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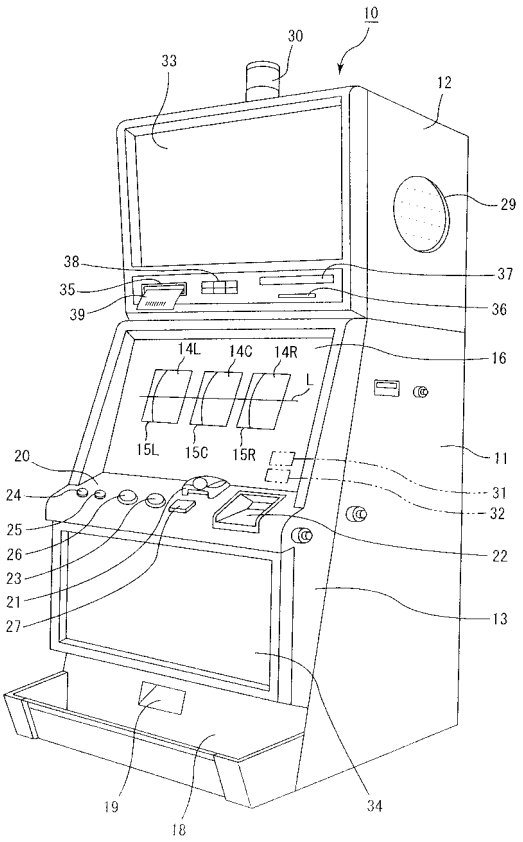
(54) Gaming machine, game control method and game system

(57) A gaming machine of the present invention comprises: winning combination determination means for determining a winning combination by a lottery; means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination; means for, when the number of games accumulatively counted each time a game is played reaches a set value that is an object of comparison with the number of games, generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high.

Fig. 2



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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit of priority based on PCT/JP2005/015810 filed on August 30, 2005. The contents of this application are incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] The present invention relates to a gaming machine such as a slot machine in which a game is conducted using a game media (game valuable) such as a coin and the like, a game control method for the gaming machine, and a game system comprising the gaming machine and a control device.

DISCUSSION OF THE BACKGROUND

[0003] Conventionally, in a facility in which gaming machines such as a slot machine are installed, a game is played by inserting various kinds of game media such as a coin, cash and the like into a gaming machine. Each gaming machine pays out a dividend to a player according to a prize wining state (a result of playing the game) generated while the game is in progress.

[0004] In a casino where plural slot machines are installed, a credit spent in each slot machine is partly reserved and in a case where the reservation reaches a predetermined amount, one of the slot machines provides a so-called "jackpot" paying out a big amount, which is not paid out in an ordinary hit (JP-A 2003-117053). In such slot machines, a hit in each machine usually occurs on a preset probability and a player advances a game with expectation of the hit to be encountered. One of the slot machines has a chance to hit a jackpot at a timing in a lottery different from a common lottery in which a hit based on the above-mentioned probability is set in the slot machines. Generally, plural casinos are interconnected in a network in order to increase a payout amount in a jackpot.

[0005] Furthermore, a system has been available in which a host computer and plural gaming machines are interconnected on a network and the generating of a bonus in the gaming machines is controlled by the host computer (U.S. Patent No. 5, 820, 459). In this system, not only is the number of coins inserted into each gaming machine addedup, but part of a total number of inserted coins in the plural gaming machines are separately added up as a bonus pool. The host computer gives a bonus qualification to a gaming machine in which the number of inserted coins reaches a predetermined number. The host computer transmits a command to one gaming machine selected from gaming machines having bonus qualification, when a value of the bonus pool reaches a predetermined threshold value. The gaming machine which received the command is enabled to play a bonus game high in gambling characteristic.

[0006] In a slot machine described in JP-A 2003-117053, however, it is a player who plays a game in a gaming machine selected in a lottery that enjoys a profit from a jackpot. Hence, there has arisen a case where a player having spent many coins cannot enjoy a jackpot at all, but another player who has just started the game acquires a jackpot profit.

[0007] In the system described in U.S. Patent No. 5, 820, 459 as well, a chance to acquire the profit of a bonus game is one of gaming machines in which a total number of inserted coins reaches a predetermined number. A chance to acquire the profit of a bonus game is not always given to a player having spent many coins. Therefore, in the system described in U.S. Patent No. 5, 820, 459, there has arisen a case where a player having spent many coins cannot secure the profit of a bonus game and another player who has just started the game acquires a bonus game profit, in a similar way to that in a slot machine described in JP-A 2003-117053.

[0008] In the system described in U.S Patent No. 5, 820, 459, part of the number of inserted coins in each of plural gaming machines is added up as a bonus pool. Hence, in a case where an operation rate of the gaming machines in the system is low, a player, who has spent many of coins, has had a possibility not to be rewarded by the profit of a bonus game since the value of the bonus pool does not reaches a predetermined threshold value.

[0009] If such circumstances occur, a player who has spent many coins may feel unpleasant against the game, build up distrust thereto, or lose interest in or a concern on the game.

[0010] The contents of JP-A 2003-117053 and U.S. Patent No. 5, 820, 459 are incorporated herein by reference in their entirety.

SUMMARY OF THE INVENTION

[0011] The present invention has been made in light of the above-mentioned problems and it is an object of the present invention to provide: a gaming machine capable of preventing a player who has spent many of the game media such as coins from feeling unpleasant against a game, building up a distrust thereto, or losing interest in or a concern on the game; a control device; and a game system.

[0012] In order to solve the above-mentionedproblems, the present invention provides the following configuration:

(1) A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery; means for generating a first special game state that is a game state advantageous to a player

when the determined winning combination is a special winning combination; and
means for, when the number of games accumulatively counted each time a game is played reaches a set value that is an object of comparison with the number of games, generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high.

[0013] According to the configuration (1), when the number of games reaches a set value that is an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0014] The present invention provides the following configuration:

(2) A gaming machine connected through a communication line to a control device which counts the number of games accumulatively for every gaming machine of plural gaming machines, comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination;
means for transmitting an identification information of a gaming machine to the control device through the communication line each time a game is played;
means for receiving a command signal transmitted from the control device when the number of games counted accumulatively by the control device based on the identification information of the gaming machine reaches a set value that is an object of comparison with the number of games; and
means for generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high, based on the command signal.

[0015] According to the configuration (2), when the number of games counted by the control device reaches a set value that is set as an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0016] The present invention provides the following configuration:

(3) A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination;
means for counting accumulatively the number of games each time a game is played;
means for determining whether or not the number of games has reached a set value that is set as an object of comparison with the number of games; and
means for generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high when the number of games is determined to have reached the set value.

[0017] According to the configuration (3), when the number of games reaches a set value that is an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. As a result, it can be prevented for a player who has spent many of the game media from

feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0018] The present invention provides the following configuration:

(4) The gaming machine according to any of the configurations (1) to (3), further comprising:

means for finishing the second special game state when the player hits the special winning combination by the lottery during generation of the second special game state.

[0019] According to the configuration (4), the second special game state is continued until the first special game state is generated. Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0020] The present invention provides the following configuration:

(5) The gaming machine according to any of the configurations (1) to (3),
wherein
reception means that can accept for one game an insertion of game media up to a predetermined upper limit value is provided, and the means for generating the second special game state generates a second special game state in a case where the number of inserted game media for the game played by the player is equal to the upper limit when the number of games reaches the set value.

[0021] According to the configuration (5), a player can be urged to insert the game media up to the upper limit, thereby enabling a facility such as a casino to increase its profit.

[0022] The present invention provides the following configuration:

(6) A gaming machine equipped with a processing device and a storage device,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program; and
a processing reading from the storage device a program for generating a second special game state in which a probability of hitting the special winning combination by executing the lottery program is set relatively high when the number of games counted accumulatively each time a game is played reaches a set value that is an object of comparison with the number of games, and executing the program.

[0023] According to the configuration (6), when the number of games reaches a set value that is an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0024] The present invention provides the following configuration:

(7) A gaming machine equipped with a processing device and a storage device, and connected through a communication line to a control device which counts the number of games accumulatively for every gaming machine of plural gaming machines,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program;
a processing transmitting an identification information on a gaming machine stored in the stor-

age device to the control device through the communication line each time a game is played;
a processing receiving a command signal transmitted from the control device when the number of games counted accumulatively by the control device based on the identification information on the gaming machine reaches a set value that is an object of comparison with the number of games; and
a processing reading from the storage device a program for generating a second special game state in which a probability of hitting the special winning combination by executing the lottery program is set relatively high, based on the command signal, and executing the program.

[0025] According to the configuration (7), when the number of games counted by the control device reaches a set value that is an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0026] The present invention provides the following configuration:

(8) A gaming machine equipped with a processing device and a storage device,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program;
a processing counting the number of games accumulatively each time a game is played;
a processing determining whether or not the number of games has reached a set value that is set as an object of comparison with the number of games; and
a processing reading from the storage device a program for generating a second special game state in which a probability of hitting the special winning combination by executing the lottery program is set relatively high when the number of games is determined to have reached the set value, and executing the program.

[0027] According to the configuration (8), when the number of games reaches a set value that is an object of comparison with the number of games, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0028] The present invention provides the following configuration:

(9) The gaming machine according to any of the configurations (6) to (8),
wherein
the processing device executes a processing finishing the second special game state when the player hits the special winning combination by the lottery during generation of the second special game state.

[0029] According to the configuration (9), the second special game state is continued until the first special game state is generated. Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the number of games reaches the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0030] The present invention provides the following configuration:

(10) The gaming machine according to any of the configurations (6) to (8), wherein the processing device executes a program for generating the second

special game state when the number of games reaches the set value in a case where the number of inserted game media for a game played by the player is the upper limit value of the number of game media to be inserted for one game.

[0031] According to the configuration (10), a player can be urged to insert game media up to the upper limit, thereby enabling a facility such as a casino to increase its profit.

[0032] The present invention provides the following configuration:

(11) A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination; and
means for, when the payment balance in terms of the game media accumulatively counted each time a game is played is equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high.

[0033] According to the configuration (11), when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0034] The present invention provides the following configuration:

(12) A gaming machine connected through a communication line to a control device which counts the payment balance in terms of the game media accumulatively for every gaming machine of plural gaming machines, comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination;
means for transmitting a payment balance in terms of the game media in a game played by a player together with an identification information of a gaming machine to the control device through the communication line each time a game is played;
means for receiving a command signal transmitted from the control device when the payment balance in terms of the game media counted accumulatively by the control device based on the identification information of the gamingmachine and the payment balance in terms of the game media in a game played by the player is equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media; and
means for generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high, based on the command signal.

[0035] According to the configuration (12), when the payment balance in terms of the game media counted by the control device becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the second special game state inwhich aprobabilityof generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0036] The present invention provides the following configuration:

(13) A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a

special winning combination;
means for counting accumulatively the number of games each time a game is played;
means for determining whether or not the payment balance in terms of the game media has become equal to or less than a set value that is set as an object of comparison with the payment balance in terms of the game media; and
means for generating a second special game state in which a probability of hitting the special winning combination by the lottery is set relatively high when the payment balance in terms of the game media is determined to have become equal to or less than the set value.

[0037] According to the configuration (13), when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.
[0038] The present invention provides the following configuration:

(14) The gaming machine according to any one of the above (11) to (13), further comprising:

means for finishing the second special game state when the player hits the special winning combination by the lottery during generation of the second special game state.

[0039] According to the configuration (14), the second special game state continues until the first special game state is generated. Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.
[0040] The present invention provides the following configuration:

(15) The gaming machine according to any one of the above (11) to (13), wherein
reception means that can accept for one game an insertion of game media up to a predetermined upper limit value is provided, and the means for generating the second special game state generates a second special game state in a case where the number of inserted game media for the game played by the player is equal to the upper limit when the payment balance in terms of the game media becomes equal to or less than the set value.

[0041] According to the configuration (15), a player can be urged to insert the game media up to the upper limit, thereby enabling increase in profit in a facility such as a casino.
[0042] The present invention provides the following configuration:

(16) A gaming machine equipped with a processing device and a storage device,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program; and
a processing reading from the storage device a program for generating a second special game state in which a probability of hitting the special winning combination by executing the lottery program is set relatively high when the payment balance in terms of the game media counted accumulatively each time a game is played becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, and executing the program.

[0043] According to the configuration (16), when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game

media, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0044] The present invention provides the following configuration:

(17) A gaming machine equipped with a processing device and a storage device, and connected through a communication line to a control device which counts the payment balance in terms of the game media accumulatively for every gaming machine of plural gaming machines,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program;
a processing transmitting the number of inserted game media and the number of payouts in the game played by a player together with an identification information on the gaming machine which are stored in the storage device to the control device through the communication line each time a game is played;
a processing receiving a command signal transmitted from the control device when the payment balance in terms of the game media counted accumulatively by the control device based on the identification information on the gaming machine and the number of inserted game media and the number of payouts in the game played by a player becomes equal to or less than a set value that is an obj ect of comparison with the payment balance in terms of the game media; and
a processing reading from the storage device a program for generating a second special game state in which a probability of hitting the special winning combination by executing the lottery program is set relatively high, based on the command signal, and executing the program.

[0045] According to the configuration (17), when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0046] The present invention provides the following configuration:

(18) A gaming machine equipped with a processing device and a storage device,
wherein
the processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in the storage device;
a processing reading from the storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing the program;
a processing counting a payment balance in terms of the game media accumulatively each time a game is played;
a processing determining whether or not the payment balance in terms of the game media is equal to or less than a set value that is set as an object of comparison with the payment balance in terms of the game media; and
a processing reading from said storage device a program for generating a second special game state in which a probability of hitting said special winning combination by executing said lottery program is set relatively high when the payment

balance in terms of the game media is determined to be equal to or less than the set value, and executing the program.

[0047] According to the configuration (18), when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the second special game state in which a probability of generating the first special game state is set relatively high is generated.
Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is necessarily generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than the set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0048] The present invention provides the following configuration:

(19) The gaming machine according to any one of the above (16) to (18), wherein
the processing device executes a processing finishing the second special game state when a player hits the special winning combination by the lottery during generation of the second special game state.

[0049] According to the configuration (19), the second special game state continues until the first special game state is generated. Hence, even if the first special game state is not generated for a long period leading to the spending of many of the game media, the second special game state is generated as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the first special game state generated during the second special game state, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media becomes equal to or less than a set value. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0050] The present invention provides the following configuration:

(20) The gaming machine according to any one of the above (16) to (18), wherein
the processing device executes a program for generating the second special game state when the payment balance in terms of the game media becomes equal to or less than the set value in a case where the number of inserted game media for a game played by the player is the upper limit value of the number of game media to be inserted for one game.

[0051] According to the configuration (20), a player can be urged to insert game media up to the upper limit, thereby enabling increase in profit in a facility such as a casino.

[0052] The present invention provides the following configuration:

(21) A gaming machine comprising:

means for generating a game state advantageous to a player when the player hits a predetermined lottery;
means for setting a hitting probability of the lottery high according to the number of games played by the player; and
means for returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set high.

[0053] According to the configuration (21), the hitting probability for a game state advantageous to a player is set high according to the number of games played by a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a return for playing the game for a long period of time. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0054] The present invention provides the following configuration:

(22) A gaming machine comprising:

means for generating a game state advantageous to a player when the player hits a predetermined lottery;
means for setting a hitting probability of the lottery high according to the payment balance in terms of the game media of the player; and
means for returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set high.

[0055] According to the configuration (22), ahitting-probability for a game state advantageous to a player is set high according to the payment balance in terms of the game media of a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a

return for the fact. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0056] The present invention provides the following configuration:

(23) A game control method comprising:

a step of generating a game state advantageous to a player when the player hits a predetermined lottery;
a step of setting a hitting probability of the lottery high according to the number of games played by the player; and
a step of returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set high.

[0057] Accordingto the configuration (23), a hitting probability for a game state advantageous to a player is set high according to the number of games played by a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a return for playing the game for a long period of time. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0058] The present invention provides the following configuration:

(24) A game control method comprising:

a step of generating a game state advantageous to a player when the player hits a predetermined lottery;
a step of setting a hitting probability of the lottery high according to the payment balance in terms of the game media of a player; and
a step of returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set high.

[0059] According to the configuration (24),a hitting probability for a game state advantageous to a player is set high according to the payment balance in terms of the game media of a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a return for the fact. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0060] The present invention provides the following configuration:

(25) A game system equipped with a gaming machine and a control device,
wherein
the control device includes:

means for transmitting a signal to the gaming machine according to the number of games played in the gaming machine by a player, and
the gaming machine includes:

means for generating a game state advantageous to the player when the player hits a predetermined lottery;
means for setting a hitting probability of the lottery high based on the signal received from the control device; and
means for returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set high.

[0061] Accordingto the configuration (25), ahitting-probability for a game state advantageous to a player is set high according to the number of games played by a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a return for playing the game for a long period of time. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0062] The present invention provides the following configuration:

(26) A game system equipped with a gaming machine and a control device,
wherein
the control device includes:

means for transmitting a signal to the gaming machine according to the payment balance in terms of the game media of the player in the gaming machine, and
the gaming machine includes:

means for generating a game state advantageous to the player when the player hits a predetermined lottery;
means for setting a hitting probability of the lottery high based on the signal received from the control device; and
means for returning the hitting probability to an original probability when the player hits the lottery while the hitting probability is set

high.

[0063] Accordingto the configuration (26), a hitting probability for a game state advantageous to a player is set high according to the payment balance in terms of the game media of a player, and the state in which the hitting probability is set high is continued until an advantageous game state is generated. Therefore, the player who has spent many game media can surely receive a return for the fact. As a result, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0064] As a result, according to the present invention, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

BRIEF DESCRIPTION OF THE DRAWINGS

[0065]

Fig. 1 is a schematic diagram showing the entire construction of a game system according to one embodiment of the present invention;

Fig. 2 is a perspective view schematically showing a gaming machine according to one embodiment of the present invention;

Fig. 3 is a schematic view showing the symbol sequence depicted on the outer circumferential surface of each reel;

Fig. 4 is a block diagram showing the internal construction of the gaming machine shown in Fig. 2;

Fig. 5 is a block diagram showing the internal construction of a control device according to one embodiment of the present invention;

Fig. 6 is a figure schematically showing an example of correspondence table between a gaming machine identification number and a game history;

Fig. 7 is a flowchart showing a procedure in an authentication reading processing for a game program and a game system program executed by a motherboard and a gaming board shown in Fig. 4;

Fig. 8 is a flowchart showing a subroutine of a game mode selection processing;

Figs. 9A and 9B are figures showing an image displayed on the lower image display panel when a game mode selection processing is executed;

Fig. 10 is a flowchart showing a subroutine of a game execution processing;

Fig. 11 is a flowchart showing a subroutine of a lottery processing;

Fig. 12 is a figure describing a relationship among winning combinations of plural kinds, establishment possibility of each winning combination and the number of coin-out in the present embodiment;

Fig. 13 is a flowchart showing a subroutine of a reel rotating control processing;

Figs. 14A to 14D are side views for describing a rotating operation of the reel;

Fig. 15 is a schematic diagram showing a correspondence table between the number of steps and the code No.;

Fig. 16 is flowchart showing a subroutine of a bonus game processing;

Fig. 17 is a flowchart showing a subroutine of a return mode processing;

Fig. 18 is a figure describing a relationship among winning combinations of plural kinds, establishment possibility of each winning combination and the number of coin-out in a lottery processing of a return mode;

Fig. 19 is a flowchart showing a subroutine of a counting processing; and

Fig. 20 is a flowchart showing another example of a subroutine of a game execution processing.

