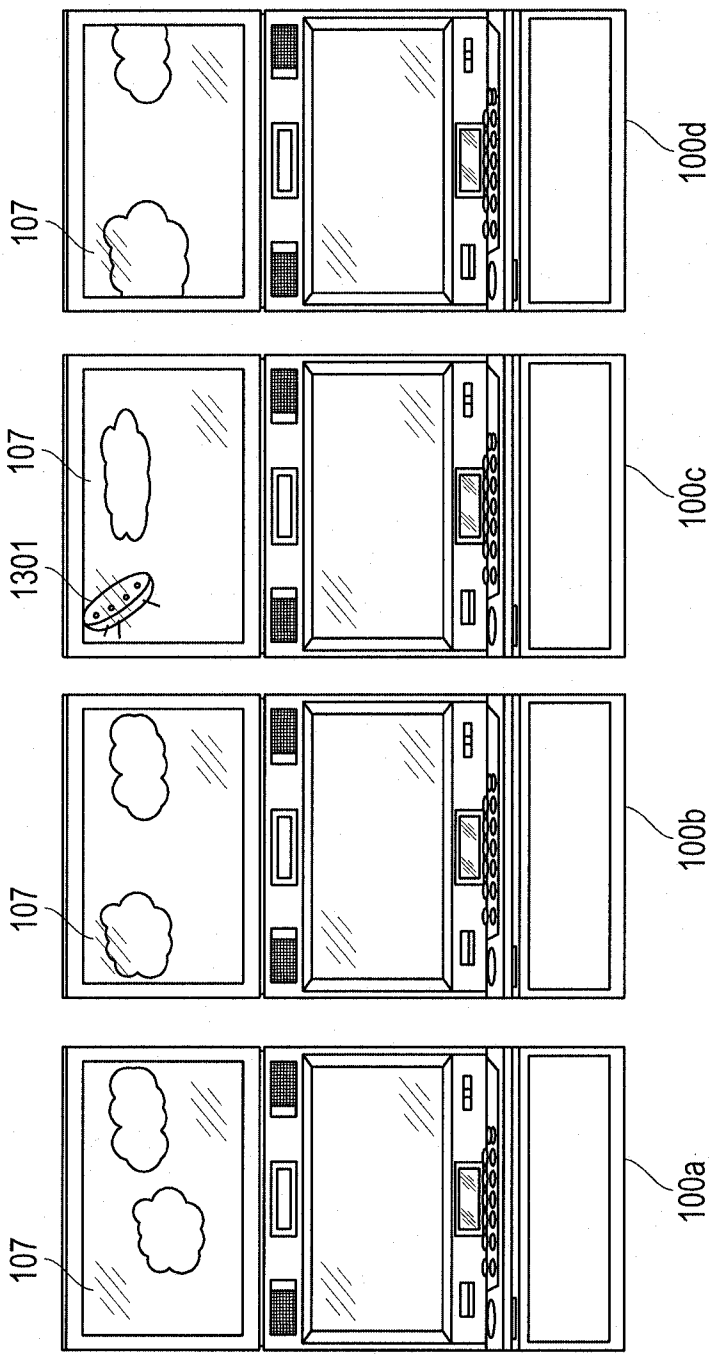

Fig. 14

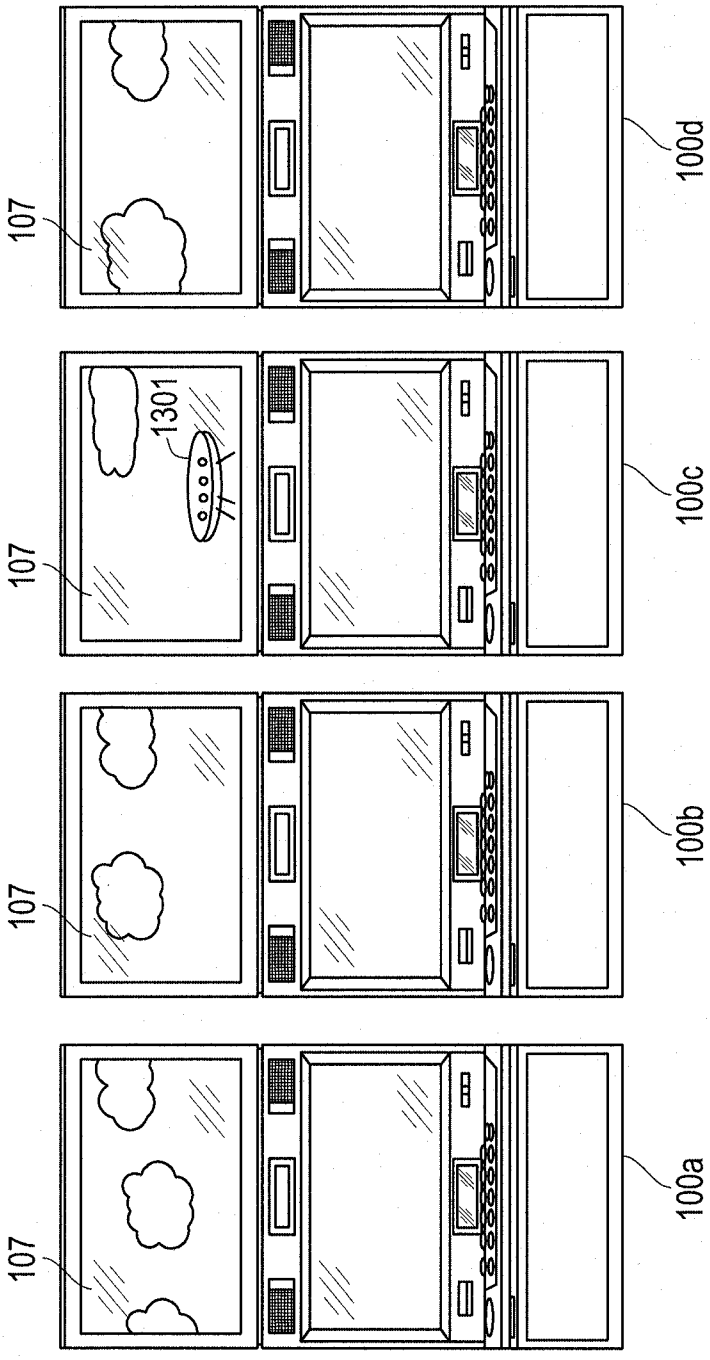

Fig. 15

INTERNATIONAL SEARCH REPORT

International application No
PCT/US 08/82976

A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A63F 9/24 (2008.04)
USPC - 463/31
According to International Patent Classification (IPC) or to both national classification and IPC

B FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC - A63F 9/24 (2008 04)
USPC - 463/31

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 463/20, 463/1

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB.USPT.USOC.EPAB.JPAB, PLUR=NO 1OP=ADJ), GoogleScholar, games, gaming, console, apparatus, display, control, video, reel, machine, device, multiple, plural, prize, mulliplayer, casino, server, shared, slot, casino

C DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	US 2007/01 672 17 A1 (Kaminkow et al) 19 July 2007 (19 07 2007), abstract, para [0006-0008], [0018], [0024-0025], [0044-0045], [0050], [0056], [0062-0063], [0065], [0078], [0107], [0109-01 10], [0133], [0174], [0202]	1-22
A	US 2007/0155485 A 1 (Cuddy et al) 05 July 2007 (05 07 2007), entire	1-22
A	US 2007/0149292 A 1 (Kaminkow et al) 28 June 2007 (28 06 2007), entire	1-22
A	US 2007/0049368 A 1 (Kuhn et al) 0 1 March 2007 (01 03 2007), entire	1-22
A	US 2006/0073879 A 1 (Baerlocher) 06 April 2006 (06 04 2006), entire	1-22

J I Further documents are listed in the continuation of Box C

*	Special categories of cited documents	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance, ihe claimed invention cannot be considered to involve an inventive siep when ihe documeni is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is ciled Io establish the publication dale of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 21 December 2008 (21 12 2008)	Date of mailing of the international search report 06 JAN 2009
Name and mailing address of the ISA/US Mail Stop PCT, Attn ISA/US, Commissioner for Patents P O Box 1450, Alexandria, Virginia 22313-1450 Facsimile No 571-273-3201	Authorized officer Lee W Young PCT Helpdesk. 571 272-4300 PCT OSP 571 272-7774

Form PCT/ISA/2 10 (second sheet) (April 2007)