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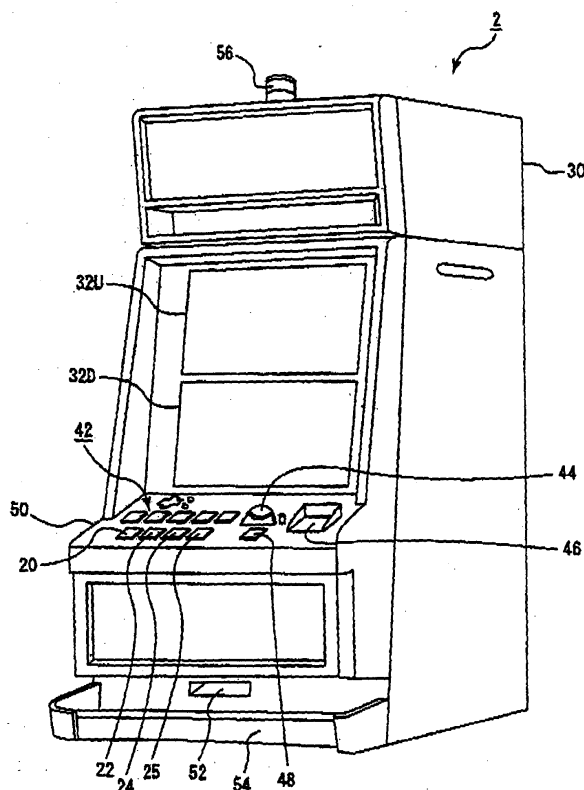
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(54) **Gaming machine**

(57) It is disclosed a gaming machine comprising: a display device; a first game controller for executing a first game in which symbols are scrolled in each of plural rows on the display device and a game result is determined corresponding to the symbol or a symbol combination stopped and displayed on the display device; a determination device for determining whether or not a predetermined condition is realized in the first game; and a second game controller for executing a second game in which the symbols are scrolled in each of plural rows on the display device when the determination device determines that the predetermined condition is realized in the first game; wherein the second game controller substitutes one or more symbols displayed while being scrolled on the display device to one or more specific symbols each of which is replaceable by any one of all kinds of the symbols; and wherein the second game controller makes a probability capable of winning in the second game higher than a probability capable of winning in the first game and makes a payout rate in the second game higher than a payout rate in the first game.

FIG.1



Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a gaming machine in which a first game is executed in a normal state and a second game is executed under a rule different from that of the first game if a specific condition is realized.

2. Description of Related Art

[0002] Conventionally, a video-slot machine and a slot machine (hereinafter, such machines are sometimes called as slot machine and the like) are generally well-known and favored as gaming machines in which winning states are determined based on symbol combinations and coins such as medals are paid out according to the symbol combination. In the slot machine and the like, when a start lever is operated after coins are inserted, a so-called first game is conducted. The first game is a variable displaying game, in which a plurality of reels (for example, three reels), on each outer periphery of which a plural kinds of symbols are arranged, are rotated and symbols are scrolled, and in a case that the symbol combination corresponds to a predetermined winning state when the reels are stopped, coins a number of which corresponds to the winning state are paid out. As a winning state in the first game, for example, there exist a so-called big prize that coins more than 1000 are paid out and a so-called small prize that coins less than 1000 are paid out.

[0003] And it will exist a gaming machine, as disclosed in Unexamined Japanese Publication No. 11-244453, in which, as the winning state in the first game, there exists a so-called "obtainment of a second game" in which the second game can be done other than the "big prize" and "small prize", and if the winning state corresponds to the "obtainment of a second game", the second game can be conducted without newly inserting coins. Such second game is done under a rule different from that of the first game, and is, for example, generally called as bonus game or free game. In most cases, the second game becomes beneficial for a player, thus many coins can be obtained according to a result of the second game.

[0004] However, the second game in the conventional gaming machine scarcely concerns with the first game, therefore it is not enough to raise interest for games so that the player is not tired.

SUMMARY OF THE INVENTION

[0005] The present invention has been done to dissolve the above problems and has an object to provide a gaming machine in which interest for games can be

improved.

[0006] In order to accomplish the above object, according to one aspect of the present invention, it is provided a gaming machine comprising:

a display device;

a first game controller for executing a first game in which symbols are scrolled in each of plural rows on the display device and a game result is determined corresponding to the symbol or a symbol combination stopped and displayed on the display device;

a determination device for determining whether or not a predetermined condition is realized in the first game; and

a second game controller for executing a second game in which the symbols are scrolled in each of plural rows on the display device when the determination device determines that the predetermined condition is realized in the first game;

wherein the second game controller substitutes one or more symbols displayed while being scrolled on the display device to one or more specific symbols each of which is replaceable by any one of all kinds of the symbols; and

wherein the second game controller makes a probability capable of winning in the second game higher than a probability capable of winning in the first game and makes a payout rate in the second game higher than a payout rate in the first game.

[0007] According to the present invention, a variable display game similar to the first game of the same kind is conducted as the second game under a condition beneficial for a player that one or more specific symbols appear and the payout rate becomes high. Thereby, connection between the first game and the second game can be raised and interest for games can be enhanced. Therefore, when the second game is executed, expectation and excitement of a player can be raised. And since it is determined on a basis of a result of the first game whether or not the second game conducted under a more beneficial condition for the player is executed, interest and concern for the first game can be raised, thus interest for games can be improved.

[0008] Here, in a case that the number of specific symbol is determined based on the symbol or the symbol combination stopped and displayed in the first game by the second game controller, since the number of the specific symbol utilized in the second game is affected by the result in the first game, connection between the first game and the second game can be improved. Thereby, interest and concern for both the first game and the second game can be increasingly raised and interest for whole game can be improved.

[0009] According to the present invention, it can be provided the gaming machine through which interest of the player for games can be improved.

[0010] The above and further objects and novel features of the invention will more fully appear from the following detailed description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for purpose of illustration only and not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings, which are incorporated in and constitute a part of this specification illustrate embodiments of the invention and, together with the description, serve to explain the objects, advantages and principles of the invention.

[0012] In the drawings,

Fig. 1 is a perspective view schematically showing one example of a gaming machine according to the present invention,

Fig. 2 is a block diagram schematically showing an electrical construction of the gaming machine shown in Fig. 1,

Fig. 3 is a block diagram showing a display control device provided in the gaming machine shown in Fig. 1,

Fig. 4 is a flowchart showing a sub-routine for conducting a first game, the sub-routine being executed in a main control circuit,

Fig. 5 is a flowchart showing a sub-routine for conducting a winning process executed in the main control circuit,

Fig. 6 is a flowchart showing a sub-routine for conducting a second game executed in the main control circuit,

Fig. 7 is an explanatory view showing one example of a WILD symbol number determination table which is utilized in S110 in the sub-routine shown in Fig. 6,

Fig. 8 is an explanatory views schematically showing images displayed on an upper display device and a lower display device in the gaming machine,

Fig. 9 is another explanatory view showing one example of a WILD symbol number determination table which is utilized in S110 in the sub-routine shown in Fig. 6,

Fig. 10 is further another explanatory view showing one example of a WILD symbol number determination table which is utilized in S110 in the sub-routine shown in Fig. 6,

Fig. 11 is a perspective view of a slot machine as another gaming machine according to the present invention,

Fig. 12 is a longitudinal sectional view of a lower liquid crystal display and a reel provided in the slot machine shown in Fig. 11,

Fig. 13 an exploded perspective view of the lower liquid crystal display provided in the slot machine

shown in Fig. 11,

Fig. 14 is an explanatory view schematically showing symbol examples formed on an outer periphery of the reel,

Fig. 15 is a block diagram schematically showing an electrical construction of the slot machine shown in Fig. 11 and

Fig. 16 is an explanatory view schematically showing a progressive game system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] An embodiment of the present invention will be described with reference to the drawings.

[0014] In the embodiment described hereinafter, it will be described a video-slot machine in which the present invention is adopted, the video-slot machine being embodied as the preferred embodiment of the gaming machine according to the present invention.

[0015] Fig. 1 is a perspective view schematically showing one example of a gaming machine according to the present invention.

[0016] A gaming machine 2 has a cabinet 30 in central front of which it is formed a plane inclined somewhat in a rearward direction against a vertical direction. On the inclined plane, two display devices 32 (upper display device 32U and lower display device 32D) are formed so that two display devices are arranged in an up-and-down relation.

[0017] Here, in the gaming machine of the present invention, the number of the display devices are not especially limited, thus it is not necessary to arrange two display devices (upper display device 32U and lower display device 32D), as in the gaming machine 2.

[0018] On the display devices 32 (upper display device 32U and lower display device 32D), images indicating the first game or the second game are displayed and both the first game and the second game are progressed on the display devices 32. In variable display games conducted as the first game and the second game, a plurality of symbols or marks to conduct a game similar to a slot game done in the slot machine and pay lines are displayed on the upper display device 32U and various effect images are displayed on the lower display device 32D.

[0019] Here, in the embodiment of the present invention, a plurality of symbols and marks to conduct a game similar to a slot game done in the slot machine and the pay lines may be displayed on the lower display device 32D and various effect images may be displayed on the upper display device 32U.

[0020] The above symbols and marks are displayed on the upper display device 32U so as to be described on the outer periphery of reels which are displayed as images. And when the game is started, the symbols are variably moved so that they are scrolled in a predetermined direction and are stopped and displayed at a pre-

determined timing.

[0021] Further, when a 1-BET switch 20, a 3-BET switch 22 or a maximum BET switch 24 mentioned later is pressed, the pay lines are activated according to the BET switch which is pressed. Here, the present invention can be adopted to, for example, a video-slot machine with 5 reels and 9 pay lines.

[0022] When the symbol combination stopped on the activated pay line becomes, for example, a winning state corresponding to the "big prize" or the "small prize", coins a number of which corresponds to the winning state are paid out. And when the symbol combination stopped on the activated pay line becomes a winning state corresponding to the "obtainment of the second game", images representing the second game are displayed on the display device 32 and the second game is progressed on the display device 32. Here, as for the second game, it will be described in detail hereinafter.

[0023] Hereinafter, it will be explained a case that a specific condition based on which the second game is executed in the gaming machine 2 corresponds to that the symbol combination stopped on the activated pay line becomes the winning state of the "obtainment of the second game". Here, as the above specific condition, for example, it can be indicated a case that a specific symbol (for example, the "JOKER" symbol) is stopped and displayed on the display device 32, a case that a specific symbol combination (for example, a specific symbol combination that four "ACE" symbols are aligned along the pay line) is realized in a predetermined number of times (for example, five times), or a case that a specific symbol combination (for example, five "7" symbols are aligned on the pay line) is realized. Of course, the specific condition is not limited to the above cases and can be voluntarily set.

[0024] At a lower position of the lower display device 32D, a base portion 50 projected horizontally is formed, and on the upper left side of the base portion 50, there are provided the 1-BET switch 20 to bet one coin among coins already inserted, the 3-BET switch 22 to bet three coins among coins already inserted and the maximum BET switch 24 to bet the maximum number of coins for one game among coins already inserted. Based on that the BET switch 20, 22 or 24 is pressed, the pay lines are activated according to the pressed BET switch. And on the upper left side of the base portion 50, a spin switch 25 to start the game is arranged. The player inserts coins through a coin insertion slot 44 mentioned later and presses one of the BET switches 20, 22 and 24, thereby a predetermined number of coins are betted. Thereafter, the player presses the spin switch 25, thereby the game is started.

[0025] On the rear side of the BET switches 20, 22, 24 arranged on the upper left side of the base portion 50, an operation portion 42 constructing from a plurality of push buttons and a cross key is provided. This operation portion 42 is operated when the second game is conducted, as mentioned hereinafter. And on the upper

right side of the base portion 50, a coin insertion slot 44 and a bill insertion slot 46 are provided. Coins or bills are inserted in the coin insertion slot 44 or bill insertion slot 44, thereby games can be executed.

[0026] And a payout switch 48 is arranged near the coin insertion slot 44 and when the payout switch 48 is pressed, coins inserted in the gaming machine 2 are paid out through a coin payout opening 52 formed at the lower front position of the cabinet 30. Coins paid out are stored in a coin receiving tray 54.

[0027] Further, on the upper part of the cabinet 30, it is provided an information lamp 56 which is turned on or blinked when abnormality of the gaming machine 2 is detected and the player calls a shop keeper in a game arcade, and is utilized to inform the shop keeper of abnormality in the gaming machine 2.

[0028] Fig. 2 is a block diagram schematically showing an electrical construction of the gaming machine shown in Fig. 1.

[0029] The above mentioned 1-BET switch 20, 3-BET switch 22 and maximum BET switch 24 are connected to an interface circuit group 62 of the main control circuit 60, and the interface circuit group 62 is connected to a input / output bus 64. Each of the switches produces a predetermined signal when pressed and outputs such signal to the input / output bus 64.

[0030] And the operation portion 42 having a plurality of push buttons and the cross key and the spin switch 25 for starting the game are connected to the interface circuit group 62 of the main control circuit 60. Each of the operation portion 42 and the spin switch 25 produces a predetermined signal when pressed respectively and outputs such signal to the input / output bus 64.

[0031] The input / output bus 64 is constructed so as to be able to input and output data signals or address signals. Here, in the embodiment, although a CPU 66 conducts transmission and reception of signals with an external through the bus, the CPU 66 may conduct transmission and reception of signals through ports.

[0032] A bill validator 40 and a coin detection sensor 58 are connected to the above mentioned interface group 62. The bill validator 40 produces a signal based on kind and number of bill when a bill is inserted therein and transmits such signal to the interface circuit group 62. And the coin detection sensor 58 produces signal based on kind and number of coin when coins are inserted in the coin insertion slot 44 and transmits such signal to the interface circuit group 62.

