(12) UK Patent Application (19) GB (11) 2 450 273 (13) A

(43) Date of Printing by UK Office 17.12.2008

(21) Application No: 0818078.8

(22) Date of Filing: 15.02.2007

(30) Priority Data:
(31) 2006102486 (32) 03.04.2006 (33) JP

(86) International Application Data:
PCT/JP2007/052695 Jp 15.02.2007

(87) International Publication Data:
WO2007/113943 Jp 11.10.2007

(71) Applicant(s):
Konami Digital Entertainment Co.,Ltd.
(Incorporated in Japan)
9-7-2, Akasaka, Minato-ku,
Tokyo 107-8324, Japan

(72) Inventor(s):
Masato Okuaki
Hiroto Nakamoto
Toru Omoto
Junichi Yamaguchi

(74) Agent and/or Address for Service:
Gill Jennings & Every LLP
Broadgate House, 7 Eldon Street,
LONDON, EC2M 7LH, United Kingdom

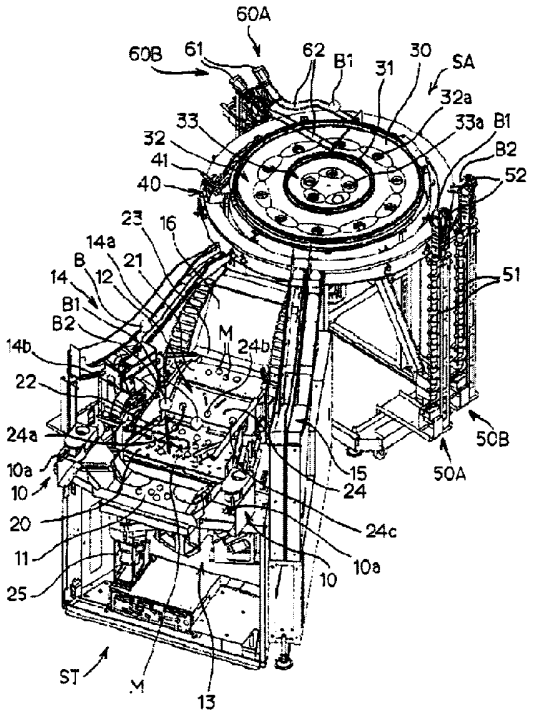
(51) INT CL:
A63F 9/00 (2006.01)

(56) Documents Cited by ISA:
JP 2006081768 A JP 2002210225 A
JP 2001038037 A JP 2000153055 A
"KONAMI AMUSEMENT MACHINE CATALOGUE 'GRANDCROSS' " KOKOKUYO BIRA, KONAMI, 17 FEBRUARY, 2006 (17.02.06) NATIONAL CENTER FOR INDUSTRIAL PROPERTY INFORMATION AND TRAINING UKEIRE, FULL TEXT, XP003018119

(58) Field of Search by ISA:
INT CL A63F
Other: Jitsuyo Shinan Koho 1922-1996, Jitsuyo Shinan Toroku Koho 1996-2007, Kokai Jitsuyo Shinan Koho 1971-2007, Toroku Jitsuyo Shinan Koho 1994-2007

(54) Abstract Title: **Game machine**

(57) A game machine where first and second game media are supplied to a play field section and a motive for sustaining a game can be imparted to a player even if the number of second game media decreases. In the game machine where a medal (M) as a first game medium and a ball (B) as a second game medium are supplied to a play field section (12) based on the operation of a player, a basic game is executed in association with the operation of the medal (M), dividend dependent on the results of that basic game is given to the player, and a chance for acquiring is imparted to the player when the ball (B) is removed from the play field section (12) due to operation of the ball (B) linked with the operation of the medal (M), the number of the balls (B) as game media existing in the play field section (12) is detected and a benefit to be tied to payment of dividend to the player is imparted in association with a decrease in the number of the balls (B).



GB 2 450 273 A

Original Printed on Recycled Paper

FIG. 1

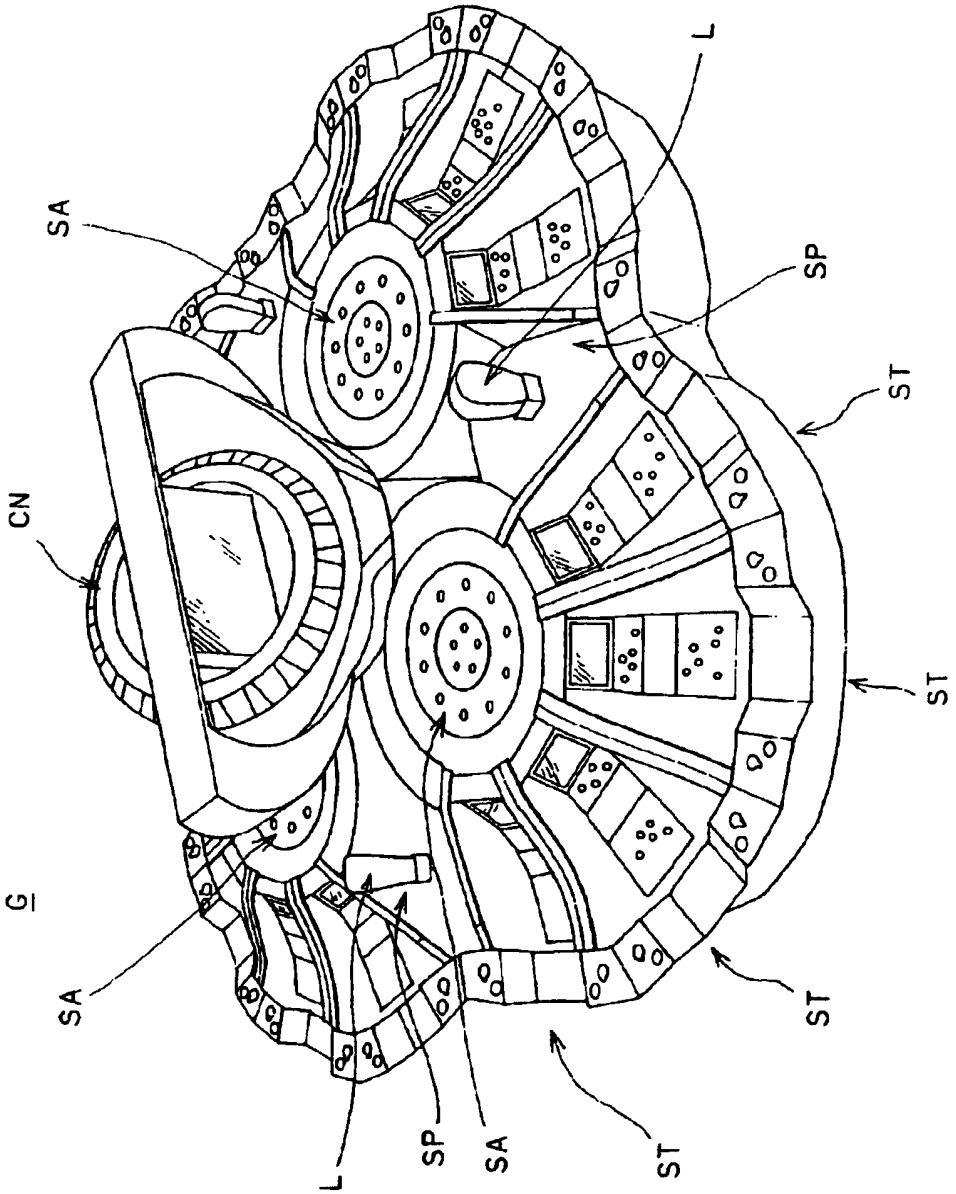


FIG. 2

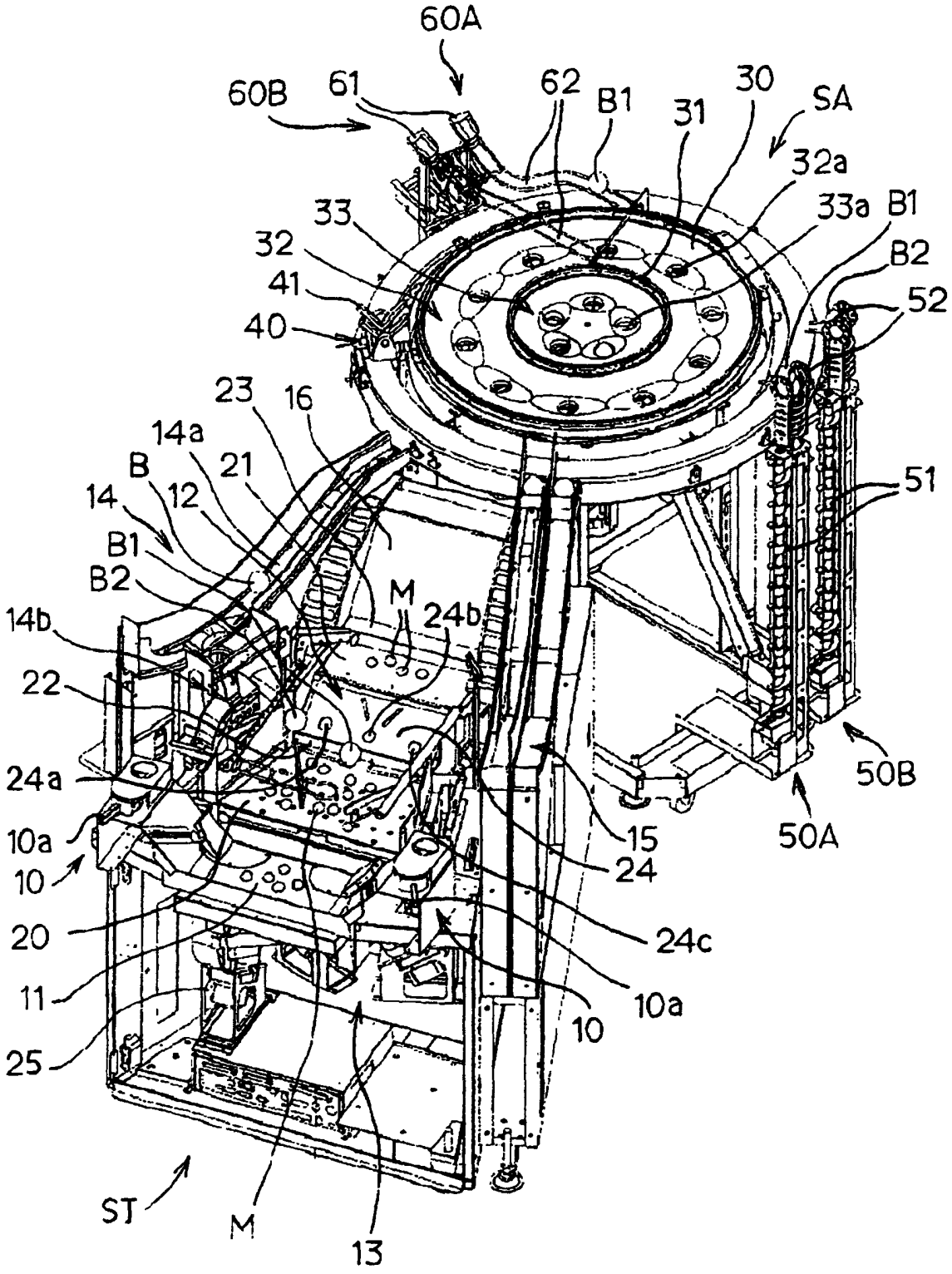

60A
60B
61
62
B1
31
30
SA
32a
33a
B1
B2
52
33
32
41
40
23
16
14a
B
21
14
12
B1
B2
M
24b
51
14b
22
24a
10a
10
20
11
25
ST
M
13
15
24
24c
10a
10
50B
50A