DESCRIPTION OF THE EMBODIMENTS

[0066] Fig. 1 is a schematic diagram showing the entire construction of a game system according to one embodiment of the present invention.

A game system 100 includes: plural gaming machines 10; and a control device 200 connected to the gaming machines 10 through a predetermined communication line 101. Such a game system 100 may be constructed in one recreation facility capable of playing various kinds of games such as a bar, a casino and the like, or between plural recreation facilities. When the game system is constructed in one recreation facility, the game system 100 may be constructed on each floor or section of the recreation facility. The communication line 101 is not particularly limited, and may be wired or wireless, and either a dedicated line or a switched line can be used.

[0067] In the embodiment, the gaming machine 10 is a slot machine. In the present invention, however, a gaming machine is not limited to a slot machine, and for example, a so-called single gaming machine such as a video slot machine, a video card gaming machine and the like may be adopted, and a so-called mass game (multi-terminal gaming machine) such as a racing game, a bingo game, a public lottery and the like, which is a game that takes a predetermined time for a result to be displayed, may also be adopted.

[0068] In the gaming machine 10, a coin, a note or an electronic valuable information corresponding thereto is used as a game media. In the present invention, however, the game media is not particularly limited, and for example, a medal, a token, an electronic money and a ticket can be used. The ticket is not particularly limited and may include, for example, a ticket with a bar code as described later, and of the like tickets.

[0069] The control device 200 controls plural gaming machines 10. Especially, in the present embodiment, the control device 200 controls a transition to a return mode

in each of the gaming machines 10. The return mode corresponds to the second special game state in the present invention and the probability of the generating of the bonus game becomes relatively high in the return mode. The control device 200 may be a device which controls the return rate by controlling the transition to the return mode. In such a construction, the control device 200 may be a device which controls the return rates of each of the gaming machines 10 individually, or a device which controls the return rate across all gaming machines 10 collectively.

[0070] The control device 200 may further function as a so-called hole server which is installed in a recreation facility having plural gaming machines 10, or as a server which collectively controls plural recreation facilities. Moreover, every gaming machine 10 has its own identification number, and the source of data transmitted to the control device 200 from each of the gaming machines 10 is distinguished therein by their identification numbers. The identification number is also used to designate a transmission destination of data transmitted to the gaming machine 10 from the control device 200.

[0071] The identification number of a gaming machine corresponds to the identification information on a gaming machine of the present invention. The identification information on a gaming machine of the present invention is not particularly limited, and examples thereof may include: a letter, a symbol, a figure, a combination thereof, and the like.

[0072] Fig. 2 is a perspective view schematically showing a gaming machine according to one embodiment of the present invention.

The gaming machine 10 includes: a cabinet 11; a top box 12 placed on the upper side of the cabinet 11; and a main door 13 provided at the front face of the cabinet 11. Inside the cabinet 11, three reels 14 (14L, 14C and 14R) are rotatably installed. Twenty two designs (hereinafter, also referred to as symbols) are depicted as symbol sequences on the outer circumferential surface of each of the reels 14.

[0073] A lower image display panel 16 is provided over the reels 14 in the main door 13. The lower image display panel 16 is provided with a transparent liquid crystal panel, and various kinds of information, representation image and the like associated with the game are displayed while the game is played.

A number-of-credits display section 31 and a number-of-payouts display section 32 are formed on the lower image displaypanel 16. The number of credited coins is displayed as an image on the number-of-credits display section 31. The number of coins to be paid out is shown as an image on the number-of-payouts display section 32, when a combination of symbols stop displayed on a winning line L is a predetermined combination.

[0074] Three display windows 15 (15L, 15C and 15R), the back faces of which are visually recognizable, are formed on the lower image display panel 16, and through each of the display windows 15, three of the symbols depicted on the outer circumferential surface of each of the reels 14 are displayed. One winning line L traversing horizontally the three display windows 15 is formed on the lower image display panel 16. The winning line L defines a combination of symbols. When a combination of symbols stop displayed on the winning line L is a predetermined combination, the number of coins corresponding to the combination and the number of inserted coins (the number of BETs) is paid out.

[0075] Moreover, in the present invention, for example, when: plural winning lines L which traverse horizontally or obliquely the three display windows 15 are formed; the winning lines L, the number thereof which becomes effective set to be dependent on the number of coin-in, become effective; and a combination of symbols stop displayed on the winning line L which became effective is a predetermined combination, the number of coins corresponding to the stop-displayed combination may be paid out.

[0076] A touch panel 69, which is not shown in the figure, is provided on the front face of the lower image display panel 16 and the player can input various kinds of commands by operating the touch panel 69.

[0077] Provided below the lower image display panel 16 are: a control panel 20 constituting of plural buttons 23 to 27 which are inputted by the player, commands associated with progress of the game; a coin receiving slot 21 accepting coins into the cabinet 11; and a note identifier 22.

[0078] The control panel 20 is provided with: a spin button 23; a change button 24; a CASHOUT button 25; a 1-BET button 26; and a maximum BET button 27. The spin button 23 is used for inputting a command to start the rotating of the reels 14. The change button 24 is used in a case where a player requests an attendant of a recreation facility to exchange money. The CASHOUT button 25 is used for inputting a command to pay out credited coins to a coin tray 18.

[0079] The 1-BET button 26 is used for inputting a command to bet one coin of the credited coins. The maximum BET button 27 is used for inputting a command to bet the maximum number of coins that can be bet on one game (50 coins in the present embodiment) of the credited coins.

[0080] In the present invention, insertion of a game media means that a game media is bet on a game. For example, when coins inserted into the coin receiving slot 21 are directly bet on a game, insertion of coins into the coin receiving slot 21 corresponds to insertion of a game media. However, when coins inserted into the coin receiving slot 21 are temporarily credited, and the credited coins are bet on a game by operating the 1-BET button 26 or the maximum BET button 27, as in the present embodiment, the bet of the credited coins on the game corresponds to insertion of a game media.

[0081] The note identifier 22 is used not only for discriminating a false note from a true note but also for accepting the true note into the cabinet 11. The note iden-

tifier 22 may be configured such that a ticket 39 with a bar code which will be described later can be read. Abelly glass 34 on which characters and the like of the gaming machine 10 are depicted is provided on the front face of the lower portion of the main door 13, that is, below the control panel 20.

[0082] An upper image display panel 33 is provided at the front face of a top box 12. The upper image display panel 33 is provided with a liquid crystal panel and, for example, an image to introduce the contents of the game or explain a game rule is displayed thereto.

[0083] A speaker 29 is provided in the top box 12. A ticket printer 35, a card reader 36, a data display 37 and a keypad 38 are provided beneath the upper image display panel 33. The ticket printer 35 prints on a ticket a bar code in which data such as the number of credits, date, time, identification number of the gaming machine 10 and of the like data are encoded, and outputs the ticket 39 with a bar code. A player can make the ticket 39 with a bar code to be read by a second gaming machine and play a game in the second gaming machine, or exchange in a predetermined place (for example, at a cashier in the casino) of a recreation facility the ticket 39 with a bar code to notes.

[0084] The card reader 36 is used for reading data from a smart card and writing data onto a smart card. The smart card is a card to be carried by a player, and for example, data to identify a player and data concerning a history of a game played by a player are stored thereon. Data corresponding to a coin, a note or a credit may also be storedon the smart card. As an alternative of a smart card, a magnetic stripe card may be adopted. The data display 37 is a fluorescent display and the like, and it is used, for example, to display data read by the card reader 36 and data inputted by a player from the keypad 38. The keypad 38 is used for inputting a command or data to issue a ticket and the like.

[0085] Fig. 3 is a schematic view showing the symbol sequence depicted on the outer circumferential surface of each reel.

Twenty two symbols each are depicted on the outer circumferential surface of the left reel 14L, the middle reel 14 C and the right reel 14 R. A sequence of the symbols depicted on the outer circumferential surface of each of the reels 14 is different from one another. The sequences of the symbols are combinations of the following symbols: "JACKPOT 7", "BLUE 7", "BELL", "CHERRY", "STRAWBERRY", "PLUM", "ORANGE" and "APPLE".

[0086] When the same three symbols of one of the symbols of "JACKPOT 7", "BLUE7", "BELL", "CHERRY", "STRAWBERRY", "PLUM" and "ORANGE" are stop displayed on the winning line L, a predetermined number of credits is added to the account of the player as a credit owned by the player (see Fig. 12). As for "CHERRY" and "ORANGE", even if one or two of one of the symbols are stop displayed, a predetermined number of credits are added to the account of the player as credits owned by the player according to the number of the symbols stop displayed (see Fig. 12).

[0087] The symbol sequence "APPLE" is a bonus game trigger (a symbol to transit to a bonus game). When three of the "APPLE" are stop displayed on the winning line L, a game state shifts to a bonus game. The bonus game corresponds to the first special game state. In the present embodiment, a bonus game is a free game (a game in which a predetermined number thereof can be played without inserting coins for BET).

[0088] In the present invention, the first special game state is not particularly limited as far as it is a game state advantageous to the player. A game state that is advantageous to the player is not particularly limited as far as it is more advantageous than an ordinary game state (a game state other than the first special game state or the second special game state) and examples thereof include: a state where more of the game media can be earned than in an ordinary game state, a state where the game media can be earned on a probability higher than in an ordinary game state, a state where the number of the game media spent by a player is less than in an ordinary game state and of the like state. More specifically, examples of the first special game state include a free game, a second game, a mystery bonus and the like.

[0089] The sequence of symbols depicted on each of the reels 14 are, when the spin button 23 is pressed after the 1-BET button or the maximum BET button 27 is pressed to start a game, scroll displayed by scrolling downwards in the display windows 15 during the rotating of the reels 14, and after a predetermined time elapses, the rotating of the reels 14 comes to a stop, and thus the sequence of symbols are stop displayed in the display windows 15. Various kinds of winning combinations (see Fig. 12) are predetermined based on combinations of symbols and when a combination of symbols corresponding to a winning combination stops on the winning line L, the number of payout coins corresponding to the winning combination is added to credits owned by the player. When a bonus game trigger has been established, a bonus game is generated.

[0090] When a return mode flag which will be described later has been set to the state "ON", a game state shifts to a return mode after the symbols are stop displayed as described above. When a bonus game has been generated, the game state shifts to the return mode after the bonus game is over. The return mode corresponds to the second special game state. In the present embodiment, if a game state shifts to the return mode, the probability of the generating of the bonus game becomes relatively high (see Fig. 14).

[0091] Fig. 4 is a block diagram showing the internal construction of the gaming machine shown in Fig. 2.

A gaming board 50 includes: CPU (Central Processing Unit) 51, ROM 55 and boot ROM 52 which are interconnected to one another by an internal bus; a card slot 53S which accepts a memory card 53; an IC socket 54S which accepts GAL (Generic Array Logic) 54.

[0092] The memory card 53 is constituted of non-vol-

atile memories such as CompactFlash (registered trademark) and stores a game program and a game system program. The game program contains a lottery program. The lottery program is a program for determining symbols (code Nos. corresponding to the symbols) on each of the reels 14 which are to be stop displayed on the winning line L. The lottery program contains one or more of symbol weighting determination data, each corresponding to respective plural kinds of payout rates (for example, 80%, 84% and 88%). The symbol weighting determination data is data showing a correspondence relationship between a code No. (see Fig. 3) of each symbol and one or plural random number values from a predetermined numerical value range (0 to 255), for each of the three reels 14. A payout rate is determined based on data for setting a payout rate outputted from the GAL 54, and the lottery is executed based on symbol weighting determination data corresponding to the payout rate.

[0093] The card slot 53S is configured so that the memory card 53 can be inserted therein or drawn out therefrom, and connected to a motherboard 40 through IDE bus. Therefore, a kind or contents of a game played in the gaming machine 10 can be changed by drawing out the memory card 53 from the card slot 53S, writing a different game program and game system program thereon, and inserting the memory card 53 into the card slot 53S thereafter. Moreover, a kind or contents of a game played in the gaming machine 10 can also be changed by changing a memory card 53 on which a game program and a game system program are stored to a different memory card 53 on which a different game program and game system program are stored. The game program includes a program related to progress in a game; a program for generating the first special game state; and a program for generating the second special game state. The game program further includes: image data and sound data outputted while a game is played and image data and sound data used as notification data.

[0094] GAL 54 is one kind of PLD having an OR fixed array structure. GAL 54 is equipped with a plurality of an input port and an output port and when a predetermined data is inputted to the input port, data corresponding to the input data is outputted from the output port. The data outputted from the output port is the above-mentioned data for setting a payout rate.

The IC socket 54S is configured such that GAL 54 can be mounted thereto or demounted therefrom, and connected to the motherboard 40 through PCI bus. Therefore, data for setting a payout rate outputted from GAL 54 can be changed by drawing out GAL 54 from the IC socket 54S, rewriting a program stored on GAL 54, mounting GAL 54 is to the IC socket 54S thereafter. Moreover, data for setting a payout rate can also be changed by changing GAL 54 to a different GAL 54.

[0095] CPU 51, ROM 55 and boot ROM 52 interconnected to each other by the internal bus are connected to the motherboard 40 by PCI bus. The PCI bus not only conducts signal transmission between the motherboard 40 and the gaming board 50, but also supplies electric power to the gaming board 50 from the motherboard 40. ROM 55 stores country identification information and an authentication program therein. Boot ROM 52 stores a preliminary authentication program, a program for CPU 51 to activate the preliminary authentication program (a boot code) and the like therein.

[0096] The authentication program is a program to authenticate a game program and a game system program (an alteration check program). The authentication program is stated along a procedure for confirmation and certification that the game program and the game system program that are objects of an authentication capture processing are not altered, that is, a procedure for conducting authentication of the game program and the game system program (an authentication procedure). The preliminary authentication program is a program for authenticating the above-mentioned authentication program. The preliminary authentication program is stated along a procedure for certification that an authentication program that is an object of an authentication processing is not altered, that is, a procedure for authenticating the authentication program (an authentication procedure).

[0097] The motherboard 40 is constructed with a general-purpose motherboard commercially available (a printed circuit board on which basic parts of a personal computer are mounted) and includes: a main CPU 41; ROM (Read Only Memory) 42; RAM (Random Access Memory) 43 and a communication interface 44. The main CPU 41 is the processing device of the present invention.

[0098] ROM 42 is constituted of a memory device such as a flash memory and stores thereon a program such as BIOS (Basic Input/Output System) executed by the main CPU 41 and permanent data. When BIOS is executed by the main CPU 41, not only is an initialization processing for predetermined peripheral devices conducted, but a capture processing for the game program and the game system program stored on the memory card 53 is also started via the gaming board 50. In the present invention, contents of ROM 42 may be rewritable or not rewritable.

[0099] RAM 43 stores data and a programused at the time of operation of the main CPU 41. RAM 43 can store the authentication program read through the gaming board 50 together with the game program and the game system program. RAM 43 is the storage device of the present invention.

[0100] RAM 43 is provided with a storage region for a return mode flag. The return mode flag is a flag to be referred to when a game state is to be selected whether or not it should be shifted to a return mode corresponding to the second special game state. The storage region of the return mode flag is constituted of a storage region with, for example, a predetermined number of bits and the return mode flag is turned "ON" or "OFF" according to storage contents in the storage region. If the return mode flag is set to the state "ON", the game state thereafter shifts to the return mode without fail. Furthermore,

when a bonus game is executed in the return mode, the return mode flag is turned "OFF". RAM 43 further stores data on the number of credits, the number of coin-in or coin-out for one game, and the like.

[0101] The communication interface 44 is used to communicate with the control device 200 through the communication line 101. The main CPU 41 transmits the number of coin-in and the number of coin-out together with the gaming machine identification number of the gaming machine 10 to the control device 200 each time a game is played. The number of games, an accumulative number of coin-in and an accumulative number of coin-out is made to be associated with each gaming machine identification number, and stored in the control device 200. In the control device 200, a set value that is an object of comparison with the number of games is preliminary determined with respect to each gaming machine identification number, and when the number of games of one gaming machine 10 reaches a set value determined for that gaming machine 10, a return command signal is transmitted from the control device 200. When the main CPU 41 receives the return command signal through the communication interface 44, the return mode flag is set to the state "ON".

[0102] Both a body PCB (Printed Circuit Board) 60 and a door PCB 80 which will be described later are connected to the motherboard 40 by USB. A power supply unit 45 is also connected to the motherboard 40. When electric power is supplied from the power supply unit 45 to the motherboard 40, not only is the main CPU 41 of the motherboard 40 activated, but CPU 51 is also activated from electric power supplied through the PCI bus to the gaming board 50.

[0103] Equipment and devices which generate input signals to be inputted to the main CPU 41, and equipment and devices of which operations are controlled by a control signal outputted from the main CPU 41 are connected to the body PCB 60 and the door PCB 80. The main CPU 41 executes a game program and a game system program stored in RAM 43 based of an input signal inputted to the main CPU 41, and thereby performs a predetermined computational processing, stores results of thereof into RAM 43 and transmits a control signal to each equipment and device as a control processing for each of the equipment and devices.

[0104] A lamp 30, a sub CPU 61, a hopper 66, a coin detecting section 67, a graphic board 68, a speaker 29 as an output device, a touch panel 69, a note identifier 22, a ticket printer 35, a card reader 36, a key switch 38S and a data display 37 are connected to the body PCB 60. The lamp 30 is lit up in a predetermined pattern based on a control signal outputted from the main CPU 41.

[0105] The sub CPU 61 controls the rotation and stopping of the reels 14 (14L, 14C and 14R). Amotor driving circuit 62 equipped with FPGA (Field Programmable Gate array) 63 and a driver 64 is connected to the sub CPU 61. FPGA 63 is an electronic circuit such as LSI capable of programming and works as a control circuit of a stepping motor 70. The driver 64 works as an amplifier circuit of a pulse to be inputted to the stepping motor 70. The stepping motors 70 (70L, 70C and 70R) which rotate each of the reels 14, are connected to the motor driving circuit 62. The stepping motor 70 is a 1-2 phase excitation type stepping motor.

[0106] In the present invention, an exciting type of the stepping motor is not particularly limited, and for example, a motor of a 2 or 1 phase excitation type can be adopted. A DC motor may be adopted instead of a stepping motor. When a DC motor is adopted, a deviation counter, a D/A converter and a servo amplifier are sequentially connected to the sub CPU 61 in this order and the DC motor is connected to the servo amplifier. A rotational position of the DC motor is detected by a rotary encoder and a current rotational position of the DC motor is supplied as data from the rotary encoder to the deviation counter.