[0033] The payout switch 48 is connected to the above mentioned interface circuit group 62 and when the player presses the payout switch 48 a predetermined signal is output to the input / output bus 64. Based on this signal, coins inserted are paid out to the coin payout opening 52 through a payout device 82 mentioned later.

[0034] And a ROM 68 and a RAM 70 are connected to the above mentioned input / output bus 64. The ROM 68 stores control program for wholly controlling proce-

dures done by the system of the gaming machine 2. Further, the ROM 68 stores initial data for executing the control program and a part of program for conducting display control of the display device 32 and the like. The RAM 70 temporarily stores the above program and data, flags as calculation result and process result and values of variables.

[0035] And a hard-disc drive 74 is also connected to the input / output bus 64, and programs for conducting games and various data such as image data are stored in the hard-disc drive 74. Here, in the present invention, instead of the hard-disc drive 74, for example, it may be utilized a non-volatile memory such as a flash memory which has comparatively large memory capacity, or a volatile memory may be utilized.

[0036] Further, a random number generator 78 for generating random numbers is connected to the input / output bus 64. When a command to generate random numbers is input to the random number generator 78 from the CPU 66, the random number generator 78 generates random numbers within a predetermined range and outputs a signal indicating the value of random number to the input / output bus 64. And the CPU 66 progresses the game according to the generated random number. Further, such random number is stored in the RAM 70 as the data indicating a lottery result. Here, the random number generator 78 may be realized, for example, by software through the program stored in the ROM 68 and the RAM 70.

[0037] Further, an interface circuit group 72 is connected to the input / output bus 64. A speaker 80, an information lamp 56 and a payout device 82 are connected to the interface circuit group 72 and the interface circuit group 72 provides drive signals and drive power to control each of the above mentioned devices, based on a result of calculation process done in the CPU 66. And the information lamp 56 is turned on or blinked when abnormality of the gaming machine 2 is detected and the player calls the shop keeper of the game arcade, thereby the information lamp 56 informs the shop keeper of occurrence of abnormality in the gaming machine 2. As the information lamp 56, for example, LED, lamp or fluorescent lamp may be utilized.

[0038] Further, a display control device 200 is also connected to the interface circuit group 72 and the display control device 200 produces a drive signal to drive the display device 32 (upper display device 32U and lower display device 32D) connected to the display control device 200, based on an image instruction signal output from the main control circuit 60.

[0039] Fig. 3 is a block diagram showing a construction of the display control device 200 provided in the gaming machine 2 shown in Fig. 1.

[0040] An interface circuit 202 is connected to an input / output bus 204 and an image display command output from the above mentioned main control circuit 60 is input to the input / output bus 204 through the interface circuit 202. Data signal and address signal are input to and out-

put from a CPU 206 through the input / output bus 204. In the embodiment, although the CPU 206 conducts transmission and reception of signals with an external through the bus, the CPU 206 may conduct transmission and reception of signals through ports.

[0041] To the above mentioned input / output bus 204, a ROM 208 and a RAM 210 are also connected. The ROM 208 stores display control program to produce a drive signal provided to the display device 32 (upper display device 32U and lower display device 32D), based on image display command output from the main control circuit 60. On the other hand, the RAM 210 stores flags used in the display control program and values of variables.

[0042] Further, an image data processor (abbreviated as VDP hereinafter) 212 is also connected to the input / output bus 204. The VDP 212 includes a splite circuit, a screen circuit and a palette circuit, thus the VDP 212 is a processing device capable of conducting various processes to display images on the display device 32 (upper display device 32U and lower display device 32D).

[0043] And to the VDP 212, it is connected a video RAM 214 for storing various image data corresponding to the image display command output from the main control circuit 60 and an image data ROM 216 for storing various image data necessary to conduct the first game and the second game. Further, to the VDP 212, it is connected a drive circuit 218 for producing a drive signal to drive the display device 32 (upper display device 32U and lower display device 32D).

[0044] The above mentioned CPU 206 reads the display control program stored in the ROM 208 and executes it, and stores in the video RAM 214 the image data displayed on the display device 32 (upper display device 32U and lower display device 32D) corresponding to the image display command output from the main control circuit 60. And the image data stored in the video RAM 214 are output to the display device 32 (upper display device 32U and lower display device 32D) through the drive circuit 218. Of course, the electrical construction of the gaming machine 2 according to the present invention is not limited to examples shown in Figs. 3 and 4.

[0045] A sub-routine executed by the main control circuit 60 to control the gaming machine 2 is shown in Figs. 4 to 6. Hereinafter, explanation will be done supposed that the gaming machine 2 is operated beforehand and variables used in the mentioned CPU 66 is initialized to a predetermined values and the gaming machine 2 normally operates.

[0046] Fig. 4 is a flowchart showing a sub-routine for conducting the first game process executed in the main control circuit 60.

[0047] This sub-routine is a sub-routine called out and executed at a predetermined timing by a main routine which is executed beforehand.

[0048] At first, it is determined whether or not coins are betted (step S11). In this process, the CPU 66 de-

termines whether or not a signal indicating that the player conducts BET process is received. If it is determined that such signal is received, the procedure shifts to step S12, and on the other hand, if it is determined that such signal is not received, the sub-routine is terminated.

[0049] The above BET process may be automatically done when the player inserts coins, and may be first done when the player presses any one of the 1-BET switch 20, the 3-BET switch 22 and the maximum BET switch 24.

[0050] Next, it is determined whether or not the spin switch 25 to instruct game start is pressed (step S12). In this process, the CPU 66 determines whether or not a signal indicating that the player presses the spin switch 25 is received. If it is determined that such signal is received, the procedure shifts to step S13, and on the other hand, if it is determined that such signal is not received, the process in step S12 is executed again.

[0051] Next, an internal lottery process is conducted (step S13). In this process, the CPU 66 produces a command indicating that random numbers should be generated by the random number generator 78 and the random number generator 78 generates random numbers based on the above command. And the CPU 66 stores in a predetermined area in the RAM 70 internal lottery data determined based on the random number obtained and a probability table set in the RAM 70. Here, the internal lottery data include data indicating a symbol combination mode which can be stopped and displayed if the "big prize" or "small prize" is won. And hereinafter explanation will be done supposed that it is set in the ROM 70 the lottery table according to which probability to win the "big prize" is 1/1024, probability to win the "small prize" is 3/1024 and probability to lose prize (including "obtainment of the second game") is 1020/1024.

[0052] Here, in the present invention, random numbers may be produced according to the software by the CPU 66, the program stored in the ROM 68 and the RAM 70 (for example, by renewing a value with a constant frequency or irregular frequency) and the internal lottery data may be stored in the predetermined area in the RAM 70 based on the obtained random number. In this case, the random number generator 78 can be omitted.

[0053] Next, rotation and display process of the reels is done (step S14). In this process, the CPU 66 transmits signals to the display control device 200 so that the game similar to the slot machine is started on the upper display device 32U, that is, the reels displayed on the upper display device 32U as images are rotated. In these signals, symbol image data to determine the symbol combination when stopped based on the above internal lottery data are included. Further, the display control device 200 displays the reels so that the reels are rotated on the upper display device 32U, based on the above signals, thereby variable display of the plural symbols is started. And while the first game is executed, the display control device 200 also executes display process of various effect images on the lower display

device 32D, based on the signals transmitted from the CPU 66.

[0054] Next, stop display process of the reels is done (step S15). In this process, the CPU 66 transmits the signal to the display control device 200 so that the game similar to the slot machine is terminated on the upper display device 32U, that is, rotation of the reels displayed on the upper display device 32U as images is stopped. And the display control device 200 conducts variable display of the plural symbols for a predetermined time, thereafter stops the symbols.

[0055] Next, winning process is conducted (step S16). In this process, the CPU 66 executes the winning process based on the symbols stopped or the symbol combination, or the internal lottery data. This winning process will be described hereinafter. After the process in the step S16 is terminated, the sub-routine is terminated.

[0056] Fig. 5 is a flowchart showing a sub-routine for conducting the winning process executed by the main control circuit 60.

[0057] This sub-routine is a sub-routine which called out in step S16 in the above mentioned sub-routine shown in Fig. 4, and is executed.

[0058] At first, it is determined whether or not the symbols or the symbol combination stopped and displayed is the winning state corresponding to the "obtainment of the second game" (step S21). In this process, the CPU 66 determines whether or not the symbols or the symbol combination stopped and displayed in step S15 of the sub-routine shown in Fig. 4 indicates a case that the procedure shifts to the second game.

[0059] If it is determined that the symbols or the symbol combination indicates the case that the procedure shifts to the second game, the CPU 66 executes the second game process (step S22). In the second game, variable display of the symbols substantially similar to game contents of the first game is done. At that time, the second game can be done without newly inserting coins and a payout rate of game worth (coins) is set higher than that of the first game. Here, the second game may be executed when coins are inserted. The second game will be explained in detail hereinafter.

[0060] Here, the above payout rate is defined as the expectation value of the game worth (coins) which is paid out per a predetermined number of games (for example, 100 games). This payout rate can be, for example, calculated based on that the game worth (coins) paid out is measured every 100 games and the average value of the measured values is obtained.

[0061] In step S21, if it is determined that the symbols or the symbol combination stopped and displayed does not indicate the case that the procedure shifts to the second game, it is continuously determined whether or not the symbols or the symbol combination is the winning state of the prize (the state that the big prize or the small prize is won)(step S23). And if it is determined that the symbols or the symbol combination stopped and dis-

played is the winning state of the prize, the CPU 66 drives the payout device 82. That is to say, the CPU 66 drives the payout device 82 so that coins the number of which corresponds to the winning state are paid out to the coin receiving tray 54 through the coin payout opening 52 (step S24), for example so that 1000 coins are paid out if the winning state is the big prize and 500 coins are paid out if the winning state is the small prize. In step S23, if it is determined that the symbols or the symbol combination is not the winning state of the prize, or if the process in step S22 or step S24 is executed, the sub-routine is terminated. When the sub-routines shown in Figs. 4 and 5 are executed, the main control circuit 60 functions as the first game controller.

[0062] Fig. 6 is a flowchart showing a sub-routine for conducting the second game process executed by the main control circuit 60. This sub-routine is a sub-routine called out and executed in step S22 in the sub-routine shown in Fig. 5.

[0063] At first, the CPU 66 determines the number of the symbols each of which is substituted to a WILD symbol as a specific symbol among the plural symbols displayed while the variable display game as the second game is conducted (step S110). This WILD symbol can be replaced by each of all kinds of symbols displayed in the second game.

[0064] For example, in a case that the winning state of the big prize is obtained if five "7" symbols are aligned on the pay line, when five symbols of the WILD symbol (s) and the "7" symbol (s) in total are aligned on the pay line, the winning state of the big prize is realized.

[0065] And in a case that the winning state of the small prize is obtained if five "3" symbols are aligned on the pay line, when five symbols of the WILD symbol (s) and the "3" symbol (s) in total are aligned on the pay line, the winning state of the small prize is realized.

[0066] Here, it is not necessary that the above specific symbol can be replaced by each of all kinds of symbols displayed in the second game, and it is enough that the specific symbol can be replaced by plural kinds of the symbols.

[0067] The process in step S110 is, for example, done based on a WILD symbol number determination table shown in Fig. 7.

[0068] Fig. 7 is an explanatory view showing one example of the WILD symbol number determination table which is utilized in step S110 of the sub-routine shown in Fig. 6.

[0069] In the WILD symbol number determination table, "symbol combination" in the most left column indicates the symbol combination stopped and displayed in the first game. And "WILD symbol number" in the center column of the table indicates the number of WILD symbol which is replaceable by the symbol displayed in the second game among a plurality of symbols. And "winning probability" in the most right column indicates kinds of the probability tables set in the RAM 70 in the process of step S110.

[0070] For example, if the "symbol combination" is "Ace", the WILD symbol number becomes "3". At that time, it is set in the RAM 70 the probability table, in which the probability that the "big prize" is won is 3/512, the probability that the "small prize" is won is 9/512 and the probability that the winning state becomes the "loss of winning" is 500/512.

[0071] And if the "symbol combination" is "Jack" (other symbol combination), the WILD symbol number becomes "1". At that time, it is set the probability table, in which the probability that the "big prize" is won is 1/512, the probability that the "small prize" is won is 3/512 and the probability that the winning state becomes the "loss of winning" is 508/512.

[0072] Here, in the probability table shown in Fig. 7 the winning probability (the probability of the "big prize" and the probability of the "small prize") is made higher than the winning probability in the first game.

[0073] After the process in step S110 is executed, it is continuously determined whether or not the spin switch 25 to instruct game start is pressed (step S112). In this process, the CPU 66 determines whether or not a signal indicating that the spin switch 25 is pressed by the player is received. If it is determined that such signal is received, the procedure shifts to S113, and on the other hand, if it is determined that such signal is not received, the process in step S112 is executed again.

[0074] Next, the internal lottery process is conducted (step S113). In this process, the CPU 66 transmits a command to generate the random numbers to the random number generator 78 and the random number generator 78 which receives the above command generates the random numbers. Further, the CPU 66 stores in the predetermined area in the RAM 70 the internal lottery data calculated based on the obtained random number and the probability table set in the RAM 70 through the above process in step S110. Here, the internal lottery data include the data indicating the symbol combination which can be stopped and displayed based on that the "big prize" or the "small prize" is won.