FIG. 3

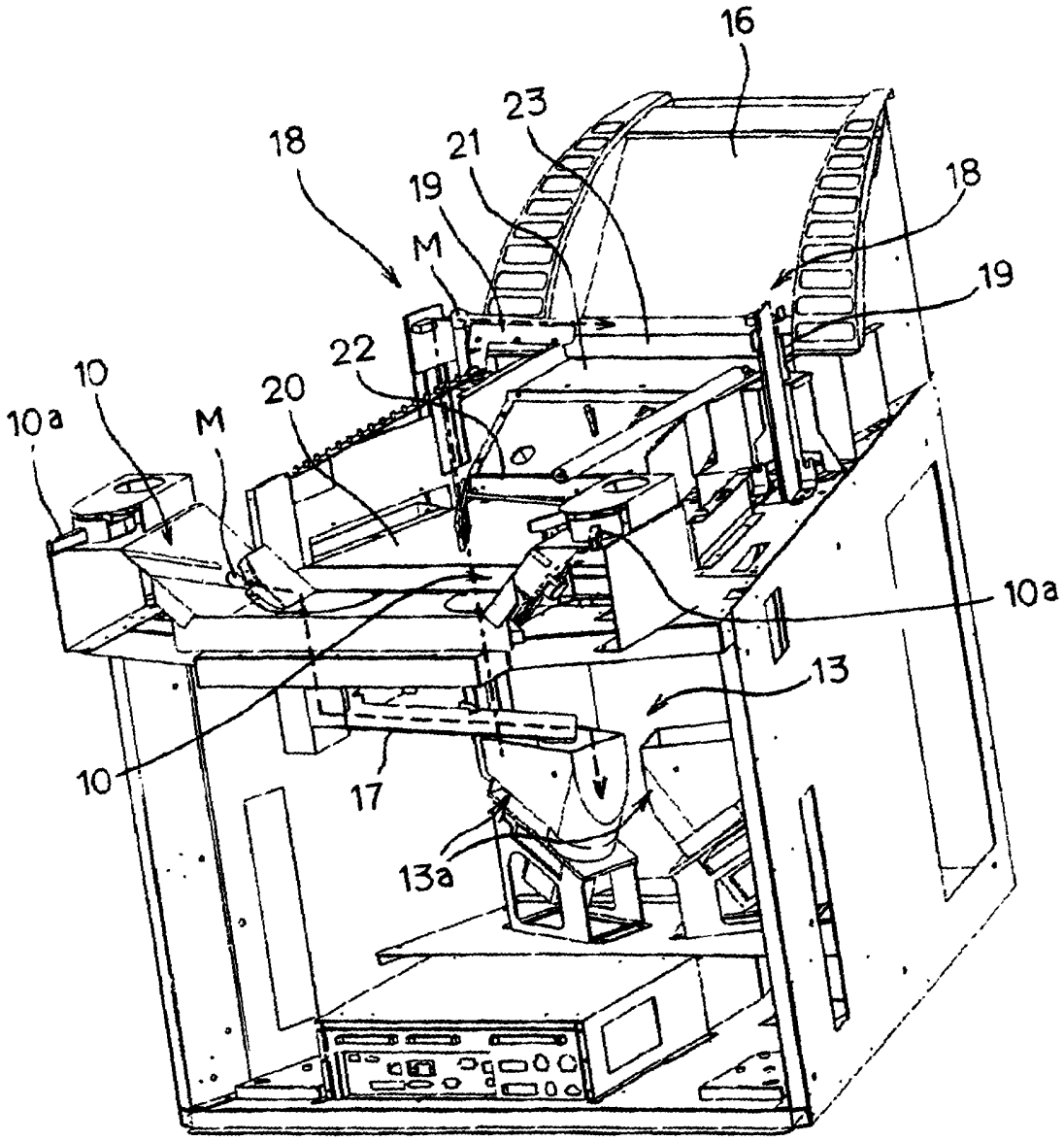


FIG. 4

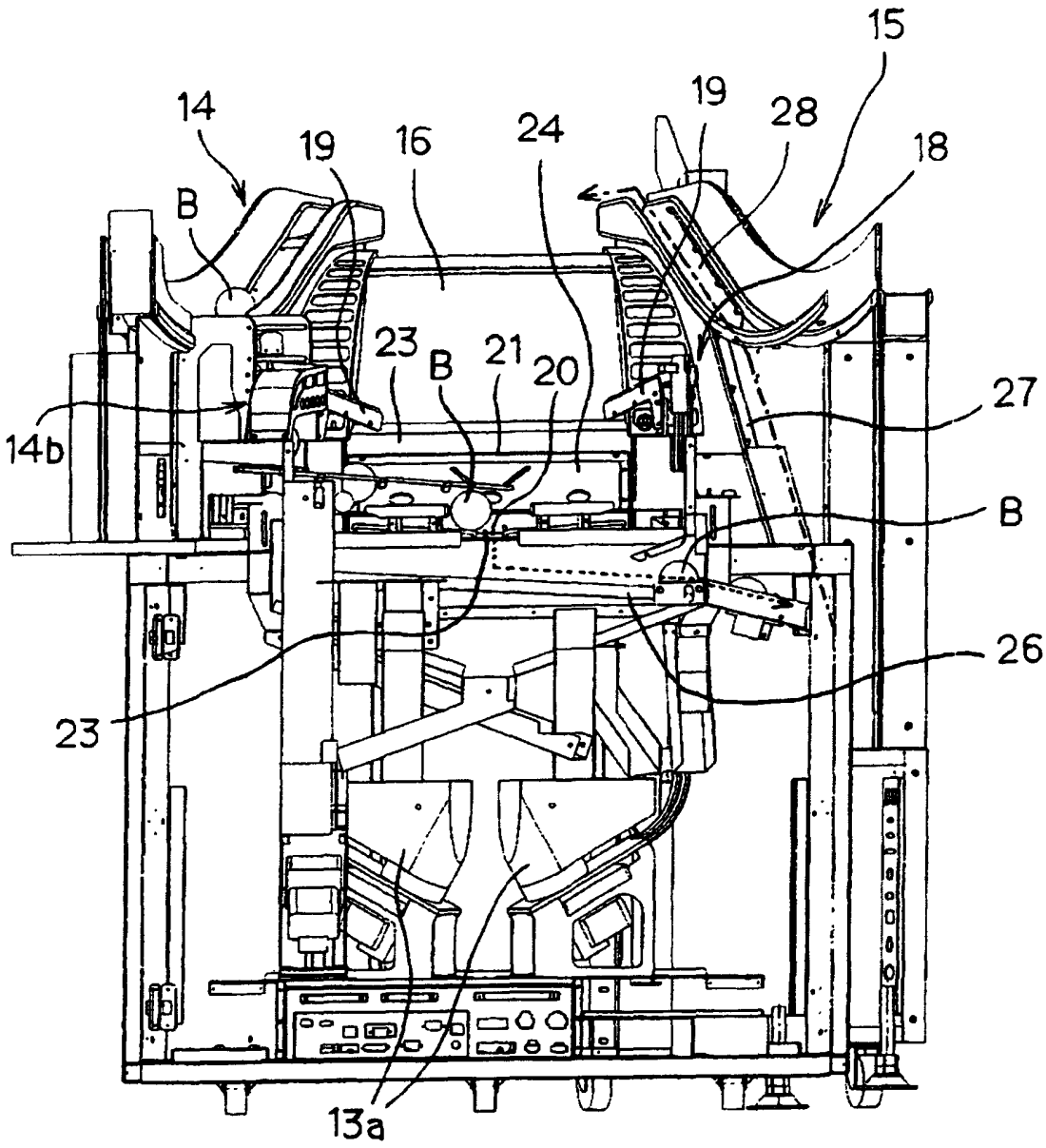


FIG. 5

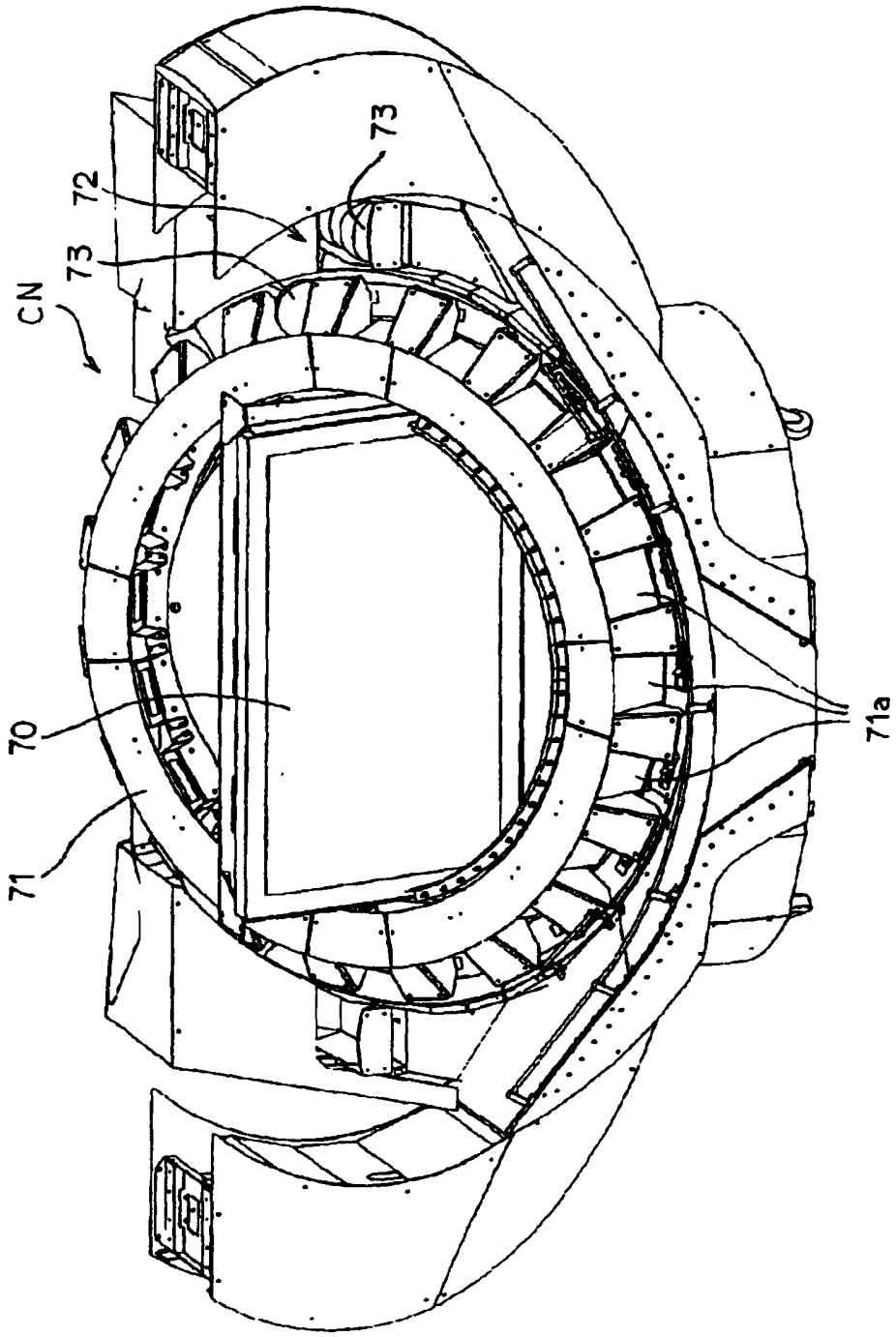


FIG. 6

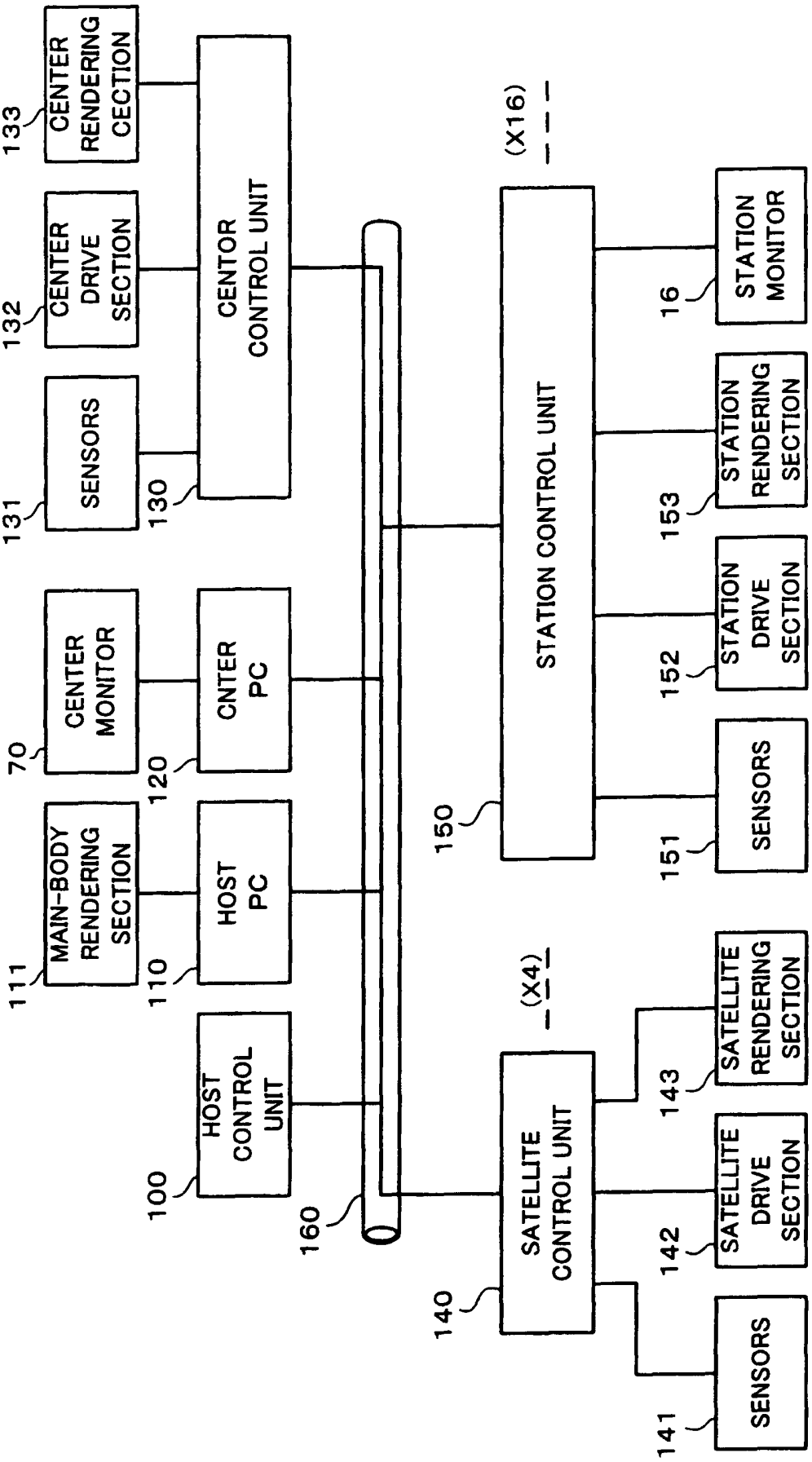

HOST CONTROL UNIT
100
HOST PC
110
MAIN-BODY RENDERING SECTION
111
CNTER PC
120
CENTER MONITOR
70
CENTOR CONTROL UNIT
130
SENSORS
131
CENTER DRIVE SECTION
132
CENTER RENDERING CECTION
133
160
SATELLITE CONTROL UNIT
140
(X4)
SATELLITE DRIVE SECTION
142
SATELLITE RENDERING SECTION
143
SENSORS
141