[0107] An index detecting circuit 65 and a position change detecting circuit 71 are connected to the sub CPU 61. The index detecting circuit 65 is used for detecting positions (indexes described later) of the rotating reels 14 and can also detect an out-of-order state of the reels 14. As for the control of the rotating and stopping of the reels 14, detailed description will be given later by making reference to the figures.

[0108] The position change detecting circuit 71 detects a change of stoppage positions of the reels 14 after the stopping of the rotating of the reels 14. The position change detecting circuit 71 detects the change of stoppage positions of the reels 14, for example, in a case where the stoppage position is changed by force by a player as if the combination of symbols was in a wining state, despite the fact that the combination of symbols is not actually in a wining state, and of the like cases. The position change detecting circuit 71 is configured to be capable of detecting the change of stoppage position of the reel 14 by, for example, detecting fins (not shown in the figure) attached with a predetermined space on the inner side of the reel 14.

[0109] The hopper 66 is installed in the cabinet 11 and pays out a predetermined number of coins from a coin payout exit 19 to a coin tray 18 based on a control signal outputted from the main CPU 41. A coin detecting section 67 is installed inside the coinpayout exit 19 and when detecting that a predetermined number of coins has been paid out from the coin payout exit 19, outputs an input signal to the main CPU 41.

[0110] The graphic board 68 controls, based on a control signal outputted from the main CPU 41, image displays on the upper image display panel 33 and the lower image display panel 16 as an output device. The number of credits stored in RAM 43 is displayed on the number-of-credits display section 31 of the lower image display panel 16. The number of coin-out is displayed on the number-of-payouts display section 31 of the lower image display panel 16.

The graphic board 68 is equipped with VDP (Video Dis-

play Processor) which generates image data based on a control signal outputted from the main CPU 41 and a video RAM which temporarily stores image data generated by VDP, and of the like equipments. Note that image data used in generating image data with VDP is read from the memory card 53 and contained in a game program stored in RAM 43.

[0111] The note identifier 22 not only discriminates a true note from a false note, but also accepts the true note into the cabinet 11. The note identifier 22, when accepting a true note, outputs an input signal to the main CPU 41 based on a face amount of the note. The main CPU 41 stores the number of credits corresponding to the amount of the note transmitted with the input signal.

[0112] The ticket printer 35, based on a control signal outputted from the main CPU 41, prints on a ticket a bar code obtained by encoding data such as the number of credits, date and time, the identification number of the gaming machine 10, and of the like data stored in RAM 43, and outputs the ticket 39 with a bar code.

The card reader 36 transmits to the main CPU 41 data read from the smart card and writes data onto the smart card based on a control signal from the main CPU 41. The key switch 38S is provided on the keypad 38, and when the keypad 38 is operated by a player, outputs a predetermined input signal to the main CPU 41. The data display 37 displays, based on a control signal outputted from the main CPU 41, data read by the card reader 36 and data inputted by a player through the keypad 38.

[0113] The control panel 20, a reverter 21S, a coin counter 21C and a cold cathode tube 81 are connected to the door PCB 80. The control panel 20 is provided with a spin switch 23s corresponding to the spin button 23, a change switch 24S corresponding to the change button 24, a CASHOUT switch 25S corresponding to the CASHOUT button 25, a 1-BET switch 26S corresponding to the 1-BET button 26, and a maximum BET switch 27S corresponding to the maximum BET button 27. When the buttons 23 to 27 are operated by a player, each of the switches 23S to 27S corresponding thereto outputs input signals to the main CPU 41.

[0114] The coin counter 21C is installed inside the coin receiving slot 21, and discriminates whether a coin inserted by a player into the coin receiving slot 21 is true or false. Coins other than the true ones are discharged from the coin payout exit 19. The coin counter 21C also outputs an input signal to the main CPU 41 when a true coin is detected.

[0115] The reverter 21S operates based on a control signal outputted from the main CPU 41 and distributes coins recognized by the coin counter 21C as true coins into a cash box (not shown in the figure) or the hopper 66, which are disposed in the gaming machine 10. In other words, when the hopper 66 is filled with coins, true coins are distributed into the cash box. On the other hand, when the hopper 66 is not filled with coins, true coins are distributed into the hopper 66. The cold cathode tube 81 works as a backlight installed on the back face sides of the lower image display panel 16 and the upper image display panel 33 and is lit up based on a control signal outputted from the main CPU 41.

[0116] Fig. 5 is a block diagram showing the internal construction of a control device according to one embodiment of the present invention.

A control device 200 includes: CPU 201 as a processing device; ROM 202; RAM 203 as a temporary storage device; a communication interface 204; and a hard disc drive 205. The communication interface 204 is connected to the communication interface 44 of the gaming machine 10 through the communication line 101. ROM 202 stores a system program for controlling operations of the control device, a permanent data, and the like. RAM 203 temporarily stores data received from each of the gaming machines 10 and data such as results of the computational operation. Moreover, a game history of a gaming machine 10 is stored in the hard disc drive 205, by being associated with the gaming machine identification number of each of the gaming machines 10.

[0117] Fig. 6 is a figure schematically showing an example of correspondence table between a gaming machine identification number and a game history.

Each of the gaming machine identification numbers correspond to a game history based on the number of games, an accumulative number of coin-in, an accumulative number of coin-out, a payment balance in terms of the coins and a return rate of coin-out.

[0118] A set value that is an object of comparison with the number of games is determined for each of the gaming machine identification numbers. In the present embodiment, description will be given of a case in which "600" is determined as a set value..

[0119] In the present invention, the values or number of the set values is not particularly limited, and may be set according to circumstances. Moreover, the set value does not need to be set individually for each of the gaming machines 10, but assigned to plural gaming machines 10 collectively.

[0120] When CPU 201 receives the number of coin-in, the number of coin-out and the gaming machine identification number from the gaming machine 10 through the communication interface 204, a game history corresponding to the gaming machine identification number is updated. More specifically, 1 is added to the number of games, the number of coins inserted is added to the accumulative number of coin-in and the number of coins paid out is added to the accumulative number of coin-out. Furthermore, a payment balance in terms of the coins and a return rate are calculated based on the accumulative number of coin-in and the accumulative number of coin-out. When CPU 201 determines that the number of games updated has reached a set value, it sends a return command signal to the gaming machine 10.

[0121] Next, description will be given of a processing performed in the gaming machine 10.

Fig. 7 is a flowchart showing a procedure in an authentication reading processing for a game program and a

game system program executed by a motherboard and a gaming board shown in Fig. 4. Note that the memory card 53 is inserted into the card slot 53S on the gaming board 50 and GAL 54 is mounted to the IC socket 54S.

[0122] When a power supply switch is turned on in the power supply unit 45, the motherboard 40 and the gaming board 50 are activated (steps S1-1 and S2-1). When the motherboard 40 and the gaming board 50 are activated, separate processing are performed at the same time. That is, in the gaming board 50, CPU 51 reads a preliminary authentication program stored in the boot ROM 52 and performs the preliminary authentication which in advance, prior to capturing the authentication program into the motherboard 40, confirms or certificates that the program is not altered according to the read preliminary authentication program (step S2-2). On the other hand, in the motherboard 40, the main CPU 41 executes BIOS stored in ROM 42 to expand on RAM 43 compressed data incorporated in BIOS (step S1-2). Then, the main CPU 41 executes BIOS expanded on RAM 43 to perform diagnosis on and initialization of various kinds of the peripheral devices (step S1-3).

[0123] Then, since ROM 55 on the gaming board 50 is connected to the main CPU 41 through PCI bus, the main CPU 41 not only performs reading of the authentication program stored in ROM 55, but also stores the read authentication program into RAM 43 (step S1-4). On this occasion, the main CPU 41 takes a checksum according to ADDSUM method (a standard check function) with the help of the function of a standard BIOS of BIOS, and by performing a confirmation processing for whether or not storage is conducted without error, stores the authentication program into RAM 43.

[0124] Then, after confirming what is connected to the IDE bus, the main CPU 41 accesses the memory card 53 inserted into the card slot 53S through the IDE bus, and conducts reading of the game program and the game system program from the memory card 53. In this case, the main CPU 41 reads 4 bites at a time of data constituting the game program and the game system program. Next, the main CPU 41 authenticates by confirming and certifying according to the authentication program stored in RAM 43, that the read game program and game system program has not been altered (step S1-5). When the authentication processing is normally completed, the main CPU 41 writes and stores in RAM 43 the game program and the game system program that have been an object of authentication (have been authenticated) (steps S1 to S6) . Then, main CPU 41 accesses through the PCI bus to GAL 54 mounted to the IC socket 54S, reads data for setting a payout rate from GAL 54 and writes and stores the data in RAM 43 (step S1-7). Then, the main CPU 41 not only reads through the PCI bus country identification information stored in ROM 55 on the gaming board 50, but also stores the read country identification information into RAM 43 (step S1-8).

[0125] After the processing is over, the main CPU 41 sequentially reads and executes the game program and the game system program to such that a game is progressed.

[0126] After the processing shown in Fig. 7 is over, the main CPU 41 performs a game mode selection processing.

Fig. 8 is a flowchart showing a subroutine of a game mode selection processing.

The main CPU 41 conducts a processing for adding credits stored in RAM 43 as an interrupt processing when it receives a detection signal outputted from the coin counter 21C in a case where the coin counter 21C detects a coin inserted into the coin receiving slot 21 while executing the subroutine.

Figs. 9A and 9B are figures showing an image displayed on the lower image display panel when a game mode selection processing is executed.

[0127] To begin with, the main CPU 41 conducts a processing to display on the lower image displaypanel 16 an image for requesting to the player selection of a game mode (step S3). In this processing, the main CPU 41 transmits a depiction command for the game mode selection image to the graphic board 68. On the graphic board, VDP extracts image data from RAM 43 and expands the data on the video RAM to produce image data for one frame and to output the image data to the lower image display panel 16, based on the depiction command. As a result, for example, an image as shown in Fig. 9A is displayed on the lower side display panel 16.

[0128] Fig. 9Ais a figure showing an example of game mode selection image displayed on the lower image display panel. In the figure, numerical reference 15 (15L, 15C and 15R) indicates display windows. An image showing "Select a mode !!" is displayed in the upper portion of the lower image display panel 16. The image is an image for requesting a player to select a game mode. Moreover, images showing "INSURANCE" and "NO INSURANCE" are displayed in the lower portion of the lower image display panel 16. The images are images indicating game mode options and the player touches a predetermined site of the touch panel 69 corresponding to a display region of the image, and is thereby enabled to input a command for selecting a game mode.

[0129] The option "INSURANCE" corresponds to the with-insurance mode. A predetermined number of credits (for example, number of credits equivalent to 1 dollar) is required for selecting the with-insurance mode. As an alternative of the number of credits, a note or a coin equivalent to the number of credits may be directly inserted. In a case where the with-insurance mode has been selected, when the number of games reaches a set value (for example, 600) without a bonus game being generated, the return mode flag is set to the state "ON" and a game state shifts to the return mode. In the payout return mode, the probability of the generating of the bonus game becomes relatively high, and the return mode is continued until the bonus game is generated. In other words, in the with-insurance mode, a game can be played in a state where an insurance is carried for compensating all

or part of a loss arising in a case where no bonus game has arisen for a long time. On the other hand, an option "NO INSURANCE" corresponds to the without-insurance mode. In a case where the without-insurance mode has been selected, the return mode flag is not set to the state of "ON" and a game state does not shift to the payout return mode even if no bonus game has arisen for a long time after the without-insurance mode is selected.

[0130] After the processing in step S3, the main CPU 41 determines whether or not the with-insurance mode has been selected (step S4). In a case where it is determined that the with-insurance mode has been selected, the main CPU conducts a processing for subtracting a predetermined number of credit from the number of credits stored in RAM 43 (step S5). Thereafter, the game execution processing in the with-insurance mode is conducted (step S6).

While detailed description of the above-mentioned processing will be given later by making reference to Fig. 10, when played in the with-insurance mode, an image showing "INSURED" is displayed in the upper left of the lower image display panel 16, as shown in Fig. 9B. The image is an image showing that a game mode is in the with-insurance mode.

[0131] On the other hand, in the case where, in step S4, it is determined that the without-insurance mode has been selected, the main CPU 41 conducts the game execution processing in the without-insurance mode (step S7). Since this processing is a processing almost the same as the game execution processing in the with-insurance mode (see Fig. 10) except that neither a processing related to transition to the return mode nor a processing related to counting of the number of games is conducted, description thereof is omitted here. When the processing in step S6 or S7 has been executed, the process is returned to step S3 thereafter.

[0132] Fig. 10 is a flowchart showing a subroutine of a game execution processing in the with-insurance mode that is called and executed in step S6 of the subroutine shown in Fig. 8.

In the game execution processing, the main CPU 41 at first determines whether or not a coin is BET (step S10). In the processing, the main CPU 41 determines whether or not an input signal outputted from the 1-BET switch 26S or the maximum BET switch 27S has been received when the 1-BET button 26 or the maximum BET button 27 is operated, respectively. If it is determined that a coin has not been BET, the process returns to step S10.

[0133] On the other hand, if it is determined in step S10 that a coin is BET, the main CPU 41 conducts aprocessing for subtracting the number of credits stored in RAM 43 according to the number of BET coins (step S11). In a case where the number of BET coins is more than the number of credits stored in RAM 43, the process returns to step S10 without conducting subtraction on the number of credits stored in RAM 43. In a case where the number of BET coins exceeds the upper limit (50 coins in the present embodiment) up to which a BET is possible in one game, the process advances to step S12 without conducting a processing for subtracting the number of BET coins from the number of credits stored in RAM 43.

[0134] Then, the main CPU 41 determines whether or not the spin button 23 has been turned ON (step S12). In the processing, the main CPU 41 d determines, when the spin button 23 is pressed, whether or not an input signal outputted from the spin switch 23S has been received.

If it is determined that the spin button 23 has not been turned ON, the process returns to step S10. Note that in a case where the spin button has not been turned ON (for example, in a case where a command of terminating a game has been inputted without turning ON the spin button), the main CPU 41 cancels a result of the subtracting processing in step S11.

[0135] In the present embodiment, description will be given of a case in which: after a coin is BET (step S10), a processing for conducting subtraction on the number of credits (step S11) is conducted prior to the determination on whether or not the spin button has been turned ON (step S12). However, the present invention is not limited to this example. For example, a processing for subtraction on the number of credits (step S11) maybe conducted after a coin is BET (step S10), determined whether or not the spin button 23 has been turned ON (step S12), and when determined that the spin button 23 has been turned ON (YES in step S12).

[0136] Meanwhile, in step S12 of Fig. 10, if it is determined that the spin button 23 has been turned ON therein, the main CPU 41 conducts a lottery processing (step S13). In the lottery processing, the main CPU 41 (processing device) executes a lottery program stored in RAM 43 (storage device) to thereby determine a code No. of the stopped reels 14. Thus, a combination of symbols stop displayed is determined. Detailed description of the processing will be given later by making reference to Figs. 11 and 12. When the processing in step S13 is executed, the main CPU 41 works as winning combination determination means for determining a winning combination by a lottery. In the present embodiment, description will be given of a case where a combination of symbols stop displayed is determined, and one winning combination of plural winning combinations is determined thereafter. However, in the present invention, one winning combination selected from plural winning combinations may at first be determined by a lottery, and the combination of symbols to be stop displayed may be determined thereafter, based on the determined winning combination.

[0137] Then, the main CPU 41 conducts a reel rotating control processing (step S14). The processing is a processing which, after all of the reels 14 starts to rotate, stops the rotating of each of the reels 14 such that a combination of symbol sequences corresponding to the winning combination determined in step S13 is stop displayed on the winning line L. Detailed description of the processing will be given later by making reference to Figs.

13 to 15.

[0138] Then, the main CPU 41 determines whether or not a bonus game trigger has been established, that is whether or not "APPLE" is stop displayed in the display window 15 (step S15). If it is determined that the bonus game trigger has been established, the main CPU 41 (processing device) reads a program for conducting a bonus game from RAM 43 (storage device) to execute a bonus game processing (step S16). Here, the first special game state is generated. Detailed description of the bonus game processing will be given later by making reference to Fig. 16. When the processing in step S16 is executed, the main CPU 41 functions as means for generating the first special game state.

[0139] On the other hand, if it is determined that the bonus game trigger has not been established, the main CPU 41 determines whether or not a winning combination has been established (step S17). If it is determined that a winning combination has been established, the main CPU 41 conducts payout of a coin corresponding to the number of coin-in and the winning combination (step S18).

In a case where coins are reserved, the main CPU 41 conducts a processing to add the coins to the number of credits stored in RAM 43. On the other hand, in a case where payout of a coin is conducted, the main CPU 41 transmits a control signal to the hopper 66 and conducts payout of a predetermined number of coins. In that situation, the coin detecting section 67 counts the number of coins paid out from the hopper 66 and when the number of counts reaches a designated number, transmits a payout completion signal to the main CPU 41. Thus, the main CPU 41 stops the driving of the hopper 66 to terminate the coin payout processing.

[0140] When the processing in step S16 or S18 is executed, or when it is determined that no winning combination has been established (that a winning combination has failed to be established) in step S17, the main CPU 41 determines whether or not the return mode flag stored in RAM 43 is set to the state "ON" (step S19). If it is determined that the return mode flag has been set to the state "ON", the main CPU 41 (processing device) reads from RAM 43 (storage device) a program for shifting a game state to the return mode, executes the return mode processing, to thus shift a game state to the return mode (step S20). Here, the second special game state has been generated. Detailed description will be given of the payout return mode processing later using Fig. 17. The main CPU 41, when executing the processing in step S20, functions as means for generating the second special game state.

[0141] If the processing in step S20 has been executed, or if it is determined that the return mode flag has not been set to the state "ON" in step S19, the main CPU 41 determines whether or not the bonus game (step S16) has been executed or whether or not a game state has shifted to the return mode (step S20) (step S21).

[0142] If it is determined that a bonus game has not been executed, or that a game state has not shifted to the payout return mode, the main CPU 41 executes a counting processing (step S22).

The counting processing is a processing conducted between the gaming machine 10 and the control device 200. The number of coin-in and the number of coin-out for one game together with the gaming machine identification number are transmitted to the control device 200. In the control device 200, the number of games, an accumulative number of coin-in, an accumulative number of coin-out and the like are updated with respect to each gaming machine identification number.

[0143] When the number of games reaches a set value, a return command signal is transmitted to the gaming machine 10 from the control device 200. The main CPU 41, when receiving the return command signal, sets the return mode flag to the state "ON". Detailed description of the counting processing will be given later by making reference to Fig. 19. After the processing in step S22 is executed, the main CPU 41 returns the process to the processing in step S10 and subsequently executes a game in the with-insurance mode.

[0144] On the other hand, when it is determined that a bonus game has been executed or a game state has shifted to the payout return mode, the present subroutine is completed and the process returns to the processing shown in Fig. 8. As a result, a player can once again select whether a game is to be played by the with-insurance mode or the without-insurance mode.