[0075] Next, WILD symbol conversion process is conducted (step S120). In this step S120, the CPU 66 conducts conversion process in which the WILD symbol is substituted to any one of plural symbols displayed so as to be described on each outer periphery of the reels, based on the WILD symbol number determined in step S110. Concerning with that the WILD symbol is substituted to which symbol among plural symbols displayed on each of outer periphery of the reels, for example, such symbol may be determined based on the random number generated by the random number generator 78. Here, it is not adopted the manner that the symbol is substituted to the specific symbol (WILD symbol) as in the embodiment, but it may be adopted the manner that the symbol is retained as it is and function as the specific symbol is given to the symbol (that is, function that the symbol can be replaced by plural kinds of symbols).

[0076] Next, rotation process of the reels is done (step

S114). In this rotation process, the CPU 66 transmits a signal to the display control device 200 so that the game like the slot machine is started on the upper display device 32U, that is, the reels displayed as images on the upper display device 32U are rotated. Such signal includes the symbol image data for determining the symbol combination when stopped and displayed based on the above internal lottery data. Based on the above signal, the display control device 200 controls the upper display device 32U so that the reels are rotated on the upper display device 32U, thereby variable display of plural symbols is started. Further, while the second game is executed, the display control device 200 also conducts the process in which various effect images are displayed on the lower display device 32D based on the signal transmitted from the CPU 66.

[0077] Next, stop display process of the reels is conducted (step S115). In this process, the CPU 66 transmits a signal to the display control device 200 so that the game like the slot machine is terminated, that is, rotation of the reels displayed as images on the upper display device is stopped. And the display control device 200 conducts variable display of plural symbols for a predetermined time, thereafter stops and displays plural symbols.

[0078] After the process in step S115 is executed, the CPU 66 determines whether or not the stopped and displayed symbols or the symbol combination corresponds to the winning state that the prize (big prize or small prize) is won (step S116). And if it is determined that the stopped and displayed symbols or the symbol combination corresponds to the winning state that the prize is won, the CPU 66 drives the payout device 82 so that coins the number of which corresponds to the winning state are paid out to the coin receiving tray 54 through the coin payout opening 52 (step S117), for example so that 1000 coins are paid out if the winning state is the big prize and 500 coins are paid out if the winning state is the small prize. In step S116, if it is determined that the symbols or the symbol combination is not the winning state of the prize, the sub-routine is terminated. Here, when the sub-routine shown in Fig. 6 is executed, the main control circuit 60 functions as the second game controller.

[0079] Figs. 8 (a) ~ (d) are explanatory views schematically showing images displayed on the upper display device 32U and the lower display device 32D when the sub-routines shown in Figs. 4 ~ 6 are executed.

[0080] The images shown in Fig. 8 (a) show an example of images displayed on the display device 32 right after the first game is terminated. On the upper display device 32U, the image showing a game like the slot machine having five (5) reels and nine (9) pay lines is displayed. In such image, five (5) "ACE" symbols are stopped and displayed on the central pay line. And on the lower display device 32D, the effect image is displayed.

[0081] Thereafter, when the second game is started,

images shown in Fig. 8 (b) are displayed.

[0082] These images show an example of images displayed on the display device 32 right after the second game is terminated, and become substantially as same as those shown in Fig. 8 (a) which is displayed right after the first game is terminated. On the upper display device 32U, the image showing a game like the slot machine having five (5) reels and nine (9) pay lines is displayed. In such image, three WILD symbols and two "7" symbols are displayed. As mentioned in the above, since each of the WILD symbols can be replaced by each of all kinds of symbols, the symbol combination of these WILD symbols and the "7" symbols constructs the winning state of the "big prize".

[0083] And the effect image displayed on the lower display device 32D includes the image indicating while the second game called "bonus game" is executed and the image indicating that 1000 coins are paid out based on that the "big prize" is won.

[0084] The images shown in Fig. 8 (c) show an example of images displayed on the display device 32 right after the first game is terminated. On the upper display device 32U, the image showing a game like the slot machine having five (5) reels and nine (9) pay lines is displayed. In such image, five (5) "JACK" symbols are stopped and displayed on the central pay line. And on the lower display device 32D, the effect image is displayed.

[0085] Thereafter, when the second game is started, the images shown in Fig. 8 (d) is displayed.

[0086] These images show another example of images displayed on the display device 32 right after the second game is terminated, and become substantially as same as those shown in Fig. 8 (c) which is displayed right after the first game is terminated. On the upper display device 32U, the image showing a game like the slot machine having five (5) reels and nine (9) pay lines is displayed. In such image, one WILD symbol and four "3" symbols are displayed. As mentioned in the above, since each of the WILD symbols can be replaced by each of all kinds of symbols, the symbol combination of the WILD symbols and the "3" symbols constructs the winning state of the "small prize".

[0087] And the effect image displayed on the lower display device 32D includes the image indicating while the second game called "bonus game" is executed and the image indicating that 500 coins are paid out based on that the "small prize" is won.

[0088] As mentioned, according to the gaming machine 2, the variable display game similar to the first game is conducted in the second game, and the WILD symbol (specific symbol) appears, thus the payout rate becomes higher since the probability winning the "big prize" and the "small prize" becomes high, as a result, the player can get a beneficial condition. Therefore, connection between the first game and the second game can be enhanced and interest for games can be raised, thus expectation and excitement of the player can be

raised. And since it is determined whether or not the second game is executed, the second game being done under a more beneficial condition according to the result in the first game, interest and connection for the first game can be raised, therefore interest for games can be improved.

[0089] And the number of symbol which is substituted to the WILD symbol (specific symbol) is determined corresponding to the symbols or symbol combination stopped and displayed in the first game, thereby connection between the first game and the second game can be improved, and interest and connection for the first game and the second game can be synergistically raised and interest for whole game can be improved.

[0090] In the gaming machine 2 mentioned in the above, although the kind of the specific symbol substituted in the second game is determined based on the symbol combination stopped and displayed in the first game, the number of the specific symbol may be determined corresponding to the symbols stopped and displayed in the first game except for the symbol combination stopped and displayed, in the present invention. For example, if the specific symbol is included in any of the plural symbols stopped and displayed in the first game, two symbols are substituted to the specific symbols, and if the specific symbol is not included in any of the plural symbols stopped and displayed in the first game, one symbol is substituted to the specific symbol.

[0091] Further, in the present invention, it is not necessary to determine the number of the specific symbol substituted in the second game corresponding to only the symbols or the symbol combination stopped and displayed in the first game.

[0092] In the present invention, it may be determined the number of the specific symbol substituted in the second game corresponding to the lottery result obtained by the lottery done when the number of the specific symbol is determined in the second game and the symbols or the symbol combination stopped and displayed in the first game. In this case, the lottery is conducted in step S110 (WILD symbol number determination process) shown in Fig. 6 while referring the WILD symbol number determination table shown in Fig. 9, and the number of the WILD symbol substituted in the second game can be determined corresponding to the lottery result and the symbols or the symbol combination stopped and displayed in the first game.

[0093] Fig. 9 is an explanatory view schematically showing another example of the WILD symbol number determination table which is utilized in step S110 of the sub-routine shown in Fig. 6.

[0094] In the WILD symbol number determination table, the "symbol combination" in the most left column indicates the symbol combination stopped and displayed in the first game. In the center column of the table, the "lottery result" indicates a random number range extracted in the lottery. Here, one random number is extracted in a random number range of 0 ~ 63 in the above

lottery.

[0095] For example, in a case that the "symbol combination" is "ACE" and the lottery result is "1", the WILD symbol number is "3". And the "symbol combination" is "JACK" (other symbol combination) and the lottery result is "47", the WILD symbol number is "2".

[0096] Here, although not shown in Fig. 9, the probability table corresponding to the WILD symbol number determined in S110 is set in the RAM 70. Further, in the probability table set in the RAM 70 during the second game, the probability for winning prizes (the probability for winning the "big prize" and the probability for winning the "small prize") is made higher than that in the first game.

[0097] As mentioned in the above, the WILD symbol number, the WILD symbol being substituted in the second game, is not determined corresponding to only the symbols or the symbol combination stopped and displayed in the first game, but is determined corresponding to both the symbols or the symbol combination and the lottery result obtained by the lottery done thereafter. Thereby, determination of the WILD symbol number, the WILD symbol being substituted, can be further variegated, as a result, interest for games can be improved.

[0098] And in the present invention, corresponding to both the symbols or the symbol combination stopped and displayed in the first game and the game worth (coins) betted in the first game, the specific symbol (WILD symbol) number, the specific symbol being substituted in the second game, may be determined.

[0099] In this case, in step S110 of the sub-routine shown in Fig. 6, a WILD symbol number determination table shown in Fig. 10 is referred and the WILD symbol number may be determined corresponding to the symbols or the symbol combination stopped and displayed in the first game and the game worth (coins) betted in the first game.

[0100] Fig. 10 is further another explanatory view showing one example of a WILD symbol number determination table which is utilized in S110 in the sub-routine shown in Fig. 6.

[0101] In the WILD symbol number determination table, the "symbol combination" in the most left column indicates the symbol combination stopped and displayed in the first game. In the center column of the table, the "bet number in the first game" indicates a range of the game worth (coins) betted in the first game. Here, the game worth (coins) in the range of 1 ~ 45 can be betted. And the "bet number" in Fig. 10 indicates a total bet number betted in the first game.

[0102] For example, in a case that the "symbol combination" is "ACE" and the "bet number in the first game" is "10", the WILD symbol number is "3". And in a case that the "symbol combination" is "JACK" (other symbol combination) and the "bet number in the first game" is "25", the WILD symbol number is "2".

[0103] Here, although not shown in Fig. 10, the probability table corresponding to the WILD symbol number

determined in S110 is set in the RAM 70. Further, in the probability table set in the RAM 70 during the second game, the probability for winning prizes (the probability for winning the "big prize" and the probability for winning the "small prize") is made higher than that in the first game.

[0104] As mentioned in the above, the WILD symbol number, the WILD symbol being substituted in the second game, is not determined corresponding to only the symbols or the symbol combination stopped and displayed in the first game, but is determined corresponding to both the symbols or the symbol combination and the number of game worth (coins) betted in the first game. Thereby, determination of the WILD symbol number, the WILD symbol being substituted, can be further variegated. And the player can change the number of the WILD symbol substituted in the second game according to his or her own intention, by increasing or decreasing the game worth (coins) betted in the first game, thereby strategy can be given to the second game.

[0105] Further, in the present invention, the number of the specific symbol substituted in the second game may be determined corresponding to the number of the specific symbol stopped and displayed in the first game.

[0106] For example, in a case that the number of the specific symbol "7" stopped and displayed in the first game is "3", the number of the specific symbol substituted in the second game may be "3", and in a case that the number of the specific symbol "7" stopped and displayed in the first game is "5", the number of the specific symbol substituted in the second game may be "5". According to this, connection between the first game and the second game can be improved, thereby interest for games can be further raised.

[0107] In the gaming machine of the present invention, the timing at which the symbol is substituted in the specific symbol during variable display game conducted as the second game, is not especially limited. For example, such timing may be a time that the symbols are stopped before variable display of a plurality of symbols is done or a time that the symbols are stopped and displayed after variable display is started.

[0108] And in the gaming machine 2, although it is explained a case that images indicating the second game are displayed over the upper display device 32U and the lower display device 32D, images indicating the second game may be displayed on one of the upper display device 32U and the lower display device 32D in the gaming machine of the present invention. Further, the gaming machine may be constructed so that images indicating the second game is displayed on each of the upper display device 32U and the lower display device 32D and two second games can be simultaneously conducted.

[0109] Further, the present invention may be adopted to the slot machine mentioned hereinafter.

[0110] Fig. 11 is a perspective view of a slot machine as another gaming machine according to the present invention.

[0111] In Fig. 11, the slot machine 301 has a cabinet 302 constructing a whole of the slot machine 301. At a front upper part of the cabinet 302 an upper liquid crystal display 303 is arranged, and at a front central part of the cabinet 302 a lower liquid crystal display 304 is arranged. Here, the upper liquid crystal display 303 is constructed from a liquid crystal display device which is generally used, and the lower liquid crystal display 304 is constructed from, so-called, a transparent liquid crystal display device. A detailed construction of the transparent liquid crystal display device will be explained hereinafter.

[0112] An operation table 305, which is projected frontward, is formed below the lower liquid crystal display 304, and from the most left side on the operation table 305, a change button 306, a payout (cash out) button 307, a help button 308 are arranged. And a coin insertion slot 309 and a bill insertion portion 310 are arranged at the right side of the help button 308. Further, from the left side, a 1-BET button 311, a SPIN/REPEAT BET button (hereinafter, abbreviated as "spin button") 312, a 3-BET button 313 and a 5-BET button 314 are positioned at the front side on the operation table 305.

[0113] Here, the change button 306 is pressed when exchanging the bill inserted in the bill insertion portion 311, and the exchanged coins are paid out through a coin payout opening 315 to a coin tray 316 which is formed at the lower part of the cabinet 302. To the change button 306, a change switch 362 (explained hereinafter) is attached, and the switch signal is output to a CPU 350 (mentioned hereinafter) from the change switch 362 based on press of the change button 306.

[0114] The payout button 307 is usually pressed when games are terminated, and when the payout button 307 is pressed coins got in games are paid out through the coin payout opening 315 to the coin tray 316. Here, to the payout button 307, a payout (cash out) switch 363 (mentioned hereinafter) is attached and a switch signal is output to the CPU 350 from the payout switch 363 based on press of the payout button 307.