STATION CONTROL UNIT
150
(X16)
STATION DRIVE SECTION
152
STATION RENDERING SECTION
153
SENSORS
151
STATION MONITOR
16

FIG. 7

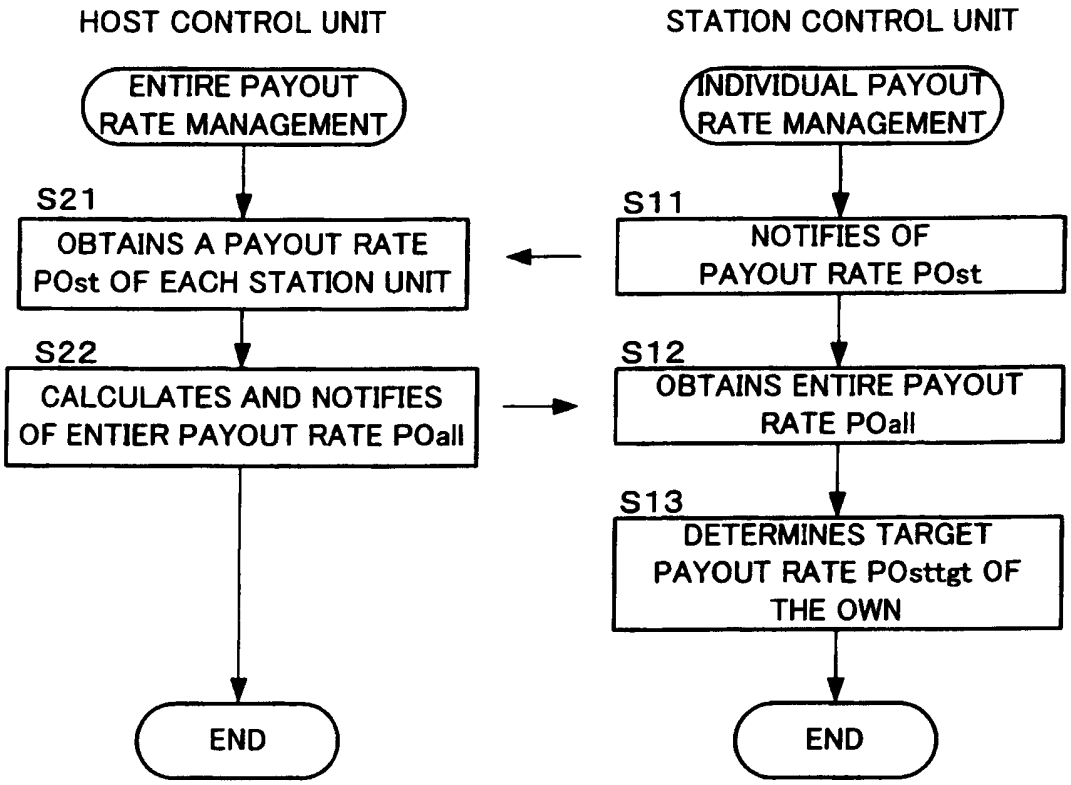

HOST CONTROL UNIT
STATION CONTROL UNIT
ENTIRE PAYOUT RATE MANAGEMENT
INDIVIDUAL PAYOUT RATE MANAGEMENT
S21
OBTAINS A PAYOUT RATE POst OF EACH STATION UNIT
S11
NOTIFIES OF PAYOUT RATE POst
S22
CALCULATES AND NOTIFIES OF ENTIER PAYOUT RATE POall
S12
OBTAINS ENTIRE PAYOUT RATE POall
S13
DETERMINES TARGET PAYOUT RATE POsttgt OF THE OWN
END
END

