A gaming terminal for playing a wagering game includes an input device configured to receive a wager to play the wagering game, a support cabinet, a rocker base connected to the support cabinet, and a primary display device coupled to the rocker base. The primary display device includes an electronic graphical display screen operable to display the wagering game. The primary display device and the rocker base are configured to be movable to a plurality of different display positions relative to the support cabinet. The plurality of different display positions are along a common arc defined by the rocker base.
FIG. 1A
GAMING TERMINAL WITH AN ADJUSTABLE DISPLAY

CROSS-REFERENCE TO RELATED APPLICATION


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TECHNICAL FIELD

[0003] The present invention relates generally to a wagering game machines and gaming systems, and more particularly, to displays for wagering games and gaming terminals with an adjustable display.

BACKGROUND

[0004] Gaming machines, such as slot machines, video poker machines and the like, have been a cornerstone of the gaming industry for several years. Generally, the popularity of such machines with players is dependent on the likelihood (or perceived likelihood) of winning money at the machine and the intrinsic entertainment value of the machine relative to other available gaming options.

[0005] Many gaming machines include a variety of visual attractions and displays, such as models, signs, and other forms of information. These items typically include fixed permanently-printed glass, video displays, artwork, models, and/or marquees. In many gaming regions, regulations provide for gaming terminals to include top-box mounted lighting and signage that indicate, for example, the class of machine, when the machine is of out of funds, or when the machine is malfunctioning.

[0006] Historically, gaming machines have been limited to a single game with a dedicated top box display and top-box mounted flat-screen display or marquee assembly. In most configurations, the gaming machine’s various display devices are rigidly mounted to the cabinet in a fixed location for all modes of game play.

SUMMARY

[0007] According to one aspect of the present disclosure, a gaming terminal for playing a wagering game includes an input device configured to receive a wager to play the wagering game, a support cabinet, a rocker base connected to the support cabinet, and a primary display device coupled to the rocker base. The primary display device includes an electronic graphical display screen operable to display the wagering game. The primary display device and the rocker base are configured to be movable to a plurality of different display positions relative to the support cabinet. The plurality of different display positions are along a common arc defined by the rocker base.

[0008] According to another aspect of the present disclosure, a gaming terminal for playing a wagering game includes a user interface having an input device for receiving a wager to play the wagering game. The gaming terminal further includes a support cabinet, a rocker base attached to the support cabinet, and a primary display coupled to the rocker base. The primary display includes a lower edge and an electronic graphical display screen operable to display information. The user interface abuts the lower edge of the primary display. The primary display and the rocker base are configured to be movable to a plurality of different display positions relative to the support cabinet during play of the wagering game. The plurality of different display positions are along a common arc defined by the rocker base.

[0009] Additional aspects of the invention will be apparent to those of ordinary skill in the art in view of the detailed description of various aspects of the present disclosure, which is made with reference to the drawings, a brief description of which is provided below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1A is a perspective-view illustration of an example of an upright free-standing gaming terminal in accordance with aspects of the present disclosure.

[0011] FIG. 1B is a perspective-view illustration of an example of a slant-top free-standing gaming terminal in accordance with aspects of the present disclosure.

[0012] FIG. 2 is a schematic diagram of an exemplary gaming system according to aspects of the present disclosure.

[0013] FIG. 3 is a screen shot of a basic-game screen from an exemplary wagering game that can be played, for example, on the gaming terminals of FIG. 1A or 1B or the gaming system of FIG. 2.

[0014] FIG. 4 is a screen shot of a bonus-game screen from an exemplary wagering game that can be played, for example, on the gaming terminals of FIG. 1A or 1B or the gaming system of FIG. 2.

[0015] FIGS. 5 and 6 are perspective-view illustrations of exemplary gaming terminals with adjustable display devices in accordance with aspects of the present disclosure.

[0016] FIG. 7 is a perspective-view illustration of an exemplary gaming terminal supporting different adjustable display devices in accordance with aspects of the present disclosure.

[0017] FIGS. 8 and 9 are perspective-view illustrations of exemplary gaming terminals with adjustable display device in accordance with aspects of the present disclosure.

[0018] FIGS. 10A and 10B are side-view illustrations of exemplary gaming terminals with adjustable primary and secondary display devices in accordance with aspects of the present disclosure.

[0019] FIGS. 11A-11C are perspective-view illustrations of exemplary banks of gaming terminals with adjustable primary and secondary display devices in accordance with aspects of the present disclosure.

[0020] While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. It should be understood, however, that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifi-
cations, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION

[0021] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

[0022] Referring to FIG. 1A, there is shown a gaming terminal 10 similar to those used in gaming establishments, such as casinos. With regard to the present disclosure, the gaming terminal 10 may be any type of gaming terminal and may have varying structures and methods of operation. For example, in some aspects, the gaming terminal 10 is an electromechanical gaming terminal configured to play a video casino game, such as slots, keno, poker, blackjack, roulette, craps, etc. It should be understood that although the gaming terminal 10 is shown as a free-standing terminal of the upright type, the gaming terminal is readily amenable to implementation in a wide variety of other forms such as a free-standing terminal of the slant-top type, such as the terminal 100 of FIG. 1B, a portable or handheld device primarily used for gaming, such as is disclosed by way of example in PCT Patent Application No. PCT/US2007/000792 filed Jan. 11, 2007, titled “Handheld Device for Wagering Games,” which is incorporated herein by reference in its entirety, a mobile telecommunications device such as a mobile telephone or personal digital assistant (PDA), a counter-top or bar-top gaming terminal, or other personal electronic device, such as a portable television, MP3 player, entertainment device, etc.

[0023] The gaming terminal 10 illustrated in FIG. 1A comprises a cabinet or housing 12. For output devices, this embodiment of the gaming terminal 10 includes a primary display area 14, a secondary display area 16, and one or more audio speakers 18. The primary display area 14 and/or secondary display area 16 variously displays information associated with wagering games, non-wagering games, community games, progressives, advertisements, services, premium entertainment, text messaging, emails, alerts or announcements, broadcast information, subscription information, etc., appropriate to the particular mode(s) of operation of the gaming terminal. For input devices, the gaming terminal 10 illustrated in FIG. 1A includes a bill validator 20, a coin acceptor 22, one or more information readers 24, one or more player-input devices 26, and one or more player-accessible ports 28 (e.g., an audio output jack for headphones, a video headset jack, a wireless transmitter/receiver, etc.). While these typical components found in the gaming terminal 10 are described below, it should be understood that numerous other peripheral devices and other elements exist and are readily utilizable in any number of combinations to create various forms of a gaming terminal in accord with the present concepts.

[0024] The primary display area 14 include, in various aspects of the present concepts, a mechanical-reel display, a video display, or a combination thereof in which a transmissive video display is disposed in front of the mechanical-reel display to portray a video image in superposition over the mechanical-reel display. Further information concerning the latter construction is disclosed in U.S. Pat. No. 6,517,433 to Loose et al. entitled “Reel Spinning Slot Machine With Superimposed Video Image,” which is incorporated herein by reference in its entirety. The video display is, in various embodiments, a cathode ray tube (CRT), a high-resolution liquid crystal display (LCD), a plasma display, a light-emitting diode (LED), a DLP projection display, an electroluminescent (EL) panel, or any other type of display suitable for use in the gaming terminal, or other form factor, such as is shown by way of example in FIG. 1A. The primary display area 14 includes, in relation to many aspects of wagering games conducted on the gaming terminal 10, one or more paylines 30 (see FIG. 3) extending along a portion of the primary display area. In the illustrated embodiment of FIG. 1A, the primary display area 14 comprises a plurality of mechanical reels 32 and a video display 34, such as a transmissive display (or a reflected image arrangement in other embodiments), in front of the mechanical reels 32. If the wagering game conducted via the gaming terminal 10 relies upon the video display 34 only and not the mechanical reels 32, the mechanical reels 32 are optionally removed from the interior of the terminal and the video display 34 is advantageously of a non-transmissive type. Similarly, if the wagering game conducted via the gaming terminal 10 relies only upon the mechanical reels 32, but not the video display 34, the video display 34 depicted in FIG. 1A is replaced with a conventional glass panel. Further, in still other embodiments, the video display 34 is disposed to overlay another video display, rather than a mechanical-reel display, such that the primary display area 14 includes layered or superimposed video displays. In yet other embodiments, the mechanical-reel display of the above-noted embodiments is replaced with another mechanical or physical member or members such as, but not limited to, a mechanical wheel (e.g., a roulette game), dice, a pachinko board, or a diorama presenting a three-dimensional model of a game environment.