[0115] The help button 308 is pressed when the player cannot understand game operation method, and when the help button 308 is pressed, various help information is displayed on the upper liquid crystal display 303 or the lower liquid crystal display 304. To this help button 308, a help switch 364 (mentioned hereinafter) is attached and a switch signal is output to the CPU 350 from the help switch 364 based on press of the help button 308.

[0116] To the coin insertion slot 309 a coin sensor 365 (mentioned hereinafter) is positioned, and when the coin is inserted in the coin insertion slot 309 a coin detection signal is output to the CPU 350 through the coin sensor 365. And to the bill insertion portion 310 a bill sensor 366 (mentioned hereinafter) is positioned, and when the bill is inserted in the bill insertion portion 310 a bill detection signal is output to the CPU 350 through the bill

sensor 366.

[0117] As for the 1-BET button 311, every the 1-BET button 311 is pressed one credit is betted, and the 1-BET button 311 can bet by pressing up to tree times as the maximum pressing time. To the 1-BET button 311, a 1-BET switch 359 is attached and when the 1-BET button 311 is pressed a switch signal is output to the CPU 350 from the 1-BET switch 359 based on press of the 1-BET button 311.

[0118] The spin button 312 is the button to start games from the present bet number or the previous bet number by press thereof, thereby reels 322 (mentioned later) are started to rotate. To the spin button 312, a spin switch 358 (mentioned later) is attached, and when the spin button 312 is pressed a switch signal is output to the CPU 350 from the spin switch 358 based on press of the spin button 312. Here, as the bet number which can be betted by press of the spin button 312, there may exist 1, 2, 3 and 5 bets.

[0119] The 3-BET button 313 is the button to start games from 3 bets on the basis of press thereof. To this 3-BET button 313, a 3-BET switch 360 (mentioned hereinafter) is attached and when the 3-BET button 313 is pressed a switch signal is output to the CPU 350 from the 3-BET switch 360. And the 5-BET button 314 is the button to start games from 5 bets on the basis of press thereof. To the 5-BET button 314, a 5-BET switch 361 is attached and when the 5-BET button is pressed a switch signal is output to the CPU 350 from the 5-BET switch 361 on the basis of press thereof.

[0120] Further, at the lower part of the cabinet 302, the coin payout opening 315 is formed and the coin tray 316 to receive coins paid out from the coin payout opening 315 is provided. In the coin payout opening 315, a coin detection part 373 constructed from a sensor and the like is positioned and the coin detection part 373 detects number of coins paid out from the coin payout opening 315.

[0121] Further, at the side plane (the right side plane in Fig. 11) of the cabinet 302, a start lever 317 is arranged rotatably within a predetermined angle range. To the start lever 317, a start switch 357 is attached and when the start lever 317 is rotated a switch signal occurring from the start switch 357 is output to the CPU 350.

[0122] Next, it will be described a detailed construction of the lower liquid crystal display 304 and reels rotatably arranged behind the lower liquid crystal display 304 in the cabinet 302, with reference to Figs. 12 and 13. Fig. 12 is a longitudinal sectional view of the lower liquid crystal display 304 and the reels 322, and Fig. 13 is an exploded perspective view of the lower liquid crystal display 304.

[0123] In Figs. 12 and 13, the lower liquid crystal display 304 is arranged within a display window 321 of a device front panel 320 positioned at the front center part of the cabinet 302 in the slot machine 301, with a transparent touch panel 330 (abbreviated as "touch panel

330" hereinafter) arranged at the front side (the left side in Fig. 12) of the lower liquid crystal display 304. And at the rear side (the right side in Fig. 12) of the lower liquid crystal display 304, three reels 322 (only one reel 322 is indicated in Fig. 12) are supported in a parallel state so that the reels 322 become independently rotatable.

[0124] Here, each reel 322 will be described. Among three reels 322, the left reel 322 when seeing the front plane of the slot machine 301 faces to a left display window 323 (see Fig. 11) formed in the lower liquid crystal display 304, the center reel 322 faces to a center display window 324 (see Fig. 11) similarly formed in the lower liquid crystal display 304 and the right reel 322 faces to a right display window 325 (see Fig. 11) similarly formed in the lower liquid crystal display 304. Construction of each of the display windows 323, 324, 325 will described hereinafter.

[0125] Further, on an outer periphery of each reel 322, various kinds of symbols shown in Fig. 14 (6 kinds of symbols are indicated in Fig. 14) are formed. Concretely, as kinds of symbols formed on the outer periphery of the reel 322, concerning with game contents conducted in the slot machine 301, it is utilized a wild symbol, a pendant symbol, a trigger symbol, a red 7 symbol to which a beautiful girl is attached, a bill bundle symbol and a gold coin symbol. And these 6 kinds of symbols and blank (s) (area where the symbol do not exist) are combined based on a predetermined combination and the combinations in which the symbols and the blanks are totally combined (the total number of the symbols and the blanks is 22) is formed. On the outer periphery of each reel 322, such combination with of symbols and blanks (total number of which is 22) is formed.

[0126] Here, various winning combinations are determined beforehand based on plural kinds of combinations of the symbols and when the symbol combination corresponding to the winning combination is stopped along a pay line L (see Fig. 11), coins are paid out from the coin payout opening 315 according to the winning combination. These points are as same as those in the conventional slot machine, therefore explanation thereof will be omitted. And formation of the symbols on the outer periphery of the reel 322 is generally done as follows. First, symbols and blanks (total number of which is 22) are printed on a long seal having a width and a length corresponding to the width and the periphery length of the reel 322, respectively. And such seal is adhered on the peripheral plane of the reel 322. Of course, the symbols may be formed by different method other than the above method. These symbols and blanks correspond to a plurality of symbols in the first game, and are variably displayed by rotating the reels 322 and are stopped and displayed by stopping rotation of the reels 322.

[0127] In the embodiment, the pay line L is determined to only the center line, and such pay line L is displayed on the lower liquid crystal display 304 when the game, namely the first game, is conducted by rotating

and stopping the reels 322 based on press of the spin button 312, the 3-BET button 313 and the 5-BET button 314 or rotation of the start lever 317.

[0128] Further, the above mentioned trigger symbol functions as a trigger to obtain the second games. In the embodiment, one trigger symbol is formed only on the peripheral plane of the right reel 322. Based on that the trigger symbol existing on the peripheral plane of the right reel 322 is stopped on the pay line L in the first game, the second game can be obtained.

[0129] That is to say, the specific condition to execute the second game is that the trigger symbol stops on the pay line L.

[0130] Next, construction of the lower liquid crystal display 304 will be described with reference to Figs. 12 and 13. In Figs. 12 and 13, the lower liquid crystal display 304 is constructed by arranging from the front side of the slot machine 301; the touch panel 330, the reel glass base 331, the bezel metal frame 332, the transparent liquid crystal panel 333, the liquid crystal holder 334, the scattering sheet 335, the light leading plate 336, the white reflector 337, the rear holder 338 and the anti-static sheet 339. In the scattering sheet 335, three openings 335A, 335B, 335C are formed. Similarly, in the light leading plate 336, the reflector 337 and the rear holder 338, three openings 336A, 336B, 336C, 337A, 337B, 337C, 338A, 338B, 338C are formed respectively, so as to coincide with the openings 335A, 335B, 335C. Here, the openings 335A ~ 338A construct the left display window 323 (see Fig. 11) by superimposing so as to coincide with each other. Similarly, the openings 335B ~ 338B construct the center display window 324 (see Fig. 11) by superimposing so as to coincide with each other and the openings 335C ~ 338C construct the right display window 325 (see Fig. 11) by superimposing so as to coincide with each other.

[0131] Here, the openings 335A ~ 335C in the scattering sheet 335 and the openings 336A ~ 336C in the light leading plate 336 construct the light transmitting areas to retain visibility while variable displaying is conducted by rotating reels 322.

[0132] In order to install the lower liquid crystal display 304 to the display window 321 of the device front panel 320, as shown in Fig. 12, brackets 340 are screwed to the rear side of the device front panel 320 by screws 341.

[0133] And at an upper and lower end of the light leading panel 336, a pair of cold cathode ray tubes 342 are arranged as light sources of the liquid crystal panel 333. And at an upper and lower positions in the rear side of each of openings 338A ~ 338C in the rear holder 338, a pair of cold cathode ray tubes 343 are arranged to illuminate the symbols on the outer periphery of each of the reels 322.

[0134] The liquid crystal panel 333 is a transparent electric display panel on which transparent electrodes such as ITO are formed, and arranged in front of each of the reels 322 which can be seen therethrough. And

the circumference in rear side of the display part of the liquid crystal panel 333 is held by the liquid crystal holder 334. The light leading plate 336 is made from the light transmitting resin panel, and in the light leading plate 336 lens cut portions are formed, the lens cut portions leading light emitted from the cold cathode ray tubes 343 positioned at side positions to the rear side of the liquid crystal panel 333. The light scattering sheet 335 is made from a light transmitting resin sheet and scatters light led by the light leading panel 336 and levels light irradiated to the liquid crystal panel 333. The liquid crystal holder 334 for holding the liquid crystal panel 333, the scattering sheet 335 and the light leading plate 336 are assembled into one body and circumference thereof is inserted in the bezel metal frame 332. Thereby, the front side of the display part in the liquid crystal panel 333 is retained by the bezel metal frame 332.

[0135] Circumference of the liquid crystal holder 334, the light scattering sheet 335 and the light leading plate 336, which are inserted in the bezel metal frame 332 and assembled into one body, is further inserted in the reel glass base 331 and retained by the reel glass base 331 in a state that the front display plane of the liquid crystal panel 333 is opened. The transparent touch panel 330 is pressed and contacted to the front side of the reel glass base 331 by installing the reel glass base 331 to the device front panel 320 through the screws 341, thereby the transparent touch panel 330 is superimposed on the front display plane of the liquid crystal panel 333.

[0136] The rear holder 338 is made from a white resin plate and retains to the reel glass base 331 the bezel metal frame 332 supported to the reel glass base 331, the liquid crystal holder 334 holding the liquid crystal panel 333, the light scattering sheet 335 and the light leading plate 336 from the rear sides thereof. The rear holder 338 also functions as a reflecting plate for reflecting light emitted from the cold cathode ray tubes 343 to the light leading plate 336 toward the liquid crystal panel 333. The antistatic sheet 339 is made transparent and adhered to the rear plane of the rear holder 338 by double-sided adhesive tape, thereby the antistatic sheet 339 covers the rear plane of each of the openings 338A ~ 338C formed in the rear holder 338.

[0137] Next, construction of the control system in the slot machine 301 will be described with reference to Fig. 15. Fig. 15 is a block diagram schematically showing the control system in the slot machine 301.

[0138] In Fig. 15, the control system of the slot machine 301 is basically constructed from the CPU 350, and a ROM 351 and a RAM 352 are connected to the CPU 350. The ROM 351 stores game control program (mentioned later), various effect programs for executing various effects on the upper liquid crystal display 303 and the lower liquid crystal display 304 according to progress in games, lottery program for conducting lottery of various winning combinations, various programs necessary for controlling the slot machine 301 and var-

ious data tables and the like. And the RAM 352 is a memory for temporarily storing various data calculated by the CPU 350.

[0139] The CPU 350 executes the first game based on the various programs stored in the ROM 351 and the second game when the specific condition is realized in the first game.

[0140] And to the CPU 350, a clock pulse generator 353 for generating standard clock pulses and a frequency divider 354 are connected, and a random number generator 355 and a sampling circuit 356 are also connected. Random number sampled by the random number generator 356 is utilized in various lotteries of the symbol every each reel 322, the effects and the like. Here, the symbols stopped on the pay line L are determined as follows. That is, a random number range corresponding to the symbols every each reel 322 is set beforehand and the random number every each reel 322 extracted from a predetermined random number range (for example, the range of "0" ~ "255") and the "probability lottery table" (not shown) are referred with each other. Thereby, the symbols are determined by judging that the extracted random number lies in the random number range of which symbol. Further, to the CPU 350, the start switch 357 attached to the start lever 317, the spin switch 358 attached to the spin button 312, the 1-BET switch 359 attached to the 1-BET button 311, the 3-BET switch 360 attached to the 1-BET button 313, the change switch 362 attached to the change button 306, the cashout switch 363 attached to the cashout button 307 and the help switch 364 attached to the help button 308 are connected respectively. The CPU 350 controls the slot machine 301 to execute various operations corresponding to each button, based on the switch signal output from each switch when such buttons are pressed.

[0141] Further, to the CPU 350, the coin sensor 365 positioned in the coin insertion slot 309 and the bill sensor 366 positioned in the bill insertion portion 310 are connected respectively. The coin sensor 365 detects coins inserted from the coin insertion slot 309 and the CPU 350 calculates the number of inserted coins based on the coin detection signal output from the coin sensor 365. The bill sensor 366 detects the kind and sum of bill and the CPU 350 calculates the number of coins equivalent to sum of bill, based on the bill detection signal output from the bill sensor 366.

[0142] To the CPU 350, three stepping motors 368 for rotating each of the reels 322 through a motor drive circuit 367 are connected, and also a reel position detection circuit 369 is connected. When a motor drive signal is output to the motor drive circuit 367, each stepping motor 368 is driven to rotate by the motor drive circuit 367, thereby each reel 322 is rotated.

[0143] At that time, after each reel 322 is started to rotate, the number of drive pulses provided to each stepping motor 368 is calculated and the calculated value is written in the predetermined area of the RAM 352. And the reset pulse is output every one rotation of the reel

322 and such reset pulse is input to the CPU 350 through the reel position detection circuit 369. When the reset pulse is input to the CPU 350, the calculated value written in the RAM 352 is cleared in "0", and the CPU 350 recognizes the symbol rotational position in the reel 322, based on the calculated value corresponding to the rotational position of the reel 322 within one rotation and the symbol table in which the rotational position of the reel 322 stored in the ROM 351 and the symbols formed on outer peripheral plane of the reel 322 are corresponded with each other.