[0145] Fig. 11 is a flowchart showing a subroutine of a lottery processing called and executed in step S13 of the subroutine shown in Fig. 10. The processing is a processing conducted by executing a lottery program stored in RAM 43 with the main CPU 41. The main CPU 41 executes a random number generating program included in the lottery program, and a random number value from the numerical value range of 0 to 255 is selected thereby such that each of the selected random number values correspond to each of the three reels 14 (step S31). In the present embodiment, description will be given of a case where random numbers are generated on a program (a case where so-called software random numbers are used). In the present invention, however, a random number generator may be used, and random numbers may be extracted therefrom (so-called hardware random numbers may be used).

[0146] After the random number values are selected, the main CPU 41 (processing device) refers to symbol weighting determination data corresponding to payout rate setting data which is outputted from GAL 54 and stored in RAM 43, and determines, based on the selected three random number values, code Nos. (see Fig. 3) for each of the reels 14 (step S32). The code Nos. of the reels 14 correspond to code Nos. of the symbols stop displayed on the winning line L. The main CPU 41 determines code Nos. of the reels 14 to thereby determine a winning combination. For example, in a case where code Nos. of the reels 14 are determined "00", "00" and "00",

it means that the main CPU 41 determined a winning combination as "JACKPOT". Based on the code Nos. determined for each of the reels, a reel rotating control processing which will be described later is conducted. On this occasion, the main CPU 41 functions as winning combination determination means.

[0147] Here, description of a winning combination in the present embodiment will be given.

Fig. 12 is a figure describing a relationship among winning combinations of plural kinds, establishment possibility of each winning combination and the number of coin-out in the present embodiment. The establishment possibilities of each of the winning combinations shown in Fig. 12 are of a case where a payout rate is set to 88% in a game other than a bonus game. The establishment possibilities shown in the figure show possibilities of the establishment of each of the shown winning combinations in such a case that code Nos. of each of the reels 14 are determined based on the selected three random number values by referring to a symbol weighting determination data. In other words, the random number values are not made to correspond to each of the winning combinations.

[0148] An establishment possibility of a bonus game trigger is 0.5%. If a player hits the bonus game trigger, three "APPLE" symbols are stop displayed on the winning line L and a bonus game is generated. In the bonus game, executed is a free game of which the number of games is determined by a lottery.

[0149] An establishment possibility of "JACKPOT 7" is 0.5%. If the winning combination has been established, three "JACKPOT 7" symbols are stop displayed on the winning line L, and 30 coins per one coin-in are paid out. The lower the establishment possibility of the winning combination is, the higher the number of coin-out is set. When a combination of symbols stop displayed is not hitting any of the winning combinations shown in Fig. 12, this is a failure, and there is no coin-out.

[0150] Fig. 13 is a flowchart showing a reel rotating control processing called and executed in step S15 of the subroutine shown in Fig. 10. This processing is a processing conducted between the main CPU 41 and the sub CPU 61.

[0151] The main CPU 41 transmits to the sub CPU 61 a start signal that starts the rotating of reels (step S40). The sub CPU 61 conducts a reel rotating processing when it receives the start signal from the main CPU 41 (step S51). In the processing, the sub CPU 61 supplies a pulse to the motor driving circuit 62. The pulse outputted from the sub CPU 61 is amplified by the driver 64 and supplied to each of the stepping motors 70 (70L, 70C and 70R). As a result, the stepping motors 70 rotate, thereby making the reels 14 (14L, 14C and 14R) to rotate. A stepping motor 70 is a 1-2 phase excitation type stepping motor which has a step angle of 0.9 degree and requires the number of steps of 400 for one rotation. Hence, if 400 pulses are supplied to the stepping motor 70, the reels 14 rotate once.

[0152] When the reels 14 start to rotate, the sub CPU 61 supplies to the motor driving circuit 62 pulses at a lower frequency, and the pulse frequency is gradually raised. A rotational speed of the reels 14 is thereby increased. When a predetermined time elapses, the pulse frequency is controlled to be constant. As a result, the reels 14 rotate at a constant speed.

[0153] Here, description of a rotational operation of the reels 14 will be given, by using Fig. 14.

Figs. 14A to 14D are side views for describing a rotating operation of a reel 14.

As shown in Fig. 14A, a semicircular metal plate 14a is attached to the side surface of a reel 14. The metal plate 14a rotates together with the reel 14. Twenty two symbols (see Fig. 3) are depicted on the circumferential surface of the reel 14. Three symbols of the twenty two symbols depicted on the circumferential surface of the reel 14 can be visually recognizable through the display window 15 formed in front of the reel 14. The arrowmark of a heavy line in the figure indicates a rotating direction of the reel 14. A proximity sensor 65a is provided on the side of the reel 14. The proximity sensor 65a is used to detect the metal plate 14a. The proximity sensor 65a does not rotate nor move even if the reel 14 rotates.

[0154] Fig. 14A shows a position of the meal plate 14a when the metal plate 14a starts being detected by the proximity sensor 65a (hereinafter also referred to as a position A). If the reel 14 rotates when the metal plate 14a is at the position A, the metal plate 14a moves to a position shown in Fig. 14B. Fig. 14B shows a position of the metal plate 14a when the metal plate 14a is being detected by the proximity sensor 65a (hereinafter also referred to as a position B). If the reel 14 rotates when the metal plate 14a is at the position B, the metal plate 14a moves to a position shown in Fig. 14C. Fig. 14C shows a position of the metal plate 14a when the metal plate 14a will no longer be detected by the proximity sensor 65a (hereinafter also referred to as a position C).

[0155] If the reel 14 rotates when the metal plate 14a is at the position C, the metal plate 14a moves to a position shown in Fig. 14D. Fig. 14D shows a position of the metal plate 14a when the metal plate 14a is not detected by the proximity sensor 65a (hereinafter also referred to as a position D). If the reel 14 further rotates, a position of the metal plate 14a returns to the position A. As described above, together with the rotating of the reel 14, the metal plate 14a changes its position in the order from the position A, to the position B, to the position C, to the position D, to the position A and so forth.

[0156] The proximity sensor 65a constitutes an index detecting circuit 65 (see Fig. 3). When it is referred to as "High" at a state where the proximity sensor 65a detects the metal plate 14a, and as "Low" at a state where the proximity sensor 65a does not detect the metal plate 14a, a state of the index detecting circuit 65 is "High" during the period when the metal plate 14a moves from the position A to the position B and to the position C, and a state of the index detecting circuit 65 is "Low" during the

period when the metal plate 14a moves from the position C to the position D and to the position A. The sub CPU 61 assigns a rise from "Low" to "High" as an index (origin) 1 and a fall from "High" to "Low" as an index (origin) 2 to thereby recognize the rotating position of the reel 14.

[0157] The main CPU 40, after transmitting in step 40 a start signal to the sub CPU 61, executes representation to be executed while the reels are rotating (step S41). The process is a processing which conducts display of an image on the lower image display panel 16 and output of a sound from the speaker 29 over a period (for example, 3 seconds) determined according to a result and the like of the lottery processing (step S13 in Fig. 10).

[0158] Then, the main CPU 40 determines whether or not it is the timing at which a command is to be issued so as to stop the rotating of the reel 14 (step S42).

The timing at which a command is issued so as to stop rotation of a reel 14 is a timing before the time when the representation to be executed while the reels are rotating is terminated, which is an interval having the minimum time necessary for stopping the rotating of the reel 14. Note that the minimum time necessary for stopping the rotating of the reel 14 is determined in advance.

[0159] If it is determined in step S42 that it is not the timing at which the command to stop the rotating of the reel 14 is to be issued, the process returns to the processing in step S42 and the representation to be executed while the reels are rotating continues to be conducted. On the other hand, if it is determined in step S42 that it is the timing at which the command to stop the rotating of the reel 14 is to be issued, the main CPU 41 transmits to the sub CPU 61 a code No. of the reel which is stored in RAM 43 (step S43). When the sub CPU 61 receives a code No. of the reel from the main CPU 41, the code No. is converted to a stopping position of the reel (the number of steps) from an index, based on a correspondence table between the number or steps and the code Nos. stored in ROM (not shown in the figure) included in the sub CPU 61 (step S52).

[0160] Fig. 15 is a schematic diagram showing a correspondence table between the number of steps and the code No.. Each of the code Nos. are related to an index and the number of steps.

Each code No. corresponds to the symbols depicted on the circumferential surfaces of the reels 14 (see Fig. 3) and symbols of code Nos. "00" to "10" correspond to the index 1. Moreover, symbols of code Nos. "11" to "21" correspond to the index 2. The number of steps in the correspondence table shown in Fig. 15 is the number of steps with the index 1 as a reference. For example, if a code No. is "08", a stopping position of the reel is at 145 steps from the index 1. If a code No. is "12", a stopping position of the reel is at 218 steps from the index 1.

[0161] Then, the sub CPU 61 executes a reel stopping processing (step S53). In the processing, the sub CPU 61 detects a rise in the index detecting circuit 65 from "Low" to "High" (the index 1) on each of the reels 14, and supplies to the motor driving circuit 65 pulses corresponding to the number of steps which were converted in step S52 from a code No. at a timing at which the index 1 is detected, and supply of pulses is ceased thereafter.

[0162] For example, when, in step S52, the stopping positions of the reels are determined to be 145 steps from the index 1, the sub CPU 61 supplies 145 pulses to the motor driving circuit 65 at a timing at which the index 1 is detected, and the supply of pulses is terminated thereafter. Furthermore, when, in step S52, the stopping positions of the reels are determined to be 218 steps from the index 1, the sub CPU 61 supplies 218 pulses to the motor driving circuit 65 at a timing at which the index 1 is detected. As a result, the reels 14 stop at the code No. determined in step 32 of Fig. 11 and the combination of symbols corresponding to the winning combination determined in step S32 of Fig. 11 is stop displayed on the winning line L. On the other hand, the main CPU 41 terminates the representation to be executed while the reels are rotating. After the processing in steps S44 and S53 are over, the present reel rotating control processing is completed.

[0163] Moreover, when an index corresponding to the code No. transmitted in step S43 is different from an index detected by the index detecting circuit 65 when the rotating of the reels 14 stop, this means that an out-of-order state occurred on the reels 14; therefore, the main CPU 41 conducts a processing for displaying an error message on the lower image display panel 16 to temporarily stop a game.

For example, in a case where, even though a processing for stopping the reel 14L was executed at the code No. 12 corresponding to the index 2, the index 1 is detected by the index detecting circuit 65 when the rotating of the reel 14L stops, the game is temporarily stopped.

[0164] Fig. 16 is a flowchart showing a subroutine of a bonus game processing called and executed in step S16 of the subroutine shown in Fig. 10. In the bonus game processing, firstly, the main CPU 41 determines a number T of bonus games from 10 to 25 games, based on a random number value obtained by executing a random number generation program included in a lottery program stored in RAM 43 (step S60). The main CPU 41 stores as data into RAM 43 the number of games of the determined bonus games.

[0165] Next, the main CPU 41 conducts a lottery processing (step S61) and a reel rotating control processing (step S63). The processing in step S61 is a processing almost the same as the processing described using Fig. 11. The processing in step S63 is a processing almost the same as the processing described using Fig. 13. Since descriptions of these processing have already been given, descriptions thereof are omitted herein.

[0166] Then, the main CPU 41 determines whether or not a bonus game trigger has been established, that is, whether or not three "APPLE" are stop displayed in the display windows 15 (step S64). If it is determined that the bonus game trigger has been established, the number t of additional games of the bonus game is de-

termined in a lottery (step S65) and the determined number t of additional games is added to the number T of games of the bonus game (step S66). Thus, when a bonus game is hit during the bonus game, a remaining number of bonus games increases. More specifically, for example, in a case where a game state shifts to 20 bonus games for the first time, and hits 17 bonus games upon conducting 12 of the bonus games, another 25 bonus games (20 bonus games - 12 bonus games + 17 bonus games) are to be conducted.

[0167] If a bonus game trigger has not been established, the main CPU 41 determines whether or not a winning combination has been established (step S67). If it is determined that the winning combination has been established, the main CPU 41 conducts payout of coins corresponding to the number of coin-in and the winning combination (step S68). Since the processing is similar to the processing in step S18 and description thereof has already been given, the description of the present processing is omitted herein.

[0168] In a case where the processing in step S66 or S68 has been executed, or if it is determined in step S67 that any winning combination has not been established (if it is determined that a failure has occurred), the main CPU 41 reads the number T of bonus games stored in RAM 43, and one bonus game is subtracted from the read number T of bonus games. The number T of bonus games after the subtraction is again stored into RAM 43 (step S69).

[0169] Then, the main CPU 41 determines whether or not the number T of bonus games reaches the number of games determined in step S60 (step S70). More specifically, it is determined whether or not the number T of games stored in RAM 43 has become 0, and if the number T of games is not 0, that is, if it is determined that the number of bonus games played does not reach the number of games which were determined in step S60, the process returns to step S61 and the above-mentioned processing is repeated. On the other hand, if the number T of games is 0, that is, if it is determined that the number T of games has reached the number of games which were determined in step S60, a number-of-games reset signal is transmitted to the control device 200 (step S71), and the present subroutine is completed thereafter. The number-of-games reset signal includes the gaming machine identification information of the gaming machine 10, and CPU 201 of the control device 200, when receiving the number-of-games reset signal, resets to 0 the number of games of which is stored in the hard disc drive 205 by being made to correspond to the gaming machine identification information included in the number-of-games reset signal.

[0170] Fig. 17 is a flowchart showing a subroutine of a return mode processing called and executed in step S20 of the subroutine shown in Fig. 10.

The processing in steps S76 to S84 are processing almost the same as the processing described using Fig. 12. Since descriptions of these processing have already been given, descriptions thereof are omitted herein.

[0171] Here, in a lottery processing executed in step 579, each winning combination is established with a establishment possibility showed in Fig. 18.

Fig. 18 is a figure describing a relationship among winning combinations of plural kinds, establishment possibility of each winning combination and the number of coin-out in a lottery processing of a return mode.

As shown in Fig. 18, the establishment possibility of the bonus game trigger is set higher than the establishment possibility of the bonus game trigger shown in Fig. 12. In the present embodiment, a case in which the establishment possibilities of the winning combinations other than the bonus game trigger are the same as in Fig. 12 will be described. However, the establishment possibilities of the winning combinations other than the bonus game trigger may also be set relatively high compared with those of Fig. 12.

[0172] In a case where the processing in step S82 or S84 has been executed, or if it is determined in step S83 that any winning combination has not been established (if it is determined that a failure has occurred), the main CPU 41 determines whether or not the bonus game has been executed (step S85).

[0173] When it is determined that the bonus game has not been executed, the main CPU 41 returns the processing to step S76. On the other hand, the main CPU 41 sets the return mode flag to the state "OFF" (step 86). In the processing of step 86, the main CPU 41 functions as means for finishing the second special game state when a player hits a special winning combination by a lottery during generation of the second special game state. Thereafter, the present subroutine is completed.

[0174] Fig. 19 is a flowchart showing a counting processing called and executed in step S22 of the subroutine shown in Fig. 10.

The processing is a processing conducted between the main CPU 41 of a gaming machine 10 and CPU 201 of the control device 200. Here, a set value "600" is set to each of the plural gaming machines 10 (see Fig. 6).

[0175] To begin with, the main CPU 41 transmits by the communication interface 44 the number of coin-in and the number of coin-out stored in RAM 43 together with the gaming machine identification number to the control device 200 through the communication line 101 (step S90). The number of coin-in and the number of coin-out transmitted to the control device 200 from the gaming machine 10 are those of the game concerned.

The processing in step S90 is a processing in which the main CPU 41 (processing device) transmits the identification information of the gaming machine 10 stored in the main RAM 43 (storage device) to the control device 200 through the communication line 101, each time a game is played. When the processing in step S90 is executed, the main CPU 41 functions as means for transmitting the identification information of the gaming machine 10 to the control device 200 through the communication line 101.

[0176] On the other hand, the CPU 201 of the control device 200, when receiving from the gaming machine 10 the number of coin-in, the number of coin-out and the gaming machine identification number through the communication line 101 by the communication interface 204, updates the number of games, the accumulative number of coin-in and the accumulative number of coin-out corresponding to the received gaming machine identification number (step S100), by choosing the data, which are made to correspond to each of the gamingmachine identification numbers, of the number of games, the accumulative number of coin-in, the accumulative number of coin-out stored in the hard disc drive 205 (see Fig. 6).

[0177] Then, CPU 201 determined whether or not the number of games after the updating has reached the set value (step S101). If it is determined that the number of games after the updating has not reached the set value, the subroutine is terminated.

[0178] On the other hand, if it is determined in step S101 that the number of games after the updating has reached the set value, CPU 201 transmits a return command signal through the communication line 101 by the communication interface 204 to the gaming machine 10 in which the number of games has reached the set value (step S103). Thereafter, CPU 201 resets to 0 the number of games stored in the hard disc drive 205 which are made to correspond to the gaming machine identification number of the gaming machine 10 (step S104). Thereafter, the present processing is terminated.

[0179] The main CPU 41 of the gaming machine 10, when receiving the return command signal transmitted from the control device 200 in step S103, sets the return mode flag to the state "ON" (step S91). The processing in step S91 is a processing for receiving a command signal transmitted from the control device 200 when the number of games accumulatively counted by the control device 200 based on the identification information of the gaming machine 10 reaches a set value that is an object of comparison with the number of games. In step S91, the main CPU 41 functions as means for receiving a command signal transmitted from the control device 200. Thereafter, the present processing is terminated.

[0180] In the present embodiment, description has been given of a case where a game state shifts to the return mode when the number of games reaches a set value (see Fig. 19). The present invention is, however, not limited to this example. For example, in a case where the number of inserted game media for a game played by the player is at the upper limit value that can be accepted in one game when the number of games reaches the set value, the second special game state may be generated (the game state shifts to the return mode). This is because in such a case, a player can be urged to insert game media up to the upper limit and a facility such as a casino and the like can increase a profit.

Moreover, in a case where the second special game state is generated when the number of inserted game media is at the upper limit value, the second special game state may be generated not when the number of games reaches the set value, but when the number of inserted game media is at the upper limit value for a game played by a player when the number of games in which insertion of game media is conducted to the upper limit value reaches a set value. This is because, in such a case, it can be prevented from a small number of game media to be inserted in a game, thereby leading to a fact that the second special game state is generated by the spending of only a small number of game media in total.

[0181] A gaming machine 10 according to the present embodiment includes the main CPU 41 (processing device) and RAM 43 (storage device), and is a gaming machine 10 connected through the communication line 101 to the control device 200 which accumulatively counts the number of games in each gaming machine 10 of plural gaming machines 10, and wherein the main CPU 41 executes: a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in RAM 43 (see Fig. 11); a processing reading from RAM 43 a program for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger", and executing the program (see Fig. 16) ; a processing transmitting through the communication line 101 to the control device 200 the identification information of the gaming machine 10 stored in RAM 43 each time a game is played (step S90 in Fig. 19); a processing for receiving a command signal transmitted from the control device 200 when the number of games accumulatively counted, based on the identification information of the gaming machine, by the control device 200 reaches a set value that is an object of comparison with the number of games (step S91 in Fig. 19) ; a processing reading from RAM 43 a program for performing transition to the return mode (the generating of the second special game state) inwhich aprobabilityof hitting the special winning combination, "bonus game trigger", by executing the lottery program is set relatively high, based on the command signal, and executing the program (see Fig. 17); and a processing finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode (step S86 in Fig. 17).