[0025] Video images in the primary display area 14 and/or the secondary display area 16 are rendered in two-dimensional (e.g., using Flash Macromedin™) or three-dimensional graphics (e.g., using Renderware™). In various aspects, the video images are played back (e.g., from a recording stored on the gaming terminal 10), streamed (e.g., from a gaming network), or received as a TV signal (e.g., either broadcast or via cable) and such images can take different forms, such as animated images, computer-generated images, or “real-life” images, either prerecorded (e.g., in the case of marketing/promotional material) or as live footage. The format of the video images can include any format including, but not limited to, an analog format, a standard digital format, or a high-definition (HD) digital format.

[0026] The player-input or user-input device(s) 26 include, by way of example, a plurality of buttons 36 on a button panel, as shown in FIG. 1A, a mouse, a joy stick, a switch, a microphone, and/or a touch screen 38 mounted over the primary display area 14 and/or the secondary display area 16 and having one or more soft touch keys 40, as is also shown in FIG. 1A. In still other aspects, the player-input devices 26 comprise technologies that do not rely upon physical contact between the player and the gaming terminal, such as speech-recognition technology, gesture-sensing technology, eye-tracking technology, etc. The player-input or user-input device(s) 26 thus accept(s) player input(s) and transforms the player input(s) to electronic data signals indicative of a player input or inputs corresponding to an enabled feature for such input(s) at a time of activation (e.g., pressing a “Max Bet”
button or soft key to indicate a player's desire to place a maximum wager to play the wagering game). The input(s), once transformed into electronic data signals, are output to a CPU or controller 42 (see FIG. 2) for processing. The electronic data signals are selected from a group consisting essentially of an electrical current, an electrical voltage, an electrical charge, an optical signal, an optical element, a magnetic signal, and a magnetic element.

[0027] The information reader 24 (or information reader/writer) is preferably located on the front of the housing 12 and comprises, in at least some forms, a ticket reader, card reader, barcode scanner, wireless transceiver (e.g., RFID, Bluetooth, etc.), biometric reader, or computer-readable-storage-medium interface. As noted, the information reader may comprise a physical and/or electronic writing element to permit writing to a ticket, a card, or computer-readable-storage-medium. The information reader 24 permits information to be transmitted from a portable medium (e.g., ticket, voucher, coupon, casino card, smart card, debit card, credit card, etc.) to the information reader 24 to enable the gaming terminal 10 or associated external system to access an account associated with cashless gaming, to facilitate player tracking or game customization, to retrieve a saved-game state, to store a current-game state, to cause data transfer, and/or to facilitate access to casino services, such as is more fully disclosed, by way of example, in U.S. Patent Application No. 2003/0045554, published on Mar. 6, 2003, entitled “Portable Data Unit for Communicating With Gaming Machines Over Wireless Link,” which is incorporated herein by reference in its entirety. The noted account associated with cashless gaming is, in some aspects of the present concepts, stored at an external system 46 (see FIG. 2) as more fully disclosed in U.S. Pat. No. 6,280,328 to Holch et al. entitled “Cashless Computerized Video Game System and Method,” which is incorporated herein by reference in its entirety, or is alternatively stored directly on the portable storage medium. Various security protocols or features can be used to enhance security of the portable storage medium. For example, in some aspects, the individual carrying the portable storage medium is required to enter a secondary independent authenticator (e.g., password, PIN number, biometric, etc.) to access the account stored on the portable storage medium.

[0028] Referring now to FIG. 1B, an exemplary gaming terminal or machine 100 of the “slant-top” type is shown in accord with at least some aspects of the disclosed concepts. Although differing in appearance, the gaming terminal 100 can be similar in function, operation, and connectivity to the gaming terminal 10 discussed above with respect to FIG. 1A. For instance, the gaming terminal 100 may be an electromechanical gaming terminal configured, for example, to play mechanical slots, or it may be an electronic gaming terminal configured, for example, to play a video casino game, such as keno, poker, slots, blackjack, roulette, or combinations thereof. The illustrated gaming terminal 100 comprises a cabinet 112 for housing and/or supporting a variety of operational and peripheral componentry (e.g., CPU 42, memory 44, external systems interface 58, etc.). For output devices, the gaming terminal 100 includes a primary display area (or “first display device”) 114, an optional secondary display area (or “second display device”) 116, and one or more audio speakers 118. These display devices 114, 116 can take on any of the possible types, include any of the optional features, and can operate in any manner described above with respect to the various displays of the gaming machine 10 of FIG. 1A.

For input devices, the gaming terminal 100 may include, in any combination, a bill-receiving and validating device 120, a coin acceptor, one or more information readers 124, one or more player-input devices 126, and one or more player-accessible ports (e.g., an audio output jack for headphones, a video headset jack, an internet cable jack, a wireless transmitter/receiver, etc.). While these typical components found in the gaming terminal 100 are described above, it should be understood that numerous additional/alternative peripheral devices and other elements may exist and may be used in any number of combinations to create various forms of a gaming terminal.

[0029] Turning now to FIG. 2, the various components of the gaming terminal 10 are controlled by one or more processors (e.g., CPU, distributed processor, etc.) 42, also referred to herein generally as a controller (e.g., microprocessor, microcontroller, etc.). The controller 42 can include any suitable processor(s), such as an Intel® Pentium processor, Intel® Core 2 Duo processor, AMD Opteron™ processor, or UltraSPARC® processor. By way of example, the controller 42 includes a plurality of microprocessors including a master processor, a slave processor, and a secondary or parallel processor. Controller 42, as used herein, comprises any combination of hardware, software, and/or firmware disposed in and/or disposed outside of the gaming terminal 10 that is configured to communicate with and/or control the transfer of data between the gaming terminal 10 and a bus, another computer, processor, or device and/or a server and/or a network. The controller 42 comprises one or more controllers or processors and such one or more controllers or processors need not be disposed proximal to one another and may be located in different devices and/or in different locations. For example, a first processor is disposed proximate a user interface device (e.g., a push button panel, a touch screen display, etc.) and a second processor is disposed remotely from the first processor, the first and second processors being electrically connected through a network. As another example, the first processor is disposed in a first enclosure (e.g., a gaming machine) and a second processor is disposed in a second enclosure (e.g., a server) separate from the first enclosure, the first and second processors being communicatively connected through a network. The controller 42 is operable to execute all of the various gaming methods and other processes disclosed herein.

[0030] To provide gaming functions, the controller 42 executes one or more game programs comprising machine-executable instructions stored in local and/or remote computer-readable data storage media (e.g., memory 44 or other suitable storage device). The term computer-readable data storage media, or “computer-readable medium;” as used herein refers to any media/medium that participates in providing instructions to controller 42 for execution. The computer-readable medium comprises, in at least some exemplary forms, non-volatile media (e.g., optical disks, magnetic disks, etc.), volatile media (e.g., dynamic memory, RAM), and transmission media (e.g., coaxial cables, copper wire, fiber optics, radio frequency (RF) data communication, infrared (IR) data communication, etc). Common forms of computer-readable media include, for example, a hard disk, magnetic tape (or other magnetic medium), a 2-D or 3-D optical disc (e.g., a CD-ROM, DVD, etc.), RAM, PROM, EPROM, FLASH-EPROM, any other memory chip or solid state digital data storage device, a carrier wave, or any other medium from which a computer can read. By way of example, a
plurality of storage media or devices are provided, a first storage device being disposed proximate the user interface device and a second storage device being disposed remotely from the first storage device, wherein a network is connected intermediate the first one and second one of the storage devices.

[0031] Various forms of computer-readable media may be involved in carrying one or more sequences of one or more instructions to controller 42 for execution. By way of example, the instructions may initially be borne on a data storage device of a remote device (e.g., a remote computer, server, or system). The remote device can load the instructions into its dynamic memory and send the instructions over a telephone line or other communication path using a modem or other communication device appropriate to the communication path. A modem or other communication device local to the gaming machine 10 or to an external system 46 associated with the gaming machine can receive the data on the telephone line or conveyed through the communication path (e.g., via external systems interface 58) and output the data to a bus, which transmits the data to the system memory 44 associated with the processor 42, from which system memory the processor retrieves and executes the instructions.

[0032] Thus, the controller 42 is able to send and receive data, via carrier signals, through the network(s), network link, and communication interface. The data includes, in various examples, instructions, commands, program code, player data, and game data. As to the game data, in at least some aspects of the present concepts, the controller 42 uses a local random number generator (RNG) to randomly generate a wagering game outcome from a plurality of possible outcomes. Alternatively, the outcome is centrally determined using either an RNG or pooling scheme at a remote controller included, for example, within the external system 46.

[0033] As shown in the example of FIG. 2, the controller 42 is coupled to the system memory 44. The system memory 44 is shown to comprise a volatile memory (e.g., a random-access memory (RAM)) and a non-volatile memory (e.g., an EEPROM), but optionally includes multiple RAM and multiple program memories.