[0144] To the CPU 350, a hopper 371 is connected through a hopper drive circuit 370. When a drive signal is output to the hopper drive circuit 370 from the CPU 350, the hopper 371 pays out predetermined number of coins from the coin payout opening 315.

[0145] And to the CPU 350, a coin detection part 373 is connected through a payout completion signal circuit 372. The coin detection part 373 is arranged in the coin payout opening 315 and when the coin detection part 373 detects that a predetermined number of coins are paid out from the coin payout opening 315, the payout completion signal is output to the payout completion signal circuit 372 from the coin detection part 373. Based on this, the payout completion signal circuit 372 outputs the payout completion signal to the CPU 350.

[0146] Further, to the CPU 350, the upper liquid crystal display 303 is connected through a liquid crystal drive circuit 374 and the lower liquid crystal display 304 is connected through a liquid crystal drive circuit 375. And to the CPU 350, the touch panel 330 is connected through a touch panel drive circuit 376.

[0147] Further, to the CPU 350 LEDs 378 are connected through a LED drive circuit 377. A plurality of the LEDs 378 are arranged on the front plane of the slot machine 301 and the LEDs 378 are controlled so as to turn on based on the drive signals from the CPU 350. Further, a speaker 380 and a sound output circuit 379 are connected to the CPU 350 and the speaker 380 produces various effective sounds when various effects are conducted based on the output signal from the sound output circuit 379. And to the CPU 350, a progressive interface (I/F) 381 is provided.

[0148] In the slot machine 301, the symbols formed on the outer periphery of each reel 322 variably displayed by rotation of the reel 322 and the symbols are stopped and displayed by stopping rotation of the reel 322, thereby the first game is progressed. The player can see and recognize the symbols, which are variably displayed and stopped and displayed, through the lower liquid crystal display 304 which is the so-called transparent liquid crystal display.

[0149] And according to the result in the first game, in a case that the symbol combination stopped and displayed becomes the predetermined symbol combination or in a case that the trigger symbol (see Fig. 14) is included in plural symbols stopped and displayed, the second game is executed. The game contents of the

second game itself is as same as those of the first game and the game contents of the first game are already explained, thus explanation of the second game will omitted. Here, in the slot machine 301, the second game may be executed on the upper display device 303 or the lower display device 304. Further, the second game may be executed on each of the upper display device 303 and the lower display device 304.

[0150] Further, the second game may be executed on three reels 322, the lower liquid crystal display 303 and the lower liquid crystal display 304. In this case, the specific symbols can be displayed on the lower liquid crystal display 304 so as to cover the symbols formed on the reels 322.

[0151] And according to the result of the second game, the game worth (for example, coins) paid out to the player may be determined based on the number of coins betted in the first game and the point number obtained in the second game, as in the gaming machine 2. For example, as mentioned later, the common bonus (so-called progressive bonus) in common with a plurality of slot machines 301 is accumulated and the game worth as the common bonus may be paid out from the slot machine 301 in which the points more than a predetermined number are obtained in the second game.

[0152] Next, it will be described a progressive gaming system in which a plurality of slot machines 301 are connected through the progressive interface (I/F) 381 provided in each slot machine 301, with reference to Fig. 16. Fig. 16 is an explanatory view schematically showing the progressive gaming system.

[0153] In the progressive gaming unit 382 shown in Fig. 16, a plurality of slot machines 301 (in the embodiment, four slot machines 301) are connected to a transmission control part 384 in the progressive unit 383 through the progressive interface (I/F) 381 provided in each slot machine 301. As for connection between the progressive unit 383 and each slot machine 301, any one of wire connection and wireless connection can be utilized. Thereby, mutual transmission can be done through the transmission control part 384 between the progressive unit 383 and each slot machine 301.

[0154] As the information transmitted to the progressive unit 383 from each slot machine 301, coin insertion information betted in each slot machine 301, winning information indicating that the first game or the second game is won. And as information transmitted to each slot machine 301 from the progressive unit 383, pool number information of coins as the common bonus in common with each slot machine 301.

[0155] Such pool number information of coins is transmitted from the progressive unit 383 to each slot machine 301 through the transmission control part 384 and displayed on the upper liquid crystal display 303 in each slot machine 301. And a pool number calculation part 385 in the progressive unit 383 adds the common bonus based on the coin insertion information transmitted from each slot machine 301.

[0156] Here, in each slot machine 301, in a case that any one of the progressive bonuses is won in the first game or the second game, the coin number corresponding to the common bonus won is rest to the initial number of coins. And the pool number storing part 386 stores the above mentioned coin number calculated by the pool number calculation part 385.

[0157] The progressive unit 383 constructed according to the above periodically transmits from the transmission control part 384 to each slot machine 301 the coin pool number information stored in the pool number storing part 386. And each slot machine 301 periodically compares the coin pool number information transmitted in previous time with the coin pool number information transmitted in present time, based on the coin pool number information transmitted from the progressive unit 383. And in a case that the coin pool number in present time reduces than the coin pool number in previous time, each slot machine 301 notifies that the common bonus in which the coin pool number reduces is won.

[0158] In the above case, if the predetermined winning state such as the "big prize" or the "small prize" is realized in the variable display game corresponding to the second game, the game worth (for example, coins) as the common bonus accumulated from a plurality of slot machines 301 can be obtained. Therefore, it concludes that competitive spirit of the other players is stirred up, as a result, interest and connection for the second game can be raised. And according to the symbols or the symbol combination stopped and displayed in the first game, the number of the specific symbol substituted in the second game is determined and the second game result is affected by the number of the specific symbol. Therefore, interest and connection for not only the second game but also the first game can be raised, thus interest for games can be improved.

Claims

1. A gaming machine comprising:

- a display device;
- a first game controller for executing a first game in which symbols are scrolled in each of plural rows on the display device and a game result is determined corresponding to the symbol or a symbol combination stopped and displayed on the display device;
- a determination device for determining whether or not a predetermined condition is realized in the first game; and
- a second game controller for executing a second game in which the symbols are scrolled in each of plural rows on the display device when the determination device determines that the predetermined condition is realized in the first

game;

wherein the second game controller substitutes one or more symbols displayed while being scrolled on the display device to one or more specific symbols each of which is replaceable by any one of all kinds of the symbols; and

wherein the second game controller makes a probability capable of winning in the second game higher than a probability capable of winning in the first game and makes a payout rate in the second game higher than a payout rate in the first game.

2. The gaming machine according to claim 1, wherein the second game controller determines a number of the specific symbol based on the symbol or the symbol combination stopped and displayed in the first game.

3. The gaming machine according to claim 2, wherein the probability capable of winning in the second game is determined corresponding to the number of the specific symbol.

4. The gaming machine according to claim 1, wherein each of the payout rate in the first game and the payout rate in the second game is defined by an expectation value of game media paid out per a predetermined number of games.

5. The gaming machine according to claim 2, wherein the probability capable of winning in the second game increases according that the number of the specific symbol increases.

6. The gaming machine according to claim 2, further comprising:

a lottery device for conducting a lottery to extract a random number when the number of the specific symbol is determined;

wherein the second game controller determines the number of the specific symbol based on the symbol or the symbol combination stopped and displayed in the first game and the random number extracted by the lottery device.

7. The gaming machine according to claim 2, further comprising:

a count device for counting a number of game medium betted in the first game;

wherein the second game controller determines the number of the specific symbol based on the symbol or the symbol combination stopped and displayed in the first game and the number of game

medium counted by the count device.

8. The gaming machine according to claim 1, wherein the display device includes a display on which a plurality of reels each of which has the symbols are displayed so that the reels are rotated and the symbols are scrolled.

9. The gaming machine according to claim 1, wherein the display device includes a plurality of reels on each of which the symbols are formed, the reels being rotatably supported, and wherein the symbols are scrolled by rotating the reels.