[0182] A gaming machine 10 is connected through the communication line 101 to the control device 200 which accumulatively counts the number of games for each gaming machine 10 of plural gaming machines 10 wherein: provided are winning combination determination means (for example, the main CPU 41) for determining a winning combination by lottery; means (for example, the main CPU 41) for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger"; means (for example, the main CPU 41) for transmitting the identification information of the gaming machine 10 through the communication line 101 to the con-

trol device 200 each time a game runs; means (for example, the main CPU 41) for receiving a command signal transmitted from the control device 200 when the number of games accumulatively counted by the control device 200 based on the identification information of the gaming machine reaches a set value; means (for example, the main CPU 41) for generating the second special game state in which a probability of hitting the special winning combination, "bonus game trigger", by the lottery is set relatively high, based on the command signal; and means (for example, the main CPU 41) for finishing the return mode when a player hits the special winning combination by the lottery during generation of the return mode.

[0183] According to the gaming machine 10, when the number of games counted by the control device 200 reaches a set value that is an object of comparison with the number of games, the return mode in which a probability of generating the bonus game after hitting "bonus game trigger" is set relatively high is generated, and the returnmode is continued until the bonus game is generated.

Hence, even if the bonus game is not generated for a long period leading to the spending of many of the game media, the return mode is generated as long as the game is played such that the number of games reaches the set value, and in the bonus game generated during the return mode, a player can surely receive the return for the fact that a game is played until the number of games reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0184] A gaming machine 10 according to the present embodiment is connected to the control device 200 through the communication line 101 and the control device 200 conducts counting of the number of games in the gaming machine 10 and determines whether or not the number of games has reached a set value. The gaming machine 10 is not required to use a network and may be standalone.

[0185] A standalone gaming machine 10 according to the present invention includes the main CPU 41 (processing device) and RAM 43 (storage device), wherein the main CPU 41 executes: a processing determining one winning combination selected from plural winning combination determined in advance by executing a lottery program stored in RAM 43; a processing reading from RAM 43 a program for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger", and executing the program; aprocessing accumulativelycounting the number of games each time a game is played; a processing determining whether or not the number of games reaches a set value that is set as an object of comparison with the number of games; a processing reading from RAM 43 a program for executing transition to the return mode (the generating of the second special game state) when it is determined that the number of games has reached the set value, and executing the program; and a processing finishing the returnmode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0186] The gaming machine 10 includes: winning combination determination means (for example, the main CPU 41) for determining a winning combination by a lottery; means (for example, the main CPU 41) for generating a bonus game when the determined winning combination is a special winning combination, "bonus game trigger"; means (for example, the main CPU 41) for accumulatively counting the number of games each time a game is played; means (for example, main CPU 41) for determining whether or not the number of games reaches a set value; means (for example, the main CPU 41) for conducting transition to the return mode (the generating of the second special game state) in which a probability of hitting the special winning combination, "bonus game trigger", by the lottery is set relatively high when the number of games is determined to have reached a set value; and means (for example, the main CPU 41) for finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0187] While the gaming machine 10 according to the present embodiment shifts to the returnmode (the generating of the second special game state) when the number of games reaches a set value, the present invention is not limited to this example. A gaming machine 10 of the present invention may shift to the return mode (the generating of the second special game state) when a payment balance in terms of coins reaches a set value.

[0188] Such a gaming machine 10 includes the main CPU 41 (processing device) and RAM 43 (storage device), and is connected through the communication line 101 to the control device 200 which accumulatively counts the payment balance in terms of coins in each gaming machine 10 of plural gaming machines 10, and wherein the main CPU 41 executes: a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in RAM 43; a processing reading from RAM 43 a program for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger", and executing the program; a processing transmitting through the communication line 101 to the control device 200 the number of coin-in and the number of coin-out in one game which is stored in RAM 43, together with the identification information of the gaming machine 10, each time a game is played; a processing receiving a command signal transmitted from the control device 200 when, a payment balance in terms of coins accumulatively counted by the control device 200 based on the identification information of the gaming machine 10, the number of coin-in and the number of coin-out in the game reaches a value equal to or less than a set

value that is an object of comparison with the payment balance in terms of the game media; a processing reading from RAM 43 a program for conducting transition to the return mode (the generating of the second special game state) in which a probability of hitting the special winning combination, "bonus game trigger", by executing the lottery program is set relatively high based on the command signal, and executing the program; and a processing finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0189] The gaming machine 10 includes: winning combination determination means (for example, the main CPU 41) for determining a winning combination by a lottery; means (for example, the main CPU 41) for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger"; means (for example, the main CPU 41) for transmitting through the communication line 101 to the control device 200 a payment balance in terms of coins in a game played, together with the identification information of the gaming machine 10, each time agameisplayed;means (forexample, the main CPU 41) for receiving a command signal transmitted from the control device 200 when the payment balance in terms of coins accumulatively counted by the control device 200 based on the identification information of the gaming machine 10 and the payment balance in terms of coins in the game played reaches a set value; means (for example, the main CPU 41) for conducting transition to the return mode (the generating of the second special game state) in which a probability of hitting the special winning combination, "bonus game trigger", by the lottery is set relatively high based on the command signal, and executing the program; means (for example, the main CPU 41) for finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0190] According to the gaming machine 10, when the payment balance in terms of the game media becomes equal to or less than a set value that is an object of comparison with the payment balance in terms of the game media, the game state shifts to the return mode in which a probability of generating the bonus game is set relatively high, and the return mode is continued until the bonus game is generated.

Hence, even if the bonus game is not generated for a long period leading to the spending of many of the game media, the game state shifts to the return mode as long as the game is played such that the payment balance in terms of the game media becomes equal to or less than the set value, and in the bonus game generated during the return mode, a player can surely receive the return for the fact that a game is played until the payment balance in terms of the game media reaches a set value. Therefore, it can be prevented for a player who has spent many of the game media from feeling unpleasant against the game, building up distrust thereto, or losing interest in or a concern on the game.

[0191] The gaming machine 10 is connected through the communication line 101 to the control device 200 and the control device 200 counts payment balance in terms of coins in the gaming machine 10, and determines whether or not the payment balance in terms of coins reaches a set value. The gaming machine 10 is, however, not necessarily required to be those using a network and may be standalone.

[0192] Such a gaming machine 10 includes the main CPU 41 (processing device) and RAM 43 (storage device), wherein the main CPU 41 executes: a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in RAM 43; a processing reading from RAM 43 a program for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger", and executing the program; a processing accumulatively counting a payment balance in terms of game media each time a game is played; a processing selecting a set value that is an object of comparison with a payment balance in terms of game media, from plural candidate values stepwise determined in advance; a processing determining whether or not a payment balance in terms of game media is equal to or less than a set value; a processing reading from RAM 43 a program for conducting transition to the return mode (the generating of the second special game state) in which a probability of hitting the special winning combination, "bonus game trigger", by executing the lottery program is set relatively high when it is determined that a payment balance in terms of game media is equal to or less than a set value, and executing the program; and a processing finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0193] This gaming machine 10 includes: winning combination determination means (for example, the main CPU 41) for determining a winning combination by a lottery; means (for example, the main CPU 41) for generating a bonus game (the first special game state) when the determined winning combination is a special winning combination, "bonus game trigger"; means (for example, the main CPU 41) for accumulatively counting a payment balance in terms of game media, each time a game is played; means (for example, the main CPU 41) for selecting a set value from plural candidate values stepwise determined in advance; means (for example, the main CPU 41) for determining whether or not a payment balance in terms of game media is equal to or less than a set value; means (for example, the main CPU 41) for conducting transition to the return mode (the generating of the second special game state) in which a probability of hitting the special winning combination, "bonus game trigger", by the lottery program is set relatively high when it is determined that the payment of balance in terms of game media is equal to or less than a set value; and

means (for example, the main CPU 41) for finishing the return mode when a player hits the special winning combination, "bonus game trigger", by the lottery during generation of the return mode.

[0194] In the present embodiment, there has been described the case where the set values of all the gaming machines 10 are set to "600". However, in the present invention, the gaming machines 10 may have different set values respectively. For example, the set value may be selected from plural candidate values stepwise determined in advance.

[0195] In the present embodiment, there has been described the case where the second special game state is continued until the first special game state is generated. However, in the present invention, the second special game state is not limited to this example as long as it is continued until predetermined conditions are satisfied. If such configuration is employed, examples of the predetermined conditions for finishing the return mode include elapse of a predetermined period, establishment of a predetermined winning combination by a predetermined number of times, and the like.

In the present invention, the second special game state is not particularly limited as far as it is a game state advantageous to the player. A game state that is advantageous to the player is not particularly limited as far as it is more advantageous than an ordinary game state (a game state other than the first special game state or the second special game state) and examples thereof include: a state where more of the game media can be earned than in an ordinary game state, a state where the game media can be earned on a probability higher than in an ordinary game state, a state where the number of the game media spent by a player is less than in an ordinary game state and of the like state. More specifically, examples of the second special game state include a free game, a second game, a mystery bonus and the like.

[0196] In the present embodiment, description has been given of a case where a game state shifts to the return mode when the return mode flag has been set to the state "ON", without other conditions being established thereafter. The present invention is, however, not limited to this example and, for example, a game state may shift to the return mode when a predetermined condition has been met after the return mode flag is set to the state "ON". In such a case, the predetermined condition for transition to the return mode is not particularly limited, and may include, for example, establishment of a bonus game trigger, stop display of a predetermined combination of symbols, and of the like conditions.

[0197] In the present embodiment, description has been given of a case where a game state shifts to the return mode when the return mode flag is set to the state "ON", regardless of the combination of symbols stop displayed thereafter. However, the present invention is not limited to this example. For example, a combination of symbols corresponding to the transition to the return mode may be set in advance and a game state may shift to the return mode after the symbols are stop displayed in that winning combination.

[0198] In the present embodiment, description has been given of a case where symbols are stop displayed (step S14 in Fig. 10), a processing is conducted based on the stop displayed combination of symbols (steps S15 to S20 in Fig. 10), and the number of games is counted (step S22 in Fig. 10) thereafter. In the present invention, however, no specific limitation is placed on a timing at which counting of the number of games is conducted. For example, the timing may be a timing at which BET of a coin is conducted (after step S10 or S11 in Fig. 10) or a timing at which the spin button is turned ON (after step S12 in Fig. 10). The number of games may be counted at a predetermined timing that is in the period from the time when display of a change in symbol is started, to the time when symbol sequences are stop displayed, and a processing based on the stop displayed combination of symbols has been conducted (for example, a timing at which symbol sequences are stop displayed). Note that a timing at which a payment balance in terms of game media can be the same as described above.

[0199] In the present embodiment, description has been given of a gaming machine 10 in which in a case where a special winning combination, "bonus game trigger", has been established (step S15 in Fig. 10) in the period from the time when the return mode flag is set to the state "ON" (step S22 in Fig. 10), to the time when transition to the return mode is conducted (step S20 in Fig. 10), transitions to the return mode is further conducted after the bonus game is generated (step S16 in Fig. 10). That is, a gaming machine according to the present embodiment generates the first special game state based on the a special winning combination, and further generates the second special game state, in a case where the special winning combination is established in the period from the time when the number of games reaches a set value, to the time when the second special game state is generated.

[0200] However, the present invention is not limited to this example. For example, in a case where a special winning combination is established in the period from the time when the number of games reaches a set value, to the time when the second special game state is generated, only the first special game state may be generated. In a case where the above embodiment is adopted, a player can earn a profit in the first special game state or the second special game state without fail when a game is played until the number of games reaches the set value. The above embodiment is one of the embodiments of the present invention. In a case where the above embodiment is adopted for the gaming machine 10, for example, the following processing has only to be conducted instead of the processing shown in Fig. 10.

[0201] Fig. 20 is a flowchart showing another example of a subroutine of a game execution processing. In the flowchart shown in Fig. 20, the same numerical references are assigned to steps which conduct processing sim-

ilar to those in the flowchart shown in Fig. 10.

[0202] After the processing in steps S10 to S14 are executed, the main CPU 41 determines whether or not a bonus game trigger has been established (step S15) and if it is determined that the bonus game trigger has been established, a bonus game processing is executed (step S16). Then, it is determined whether or not a return mode flag is set to the state "ON" (step S25) and if the return mode flag is set to "ON", the return mode flag is set to the state "OFF" (step S26). The processing in step S21 is performed thereafter and thus the present subroutine is completed. Since the other processing are processing similar to those described in Fig. 10, descriptions thereof are omitted here. In the subroutine shown in Fig. 20, after a coins is BET (step S10), in a case where it is determined whether or not the spin button 23 has been turned ON (step S12), and if it is determined that the spin button has been turned ON (YES in step S12), a processing for subtracting the number of credits (step S11) may be conducted, as in the subroutine shown in Fig. 10.

[0203] A more specific description of the processing shown in Fig. 20 will be given here with a case where a set value is 600. In a case where, in step S22, the number of games reaches 600 and a return mode flag has been established, if a bonus game trigger has been established (step S15) in the 601st game, the bonus game is generated (step S16) but transition to the return mode is not performed (steps S25 and S26). On the other hand, in a case where a bonus game trigger has not been established in the 601st game run, transition to the return mode is conducted (steps S19 and S20).

Hence, in a case where the processing shown in Fig. 20 is performed, a bonus game is generated or transition to the return mode is performed without fail, when the number of games reaches a set value.

[0204] In the present invention, in a case where a special winning combination has been established in the period from the time when the number of games reaches a set value, to the time when the second special game state is generated, only the second special game state may be generated, or alternatively, either the first special game state or the second special game state may be generated depending on a game situation and the like.

[0205] An embodiment similar to the above-mentioned embodiment can also be adopted in a case where the second special game state is generated according to a payment balance in terms of game media. In other words, in a case where a special winning combination has been established in the period from the time when a payment balance in terms of game media is equal to or less than a set value, to the time when the second special game state is generated, only the first special game state may be generated, only the second special game state may be generated, or either the first special game state or the second special game state may be generated depending on a game situation and the like.

[0206] Although the embodiment according to the present invention has been described, the description presents only some of the specific examples, and is not intended to limit the present invention in any way and specific constructions of each means and the like can be properly changed in terms of design. Besides, the effects described in the embodiment of the present invention are only the most preferable effects generated from the present invention and effects to be caused by the present invention is not limited to those described in the embodiment of the present invention.

Claims

1. A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination; and
means for, when the number of games accumulatively counted each time a game is played reaches a set value that is an object of comparison with said number of games, generating a second special game state in which a probability of hitting said special winning combination by said lottery is set relatively high.

2. A gaming machine connected through a communication line to a control device which counts the number of games accumulatively for every gaming machine of plural gaming machines, comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination;
means for transmitting an identification information of a gaming machine to said control device through said communication line each time a game is played;
means for receiving a command signal transmitted from said control device when said number of games counted accumulatively by said control device based on said identification information of the gaming machine reaches a set value that is an object of comparison with said number of games; and
means for generating a second special game state in which a probability of hitting said special winning combination by said lottery is set relativelyhigh, based on said command signal.

3. A gaming machine comprising:

winning combination determination means for determining a winning combination by a lottery;
means for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination;
means for counting accumulatively the number of games each time a game is played;
means for determining whether or not said number of games has reached a set value that is set as an object of comparison with said number of games; and
means for generating a second special game state in which a probability of hitting said special winning combination by said lottery is set relatively high when said number of games is determined to have reached said set value.

4. The gaming machine according to claim 1, further comprising:

means for finishing said second special game state when the player hits said special winning combination by said lottery during generation of said second special game state.

5. The gaming machine according to claim 1,
wherein
reception means that can accept for one game an insertion of game media up to a predetermined upper limit value is provided, and said means for generating said second special game state generates a second special game state in a case where the number of inserted game media for the game played by the player is equal to said upper limit when said number of games reaches said set value.

6. A gaming machine equipped with a processing device and a storage device,
wherein
said processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in said storage device;
a processing reading from said storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing said program; and
a processing reading from said storage device a program for generating a second special game state in which a probability of hitting said special winning combination by executing said lottery program is set relatively high when the number of games counted accumulatively each time a game is played reaches a set value that is an object of comparison with said number of games, and executing said program.

7. A gaming machine equipped with a processing device and a storage device, and connected through a communication line to a control device which counts the number of games accumulatively for every gaming machine of plural gaming machines,
wherein
said processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in said storage device;
a processing reading from said storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing said program;
a processing transmitting an identification information on a gaming machine stored in the storage device to said control device through said communication line each time a game is played;
a processing receiving a command signal transmitted from said control device when said number of games counted accumulatively by said control device based on said identification information on the gaming machine reaches a set value that is an object of comparison with said number of games; and
a processing reading from said storage device a program for generating a second special game state in which a probability of hitting said special winning combination by executing said lottery program is set relatively high, based on said command signal, and executing said program.

8. A gaming machine equipped with a processing device and a storage device,
wherein
said processing device executes:

a processing determining one winning combination selected from plural winning combinations determined in advance by executing a lottery program stored in said storage device;
a processing reading from said storage device a program for generating a first special game state that is a game state advantageous to a player when the determined winning combination is a special winning combination, and executing said program;
a processing counting the number of games accumulatively each time a game is played;
a processing determining whether or not said

number of games has reached a set value that is set as an object of comparison with said number of games; and
a processing reading from said storage device a program for generating a second special game state in which a probability of hitting said special winning combination by executing said lottery program is set relatively high when said number of games is determined to have reached said set value, and executing said program.

9. The gaming machine according to claim 6, wherein
said processing device executes a processing finishing said second special game state when a player hits said special winning combination by said lottery during generation of said second special game state.

10. The gaming machine according to claim 6, wherein
said processing device executes a program for generating said second special game state when said number of games reaches said set value in a case where the number of inserted game media for a game played by the player is the upper limit value of the number of game media to be inserted for one game.

11. A gaming machine comprising:

means for generating a game state advantageous to a player when the player hits a predetermined lottery;
means for setting a hitting probability of said lottery high according to the number of games played by the player; and
means for returning the hitting probability to an original probability when the player hits said lottery while said hitting probability is set high.

12. A game control method comprising:

a step of generating a game state advantageous to a player when the player hits a predetermined lottery;
a step of setting a hitting probability of said lottery high according to the number of games played by the player; and
a step of returning the hitting probability to an original probability when the player hits said lottery while said hitting probability is set high.

13. A game system equipped with a gaming machine and a control device,
wherein
said control device includes:

means for transmitting a signal to said gaming machine according to the number of games played in said gaming machine by a player, and said gaming machine includes:

means for generating a game state advantageous to the player when the player hits a predetermined lottery;
means for setting a hitting probability of said lottery high based on said signal received from said control device; and
means for returning the hitting probability to an original probability when the player hits said lottery while said hitting probability is set high.