[0034] As shown in the example of FIG. 2, the controller 42 is also coupled to a money/credit detector 48. The money/credit detector 48 is configured to output a signal the controller 42 that money and/or credits have been input via one or more value-input devices, such as the bill validator 20, coin acceptor 22, or via other sources, such as an electronic gaming account, etc. The value-input device(s) is integrated with the housing 12 of the gaming terminal 10 and is connected to the remainder of the components of the gaming terminal 10, as appropriate, via a wired connection, such as I/O 56, or wirelessly.

The money/credit detector 48 detects the input of valid funds into the gaming terminal 10 (e.g., via currency, electronic funds, ticket, card, etc.) via the value-input device(s) and outputs a signal to the controller 42 carrying data regarding the input value of the valid funds. The controller 42 extracts the data from these signals from the money/credit detector 48, analyzes the associated data, and transforms the data corresponding to the input value into an equivalent credit balance that is available to the player for subsequent wagers on the gaming terminal 10, such transforming of the data being effected by software, hardware, and/or firmware configured to associate the input value to an equivalent credit value. Where the input value is already in a credit value form, such as in a cashless gaming account having stored therein a credit value, the wager is simply deducted from the available credit balance.

[0035] As seen in FIG. 2, the controller 42 is also connected to, and controls, the primary display area 14, the player-input device(s) 26, and a payoff mechanism 50. The payoff mechanism 50 is operable in response to instructions from the controller 42 to award a payoff to the player in response to certain winning outcomes that occur in the base game, the bonus game(s), or via an external game or event. The payoff is provided in the form of money, credits, redeemable points, advancement within a game, access to special features within a game, services, another exchangeable media, or any combination thereof. Although payoffs may be paid out in coins and/or currency bills, payoffs are alternatively associated with a coded ticket (from a ticket printer 52), a portable storage medium or device (e.g., a card magnetic strip), or are transferred or transmitted to a designated player account. The payoff amounts distributed by the payoff mechanism 50 are determined by one or more pay tables stored in the system memory 44.

[0036] Communications between the controller 42 and the peripheral components of the gaming terminal 10 and the external system 46 occur through input/output (I/O) circuit 56, which may include any suitable bus technologies, such as an AGTL+ frontside bus and a PCI backside bus. Although the I/O circuit 56 is shown as a single block, it should be appreciated that the I/O circuit 56 alternatively includes a number of different types of I/O circuits. Furthermore, in some embodiments, the components of the gaming terminal 10 can be interconnected according to any suitable interconnection architecture (e.g., directly connected, hypercube, etc.).

[0037] The I/O circuit 56 is connected to an external system interface or communication device 58, which is connected to the external system 46. The controller 42 communicates with the external system 46 via the external system interface 58 and a communication path (e.g., serial, parallel, IR, RC, I2C, or near field, etc.). The external system 46 includes, in various aspects, aspects of gaming networks, other gaming terminals, a gaming server, a remote controller, communications hardware, or a variety of other interfaced systems or components, in any combination. In yet other aspects, the external system 46 may comprise a player’s portable electronic device (e.g., cellular phone, electronic wallet, etc.) and the external system interface 58 is configured to facilitate wireless communication and data transfer between the portable electronic device and the controller 42, such as by a near field communication path operating via magnetic field induction or a frequency-hopping spread spectrum RF signals (e.g., Bluetooth, etc.).

[0038] The gaming terminal 10 optionally communicates with external system 46 (in a wired or wireless manner) such that each terminal operates as a “thin client” having relatively less functionality, a “thick client” having relatively more functionality, or with any range of functionality therebetween (e.g., an “intermediate client”). In general, a wagering game includes an RNG for generating a random number, game logic for determining the outcome based on the randomly generated number, and game assets (e.g., art, sound, etc.) for presenting the determined outcome to a player in an audiovisual manner. The RNG, game logic, and game assets are contained within the gaming terminal 10 ("thin client" gaming terminal), the external systems 46 ("thin client" gaming terminal), or are distributed therebetween in any suitable manner ("intermediate client" gaming terminal).
Referring now to FIG. 3, an image of a basic-game screen 60 adapted to be displayed on the primary display area 14 is illustrated, according to one embodiment of the present disclosure. A player begins play of a basic wagering game by providing a wager. A player can operate or interact with the wagering game using the one or more player-input devices 26. The controller 42, the external system 46, or both, in alternative embodiments, operate(s) to execute a wagering game program causing the primary display area 14 to display the wagering game that includes a plurality of visual elements.

In accord with various methods of conducting a wagering game on a gaming system in accord with the present concepts, the wagering game includes a game sequence in which a player makes a wager, such as through the money/credit detector 48, touch screen 38 soft key, button, or the like, and a wagering game outcome is associated with the wager. The wagering game outcome is then revealed to the player in due course following initiation of the wagering game. The method comprises the acts of conducting the wagering game using a gaming apparatus, such as the gaming terminal 10 depicted in FIG. 1A, following receipt of an input from the player to initiate the wagering game. The gaming terminal 10 then communicates the wagering game outcome to the player via one or more output devices (e.g., primary display 14) through the display of information such as, but not limited to, text, graphics, text and graphics, static images, moving images, etc., or any combination thereof. In accord with the method of conducting the wagering game, the controller 42, which comprises one or more processors, transforms a physical player input, such as a player's pressing of a "Spin Reels" soft key 84 (see FIG. 3), into an electronic data signal indicative of an instruction relating to the wagering game (e.g., an electronic data signal bearing data on a wager amount).

In the aforementioned method, for each data signal, the controller 42 is configured to process the electronic data signal, to interpret the data signal (e.g., data signals corresponding to a wager input), and to cause further actions associated with the interpretation of the signal in accord with computer instructions relating to such further actions executed by the controller. As one example, the controller 42 causes the recording of a digital representation of the wager in one or more storage devices (e.g., system memory 44 or a memory associated with an external system 46), the controller, in accord with associated computer instructions, causing the changing of a state of the data storage device from a first state to a second state. This change in state is effected by changing a magnetization pattern on a magnetically coated surface of a magnetic storage device or changing a magnetic state of a ferromagnetic surface of a magneto-optical disc storage device, a change in state of transistors or capacitors in a volatile or a non-volatile semiconductor memory (e.g., DRAM), etc. The noted second state of the data storage device comprises storage in the storage device of data representing the electronic data signal from the controller (e.g., the wager in the present example). As another example, the controller 42 further, in accord with the execution of the instructions relating to the wagering game, causes the primary display 14 or other display device and/or other output device (e.g., speakers, lights, communication device, etc.), to change from a first state to at least a second state, wherein the second state of the primary display comprises a visual representation of the physical player input (e.g., an acknowledgement to a player), information relating to the physical player input (e.g., an indication of the wager amount), a game sequence, an outcome of the game sequence, or any combination thereof, wherein the game sequence in accord with the present concepts comprises acts described herein. The aforementioned executing of computer instructions relating to the wagering game is further conducted in accord with a random outcome (e.g., determined by the RNG) that is used by the controller 42 to determine the outcome of the game sequence, using a game logic for determining the outcome based on the randomly generated number. In at least some aspects, the controller 42 is configured to determine an outcome of the game sequence at least partially in response to the random parameter.

The basic-game screen 60 is displayed on the primary display area 14 or a portion thereof. In FIG. 3, the basic-game screen 60 portrays a plurality of simulated movable reels 62a-e. Alternatively or additionally, the basic-game screen 60 portrays a plurality of mechanical reels or other video or mechanical presentation consistent with the game format and theme. The basic-game screen 60 also advantageously displays one or more game-session meters and various buttons adapted to be actuated by a player.

In the illustrated embodiment of FIG. 3, the game-session meters include a "credit" meter 64 for displaying a number of credits available for play on the terminal; a "lines" meter 66 for displaying a number of paylines to be played by a player on the terminal; a "line bet" meter 68 for displaying a number of credits wagered (e.g., from 1 to 5 or more credits) for each of the number of paylines played; a "total bet" meter 70 for displaying a total number of credits wagered for a particular round of wagering; and a "paid" meter 72 for displaying an amount to be awarded based on the results of the particular round's wager. The depicted user-selectable buttons include a "collect" button 74 to collect the credits remaining in the credits meter 64; a "help" button 76 for viewing instructions on how to play the wagering game; a "pay table" button 78 for viewing a pay table associated with the basic wagering game; a "select lines" button 80 for changing the number of paylines (displayed in the lines meter 66); a player wishes to play; a "bet per line" button 82 for changing the amount of the wager which is displayed in the line-bet meter 68; a "spin reels" button 84 for moving the reels 62a-e; and a "max bet spin" button 86 for wagering a maximum number of credits and moving the reels 62a-e of the basic wagering game. While the gaming terminal 10 allows for these types of player inputs, the present disclosure does not require them and can be used on gaming terminals having more, less, or different player inputs.