FIG. 8

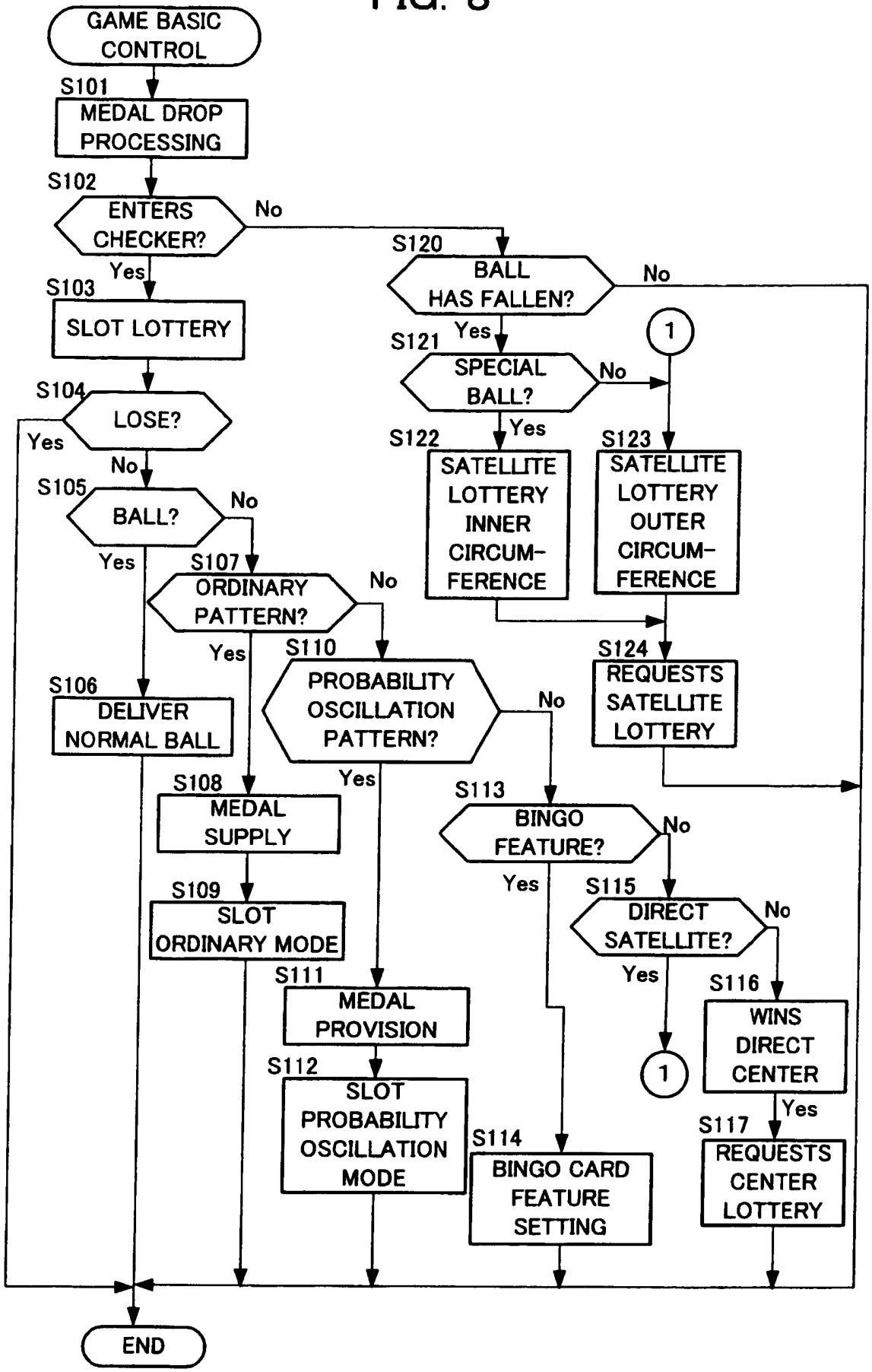

GAME BASIC CONTROL
S101
MEDAL DROP PROCESSING
S102
ENTERS CHECKER?
No
Yes
S103
SLOT LOTTERY
S104
LOSE?
Yes
No
S105
BALL?
No
Yes
S107
ORDINARY PATTERN?
No
Yes
S106
DELIVER NORMAL BALL
S110
PROBABILITY OSCILLATION PATTERN?
No
Yes
S108
MEDAL SUPPLY
S109
SLOT ORDINARY MODE
S111
MEDAL PROVISION
S112
SLOT PROBABILITY OSCILLATION MODE
S120
BALL HAS FALLEN?
No
Yes
S121
SPECIAL BALL?
No
Yes
1
S122
SATELLITE LOTTERY INNER CIRCUM-FERENCE
S123
SATELLITE LOTTERY OUTER CIRCUM-FERENCE
S124
REQUESTS SATELLITE LOTTERY
S113
BINGO FEATURE?
No
Yes
S114
BINGO CARD FEATURE SETTING
S115
DIRECT SATELLITE?
No
Yes
1
S116
WINS DIRECT CENTER
Yes
S117
REQUESTS CENTER LOTTERY
END

FIG. 9

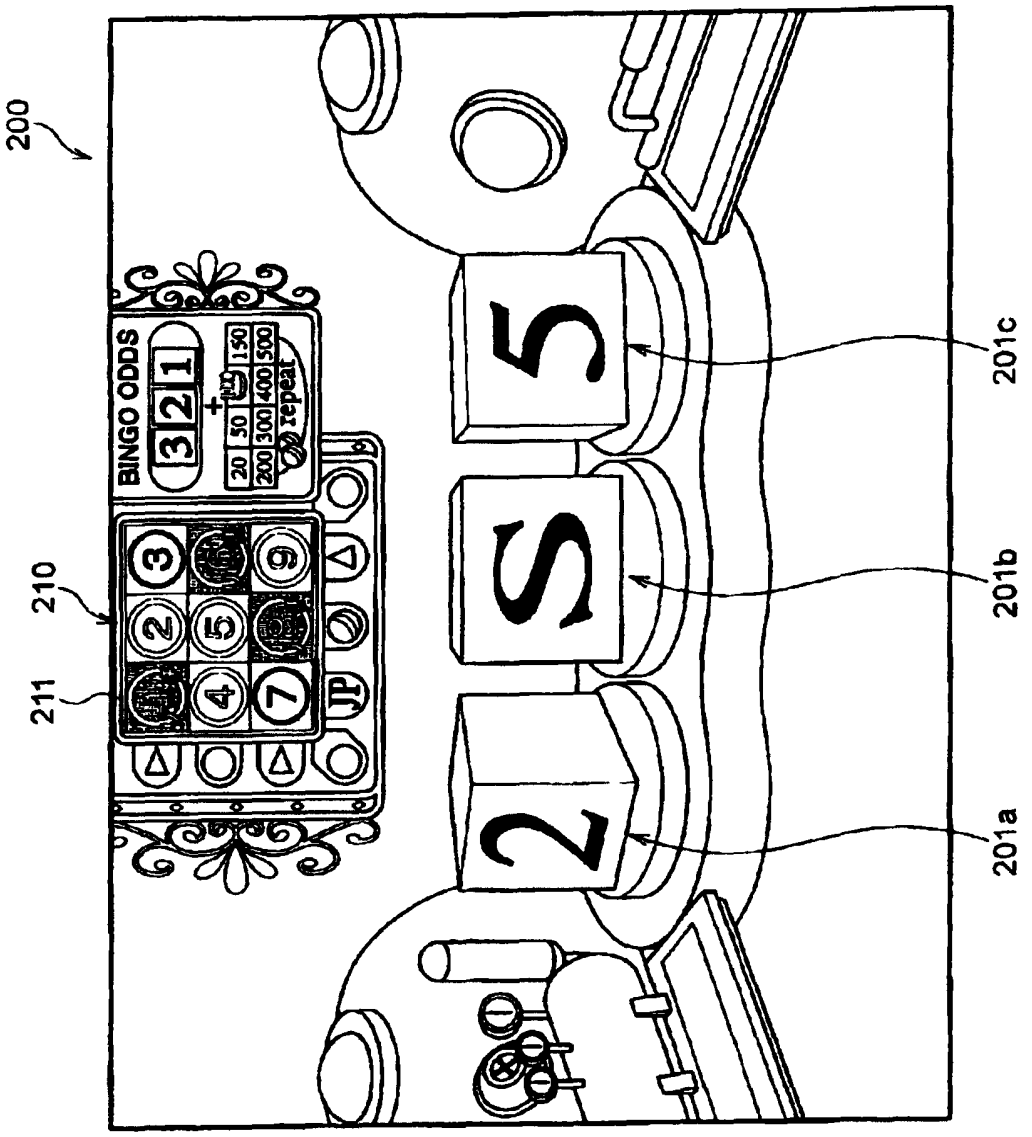

200
210
211
BINGO ODDS
3 2 1
20 50 150
200 300 400 500
repeat
JP
2
5
5
201a
201b
201c

FIG. 10

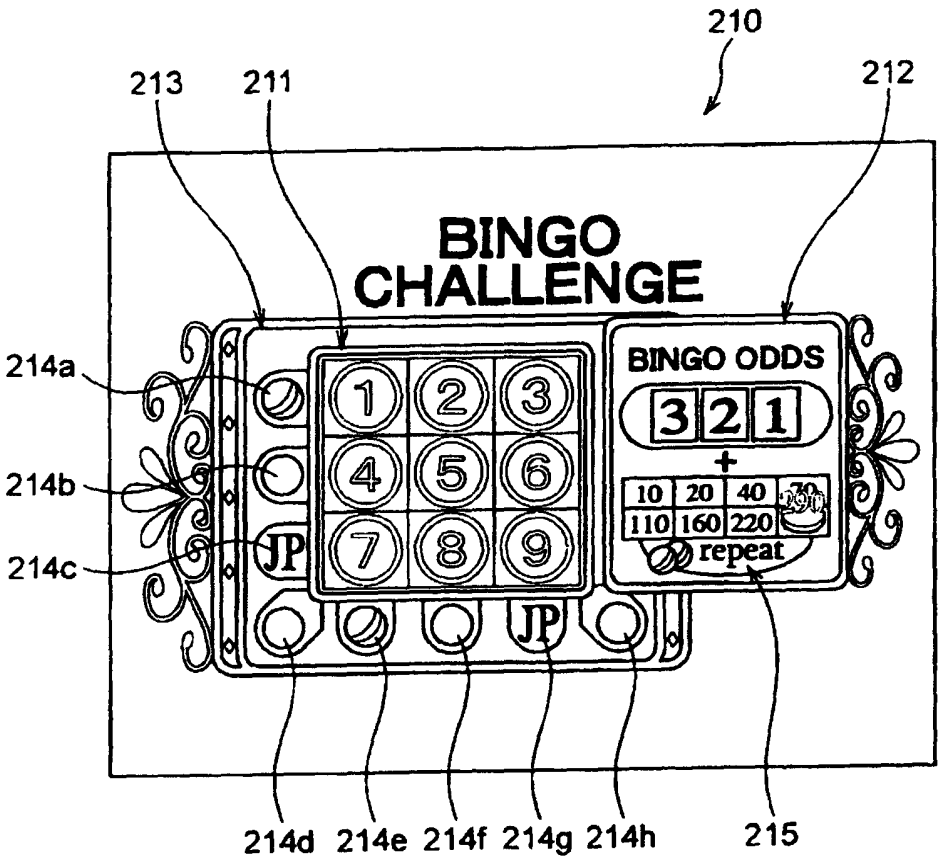

210
213
211
212
BINGO
CHALLENGE
BINGO ODDS
3 2 1
+
10 20 40 70
110 160 220
repeat
1 2 3
4 5 6
JP 7 8 9
JP
214a
214b
214c
214d 214e 214f 214g 214h
215