Fig. 1

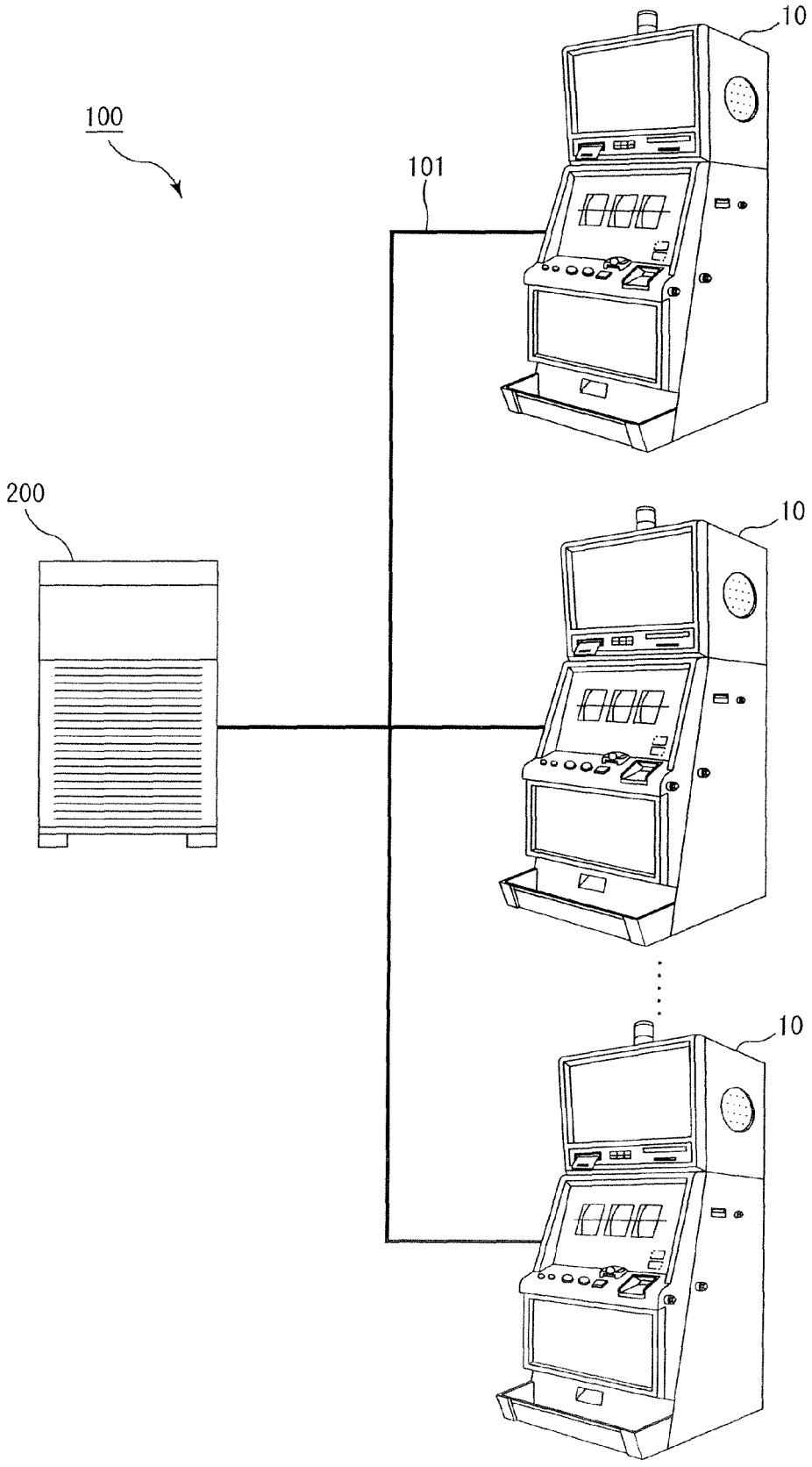


Fig. 2

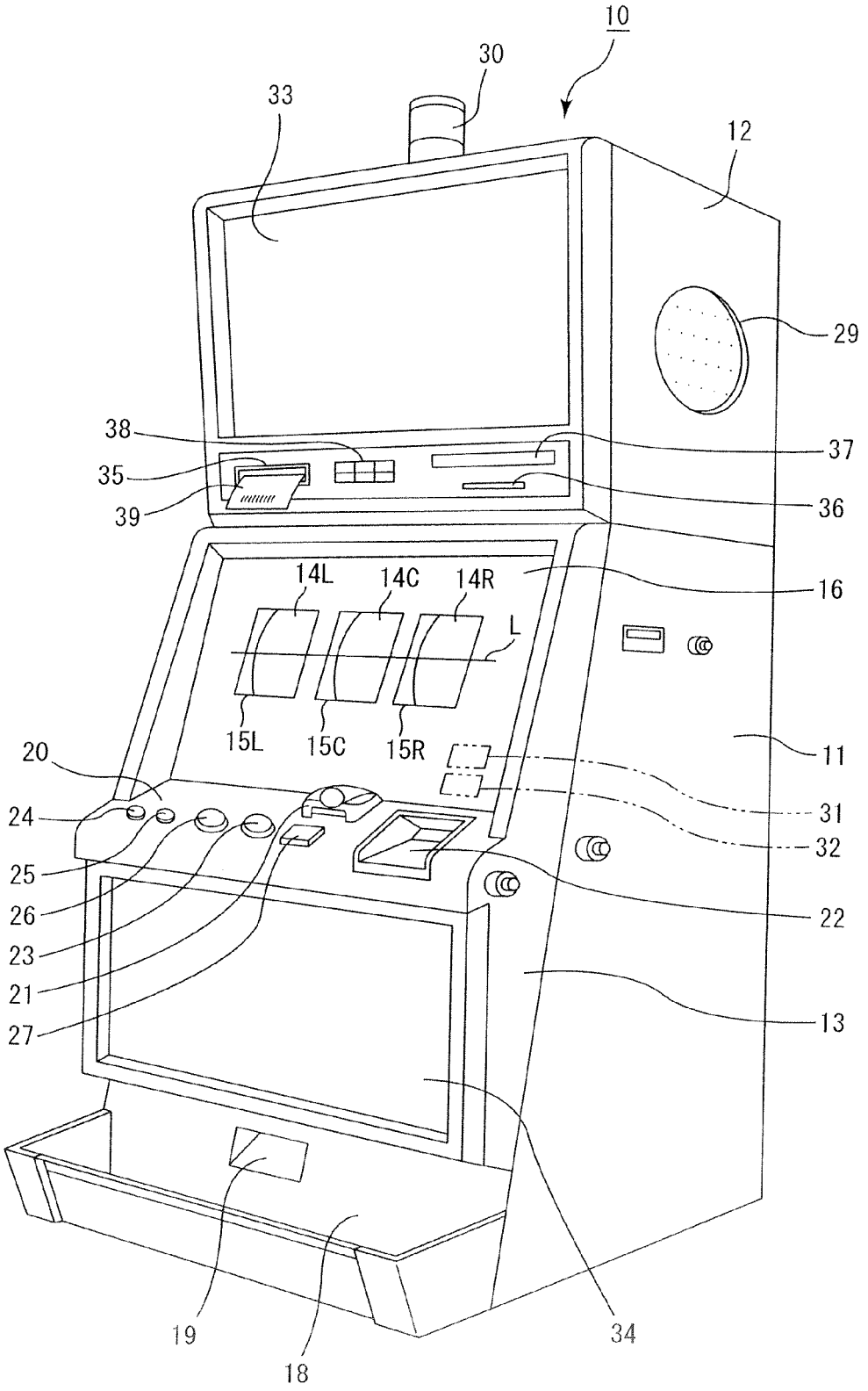

10
30
33
12
29
38
37
35
36
39
14L
14C
14R
16
L
15L
15C
15R
20
11
24
31
32
25
22
26
23
21
13
27
19
34
18

Fig. 3

	Left reel	Center reel	Right reel
Code No.	Symbol	Symbol	Symbol
00	JACKPOT 7	JACKPOT 7	JACKPOT 7
01	PLUM	BELL	CHERRY
02	ORANGE	APPLE	ORANGE
03	PLUM	BELL	APPLE
04	ORANGE	CHERRY	ORANGE
05	PLUM	ORANGE	PLUM
06	ORANGE	PLUM	ORANGE
07	PLUM	CHERRY	PLUM
08	BLUE 7	BELL	ORANGE
09	CHERRY	APPLE	PLUM
10	ORANGE	BELL	ORANGE
11	BELL	STRAWBERRY	PLUM
12	ORANGE	PLUM	BELL
13	STRAWBERRY	BLUE 7	STRAWBERRY
14	BLUE 7	BELL	BLUE 7
15	ORANGE	APPLE	BELL
16	APPLE	BELL	CHERRY
17	PLUM	STRAWBERRY	PLUM
18	ORANGE	PLUM	ORANGE
19	PLUM	CHERRY	PLUM
20	BLUE 7	BELL	ORANGE
21	CHERRY	APPLE	PLUM

Fig. 4

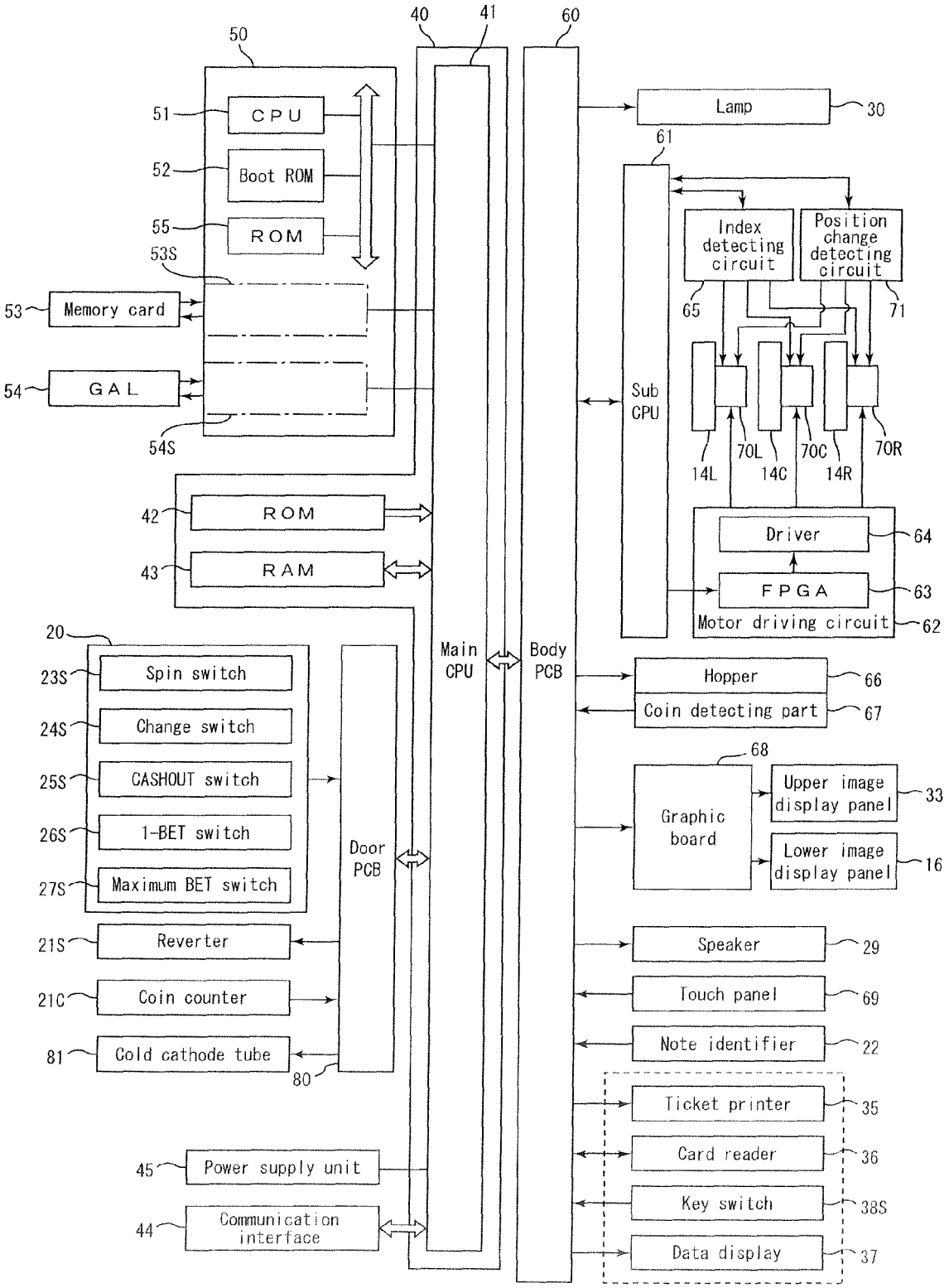

40
41
60
50
51
CPU
52
Boot ROM
55
ROM
53S
53
Memory card
54
GAL
54S
Lamp
30
61
Index detecting circuit
Position change detecting circuit
65
71
Sub CPU
14L
70L
14C
70C
14R
70R
Driver
64
FPGA
63
Motor driving circuit
62
42
ROM
43
RAM
Main CPU
Body PCB
20
23S
Spin switch
24S
Change switch
25S
CASHOUT switch
26S
1-BET switch
27S
Maximum BET switch
Door PCB
Hopper
66
Coin detecting part
67
68
Graphic board
Upper image display panel
33
Lower image display panel
16
21S
Reverter
21C
Coin counter
81
Cold cathode tube
80
Speaker
29
Touch panel
69
Note identifier
22
Ticket printer
35
Card reader
36
Key switch
38S
Data display
37
45
Power supply unit
44
Communication interface

Fig. 5

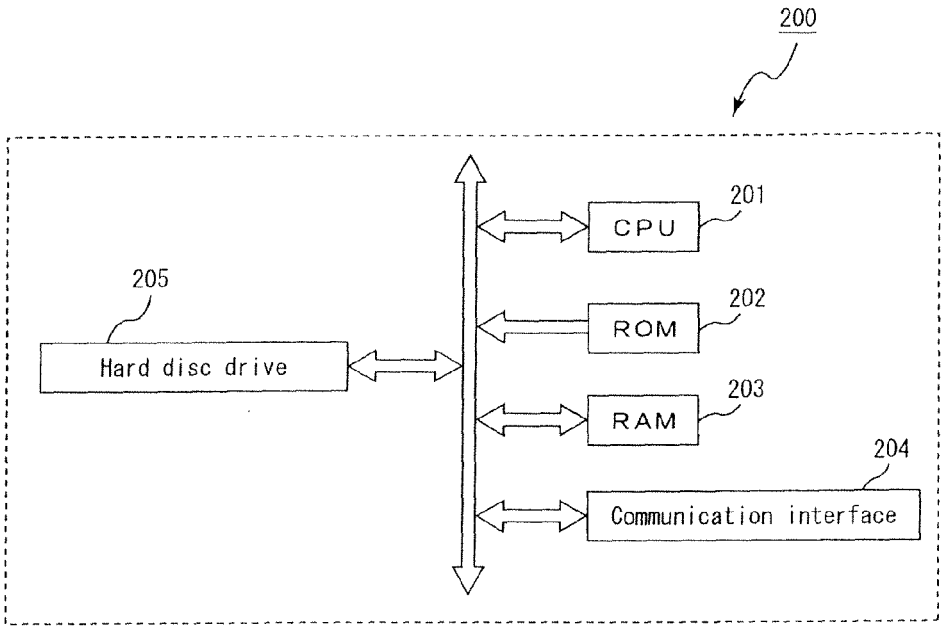


Fig. 6

Gaming machine identification number	Number of games	Accumulative number of coin-in	Accumulative number of coin-out	Payment balance	Return rate (%)	Set value
001	600	30000	27000	-3000	90	600
002	600	30000	33000	3000	110	600
003	550	50000	40000	-10000	80	600
⋮	⋮	⋮	⋮	⋮	⋮	⋮

Fig. 7

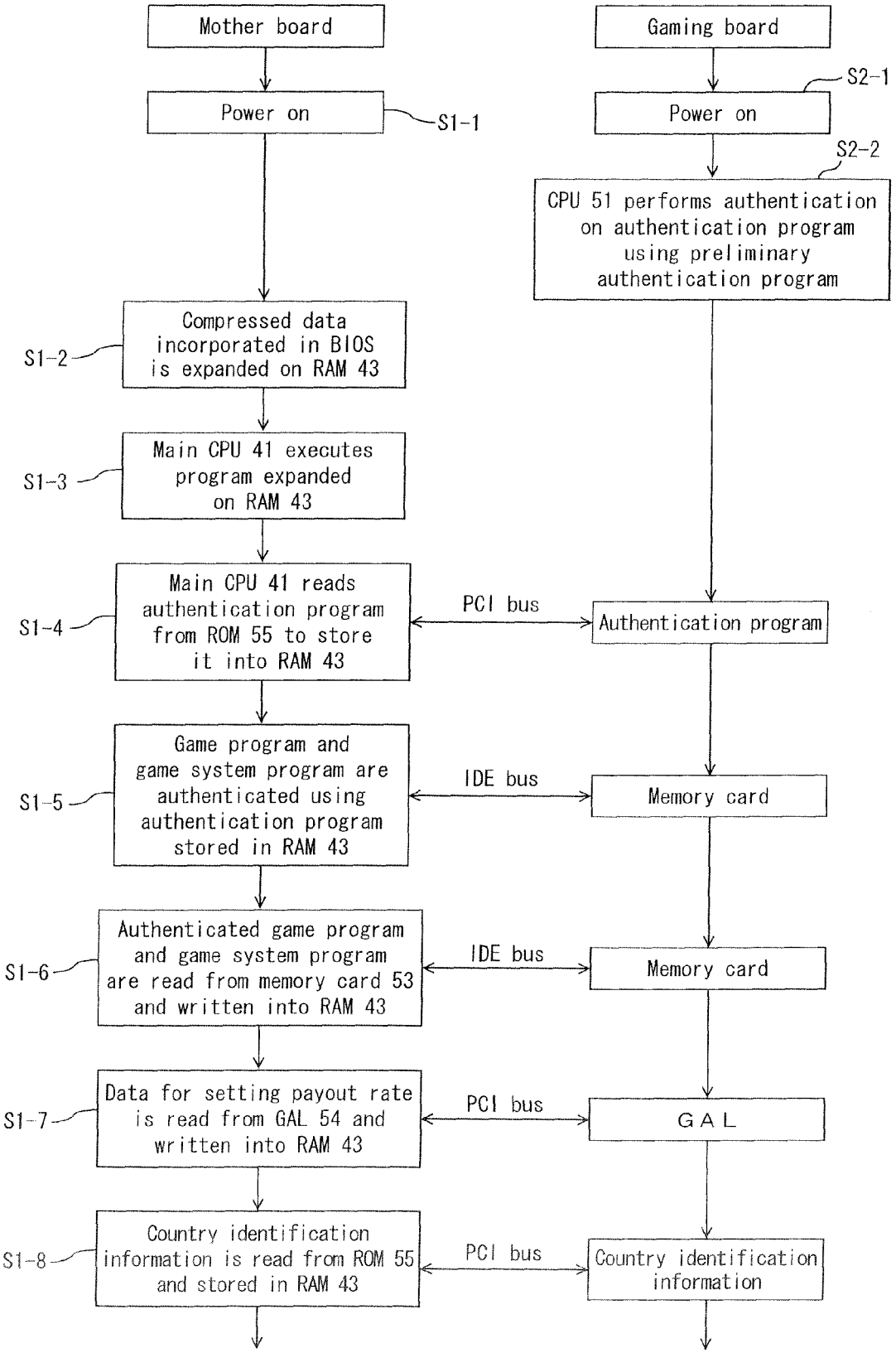

Mother board
Gaming board
Power on
S1-1
Power on
S2-1
S2-2
CPU 51 performs authentication on authentication program using preliminary authentication program
S1-2
Compressed data incorporated in BIOS is expanded on RAM 43
S1-3
Main CPU 41 executes program expanded on RAM 43
S1-4
Main CPU 41 reads authentication program from ROM 55 to store it into RAM 43
PCI bus
Authentication program
S1-5
Game program and game system program are authenticated using authentication program stored in RAM 43
IDE bus
Memory card
S1-6
Authenticated game program and game system program are read from memory card 53 and written into RAM 43
IDE bus
Memory card
S1-7
Data for setting payout rate is read from GAL 54 and written into RAM 43
PCI bus
GAL
S1-8
Country identification information is read from ROM 55 and stored in RAM 43
PCI bus
Country identification information