As shown in the example of FIG. 3, paylines 30 extend from one of the payline indicators 88a-i on the left side of the basic-game screen 60 to a corresponding one of the payline indicators 88a-i on the right side of the screen 60. A plurality of symbols 90 is displayed on the plurality of reels 62a-e to indicate possible outcomes of the basic wagering game. A winning combination occurs when the displayed symbols 90 correspond to one of the winning symbol combinations listed in a pay table stored in the memory 44 of the terminal 10 or in the external system 46. The symbols 90 may include any appropriate graphical representation or animation, and may further include a "blank" symbol.

Symbol combinations are evaluated in accord with various schemes such as, but not limited to, "line pays" or "scatter pays." Line pays are evaluated left to right, right to
left, top to bottom, bottom to top, or any combination thereof by evaluating the number, type, or order of symbols appearing along an activated payline. While an embodiment with nine paylines is shown, a wagering game with no paylines, a single payline, or any plurality of paylines will also work with the present disclosure. Additionally, though an embodiment with five reels is shown in FIG. 3, different embodiments of the gaming terminal comprise a greater or lesser number of reels in accordance with the present disclosure.

Turning now to FIG. 4, an example of a bonus game to a basic wagering game is illustrated. A bonus-game screen includes an array of markers located in a plurality of columns and rows. The bonus game is entered upon the occurrence of a triggering event, such as the occurrence of a start-bonus game outcome (e.g., symbol trigger, mystery trigger, time-based trigger, etc.) in or during the basic wagering game. Alternatively, any bonus game described herein is able to be deployed as a stand-alone wagering game independent of a basic wagering game.

In the illustrated bonus game of FIG. 4, a player selects, one at a time, from the array of markers to reveal an associated bonus-game outcome. According to one embodiment of this bonus game, each marker in the array is associated with an award outcome (e.g., credits or other non-negative outcomes) or an end-game outcome. In the illustrated example, a player has selected an award outcome with the player’s first two selections (25 credits and 100 credits, respectively). When one or more end-game outcome is selected (as illustrated by the player’s third pick), the bonus game is terminated and the accumulated award outcomes are provided to the player.

Referring now to FIGS. 5 and 6, perspective-views of exemplary gaming terminals with adjustable display devices are illustrated in accordance with aspects of the present disclosure. Although differing in appearance, the gaming terminals can be similar in function, operation and connectivity to the gaming terminals discussed above with respect to FIGS. 1-4. For example, the gaming terminals (also referred to herein as “wagering game machine” or “gaming machine”) may be an electronic gaming terminal configured, for example, to play a video casino game, such as keno, poker, slots, blackjack, roulette, etc. The gaming terminals are purely representative in nature, and presented solely for explanatory purposes.

Gaming terminals can include respective support cabinets for housing and/or supporting a variety of operational componentry (e.g., a CPU, memory interface, etc.). The support cabinets may include respective lower portions and respective upper portions that integrally or separately form cabinets. The lower portion can be broader than the upper portion and generally provide a stable, balance, support to the upper portion and any other components connected thereto (e.g., a display) during play of the wagering game. By way of another non-limiting example, the support cabinet can also be a standard trapezoidal-style cabinet. For output devices, the gaming terminals can include respective adjustable primary display areas (or “display device”) that are connected to the respective upper portions of support cabinets. The gaming terminals may also include a bill-receiving and validating device (not shown), a coin acceptor (not shown), one or more information readers (not shown), and one or more player-input devices, which may be collectively represented by a button panel or touch-screen button panel associated with respective user interfaces. In certain aspects of a gaming terminal, other player input devices or user interfaces, such as those described in FIGS. 1A and 1B, are contemplated. While typical components found in gaming terminals are described above, it should be understood that numerous additional/alternative peripheral devices or combinations of devices along with other elements may exist and may be used in any number of combinations to create various forms of a gaming terminal.

The primary display devices are also referred to herein as “adjustable display device” can be mounted to their respective support cabinets via, for example, a support assembly that allows the primary display device to be movable to a plurality of different player-viewing positions. The primary display device can include an electronic graphical display screen that is operable to dynamically display information related to the wagering game. As used herein, the term “electronic graphical display screen” should be defined or interpreted as inclusive of, but not exclusive to, display devices that create visual images, both moving and stationary alike, through the electronic generation and manipulation of light. By way of non-limiting example, the display screen may include an organic light emitting diode (OLED) panel. One such OLED display panel is the AMOLED screen, which is manufactured by LG Display Co., Ltd., of Seoul, South Korea. In another optional configuration, the display screen may include an organic thin-film transistor (OTFT) display panel, which may be integrated with OLED technology. One such OTFT display is the Rollable OTFT-Driven OLED Panel, which is manufactured by Sony Corp., of Tokyo, Japan. In yet another optional configuration, the display screen includes a light emitting diode (LED) display comprising a plurality of juxtaposed LED tubes. One such LED display device comprises the LED Tube Screen, which is manufactured by Zhuhai iTech Electronics Technology Co., Ltd., of Guangdong Province, China. As used herein, the term “electronic graphical display screen” should not be defined or interpreted as consisting of a projector screen or an electro-mechanically automated exhibit, such as moving marquees and mechanized cabinet ornaments.

The primary display device illustrated in FIG. 5 can be mounted to a plate that is further secured to one or more rocker base supports (also referred to herein as “rocker base”). The plate and rocker base may be flat and fabricated out of metal, plastic, wood, or a composite material. The rocker base can have a side-view that is defined by a surface enclosed by a chord of a circle or ellipse such that the perimeter of the rocker base includes a first edge that is arc-shaped or curved and a second edge that is flat and abuts the plate. The first edge may be parabolic or partially-elliptical. It is also contemplated that the first edge can have a fixed radius of curvature. In certain aspects, it is contemplated that the flat second edge may directly abut the primary display device, such that the primary display device is mounted directly to the rocker base without an intermediate plate or other intervening
structure. It is further contemplated that in certain aspects, the rocker base may have a side-view that is crescent-like or half-crescent-like in shape.

[0052] It is contemplated that the first edge 562 of the rocker base 560 may be smooth or may include teeth configured to engage a rotating gear 564 or other driving mechanism (s) so that the combination of the rocker base 560, the plate 580, and the primary display device 514 is repositionable relative to the support cabinet 512. The different positions may be determined by the arc shape or curve of at least a portion of the first edge 562 of the rocker base 560. It is also contemplated that the different positions can be determined by substantially the entire length of the first edge 562. The gear 564 or other drive mechanism may be supported by the support cabinet 512 via, for example, a shaft (not shown) extending laterally out from the side of the upper portion 513b of support cabinet 512. The gear 564 can remain fixed except for being rotatable about the shaft.

[0053] The gear 564 extending from one side, or a series of gears (not shown) extending from both sides, of the support cabinet may engage the first edge 562 of the rocker base 560 and allow the primary display device 514 to transition or rock from a generally upright position to a generally flat position. An operator of the gaming terminal may be protected from the gear(s) and associated teeth along the first edge 562 of the rocker base through an elongated shield 570 connected to the rocker base 560. The elongated shield 570 may desirably have a similar length and similar arc shape or curve as the first edge. Furthermore, the elongated shield 570 may include a first end and a second end that are tapered to limit the range of movement of the primary display device 514 to the length of the arc shaped or curved path of the first edge or a slightly shorter length. The gear 564 or series of gears may also physically support the rocker base 560 and in combination with the elongated shield 570 keep the primary display device 514 physically attached to the support cabinet 512.

[0054] In some embodiments, the position of the primary display device 514 relative to the support cabinet 512 is manually changed, for example, by pulling or pushing on the lateral edges of the primary display device 514. Alternatively, the change in position of the primary display device 514 is automated. For example, it is contemplated that the gear(s), or shaft(s) thereof, that engage the rocker base may be used to rotate or reposition the primary display device 514 via a drive mechanism. The drive system may comprise one or more pneumatic or hydraulic cylinders, electrically driven DC or servo motors, linear actuators, etc. By way of further example, and not limitation, one or more of the gears may be connected directly or through additional gear, screw, shaft, and/or belt features to an electric motor that controls the movement of the primary display device 514 from an upright position to a horizontal position, the reverse, or any intermediate position. In certain aspects, the drive mechanism, including the placement of the primary display device in different positions, may be controlled via the CPU 42 or via external system(s) 46 described above.