FIG. 11

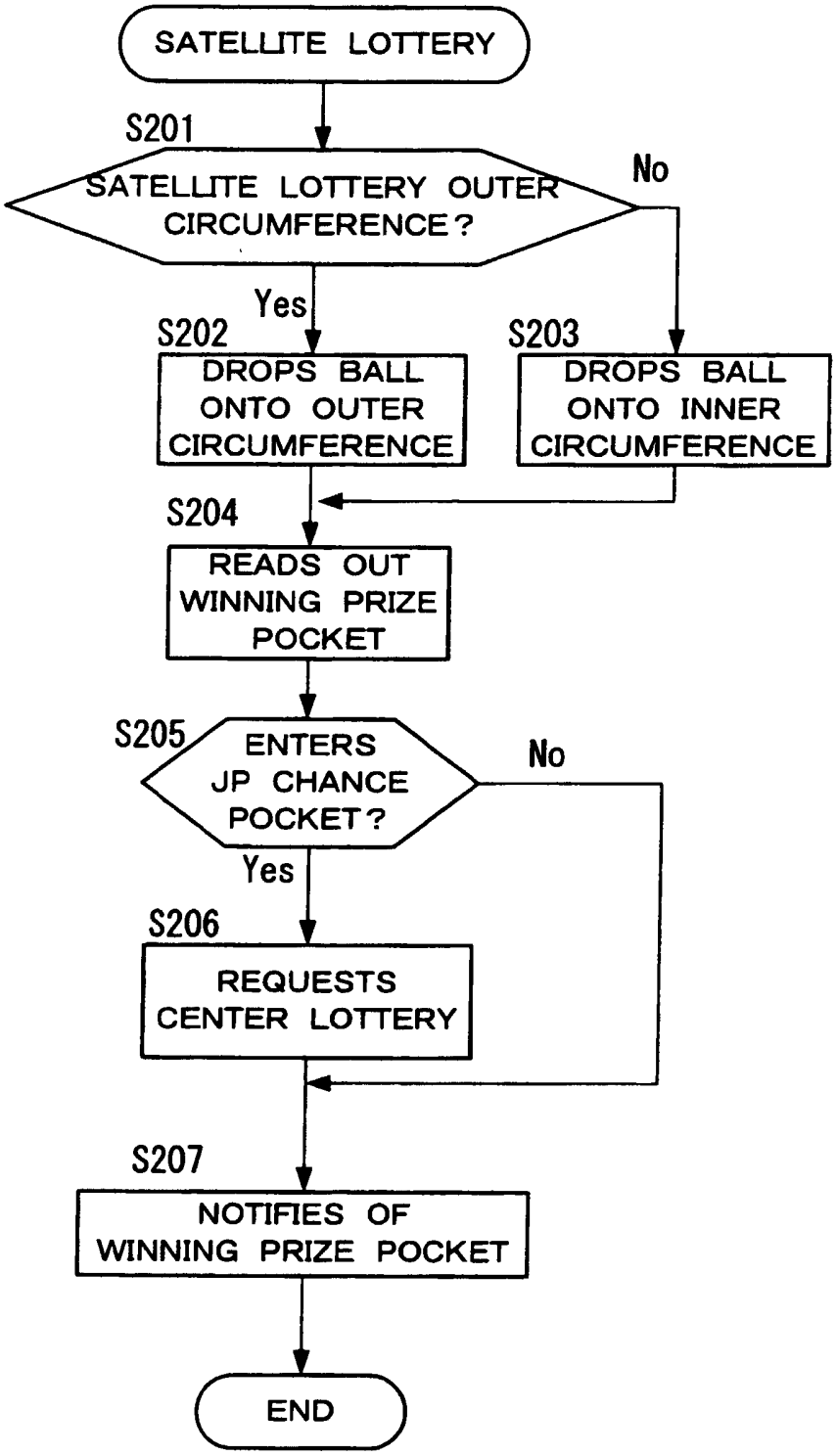

SATELLITE LOTTERY
S201
SATELLITE LOTTERY OUTER CIRCUMFERENCE?
No
Yes
S202
DROPS BALL ONTO OUTER CIRCUMFERENCE
S203
DROPS BALL ONTO INNER CIRCUMFERENCE
S204
READS OUT WINNING PRIZE POCKET
S205
ENTERS JP CHANCE POCKET?
No
Yes
S206
REQUESTS CENTER LOTTERY
S207
NOTIFIES OF WINNING PRIZE POCKET
END

FIG. 12

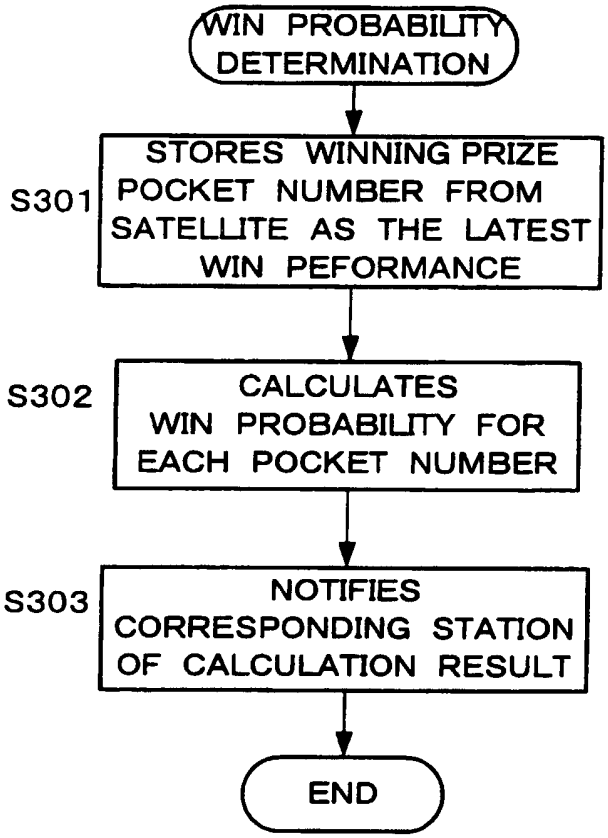


FIG. 13

POCKET NUMBER 1	THE NUMBER OF WINS N1
POKCET NUMBER 2	THE NUMBER OF WINS N2
POCKET NUMBER 3	THE NUMBER OF WINS N3
POCKET NUMBER 4	THE NUMBER OF WINS N4
POCKET NUMBER 5	THE NUMBER OF WINS N5
POCKET NUMBER 6	THE NUMBER OF WINS N6
POCKET NUMBER 7	THE NUMBER OF WINS N7
POCKET NUMBER 8	THE NUMBER OF WINS N8
POCKET NUMBER 9	THE NUMBER OF WINS N9
POCKET NUMBER JP	THE NUMBER OF WINS Njp

FIG. 14

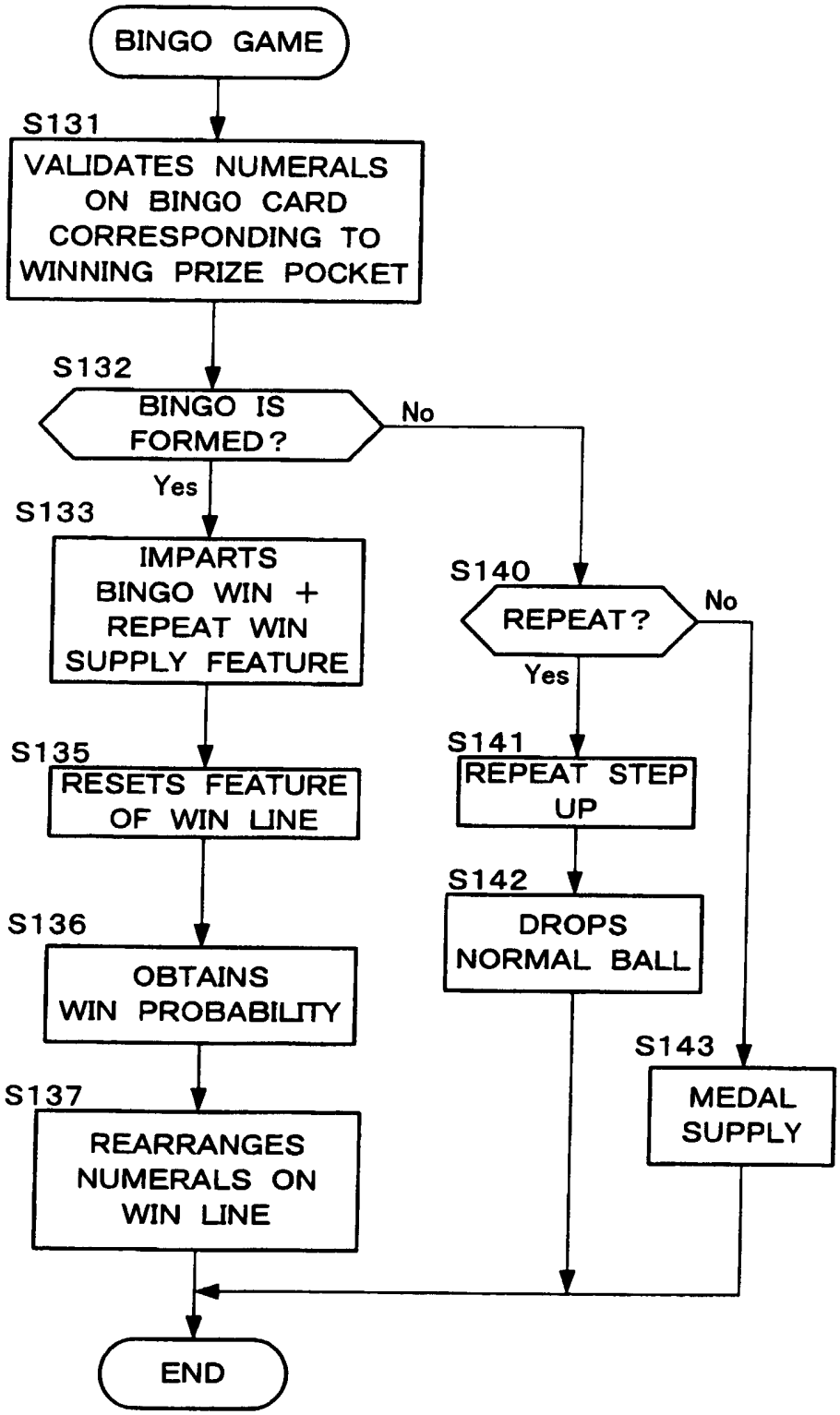

BINGO GAME
S131
VALIDATES NUMERALS ON BINGO CARD CORRESPONDING TO WINNING PRIZE POCKET
S132
BINGO IS FORMED?
No
Yes
S133
IMPARTS BINGO WIN + REPEAT WIN SUPPLY FEATURE
S135
RESETS FEATURE OF WIN LINE
S136
OBTAINS WIN PROBABILITY
S137
REARRANGES NUMERALS ON WIN LINE
S140
REPEAT?
No
Yes
S141
REPEAT STEP UP
S142
DROPS NORMAL BALL
S143
MEDAL SUPPLY
END

FIG. 15

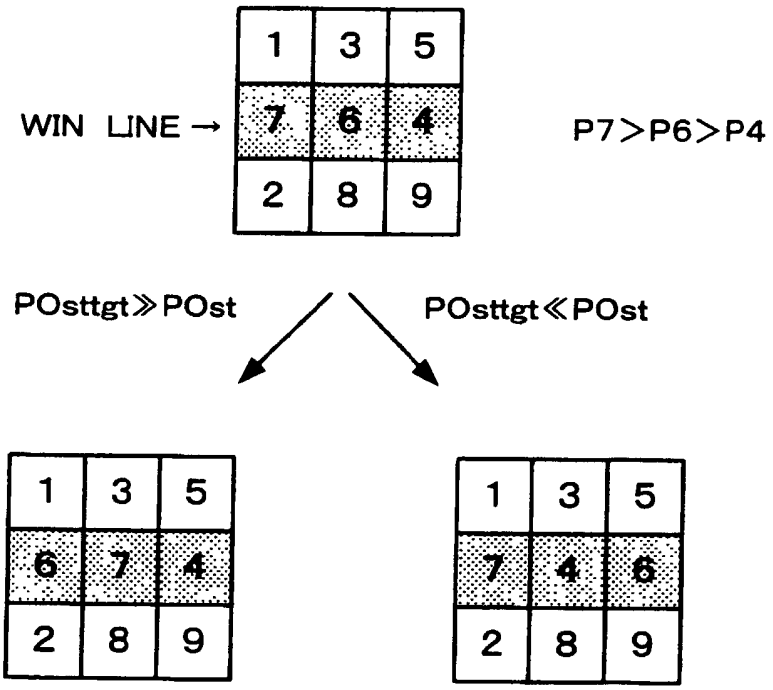

WIN LINE →
1
3
5
7
6
4
2
8
9
P7>P6>P4
POsttgt≫POst
POsttgt≪POst
1
3
5
6
7
4
2
8
9
1
3
5
7
4
6
2
8
9