Fig. 8

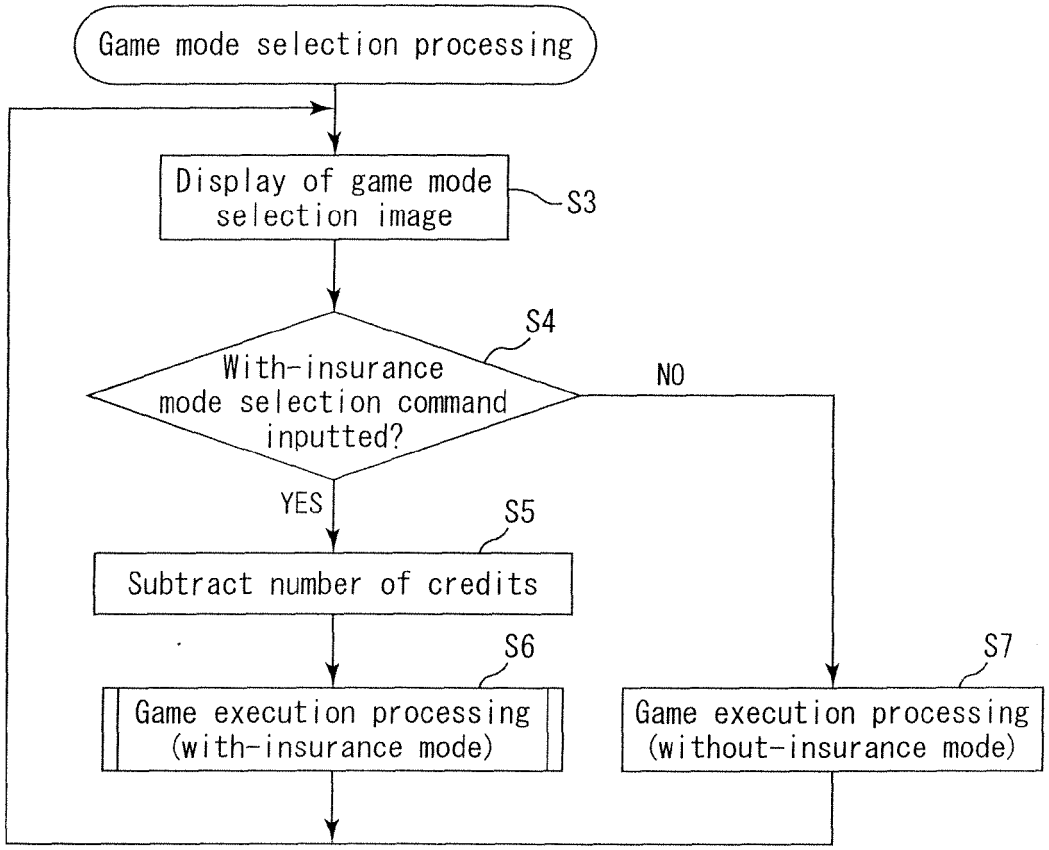

Game mode selection processing
Display of game mode selection image
S3
S4
With-insurance mode selection command inputted?
NO
YES
S5
Subtract number of credits
S6
Game execution processing (with-insurance mode)
S7
Game execution processing (without-insurance mode)

Fig. 9A

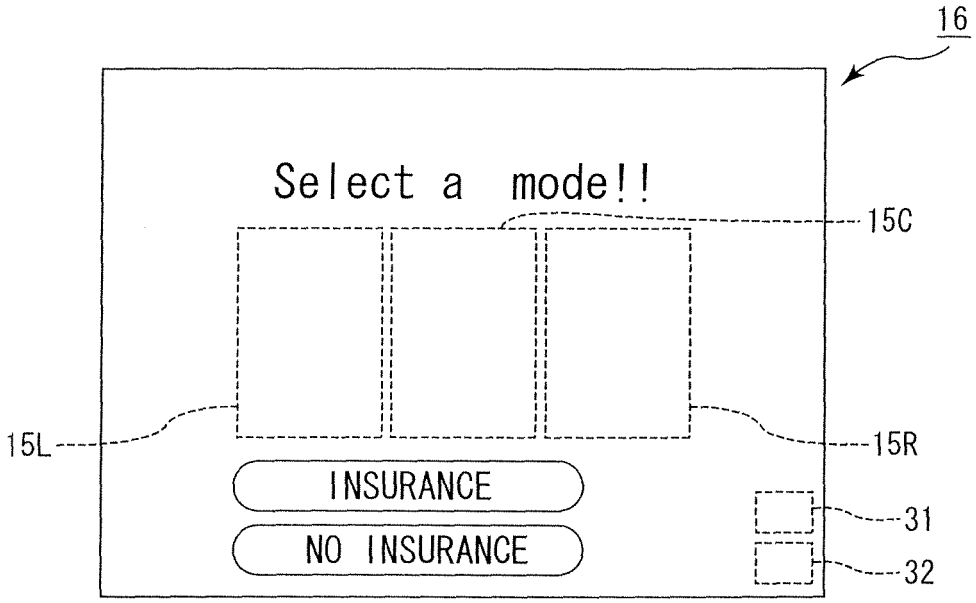

16
Select a mode!!
15C
15L
15R
INSURANCE
NO INSURANCE
31
32

Fig. 9B

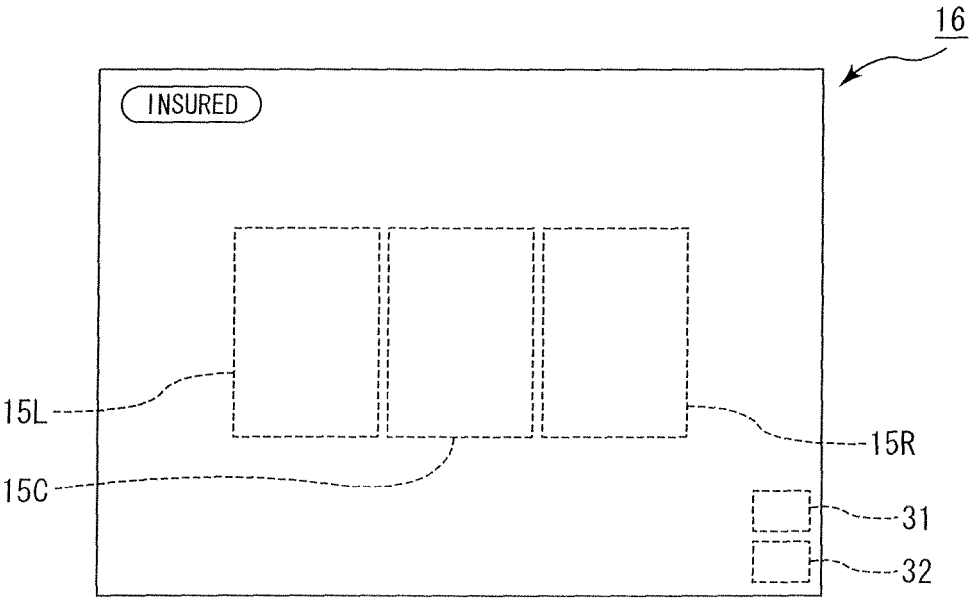

16
INSURED
15L
15C
15R
31
32

Fig. 10

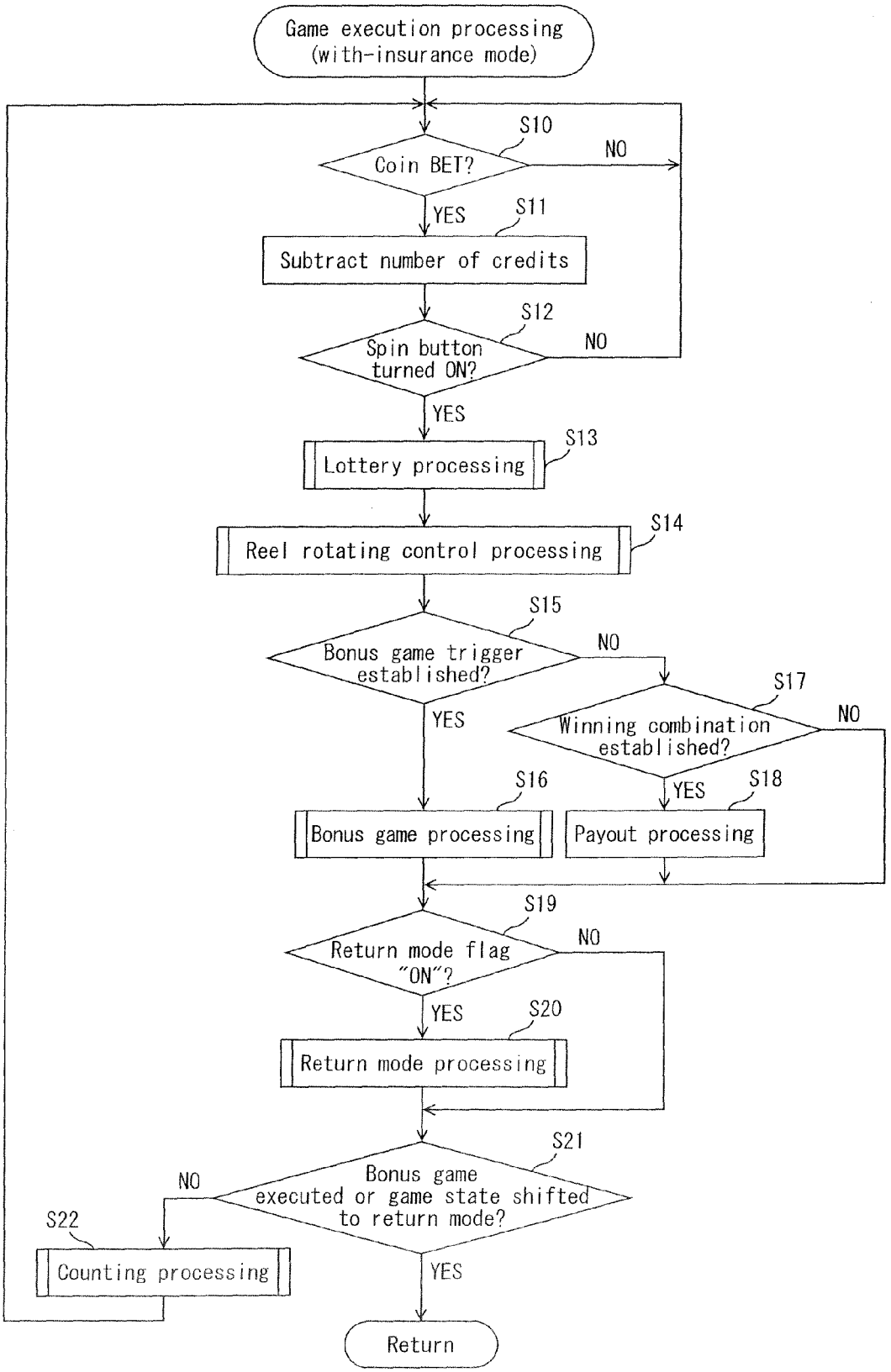

Game execution processing (with-insurance mode)
S10
Coin BET?
NO
YES
S11
Subtract number of credits
S12
Spin button turned ON?
NO
YES
S13
Lottery processing
S14
Reel rotating control processing
S15
Bonus game trigger established?
NO
YES
S17
Winning combination established?
NO
YES
S16
Bonus game processing
S18
Payout processing
S19
Return mode flag "ON"?
NO
YES
S20
Return mode processing
S21
Bonus game executed or game state shifted to return mode?
NO
YES
S22
Counting processing
Return

Fig. 11

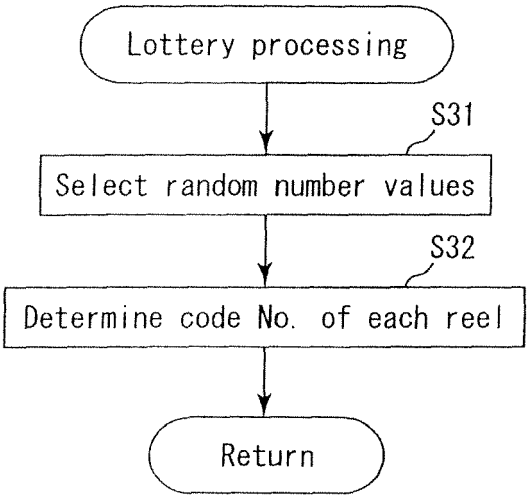


Fig. 12

Winning combination			Establishment possibility (%)	Number of coin-out (※1)
Bonus game trigger			0.5	(※2)
JACKPOT 7	JACKPOT 7	JACKPOT 7	0.5	30
BLUE 7	BLUE 7	BLUE 7	0.8	10
BELL	BELL	BELL	1.1	8
CHERRY	CHERRY	CHERRY	1.5	5
STRAWBERRY	STRAWBERRY	STRAWBERRY	1.5	5
PLUM	PLUM	PLUM	1.8	4
ORANGE	ORANGE	ORANGE	2.3	3
CHERRY	CHERRY	(ANY)	3.0	2
ORANGE	ORANGE	(ANY)	3.0	2
CHERRY	(ANY)	(ANY)	7.5	1
ORANGE	(ANY)	(ANY)	7.5	1

※1: the number of coin-out per one coin-in
※2: the number of free games determined by lottery is performed

Fig. 13

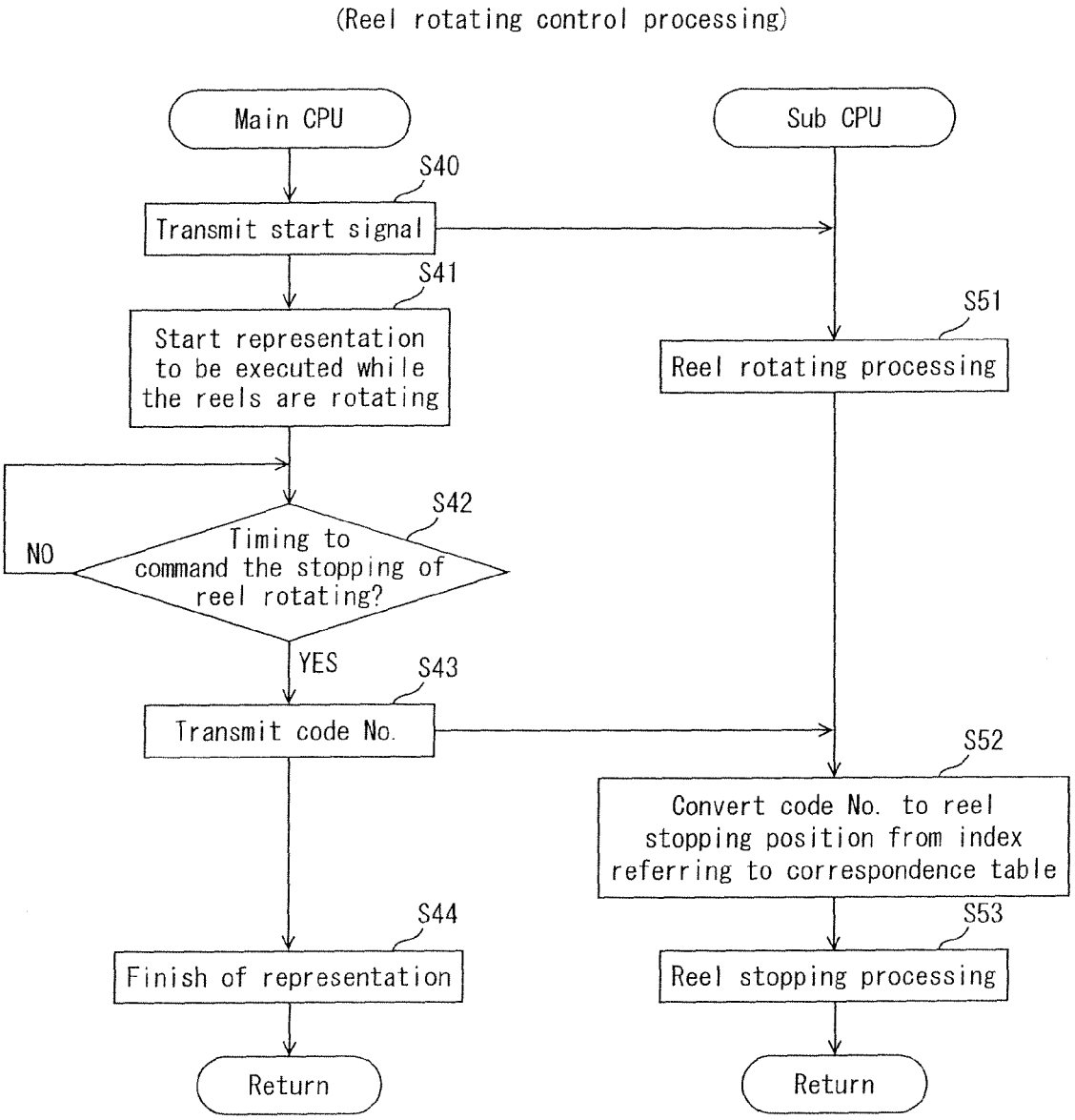

(Reel rotating control processing)
Main CPU
Sub CPU
S40
Transmit start signal
S41
Start representation to be executed while the reels are rotating
S51
Reel rotating processing
S42
NO
Timing to command the stopping of reel rotating?
YES
S43
Transmit code No.
S52
Convert code No. to reel stopping position from index referring to correspondence table
S44
Finish of representation
S53
Reel stopping processing
Return
Return