FIG. 1

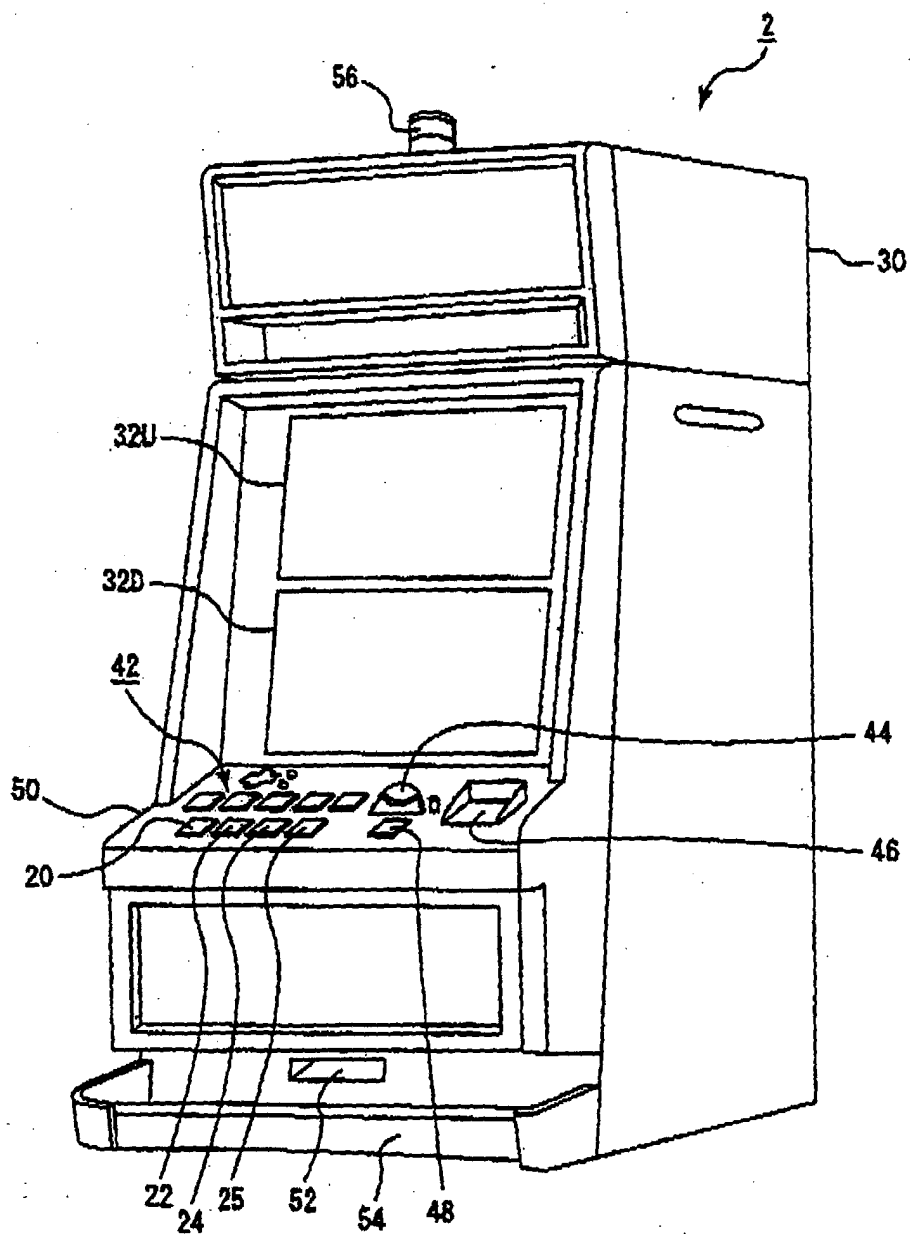


FIG.2

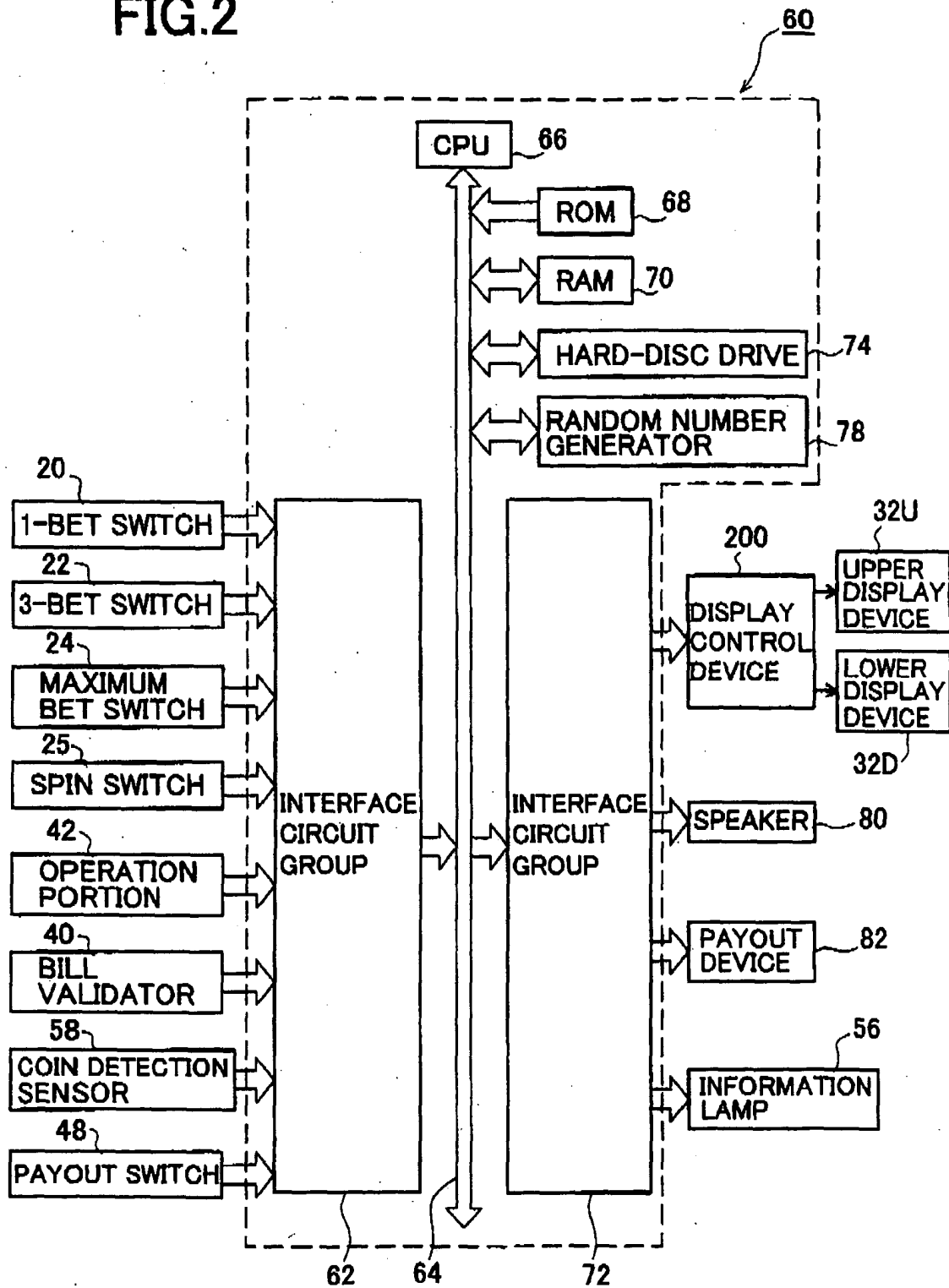


FIG.3

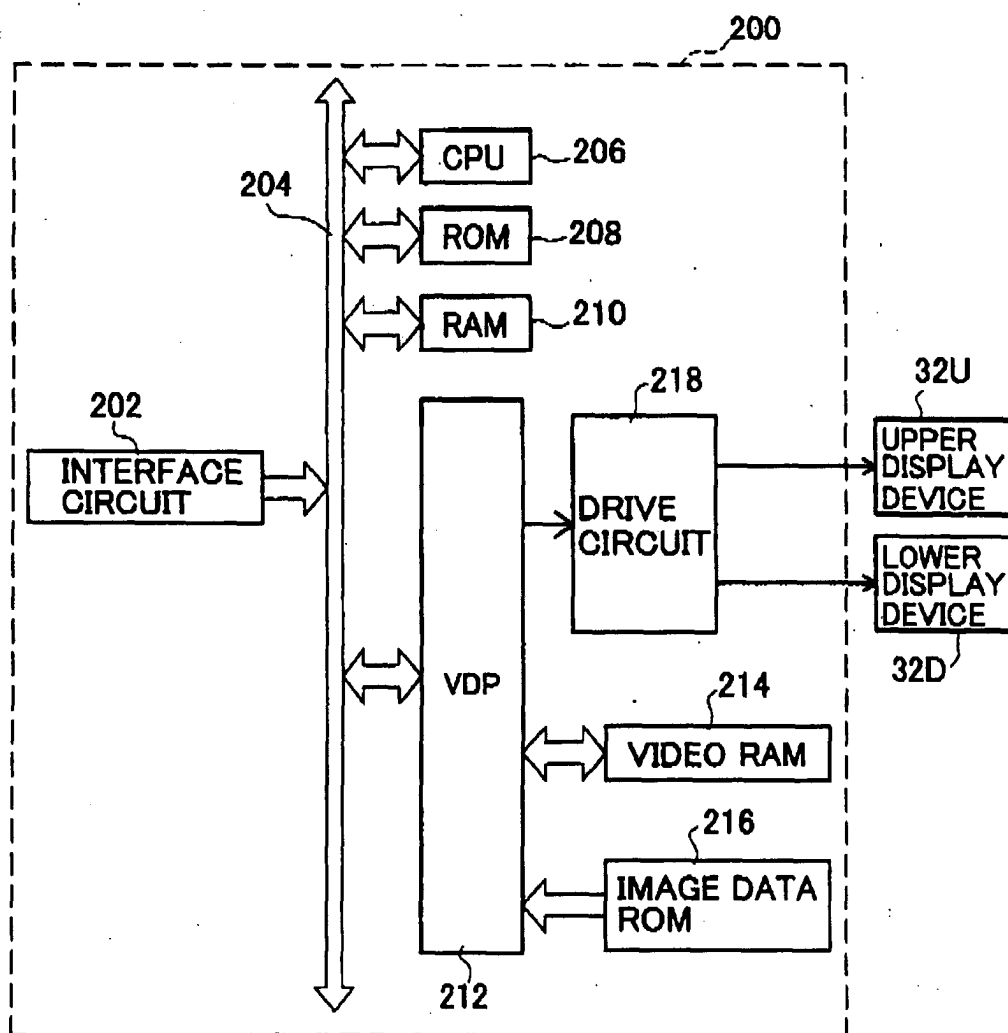


FIG.4

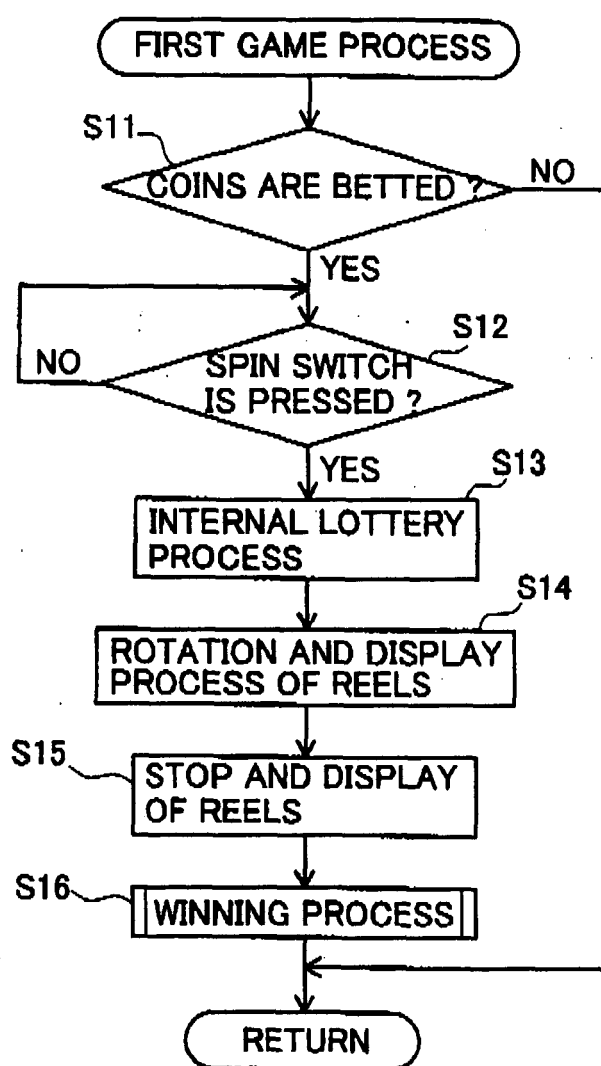


FIG.5

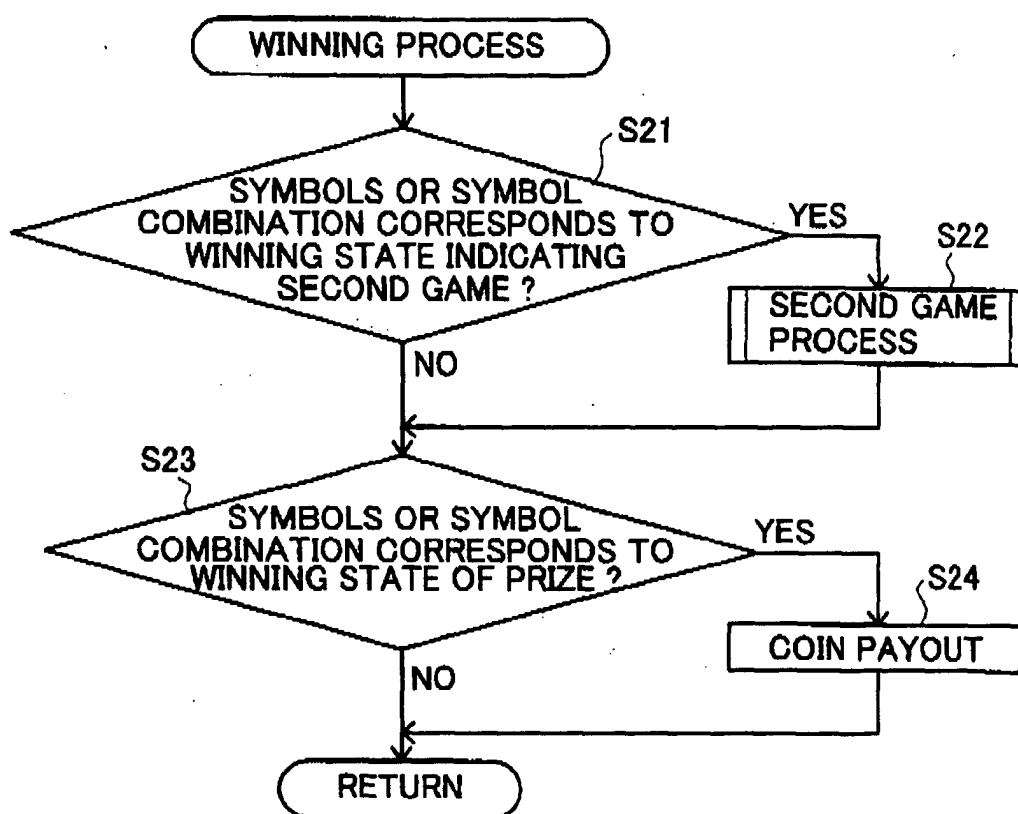


FIG.6

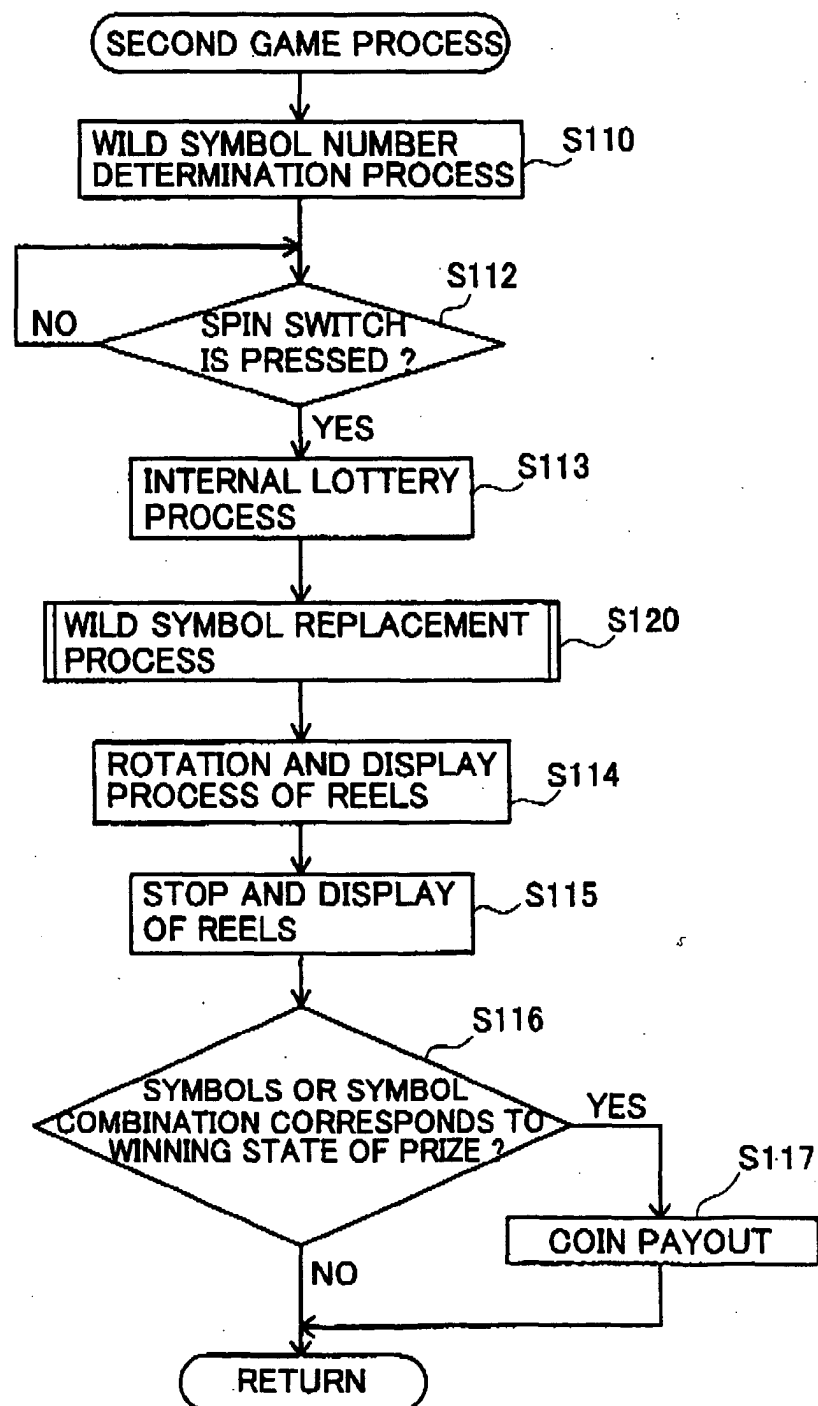


FIG.7

SYMBOL COMBINATION	WILD SYMBOL NUMBER	WINNING PROBABILITY	
「Joker」	2	「BIG PRIZE」	2/512
		「SMALL PRIZE」	6/512
		「LOSS OF WINNING」	504/512
「Ace」	3	「BIG PRIZE」	3/512
		「SMALL PRIZE」	9/512
		「LOSS OF WINNING」	500/512
「King」	4	「BIG PRIZE」	4/512
		「SMALL PRIZE」	12/512
		「LOSS OF WINNING」	496/512
「Queen」	5	「BIG PRIZE」	5/512
		「SMALL PRIZE」	15/512
		「LOSS OF WINNING」	492/512
OTHER COMBINATION	1	「BIG PRIZE」	1/512
		「SMALL PRIZE」	3/512
		「LOSS OF WINNING」	508/512