FIG. 16

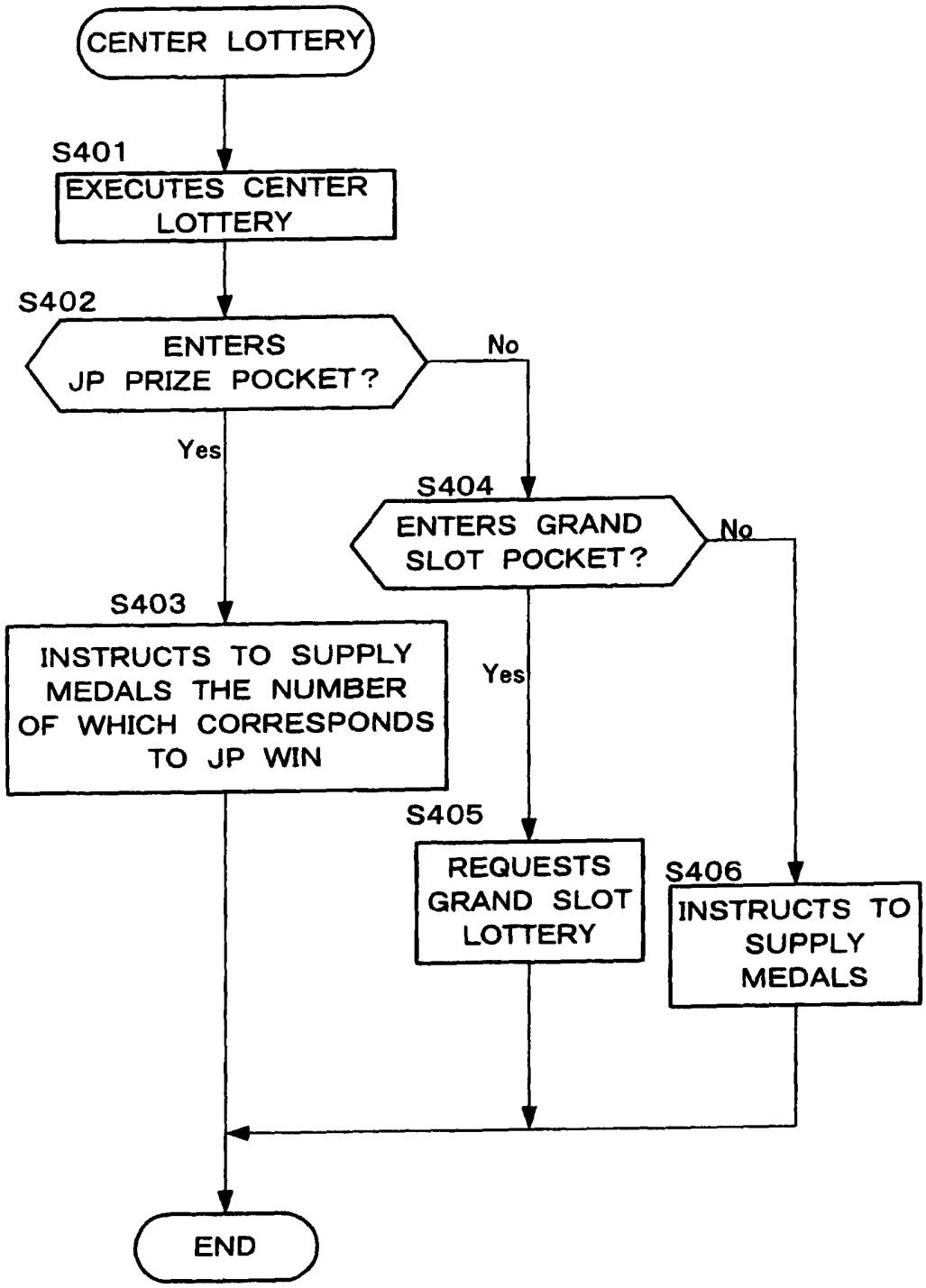

CENTER LOTTERY
S401
EXECUTES CENTER LOTTERY
S402
ENTERS JP PRIZE POCKET?
No
Yes
S404
ENTERS GRAND SLOT POCKET?
No
S403
INSTRUCTS TO SUPPLY MEDALS THE NUMBER OF WHICH CORRESPONDS TO JP WIN
Yes
S405
REQUESTS GRAND SLOT LOTTERY
S406
INSTRUCTS TO SUPPLY MEDALS
END

FIG. 17

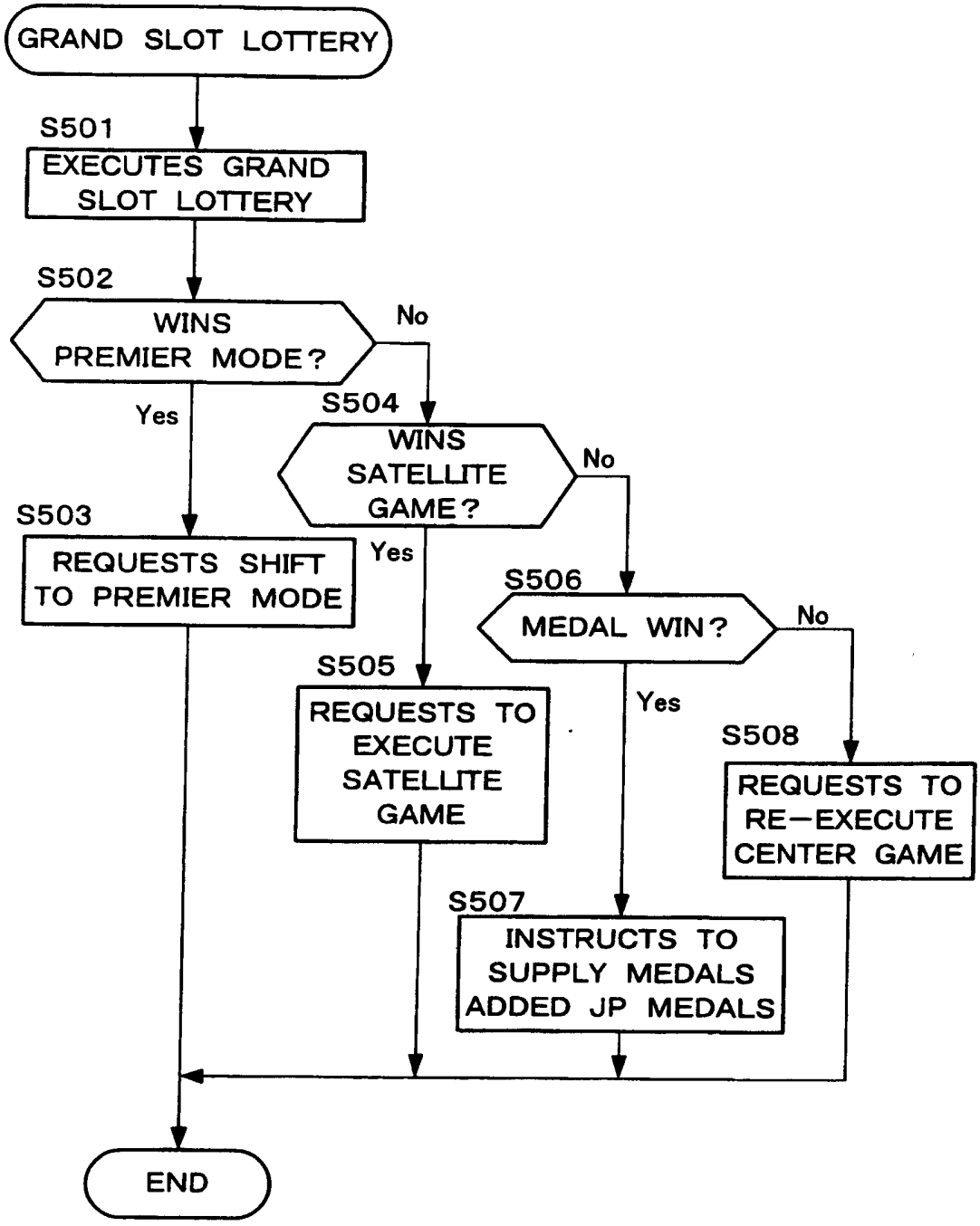

GRAND SLOT LOTTERY
S501
EXECUTES GRAND SLOT LOTTERY
S502
WINS PREMIER MODE?
No
Yes
S504
WINS SATELLITE GAME?
No
S503
REQUESTS SHIFT TO PREMIER MODE
Yes
S506
MEDAL WIN?
No
S505
REQUESTS TO EXECUTE SATELLITE GAME
Yes
S508
REQUESTS TO RE-EXECUTE CENTER GAME
S507
INSTRUCTS TO SUPPLY MEDALS ADDED JP MEDALS
END