[0055] It is further contemplated that the position of primary display device 514 can also be locked or fixed by temporarily preventing the gear from moving until it is desired to adjust or reposition the primary display device 514. It is further contemplated that the gear may be associated with a hydraulic mechanism that controls the movement of the primary display device 514. The hydraulic mechanism may allow the primary display device 514 to be moved to any position along the arc shaped or curved path defined by the first edge 562. Furthermore, the hydraulic mechanism can allow the primary display device 514 to remain at a selected position. The primary display device 514 may then be fixed at that location via the hydraulic mechanism. It is also contemplated that the primary display device 514 may be held stationary through a resistive force provided through the hydraulic mechanism and can subsequently be moved through the application of a force to the primary display device 514 that overcomes the resistance provided by the hydraulic mechanism.

[0056] As illustrated in FIG. 6, the primary display device 614 can be mounted directly to a rocker base 660. It is further contemplated that a primary display device may be secured, directly or via a plate or other support structure, to one rocker base or a plurality of rocker bases as generally illustrated in FIGS. 5 and 6.

[0057] The gaming terminal 610 of FIG. 6 includes many similar features as the gaming terminal 510. One primary difference is that rather than support and provide for movement of a primary display device via a gear-type system as illustrated in FIG. 5, gaming terminal 610 has a roller-type connection 664 for connecting the primary display device 614 to the support cabinet 612. The roller connection 664 includes a plurality of rotating elements 664a, 664b that engage an elongated rail 670 (e.g., and I-beam or C-beam shaped support) connected to an arc-shaped or curved edge of rocker base 660. The rotating elements 664a, 664b may be fixed to the support cabinet 612 and have limited moving components such as rotating elements (e.g., a wheel, roller, etc.).

[0058] It is contemplated that the elongated rail 670 may have a similar arc shape or curve as the arc-shaped edge of rocker base 660. In certain embodiments, the elongated rail itself may be directly connected to the primary display device 614 and form a rocker-type base without intervening feature 660. The rotating elements (e.g., wheels, rollers, etc.) of the roller-type connection 664 can then be allowed to rotate allowing the elongated rail, and thus, the primary display device, to transition along the arc-shaped or curved path as defined by the rail 670. The primary display device 614 may then be moved or transitioned from a generally upright position to a generally horizontal position or somewhere in between (e.g., slant-top orientation), or vice versa. The rail 670 may be configured to rest on the roller connection elements including one or more of the plurality of rotating elements. It is further contemplated that similar hydraulic mechanisms, as those described for FIG. 5, may be used to hold the primary display device 614 in a desired position or to move the primary display device 614 from one position to another.

[0059] It is contemplated that in certain aspects of the present disclosure, an adjustable primary display device may include features of both gaming terminal 510 and gaming terminal 610. By way of a non-limiting example, a primary display device may have two rocker bases with one rocker base connected to a support cabinet via the gear-type connection as described for FIG. 5 and the other rocker base having a roller-type connection as described for FIG. 6. By way of another non-limiting example, the primary display device may be adjusted or repositioned driven by a combination of automated drive mechanisms or a hybrid of a hydraulic mechanism and a motor based mechanism. It is further contemplated that the primary display device can have an adjoining user interface that may include both a button panel (e.g.,
and a touch-screen panel (e.g., 628). It is further contemplated that the user interface may be configured to pivot about the bottom edge (e.g., 515, 615) of the primary display device so that when the primary display device is in a generally upright position the user interface may be generally horizontal and with the primary display device generally horizontal the user interface may be angled downwardly from horizontal so that the panel elements face towards a player.

In some embodiments, the elongated rail 670 may include one or a plurality of spaced-apart holes (e.g., 674) extending through the rail (e.g., extending through the web of an L-beam shaped rail). Each of the holes can be configured or sized to accept a pin (e.g., 672). The pin may be removable or fixed. The pin can be inserted into the hole 674 and used to either hold the primary display device in a desired position along the arc shaped or curved path defined by the rail or it can be used to establish range(s) between which the primary display device 614 may be moved along the length of the path defined by the rail. Similarly, the shield 570 illustrated in FIG. 5 may include similar pin and hole features engaging the gear 564 to limit the movement of the rocker base 560 along the length of the first edge 562. It is further contemplated that the pin may include a threaded end that can be screwed into the hole. Other features for temporarily fixing, locking, or limiting the range of movement of the primary display device are also contemplated by the present disclosure.

In some embodiments, in addition to the adjustable primary display device being configured to transition to different positions along the arc shaped or curved path defined by the elongated rail 670 or rocker base (e.g., 560, 660), the primary display device can be adjusted to other positions or orientations. By way of non-limiting example, the primary display device may be configured to also rotate from a portrait position, as generally illustrated in FIGS. 5 and 6, to a landscape position or to rotate an entire 360 degrees. Furthermore, the back of the primary display device may include horizontal and/or vertical tracks or a rack and pinion-shaft type arrangement connected to the plate and/or to the rocker base that allow the primary display device to slide up and down or left and right along the plane defined by a display screen (e.g., the viewing surface) of the primary display device.

Referring now to FIG. 7, a perspective-view of an exemplary gaming terminal 710 supporting different adjustable display devices is illustrated in accordance with aspects of the present disclosure. It is contemplated that display devices of different sizes may be connected to a standard support cabinet 712. By way of non-limiting example, primary display device 714a may be removed and replaced with primary display device 714b, which has a larger display area, but a similar configuration of support features for attaching the primary display device 714b to the support cabinet 712. This may be accomplished by the same or a similar configuration of support features being used for display device 714a and display device 714b, and can include, for example, a support feature having the same or a similar rocker base and elongated rail configured to engage rotating elements (see, e.g., FIG. 6) fixed to the support cabinet 712, or the same or similar support features such as those described in FIG. 5. The dimensions of certain key aspects of the support features, such as the elongated rail or the teeth along the arc-shaped edge are desirably kept the same or very similar so that the gear or rolling connection fixed to the support cabinet can readily engage the rail or teeth.

FIGS. 8 and 9 are perspective-view illustrations of exemplary gaming terminals with adjustable display devices in accordance with aspects of the present disclosure. Similar to the exemplary gaming terminals illustrated in FIGS. 8-7, gaming terminals 810, 910 include an adjustable primary display device 814, 914 connected to and supported via a support cabinet 812, 912. FIGS. 8 and 9 illustrate additional exemplary aspects of support features for the adjustable primary display devices 814, 914. For example, FIG. 8 illustrates another exemplary aspect including a rocking base 860 having a similar arc-shaped or curved first edge 862 and a flat second edge (not shown) coupled at the back of the primary display device 814. The support cabinet 812 has a protrusion 865 such as a pin or roller, extending out from a side panel 867 of the support cabinet engaging an elongated arc-shaped or curved aperture 863 extending through and defined by the rocker base 860. Similar to the exemplary gaming terminals illustrated above, the adjustable primary display device 814 can be similarly transitioned along a path defined by the arc-shaped aperture or replaced by a larger primary display device as discussed for the exemplary gaming terminals described above. Furthermore, similar drive mechanisms (e.g., manual, motor-driven, hydraulic) may be used as well for transitioning the primary display device 814 to different viewing positions.

It is further contemplated that the gaming terminals described herein, such as those similar to gaming terminal 810, may also include a single sensing device 880 and a sensor cluster 882 for detecting or sensing various physical player characteristics. The sensor(s) can perform one or more functions and are typically coupled to the CPU 34 (FIG. 2) of the gaming system. For example, the sensor(s) can find the location of the player relative to primary display device 814 or the location of the head of the player relative to the primary display 814. In one non-limiting example, the sensor(s) can include e-field sensors for location determination. Example e-field sensor chips are available through Freescale Semiconductor of Austin, Tex. The e-field sensor is a non-contact location sensor and contains circuitry necessary to generate a low level electric field in a semi-circular arc between a set of electrodes on each of the sensors. The e-field sensor measures the field loading caused by conductor objects, such as the head, that move into the low level electrical field. A low frequency sine wave is generated via the low level electrical field. The frequency can be adjusted using an external resistor and can also be optimized for a certain frequency, such as 125 kHz. The sine wave can have very low harmonic content to avoid the generation of harmonic interference. The detected object can act as a capacitor to virtual ground while the electrode forms the other capacitor plate. The current flowing between the electrode and its surrounding virtual ground will result in a voltage drop across the internal resistance. This, in turn, can lead to a voltage change at the electrode. The signals for the set of electrodes may be analyzed to determine both the position and the size of the object. For example, the voltage can change at the electrode (for the e-field sensors, for example) in the sensors when the object such as the player’s head moves to a different location. The intersection of the object in the low level electrical field at a different position will result in a different voltage at the electrode. The set of electrodes may be of sufficient area roughly corresponding to a player’s head in order to provide optimal object detection. In order to increase the number of electrodes, multiple electrodes in an array may be used with a multi-plexing arrange-
ment. Other sensors known in the field of the present disclosure are also contemplated, including, for example, LED sensors, potentiometric sensors, capacitive sensors, inductive sensors, optical sensors, thermal sensors, motion sensors, and others.