FIG.8

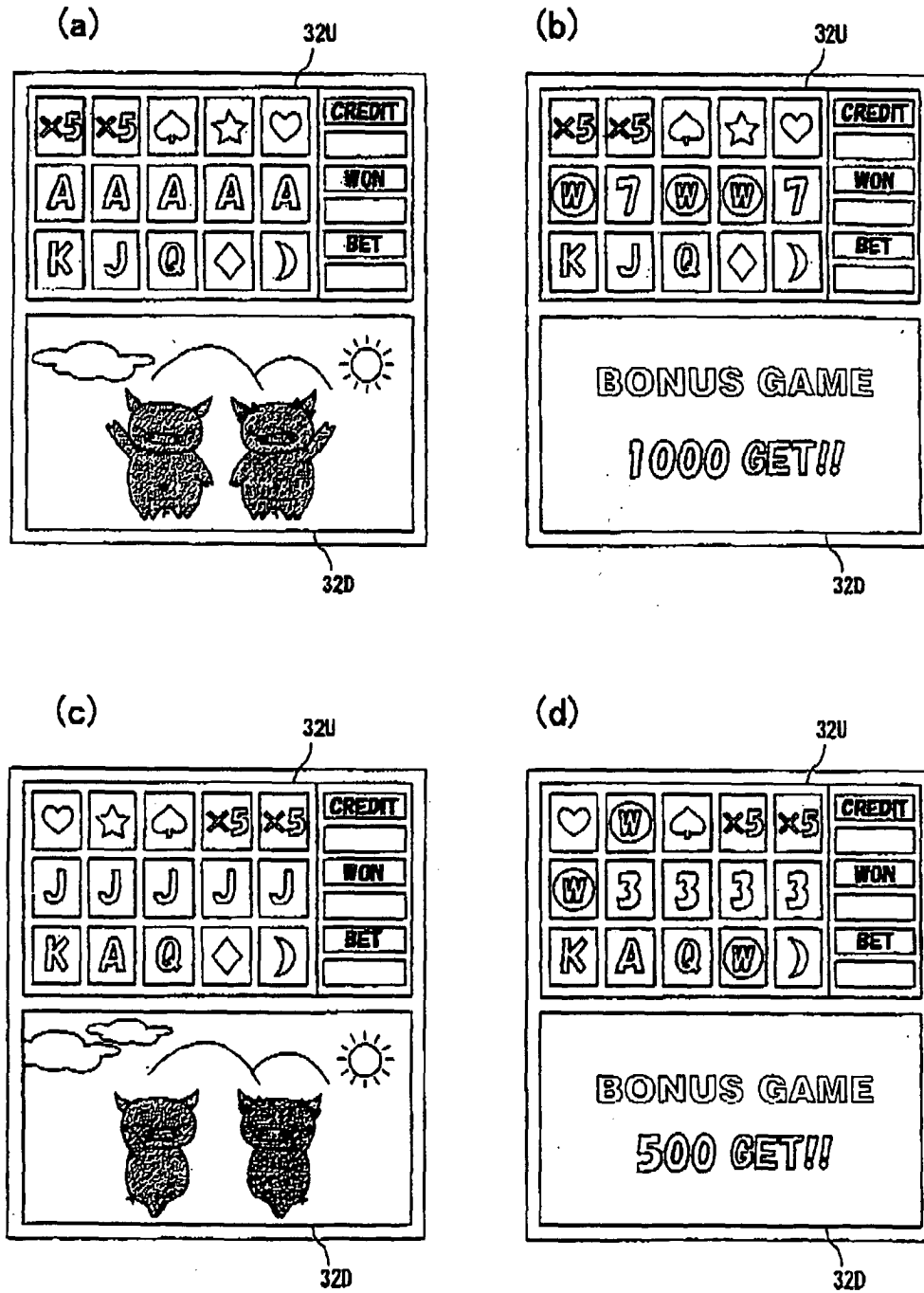


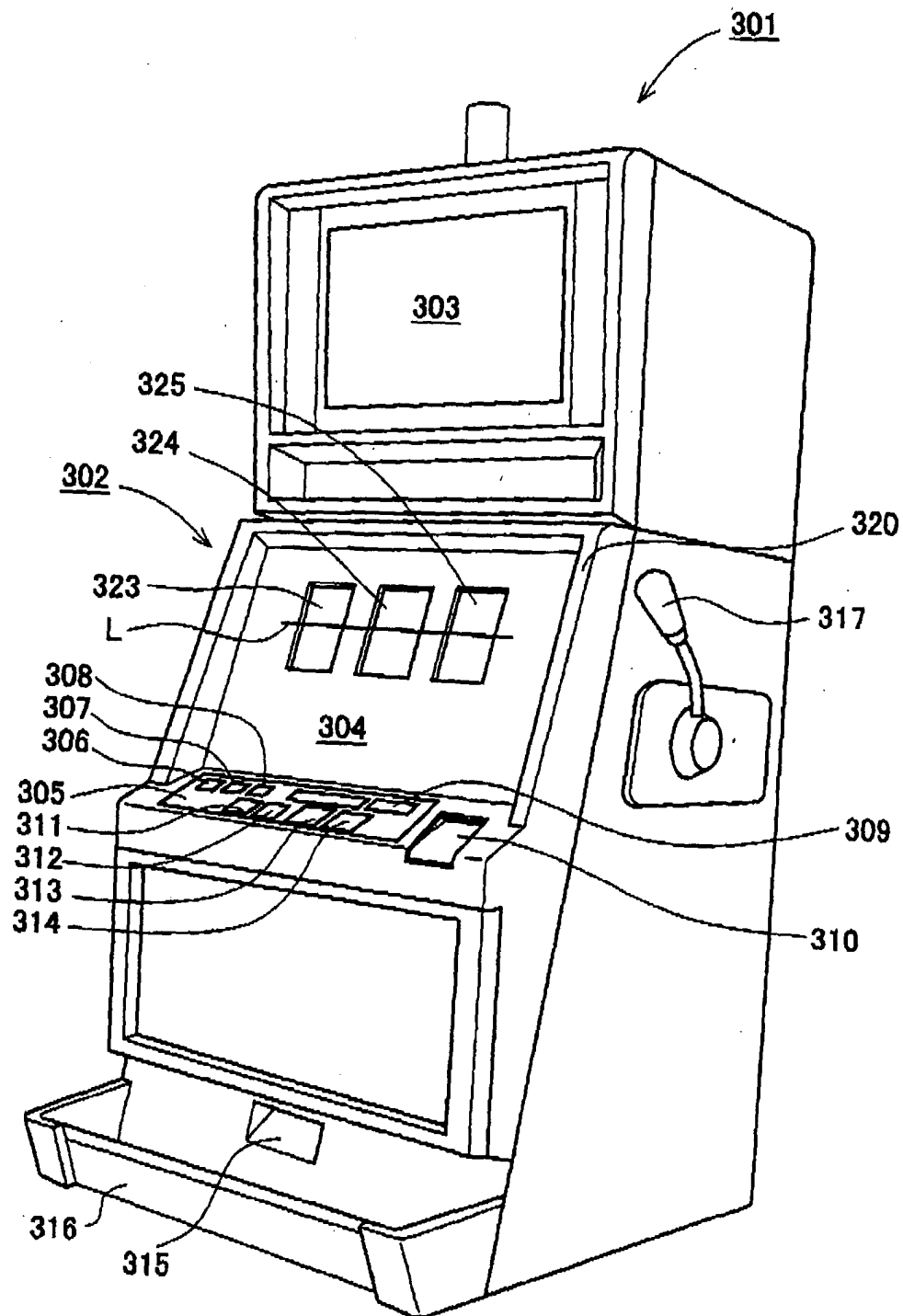
FIG.9

SYMBOL COMBINATION	LOTTERY RESULT (RANGE OF RANDOM NUMBER : 0~63)	WILD SYMBOL NUMBER
「Joker」	0 ~ 31	2
	32 ~ 47	3
	48 ~ 63	4
「Ace」	0 ~ 31	3
	32 ~ 47	4
	48 ~ 63	5
「King」	0 ~ 31	4
	32 ~ 47	5
	48 ~ 63	6
「Queen」	0 ~ 31	5
	32 ~ 47	6
	48 ~ 63	7
OTHER COMBINATION	0 ~ 31	1
	32 ~ 47	2
	48 ~ 63	3

FIG.10

SYMBOL COMBINATION	BET NUMBER IN FIRST GAME (1~45)	WILD SYMBOL NUMBER
「Joker」	1 ~ 15	2
	16 ~ 30	3
	31 ~ 45	4
「Ace」	1 ~ 15	3
	32 ~ 47	4
	48 ~ 63	5
「King」	1 ~ 15	4
	16 ~ 30	5
	31 ~ 45	6
「Queen」	1 ~ 15	5
	16 ~ 30	6
	31 ~ 45	7
OTHER COMBINATION	1 ~ 15	1
	16 ~ 30	2
	31 ~ 45	3