FIG. 18

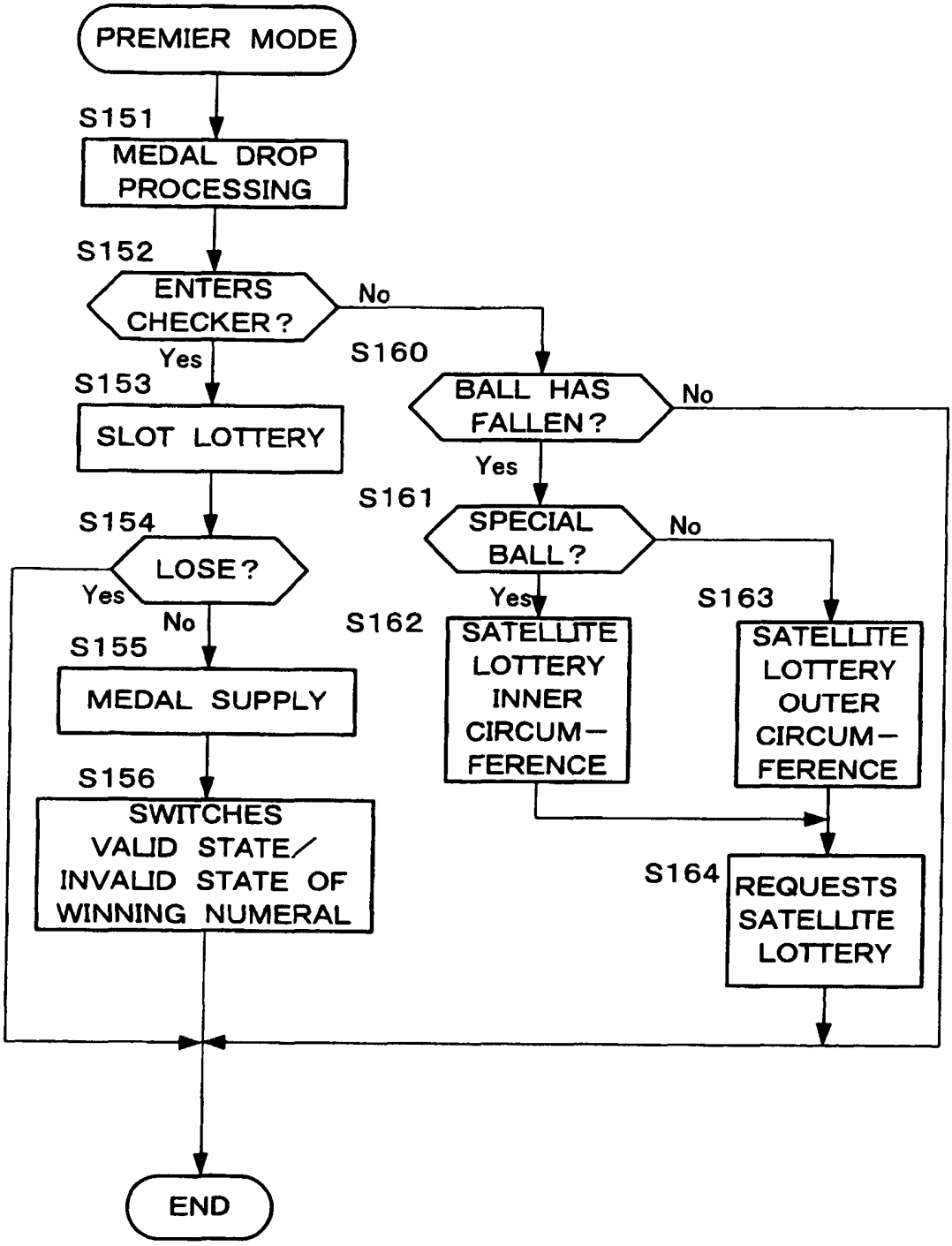

PREMIER MODE
S151
MEDAL DROP PROCESSING
S152
ENTERS CHECKER?
No
Yes
S153
SLOT LOTTERY
S154
LOSE?
Yes
No
S155
MEDAL SUPPLY
S156
SWITCHES VALID STATE/ INVALID STATE OF WINNING NUMERAL
S160
BALL HAS FALLEN?
No
Yes
S161
SPECIAL BALL?
No
Yes
S162
SATELLITE LOTTERY INNER CIRCUM-FERENCE
S163
SATELLITE LOTTERY OUTER CIRCUM-FERENCE
S164
REQUESTS SATELLITE LOTTERY
END

FIG. 19

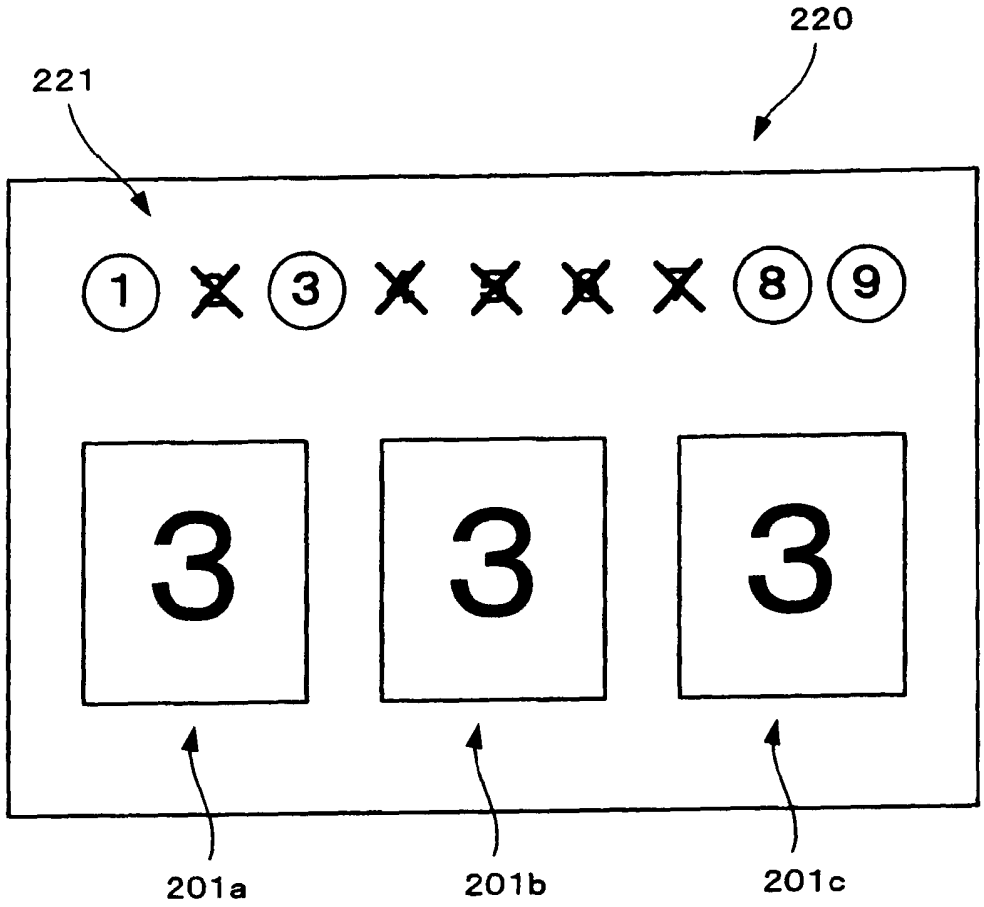


FIG. 20

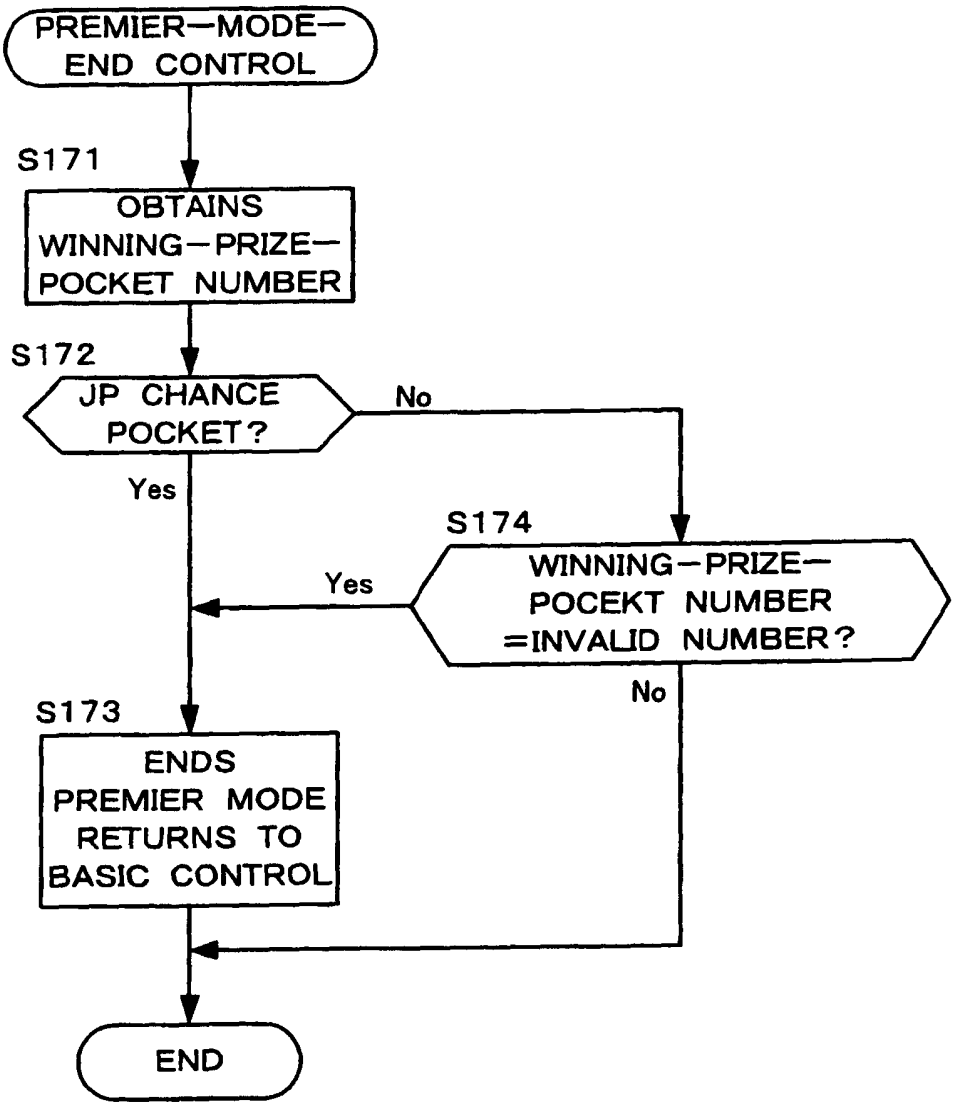

PREMIER—MODE—
END CONTROL
S171
OBTAINS
WINNING—PRIZE—
POCKET NUMBER
S172
JP CHANCE
POCKET?
No
Yes
S174
WINNING—PRIZE—
POCEKT NUMBER
=INVALID NUMBER?
Yes
No
S173
ENDS
PREMIER MODE
RETURNS TO
BASIC CONTROL
END