[0065] It is further contemplated that different arrangements and combinations of sensors can be disposed on the support cabinet 812 to sense various player characteristics such as the player height, whether the player is sitting in seat 890 or standing in front of the gaming terminal, and/or the approximate location of the player's head. By sensing such characteristics, the primary display device 814 may automatically adjust position along the arc-shaped path via signals sent from the sensor(s), processed by the controller, and subsequent instructions transmitted from the controller to the drive mechanism to position the primary display device 814 at an optimal viewing position for the received player characteristics.

[0066] In certain aspects of the present disclosure, the position of the adjustable primary display 814 can also be determined by other sensed player characteristics. For example, the seat 890 or a floor pad (not shown) can include a weight sensing sensor (not shown). If it is determined a player is sitting, the primary display device 814 may be placed in one position, and if the player is determined to be sitting, the primary display device 814 may be placed in a second position having a different incline from the first position.

[0067] It is also contemplated that in certain aspects of gaming terminal sensors, such as sensing device 880 or sensor cluster 882, may be positioned to receive or measure certain types of feedback information related to a player, a gaming terminal, a chair, and/or environmental aspects surrounding the gaming terminal. For example, feedback mechanisms associated with the sensors and/or a controller may be used to slow or halt movement of the adjustable display and/or chair based on certain measured feedback. It is also contemplated that the feedback mechanisms associated with the sensors and/or a controller can be used to slow, alter, or halt movements of the adjustable display and/or chair based on a determination from the feedback information of unexpected conditions or movements related to the gaming terminal or chair.

[0068] FIG. 9 illustrates yet another non-limiting exemplary aspect of a support feature for an adjustable primary display device 914. Gaming terminal 910 includes an adjustable primary display device 914 supported via a support feature 950 comprising a single rocker-type base 960 connected to an elongated rail 970. The elongated rail 970 is configured to slidingly engage (e.g. slides to engage, slides and engages) a track 915 having surface boundaries defined by the upper portion 913 of support cabinet 912. The elongated rail 970 has a curved arc-shape that defines the length of a path that the primary display device can be transitioned along. The length of the path and the shape of the elongated rail 970 allow the primary display device to be positioned from a generally horizontal position (not shown) to a generally upright position (shown). The cross-sectional dimensions of the elongated rail are slight smaller than the cross-sectional dimensions of the track 915 defined by upper portion 913 so that the rail can slide along the track. The elongated rail may frictionally engage the track 915 so that the primary display device can be held in any of a number of desired positions. It is also contemplated that a pin, wheel, or plate within the upper portion 913 of the support cabinet 912 may extend into the track 915 to frictionally engage the elongated rail 970 and allow it to be temporarily fixed at a desired position. Similar to the exemplary gaming terminals illustrated above, the adjustable primary display device 914 can be similarly transitioned and replaced as described for the exemplary gaming terminals described above in FIGS. 5-8. Furthermore, similar drive mechanisms (e.g., manual, motor-driven, hydraulic) may be used as well for transitioning the primary display device 914 to different viewing positions.

[0069] Referring now to FIGS. 10A and 10B, side-views of exemplary gaming terminals with adjustable primary and secondary display devices are illustrated in accordance with aspects of the present disclosure. Gaming terminal 1010 illustrated in FIG. 10A includes similar support features described in greater detail for gaming terminal 814, but can include the support features discussed for the other gaming terminals described herein. The gaming terminal 1010a includes a support cabinet 1012a, a rocker base 1060a, an elongated arc-shaped aperture 1063a extending into or through the rocker base, and a supporting projection 1065a that slidingly engages (e.g., slides and engages, slides to engage) the rocker base 1060a via aperture 1063a. Furthermore, a primary display device 1014a is mounted to the rocker base 1060a with the display device shown in a generally upright position. A seat 1090a is positioned in a first position in front of the viewing surface of the upright primary display device 1014a. Gaming terminal 1010a further includes a secondary display device 1016a that is secured to secondary display support 1017 that allows the secondary display device 1016a to be adjusted to different viewing angles. The aspect illustrated in FIG. 10A, the upright primary display device 1014a is positioned so that a top edge 1015a of the primary display device nearly abuts a bottom edge 1018a of the secondary display device 1016a.

[0070] In FIG. 10B, a gaming terminal 1010b is illustrated and provides alternate exemplary aspects of gaming terminal 1010a. In response to a predetermined event, the gaming terminal 1010b may be reconfigured so that the primary display device 1014a moves from a generally upright position as illustrated in FIG. 10A to a generally horizontal position as illustrated by primary display device 1014b in FIG. 10B. Simultaneous with the primary display device changing positions, the secondary display device 1017 may also move or pivot about secondary display support 1017 to a second downwardly angled position as illustrated by secondary display device 1016b. In addition, in certain aspects of the present disclosure the seat 1090a may move from a first position as illustrated in FIG. 10A to a second position as illustrated by seat 1090b in FIG. 10B. The movements of the primary display device 1014a, 1014b, the secondary display device 1016a, 1016b, and the seat 1090a, 1090b may all be synchronized to begin and end at approximately the same time or to occur in some sequential order. In certain embodiments, the gaming terminal may also include a user interface 1026 that pivots about a bottom edge 1080 of the primary display device 1014b from a first position to a second position corresponding to the movements of the primary display device from the generally upright position to the generally horizontal position. As described above for the other gaming terminals, and as illustrated in FIG. 10B, support cabinet 1012b can include a fixed component 1065b extending out of the side of the cabinet 1012b that engages an arc-shaped aperture feature 1063b that is integral to or attached to a rocker base 1060b. The rocker base 1060b may
be coupled to the back of the primary display device 1014b via a direct connection or through an intermediate supporting structure (e.g., plate).

[0071] It is contemplated that in certain non-limiting exemplary aspects that sensors such as those described above may be associated with a gaming terminal such as gaming terminal 1010a or 1010b. The sensor(s) (not shown) may be connected with a CPU 42 for the gaming terminal and can detect whether a player is at the gaming terminal and/or if the player is sitting or standing. Based on the assessment of if a player is sitting or standing, the gaming terminal components may be either be arranged similar to the configuration of FIG. 10A or the configuration of FIG. 10B. By way of a non-limiting example, if a player is detected in front of the gaming terminal 1010a and is further detected to be sitting in seat 1090a, the primary display device may be moved so that the primary display device 1014a is in an upright position as illustrated in FIG. 10A and the secondary display device 1016b is positioned at a downward facing angle, such as illustrated in FIG. 10B. If the player is then detected to be sitting in seat 1090a, the gaming terminal components may then move to different positions via instructions provided by the CPU 42. For example, the position of seat 1090a may move to a new position farther away from the support cabinet 1012 as illustrated by seat 1090b in FIG. 103. Furthermore, the primary display device 1014a may be repositioned to a second generally horizontal position as illustrated by primary display device 1014b in FIG. 103. In addition, a secondary display device 1016b may also be moved from a downward facing angle to a generally vertical view such as secondary display device 1016a in FIG. 10A. As generally described above, all the movements may be coordinated through the CPU 42 to occur either simultaneously or via a predetermined sequential order.

[0072] In some configurations, it is contemplated that a primary display device and/or a secondary display device may automatically change position in response to events in a wagering game, user-input preferences, operator-input preferences, save preferences, and other game-related and non-game-related occurrences. In certain aspects, it is also contemplated that a display device position can be controlled centrally by a casino. In one instance, a driving mechanism can be operated to selectively reconfigure (e.g., relocate, reorient, or a combination thereof) a display device in response to random events occurring in the wagering game so as to simulate these random events. If the wagering game were to include, for example, a bonus-game feature, the display device can be made to change from a portrait-view orientation to a landscape-view orientation, or to switch from a generally horizontal configuration to an upright configuration. Moreover, during play of the bonus-game feature, the display device can be made to pitch forward and backward, swing side-to-side, or move up-and-down.