Fig. 14A

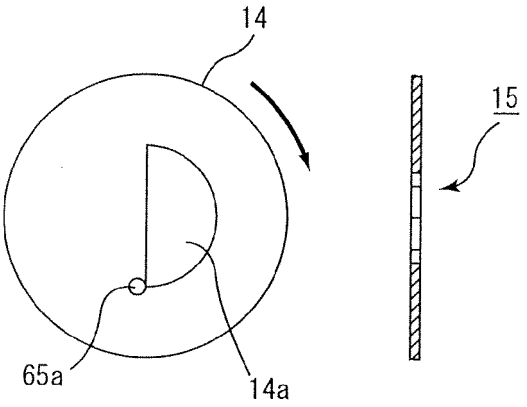


Fig. 14B

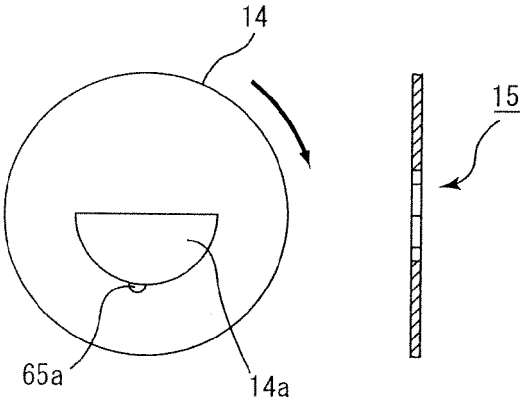


Fig. 14C

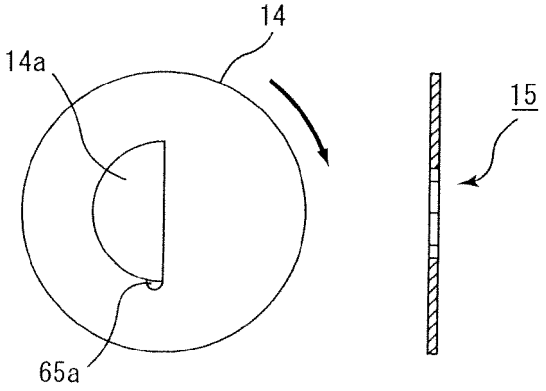


Fig. 14D

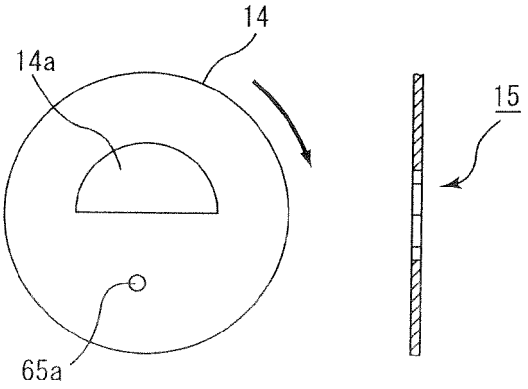


Fig. 15

Code No.	Index	Number of steps (※)
00	1	0
01		18
02		36
03		54
04		72
05		91
06		109
07		127
08		145
09		163
10		182
11	2	200
12		218
13		236
14		254
15		273
16		291
17		309
18		327
19		345
20		364
21		382

※the number of steps with index 1 as a reference

Fig. 16

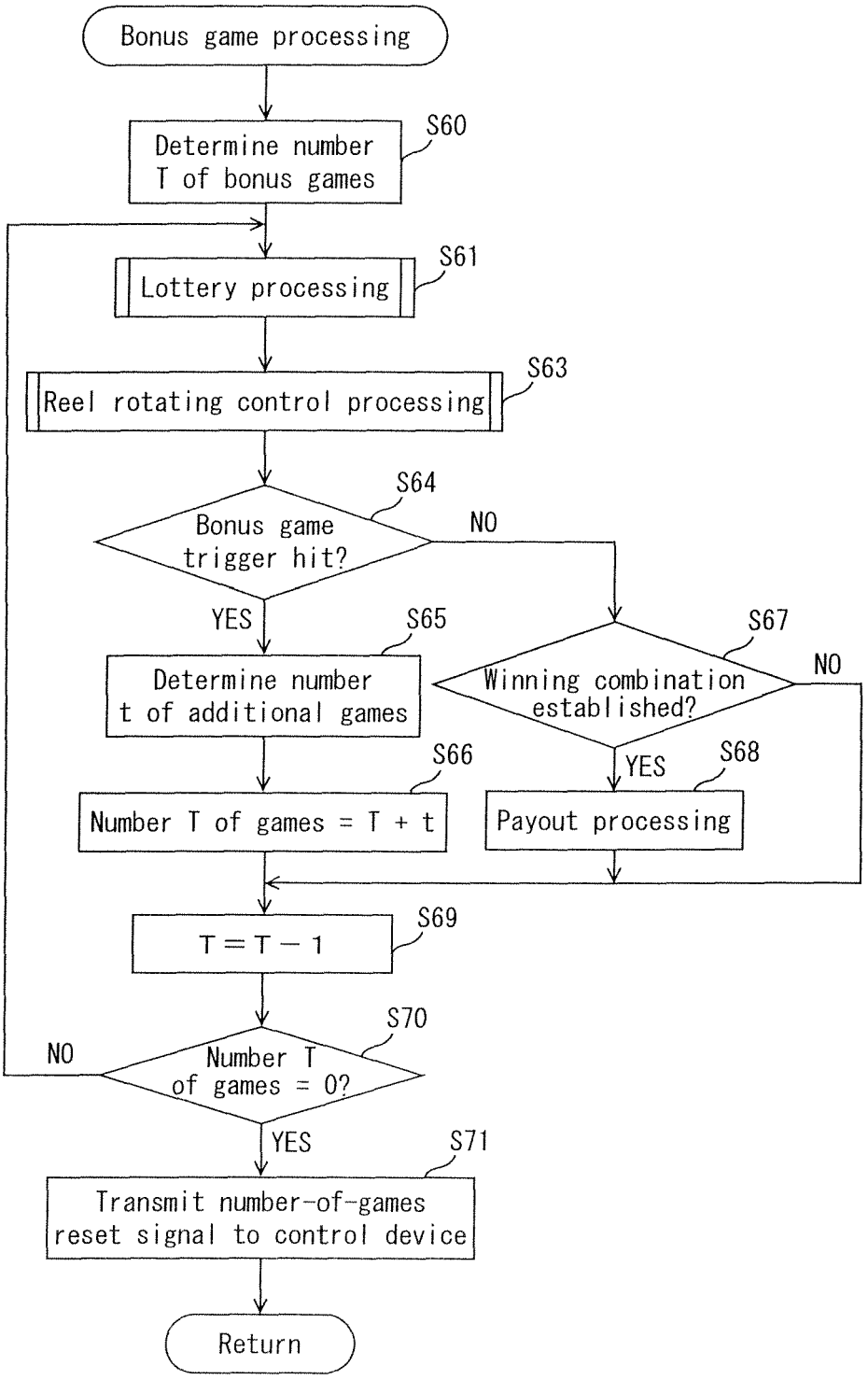

Bonus game processing
Determine number T of bonus games
S60
Lottery processing
S61
Reel rotating control processing
S63
Bonus game trigger hit?
S64
NO
YES
Determine number t of additional games
S65
Winning combination established?
S67
NO
YES
Number T of games = T + t
S66
Payout processing
S68
T = T − 1
S69
Number T of games = 0?
S70
NO
YES
Transmit number-of-games reset signal to control device
S71
Return

Fig. 17

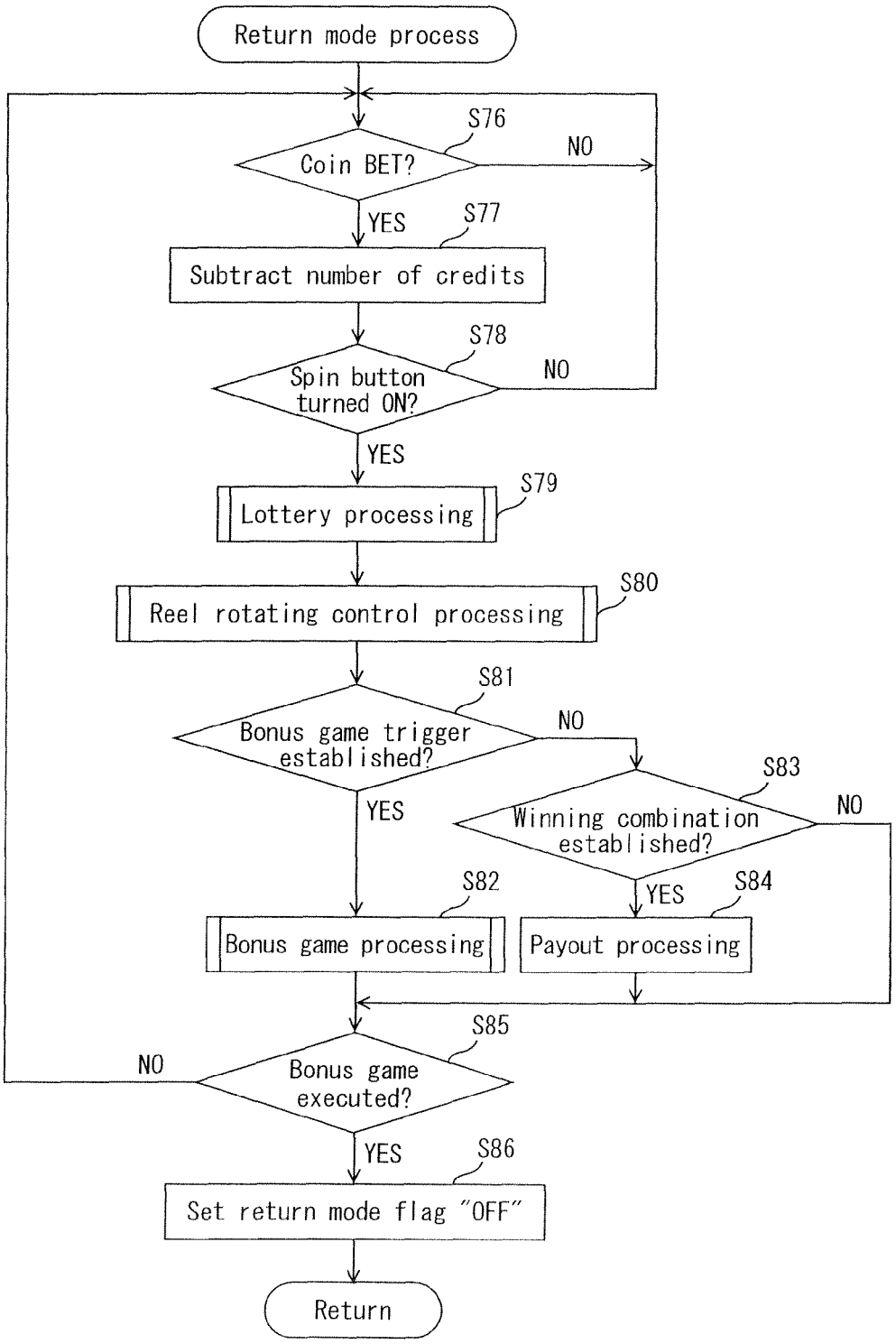

Return mode process
S76
Coin BET?
NO
YES
S77
Subtract number of credits
S78
Spin button turned ON?
NO
YES
S79
Lottery processing
S80
Reel rotating control processing
S81
Bonus game trigger established?
NO
YES
S83
Winning combination established?
NO
YES
S82
Bonus game processing
S84
Payout processing
S85
Bonus game executed?
NO
YES
S86
Set return mode flag "OFF"
Return

Fig. 18

Winning combination			Establishment possibility (%)	Number of coin-out (※1)
Bonus game trigger			10.0	(※2)
JACKPOT 7	JACKPOT 7	JACKPOT 7	0.5	30
BLUE 7	BLUE 7	BLUE 7	0.8	10
BELL	BELL	BELL	1.1	8
CHERRY	CHERRY	CHERRY	1.5	5
STRAWBERRY	STRAWBERRY	STRAWBERRY	1.5	5
PLUM	PLUM	PLUM	1.8	4
ORANGE	ORANGE	ORANGE	2.3	3
CHERRY	CHERRY	(ANY)	3.0	2
ORANGE	ORANGE	(ANY)	3.0	2
CHERRY	(ANY)	(ANY)	7.5	1
ORANGE	(ANY)	(ANY)	7.5	1

※1: the number of coin-out per one coin-in
※2: the number of free games determined by lottery is performed

Fig. 19

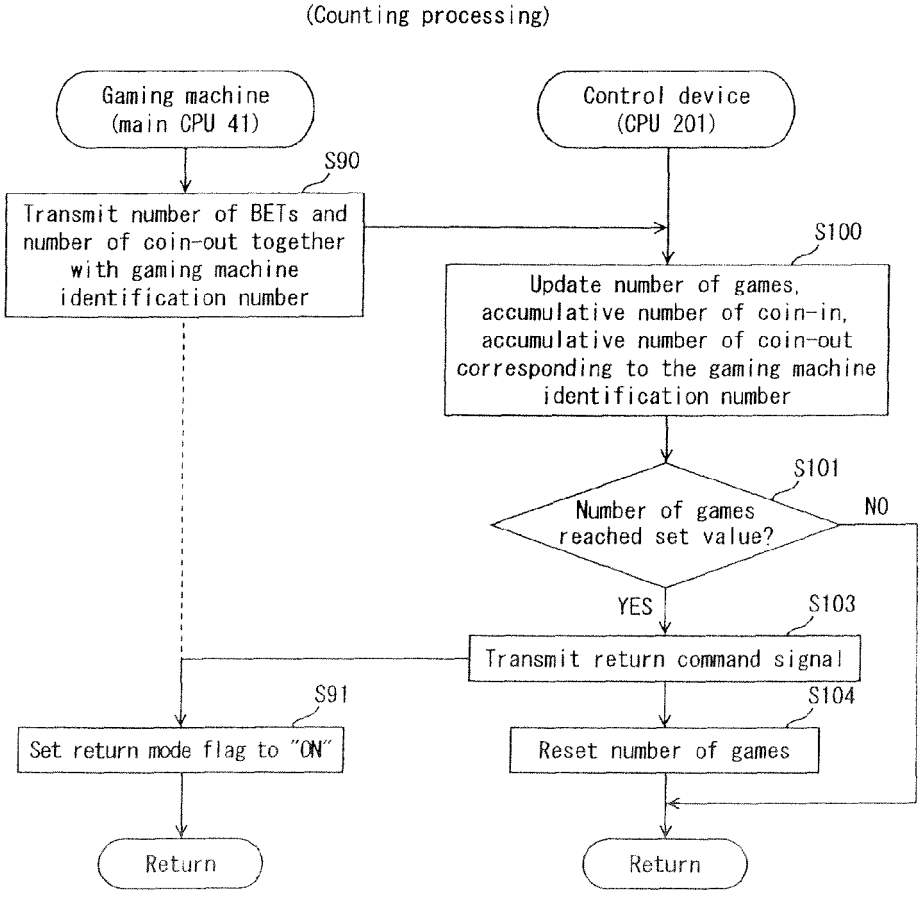
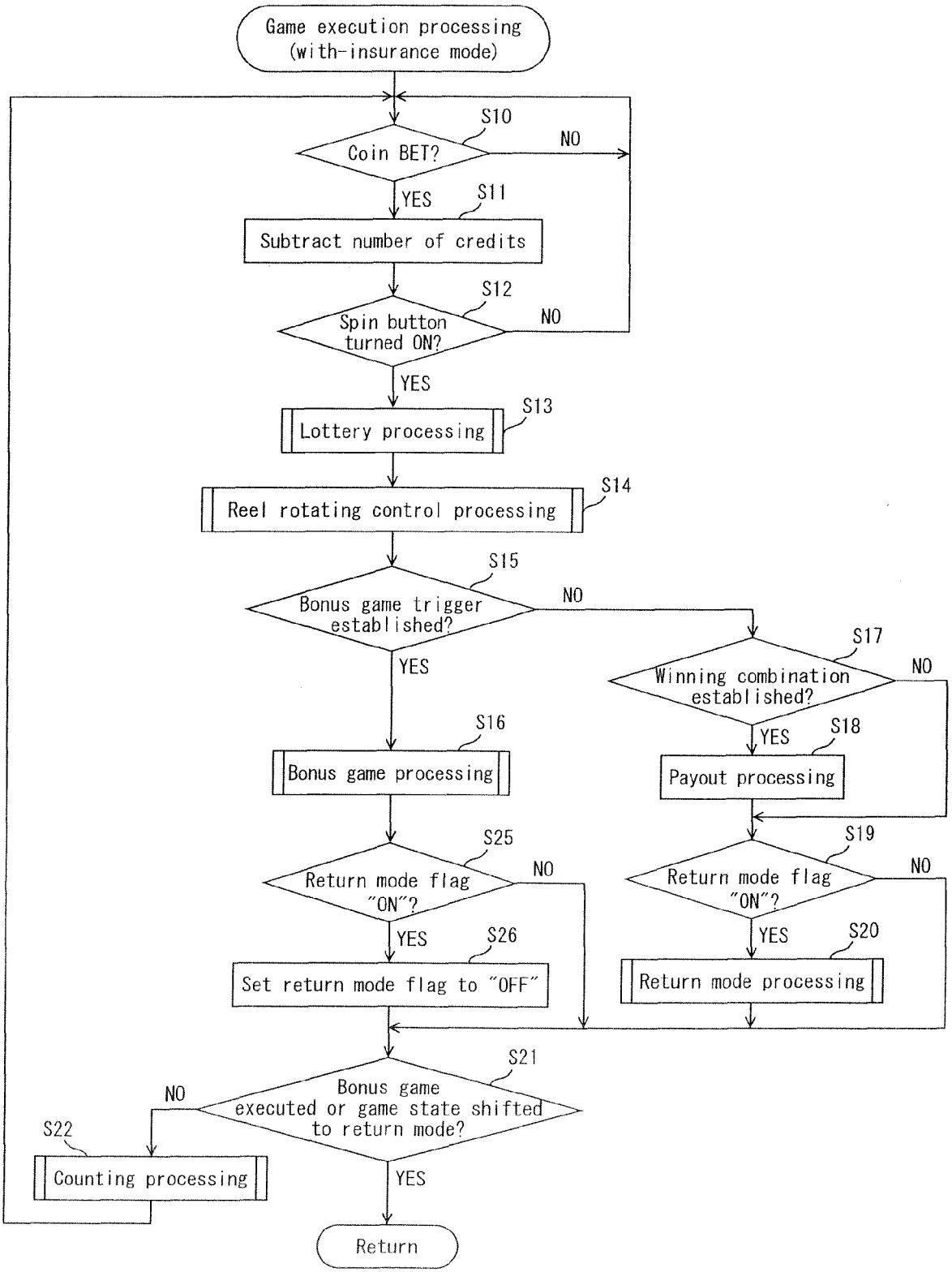


Fig. 20


Game execution processing (with-insurance mode)
S10
Coin BET?
NO
YES
S11
Subtract number of credits
S12
Spin button turned ON?
NO
YES
S13
Lottery processing
S14
Reel rotating control processing
S15
Bonus game trigger established?
NO
YES
S16
Bonus game processing
S17
Winning combination established?
NO
YES
S18
Payout processing
S25
Return mode flag "ON"?
NO
YES
S26
Set return mode flag to "OFF"
S19
Return mode flag "ON"?
NO
YES
S20
Return mode processing
S21
Bonus game executed or game state shifted to return mode?
NO
YES
S22
Counting processing
Return

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2005015810 W **[0001]**
- JP 2003117053 A **[0004] [0006] [0007] [0010]**
- US 5820459 A **[0005] [0007] [0007] [0010]**