FIG.11



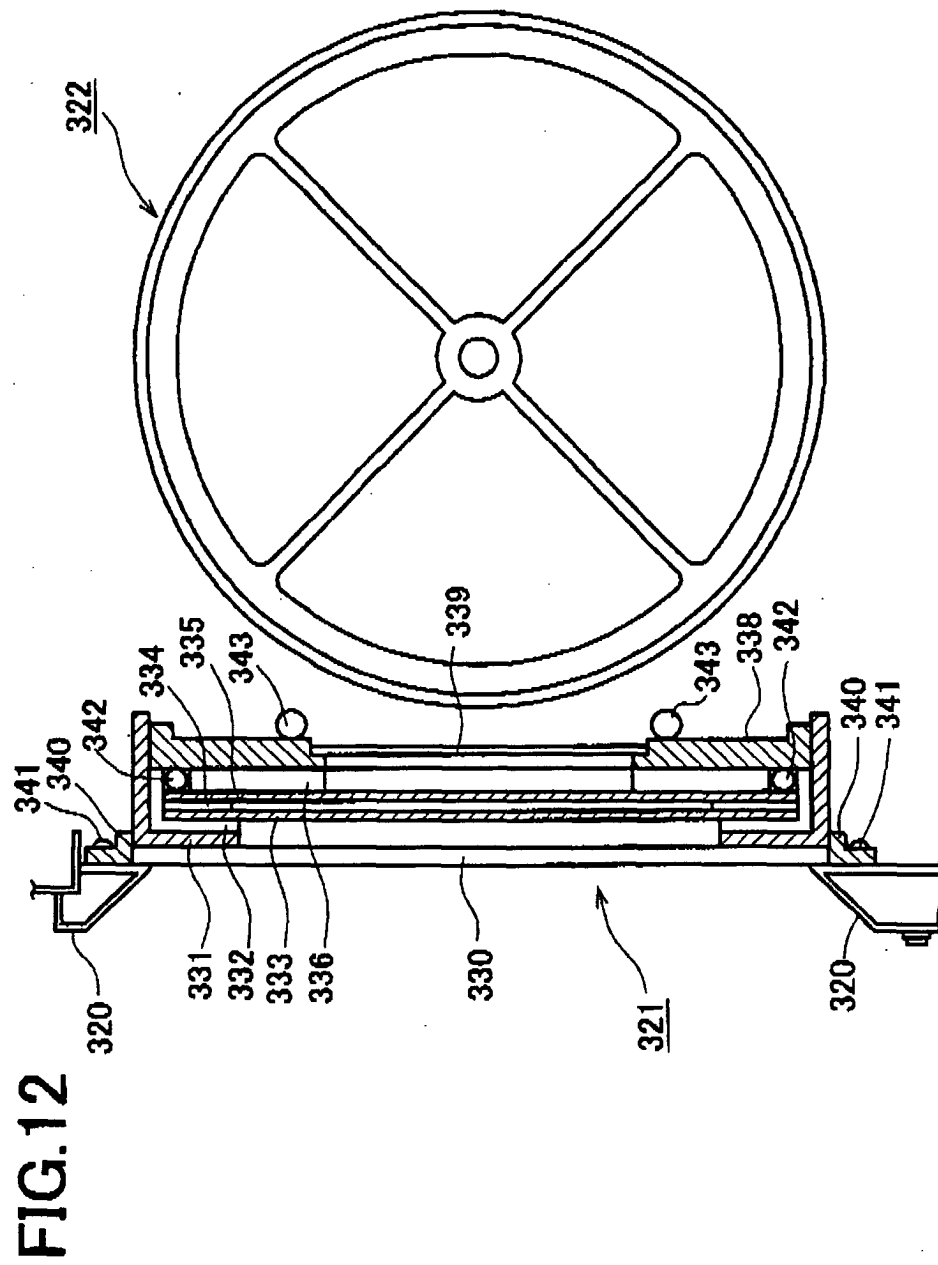


FIG.13

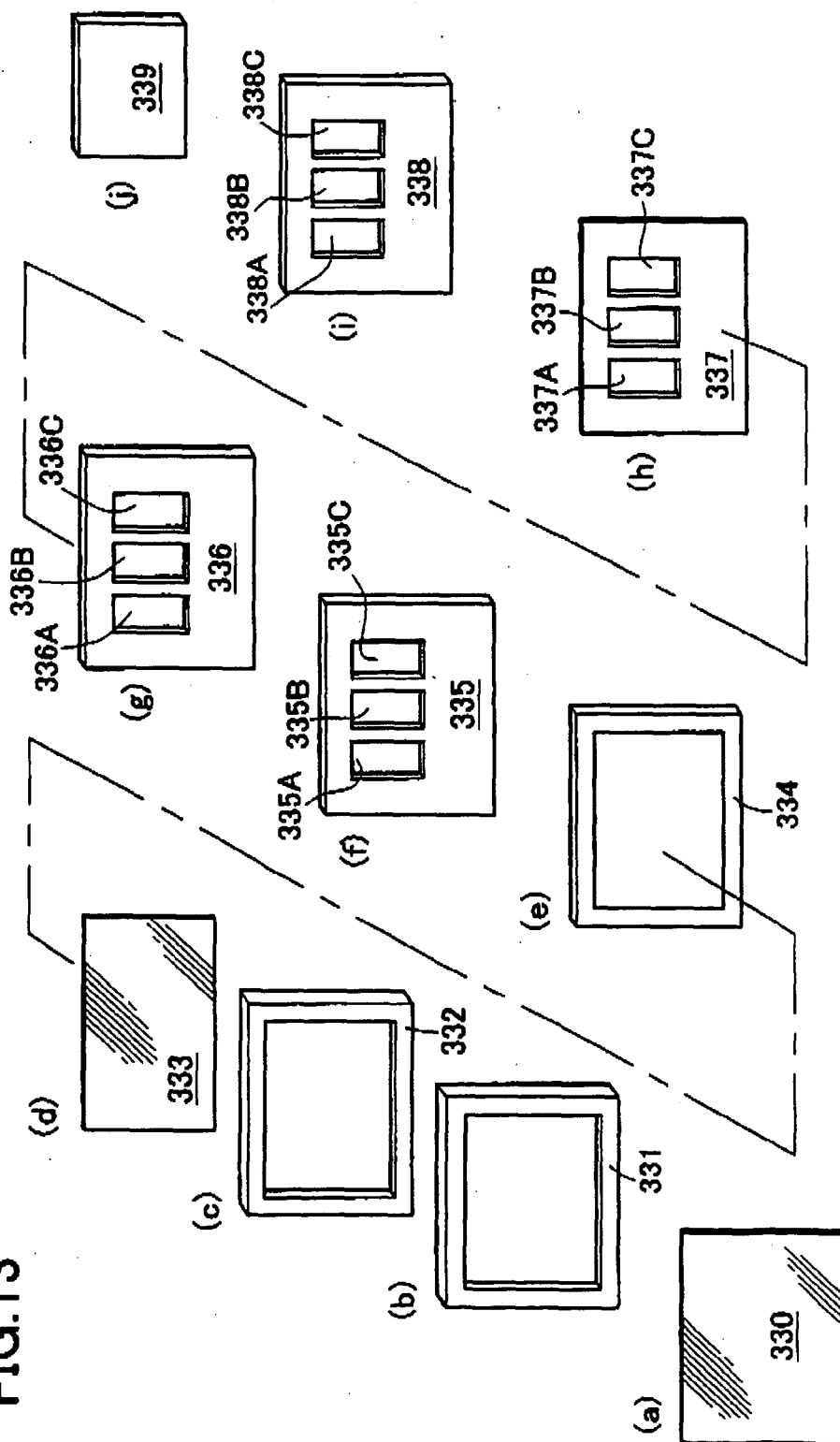
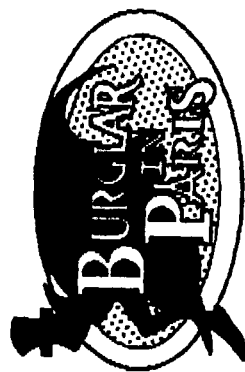


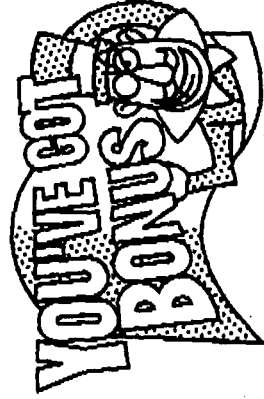
FIG.14



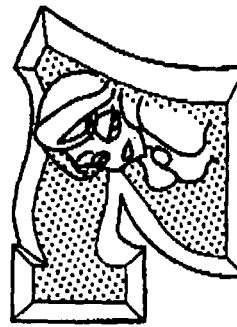
WILD SYMBOL



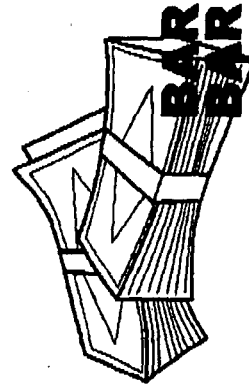
PENDANT(3 BAR)



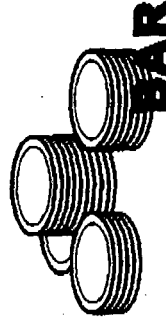
TRIGGER SYMBOL



RED 7 SYMBOL WITH
BEAUTIFUL GIRL



BILL BUNDLE (2 BAR)



GOLD COIN (1 BAR)

FIG. 15

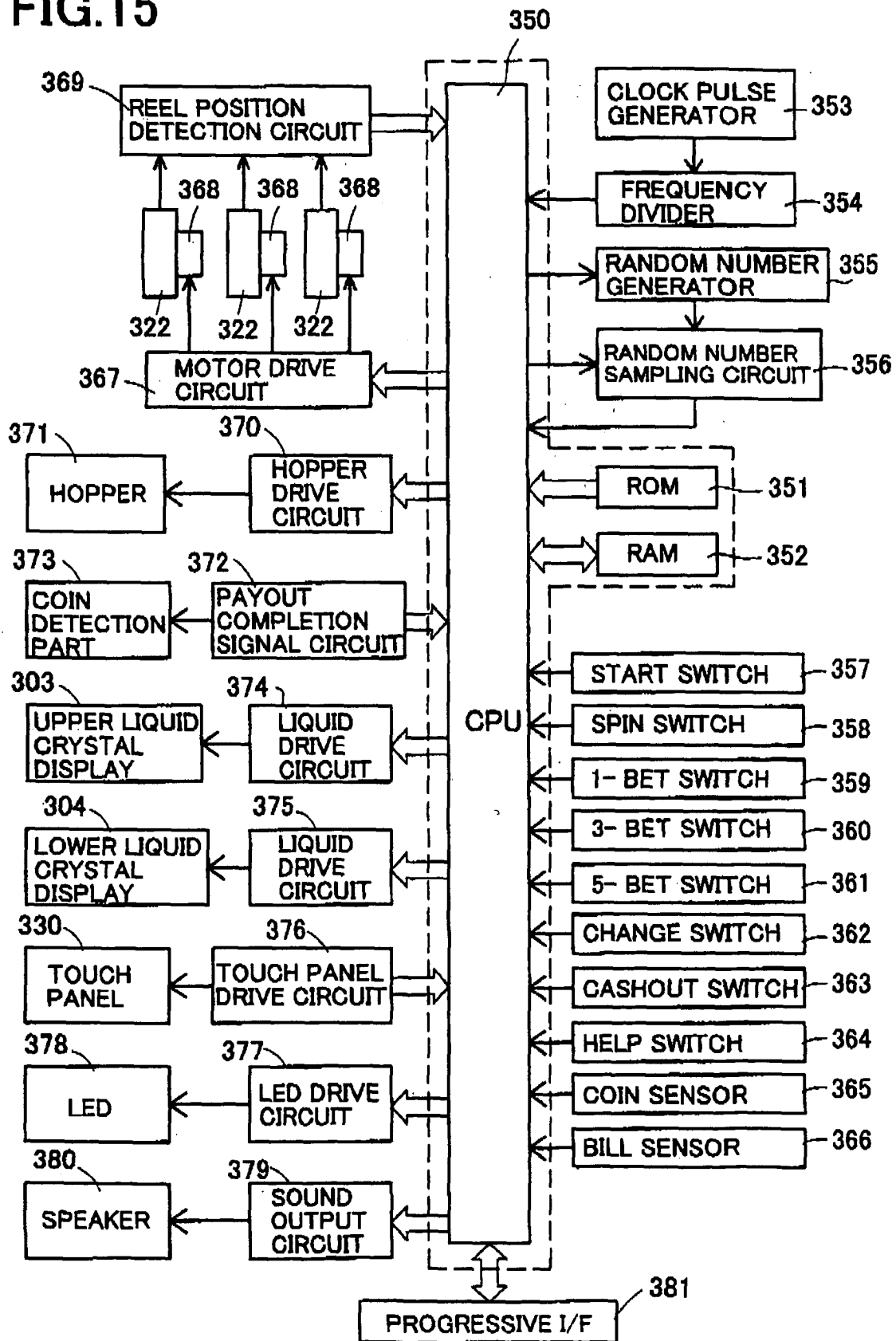
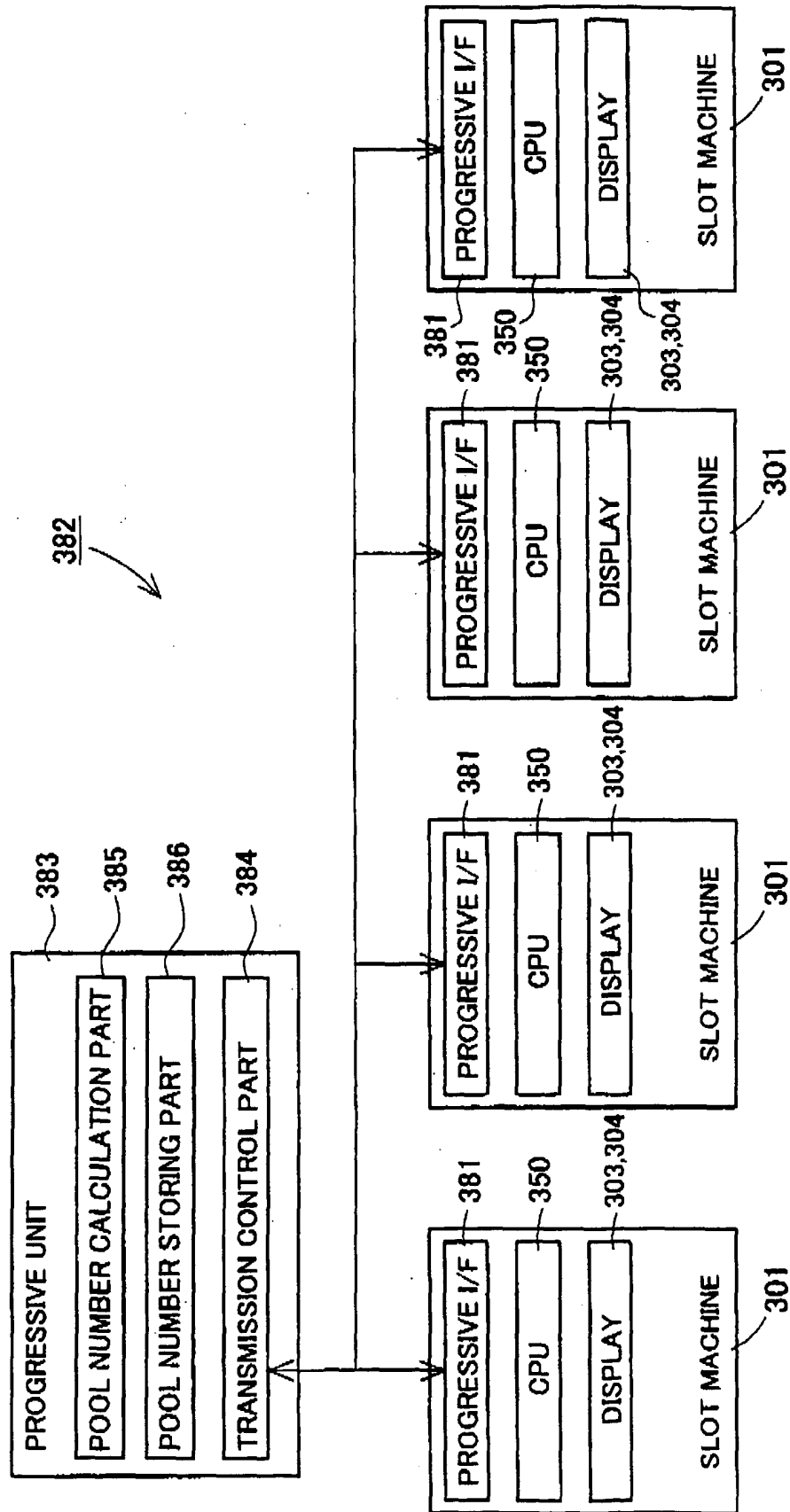


FIG.16





European Patent
Office

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Application Number
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Place of search Munich		Date of completion of the search 22 April 2005	Examiner Kling, J
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