[0073] Automation of the display device can also be employed for other gaming and non-gaming functions. According to various aspects of the disclosed concepts, the driving mechanism for repositioning the display devices can respond to signals from a button panel, joystick, or other player input device on the gaming terminal, which would allow the player to reconfigure a display device, for example, to meet the player’s particular preferences. Some examples include setting the primary display device to a particular screen height, moving the primary display device from a slant-top to an upright orientation, changing the viewing angle of the secondary display device, etc. Optionally, the driving mechanism can respond to signals from an onboard controller (e.g., CPU 42 of FIG. 2), a central controller (e.g., remotely located in the external system 46 depicted in FIG. 2), or other operator input device on the gaming terminal to allow the operator or a central server to reconfigure a primary or secondary display device, for example, to provide new/different gaming features, to implement a display-based “attract mode” to draw new players to the gaming terminal, or to meet a particular set of parameters (e.g., to create additional room for adjacent gaming devices). An additional benefit would be to allow the player/operator to adjust the display to reduce/remove glare from environmental lighting, or automatically sense both the player’s facial position, and surrounding lighting, and adjust accordingly to reduce such reflection.

[0074] In some aspects of the present disclosure, it is contemplated that special lighting, certain color schemes, or various game themes are accessible or applied when a particular primary and/or secondary display device is in one of the various positions described above. Otherwise, it is contemplated that in certain aspects the special lighting, color scheme, or game theme may not be available or applied. Furthermore, in certain aspects, the characteristics of the display area of a display device may be adjusted based a display device position. By way of non-limiting example, the brightness, contrast, or various anti-glare controls may be implemented depending on whether the display device is in an upright position, a horizontal position, or a slanted position. Sensors on the display device or the support cabinet can be used to sense various environmental conditions such as the lighting of the gaming environment.

[0075] Referring now to FIGS. 11A-11C, perspective views of exemplary banks of gaming terminals with adjustable primary and secondary display devices are illustrated in accordance with aspects of the present disclosure.

[0076] FIGS. 11A-11C illustrates an exemplary bank of gaming terminals 1110 similar to the gaming terminals described for FIGS. 5-10 and elsewhere herein. In FIG. 11A, a representative primary display device 1114 is illustrated in a generally upright position among the bank of similarly positioned gaming terminals. A representative secondary display device 1116 is coupled to a secondary support frame 1117 that supports a plurality of secondary display devices above the primary display devices in the bank of gaming terminals 1110. The secondary display devices can pivot or tilt downward and upward so that the front viewing area is more visible to a player and/or to move, for example, to a predetermined viewing position associated with a particular game state. The secondary support frame 1117 can also support representative end secondary display device 1119, which is not associated with a particular gaming terminal, but may be used to display other information related to a wagering game including information related to bonus, community, or progressive games, or information associated with an attract mode. Each of the gaming terminals in the bank of gaming terminals 1110 may also include a seat similar to representative seat 1190.

[0077] FIG. 11B illustrates the exemplary bank of gaming terminals 1110 with the primary display devices having moved from a first position with the viewing surface of the primary display device generally upright (see FIG. 11A) to a second position with the viewing surface of the primary display device generally horizontal. The movement of the pri-
mary display devices from a generally upright position to the general horizontal position can be synchronized among all the primary display devices in the bank of gaming terminals 1110 such that the primary display devices align to form a generally horizontal display surface. The generally horizontal display surface formed by the bank of gaming terminals 1110 can include a predetermined spacing between each of support cabinets 1112 such that when the primary display devices are in a fully horizontal position the group of individual primary displays gives the general appearance of one semi-continuous horizontal display surface. For example, the edge-to-edge spacing between the primary display surfaces of any two gaming terminals can be less than two inches or less than one inch. It is further contemplated that any images displayed on the primary display device forming the semi-continuous horizontal display surface can be synchronized or coordinated to present a continuous single aspect of the wagering game (e.g., a group bonus game, a community game, a progressive game) across a plurality of the primary display devices.

[0078] As illustrated in FIGS. 11A and 11B, the position of seat 1190 is initially closer to the support cabinet when the primary display device 1114 is in a generally upright position (see FIG. 11A) but then the seat 1190 moves as positioned in FIG. 11B when the primary display device 1114 is moved to the generally horizontal position. The movement of seat 1190 may be synchronized or coordinated to be in different positions depending on the position of the primary display device 1114. For example, seat 1190 can be moved horizontally to and from the primary display device in a direction generally perpendicular to the front viewing surface of the primary display device. When the primary display device 1114 is in an upright position, the seat 1190 may be positioned closer to the support cabinet 1112 and as the primary display device moves to a slant-top or horizontal position (see FIG. 11B), the seat 1190 can move horizontally and perpendicularly away from the support cabinet 1112 to maintain approximately the same horizontal distance between the seat 1190 and the bottom edge 1115 of the primary display device 1114. It is also contemplated that the seat 1190 may operate back from the support cabinet 1115 a sufficient distance to allow a player to stand up during a group bonus game (e.g., progressive game, community game, group bonus game) when the primary display devices are, for example, in the generally horizontal position. The distance can be enough so that the sitting player would have a difficult time playing (e.g., difficulty reaching the user interface or seeing the viewing surface of the display devices) the wagering game without standing up, thus encouraging the players in the bank of gaming terminals to stand up.

[0079] FIGS. 11A and 11B also illustrate the representative secondary display device 1116 pivotally or rotatably connected to the secondary support frame 1117 so that it may pivot or rotate from a generally vertical position (e.g., viewing side facing a player) to a downwardly-facing generally horizontal position (e.g., the viewing side facing the horizontally positioned primary display device). It is also contemplated that the secondary display device 1117 can be adjusted from a generally vertical position to downward-facing angled position (see FIG. 10B). The adjustment of each secondary display device between the generally vertical position to the downward-facing position can be synchronized with the other secondary display devices in the bank of gaming terminals such that all of the secondary display devices are at the same position. The movement of the secondary display device may occur simultaneously or in some sequential order. It is further contemplated that certain secondary display devices such as the end display device 1119 may not move at all or may move to a position that is opposite of the position of the other secondary display devices. For example, the end secondary display device 1119 may be in a generally vertical position while representative secondary display device 1116 may be in a generally horizontal position. In general, it is contemplated that the movement of the secondary display device is completed to position the devices at an angle that improves the player viewing experience during an individual or group bonus game. The movement of the secondary display device may also include minimizing the viewability of the secondary display device to further highlight the player viewing experience of the primary display device(s). For example, a particular game or game state may include focusing player attention on the primary display devices, and thus, the secondary display devices may be positioned with their viewing surfaces horizontal so as to minimize interference with the desired player-viewing experience.

[0080] FIG. 11C illustrates another exemplary aspect of the bank of gaming terminals 1110. Specifically, FIG. 11C illustrates the primary display devices (e.g., 1114) for the bank of gaming terminals in a generally horizontal position with the secondary display devices (e.g., 1116) in a generally vertical position. Depending on the height of the secondary display devices or the configuration of the secondary support frame 1117, a vertical orientation of the secondary display devices may provide a more desirable viewing angle when the primary display devices are generally horizontal.

[0081] According to certain aspects of the present disclosure, a gaming terminal for playing a wagering game can include an input device configured to receive a wager to play the wagering game, a support cabinet, a rocker base connected to the support cabinet, and a primary display device coupled to the rocker base. The primary display device can have an electronic graphical display screen operable to dynamically display information related to the wagering game. The primary display device and the rocker base can be configured to be movable to a plurality of different display positions relative to the support cabinet during play of the wagering game. The plurality of different display positions can be along a common arc defined by the rocker base.

[0082] It is further contemplated that the gaming terminal may include a mounting plate. The mounting plate can be fixed to the rocker base with the primary display device mounted to the mounting plate. The gaming terminal can also include the common arc being an elliptical arc. It is also contemplated that the rocker base can be connected to the support cabinet via a roller connection. The roller connection may include a plurality of rotating elements connected to one or more fixed supports extending from the support cabinet. The rocker base can also include one or more elongated arc-shaped track supports with the rotating elements engaging the one or more elongated arc-shaped track supports. The rotating elements can include one or more rollers, or the rotating elements can include one or more drive gears. The rocker base can include two elongated arc-shaped track supports.

[0083] It is further contemplated that the gaming terminal can include a locking device configured to fix the primary display device and the rocker base in one of the plurality of different display positions. In certain aspects, the gaming terminal may include a rocker base having an arc-shaped support with at least one aperture. The locking device can
include a locking pin configured to extend through the aperture. In certain aspects, the gaming terminal may include a rocker base having an arc-shaped support with the locking device configured to frictionally engage an arc-shaped support.

[0084] It is further contemplated that the plurality of different display positions for the primary display device of the gaming terminal may include positions extending from a generally upright position to a generally horizontal position. Each of the plurality of different display positions can be associated with a different game state. The different game states can include a bonus game and progressive game. The gaming terminal may also include a driving mechanism configured to automate changing the primary display device between the generally upright position and the generally horizontal position.

[0085] In certain aspects of the present disclosure, the rocker base for the display may be connected to the support cabinet via a sliding connection. The sliding connection can include an arc-shaped track at least partially defined within an upper portion of the support cabinet and an elongated arc-shaped rail connected to the rocker base. The elongated arc-shaped rail can have a curvature similar to the arc-shaped track such that the elongated arc-shaped rail slidably engages (e.g., slides and engages, slides to engage) the arc-shaped track. The sliding connection can include a pin extending from the support cabinet with the pin extending through an elongated arc-shaped aperture defined by the rocker base. The rocker base may include two or more elongated arc-shaped rails.

[0086] It is further contemplated that the gaming terminal can include a secondary display device positioned above the primary display device such that one of the plurality of different display positions for the primary display device includes a generally upright position. The primary display device in the generally upright position can abut the secondary display device. In certain aspects, a secondary display device may be positioned above the primary display device with the secondary display device being adjustable to a plurality of viewing positions. The secondary display device may be in a generally vertical viewing position in response to the primary display device being in a generally upright position. In certain aspects, the secondary display device may move from a generally downward viewing position toward a generally downward viewing position in response to the primary display device moving from a generally upright position to a generally horizontal position. It is also contemplated that the secondary display device can be in a generally vertical viewing position in response to the primary display device moving to a generally horizontal position.

[0087] It is further contemplated that the gaming terminal can include a user interface abutting a lower edge of the primary display device. An input device may be integrated into the user interface. In certain aspects, the user interface includes a flat panel that is generally horizontal in response to the primary display device being in a generally upright position. The user interface can also include a flat panel configured to tilt downwardly at an interface between the user interface and the primary display device. The flat panel may tilt downwardly from a generally horizontal position in response to the primary display device moving from a generally upright position to a generally horizontal position.

[0088] It is further contemplated that the gaming terminal includes a processing unit configured to receive player-characteristic information from at least one sensor coupled to the support cabinet. The processing unit may be configured to adjust the position of the primary display device based on the received player-characteristic information. In certain aspects of the gaming terminal, the primary display device may be operable to automatically move to a different position in response to events in the wagering game, user-input preferences, or operator-input preferences.

[0089] It is further contemplated that the gaming terminal includes an operator seat positioned on a viewing side of the primary display device. The operator seat can be configured to horizontally slide in a direction generally perpendicular to the support cabinet and the viewing side of the primary display device such that the operator seat is configured to move toward and away from the primary display device. The operator seat may slide away from the support cabinet in response to the primary display device moving from a generally upright position to a generally horizontal position.

[0090] According to certain aspects of the present disclosure, it is contemplated that a primary display device is one of a plurality of primary display devices in a bank of gaming terminals. Each gaming terminal in the bank of gaming terminals can have a primary display device mounted to a rocker base connected to a support cabinet via a roller connection or otherwise. The movement of the primary display device from a generally upright position to a general horizontal position can be synchronized with movements of other primary display devices in the bank of gaming terminals such that the primary display device and the other primary display devices align to form a generally horizontal display surface for the entire bank of gaming terminals. The generally horizontal display surface can include a predetermined spacing between each of the primary display devices such that the individual primary displays give the general appearance of one semi-continuous horizontal display surface.

[0091] It is further contemplated that the gaming terminal may include a secondary display device. The secondary display device can be one of a plurality of secondary display devices associated with the bank of gaming terminals. The secondary display can be adjustable from a generally vertical position to downward-facing angled position. The adjustment of the secondary display device between the generally vertical position to the downward-facing angled position can be synchronized with each of the other secondary display devices in the bank of gaming terminals such that all of the secondary display devices are at the same position. In certain aspects, the adjustment of the secondary display device can be further synchronized with movement of the primary display device such that the secondary display devices are in the generally vertical position in response to the primary display devices being in generally upright positions.

[0092] Each of these embodiments and obvious variations thereof is contemplated as falling within the spirit and scope of the claimed invention, which is set forth in the following claims.

What is claimed is:
1. A gaming terminal for playing a wagering game, the gaming terminal comprising:
an input device configured to receive a wager for the wagering game;
a support cabinet;
a rocker base connected to the support cabinet; and
a primary display device coupled to the rocker base, the primary display device including an electronic graphical
display screen operable to display the wagering game, the primary display device and the rocker base configured to be movable to a plurality of different display positions relative to the support cabinet, the plurality of different display positions being along a common arc defined by the rocker base.

2. The gaming terminal of claim 1, further comprising a mounting plate, the mounting plate fixed to the rocker base, the primary display device mounted to the mounting plate.

3. The gaming terminal of claim 1, wherein said common arc is an elliptical arc.

4. The gaming terminal of claim 1, wherein the rocker base is connected to the support cabinet via a roller connection.

5. The gaming terminal of claim 4, wherein the roller connection includes a plurality of rotating elements connected to one or more fixed supports extending from the support cabinet, and wherein the rocker base includes one or more elongated arc-shaped track supports, the rotating elements engaging the one or more elongated arc-shaped track supports.

6. The gaming terminal of claim 5, wherein the rotating elements include one or more rollers.

7. The gaming terminal of claim 5, wherein the rotating elements include one or more drive gears.

8. The gaming terminal of claim 5, wherein rocker base includes two elongated arc-shaped track supports.

9. The gaming terminal of claim 1, further comprising a locking device configured to fix the primary display device and the rocker base in one of the plurality of different display positions.

10. The gaming terminal of claim 9, wherein the rocker base includes an arc-shaped support having at least one aperture, the locking device including a locking pin configured to extend through the aperture.

11. The gaming terminal of claim 9, wherein the rocker base includes an arc-shaped support, the locking device configured to frictionally engage an arc-shaped support.

12. The gaming terminal of claim 1, wherein the plurality of different display positions for the primary display device includes positions extending from a generally upright position to a generally horizontal position.

13. The gaming terminal of claim 1, wherein each of the plurality of different display positions are associated with a different game state during play of the wagering game.

14. The gaming terminal of claim 12, further comprising a driving mechanism configured to automate changing the primary display device between the generally upright position and the generally horizontal position.

15. The gaming terminal of claim 1, wherein the rocker base is connected to the support cabinet via a sliding connection.

16. The gaming terminal of claim 15, wherein the sliding connection includes an arc-shaped track at least partially defined within an upper portion of the support cabinet and an elongated arc-shaped rail connected to the rocker base, the elongated arc-shaped rail having a curvature similar to the arc-shaped track such that the elongated arc-shaped rail slidingly engages the arc-shaped track.

17. The gaming terminal of claim 15, wherein the sliding connection includes a pin extending from the support cabinet, the pin extending through an elongated arc-shaped aperture defined by the rocker base.

18. The gaming terminal of claim 16, wherein the rocker base includes two elongated arc-shaped rails.

19. A gaming terminal for playing a wagering game, the gaming terminal comprising:
   an user interface including an input device for receiving a wager to play the wagering game;
   a support cabinet; a rocker base attached to the support cabinet; and
   a primary display coupled to the rocker base, the primary display including a lower edge and an electronic graphical display screen operable to display information, the user interface abutting the lower edge of the primary display, the primary display and the rocker base configured to be movable to a plurality of different display positions relative to the support cabinet during play of the wagering game, the plurality of different display positions being along a common arc defined by the rocker base.

20. The gaming terminal of claim 19, further comprising a secondary display positioned above the primary display, wherein one of the plurality of different display positions for the primary display includes a generally upright position, the primary display in the generally upright position abutting the secondary display.

21. The gaming terminal of claim 19, further comprising a secondary display positioned above the primary display, the secondary display being adjustable to a plurality of viewing positions, the secondary display being in a generally vertical viewing position in response to the primary display being in a generally upright position.

22. The gaming terminal of claim 19, further comprising a secondary display positioned above the primary display, the secondary display being adjustable to a plurality of viewing positions, the secondary display moving from a generally vertical viewing position toward a generally downward viewing position in response to the primary display moving from a generally upright position to a generally horizontal position.

23. The gaming terminal of claim 19, wherein the user interface includes a flat panel that is generally horizontal in response to the primary display being in a generally upright position.

24. The gaming terminal of claim 19, where the user interface includes a flat panel configured to tilt downwardly at an angle between the user interface and the primary display, the flat panel tilting downwardly from a generally horizontal position in response to the primary display moving from a generally upright position to a generally horizontal position.

25. The gaming terminal of claim 19, further comprising a processing unit configured to receive player-characteristic information from at least one sensor coupled to the support cabinet, the processing unit configured to adjust the position of the primary display based on the received player-characteristic information.

26. The gaming terminal of claim 19, further comprising an operator seat positioned on a viewing side of the primary display, the operator seat configured to horizontally slide in a direction generally perpendicular to the support cabinet and the viewing side of the primary display such that the operator seat is configured to move toward and away from the primary display, wherein the operator seat slides away from the support cabinet in response to the primary display moving from a generally upright position to a generally horizontal position.