FIG. 21

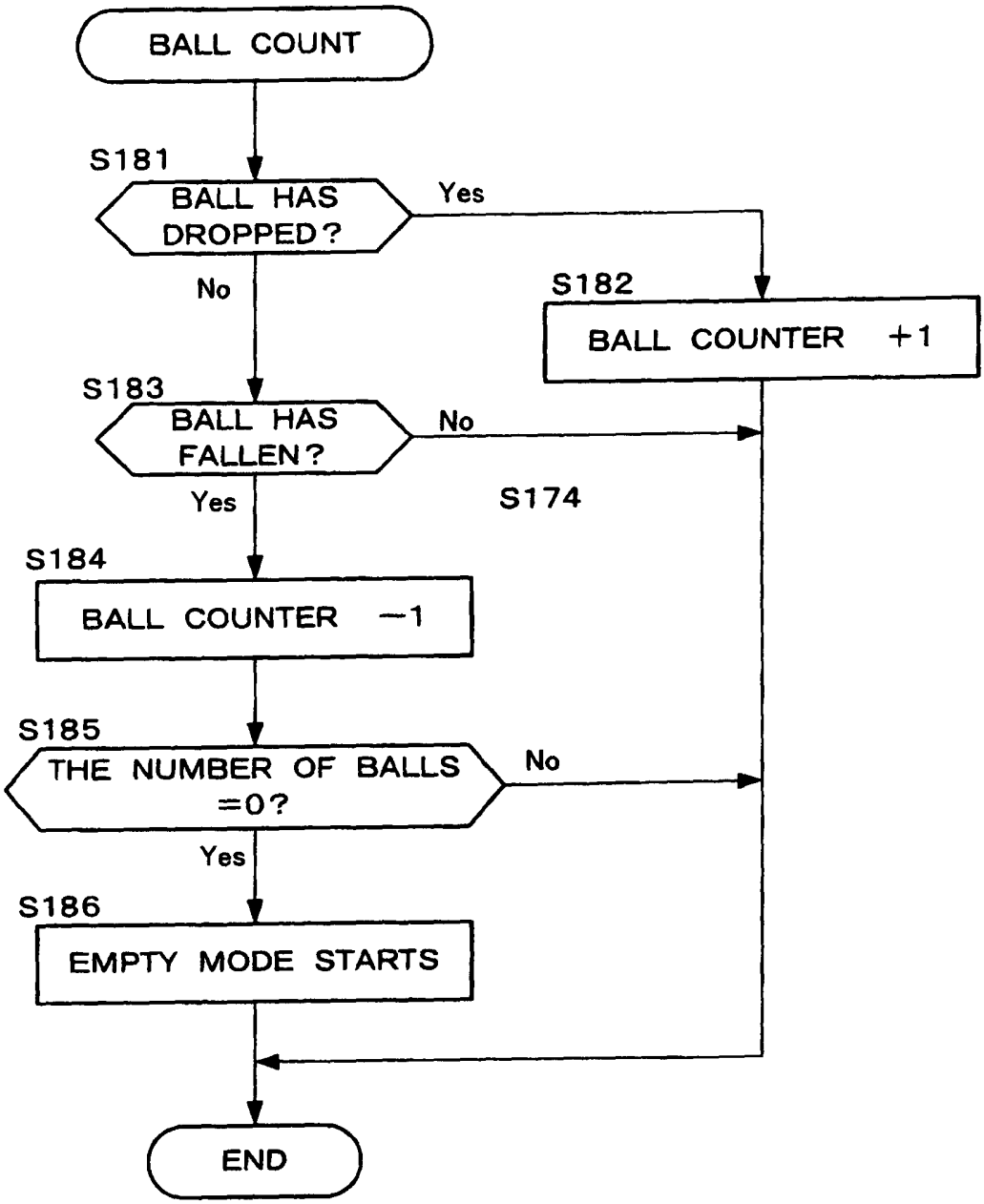
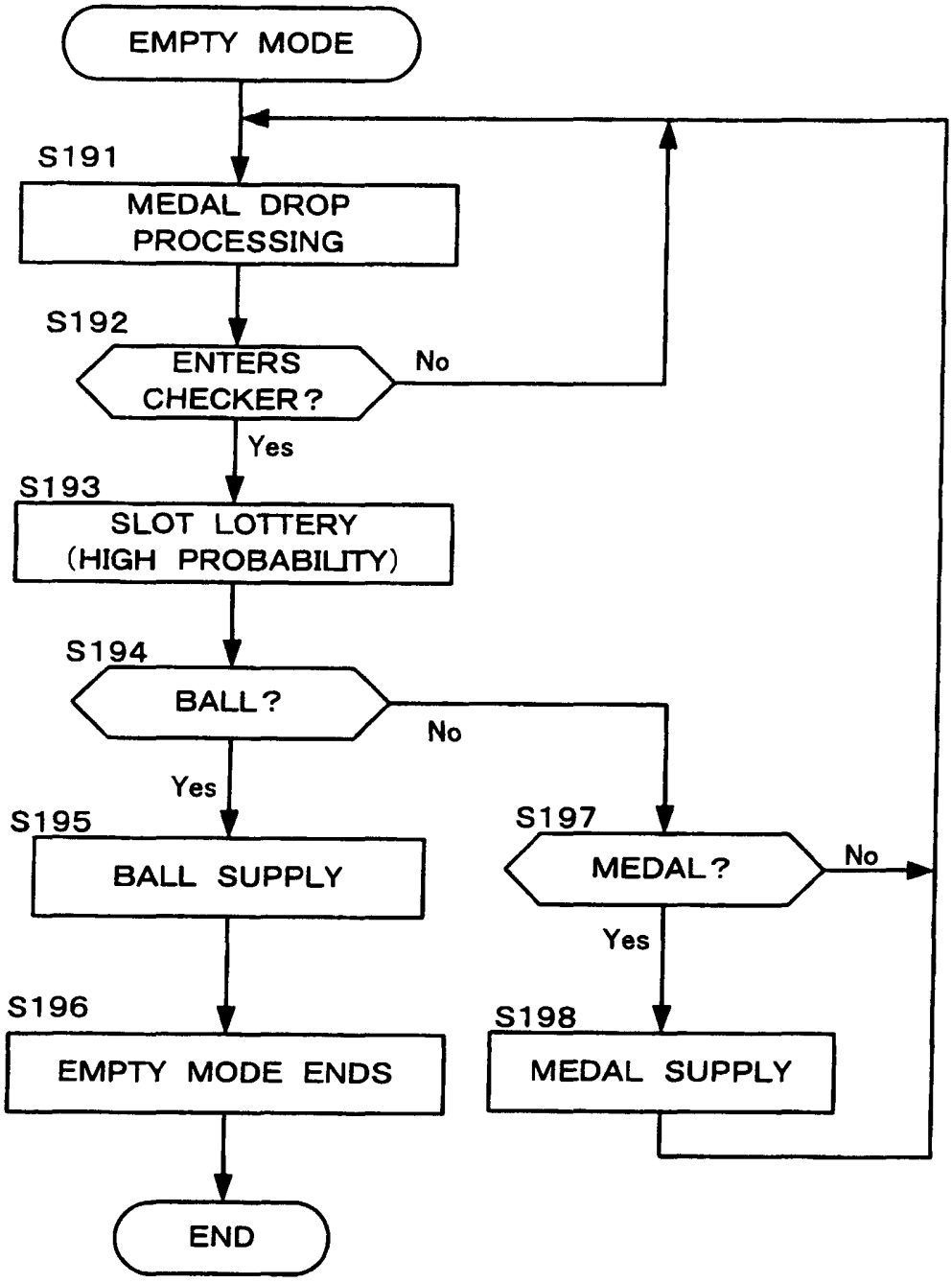

BALL COUNT
S181
BALL HAS DROPPED?
Yes
No
S182
BALL COUNTER +1
S183
BALL HAS FALLEN?
No
Yes
S174
S184
BALL COUNTER −1
S185
THE NUMBER OF BALLS =0?
No
Yes
S186
EMPTY MODE STARTS
END

FIG. 22


EMPTY MODE
S191
MEDAL DROP PROCESSING
S192
ENTERS CHECKER?
No
Yes
S193
SLOT LOTTERY (HIGH PROBABILITY)
S194
BALL?
No
Yes
S195
BALL SUPPLY
S197
MEDAL?
No
Yes
S196
EMPTY MODE ENDS
S198
MEDAL SUPPLY
END

DESCRIPTION

GAME MACHINE

TECHNICAL FIELD

[0001]

The present invention relates to supply first game media and second game media to a play field section.

BACKGROUND ART

[0002]

As one type of game machines where game medium is used, there is well-known a so-called medal pusher game machine to allow a medal thrown into by a player to drop down to a play field section, by pushing out by a pusher table the medal having dropped down, arrangement of a clump of medals is changed, and because of the change, the medal which has fallen down from a predetermined range of the play field section is delivered to the player. Moreover, as this type of pusher game, there is also provided a game machine where a second game medium (a ball for example) which is different from the medal as the first game media is supplied to the play field section in addition to the medal, the second game medium is allowed to move with the medal, a lottery processing is executed subject to the second game medium which has fallen down from the play field section, and a dividend depending on the lottery is delivered to the player. According to the game machine like this, the second game medium is supplied to the play field section in addition to the first game media, and the second game medium is pushed out linked with the first game medium and ejected from the play field section. Thereby a chance for obtaining the dividend is imparted to the player. The motion of game medium such as the medal or the like is subject to physical law. Therefore, if it is set to impart the chance for obtaining dividend depending on the motion of the game medium, while it is possible to remove an impression of adding an intentional operation by the game machine, it is

possible to make the player expect more dividend in comparison with a game machine where one kind of game medium is used.

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0003]

In the above mentioned game machine, as more number of pieces of the second game medium existing in the play field section, the expectation of the player about obtaining the dividend gets higher. Accordingly, when the number of the second game media existing in the play field section decreases, the player recognizes that the situation is not good for obtaining the dividend, which can make the player lose his/her motive for sustaining the game. Especially, when the second game medium does not exist in the play field section, the inclination is enhanced. If such situation occurs at a game machine for commercial use, which will bring inexpedience such as a decrease of operation rate or a decrease of profit.

[0004]

Therefore, the present invention aims to provide a game machine which supplies not only the first game medium but also the second game medium in the play field section, is capable of imparting a motive for sustaining a game to a player even if the number of the second game media existing in the play field section decreases.

MEANS FOR SOLVING THE PROBLEMS

[0005]

The present invention solves the above problems by the following configuration. A game machine comprises: a first game-medium supply device for supplying a first game medium to a play field section based on an operation by a player; a basic-game execution device for executing a basic game in association with an operation of the first game medium dropped to the play field section, and imparting to the player a dividend depending on a game result of the basic game; a second

game-medium supply device for supplying to the play field section a second game medium different in kind from the first game medium, in a case that a predetermined situation occurs in the basic game; and a dividend chance imparting device for imparting a chance of obtaining dividend to the player, in a case that the second game medium is ejected from the play field section by an operation of the second game medium linked with the operation of the first game medium, wherein the game machine further comprises: a medium number-of-pieces detection device for detecting the number of the second game media existing in the game field; and a privilege imparting device for imparting privilege to be tied with a delivery of the dividend to the player, in a case that the number of the second game media detected by the medium number-of-pieces detection device decreases to less than a predetermined number.

[0006]

According to the game machine of the present invention, in the case when the number of the second game media existing in the play field section decreases to less than a predetermined number, in response to this, the privilege tied to the delivery of dividend to the player is imparted by the privilege imparting device. Consequently, even if the number of the second game media decreases, it is possible to make the player feel an expectation for obtaining the dividend through the privilege newly imparted. Thereby, it is possible to impart to the player the motive for sustaining the game, and expect to improve of the operation rate and the profit performance and the like of the game machine.

[0007]

In addition, in the game machine of the game machine, a game where a play chance is ensured to the player based on the drop of the first game medium can be employed to the basic game. The range of the basic game may be set in a coordinated fashion. With respect to the imparting of dividend in the basic game, it can be employed that either the first game medium itself may be imparted to the player, or some game value exchangeable with

the first game medium may be imparted to the player. In the case that the first game medium is delivered, it can be employed that either the first game medium may be delivered directly to the player, or indirectly to the player such that the first game medium is delivered to the play field section and the like. The second game medium can be utilized as a medium for executing various processing such as a lottery and the others to be executed for delivering the dividend. Additionally, the second game medium itself can be delivered as the dividend to the player. The privilege imparted by the privilege imparting device can be any privilege as long as the privilege is tide to the delivery of dividend. For example, a lottery chance for determining dividend can be imparted to the player and the like, it is possible to impart as the privilege, a chance for delivering the dividend when an additional condition is satisfied in addition to the decrease of the second game media. Alternatively, it is possible to impart the delivery of the dividend itself as the privilege. Further, it is possible for the the game machine of the present invention to include the following configurations.

[0008]

In one configuration of the game machine according to the present invention, the privilege imparting device may impart the privilege by executing processing for increasing a probability that the predetermined situation is formed in the basic game. According to this configuration, it is possible to increase the probability that a predetermined situation is formed in the based game to supply the second game medium to the play field section. Therefore, in the case that the number of the second game media decreases, it is possible to expect to reduce a necessary time up to supply the next second medium. Thereby, it is possible to impart the motive for sustaining the game to the player.

[0009]

In one configuration of the game machine according to the present invention, the basic-game execution device may execute,

as a game included in the basic game, a lottery game where a lottery processing in which the basic-game execution device executes a lottery processing to allow a winning case to occur in a case that the first game medium pass through a predetermined position in the play field section, while controlling win probability in accordance with a predetermined control law, and may deliver the dividend directly and indirectly to the player in a case that the winning case is formed, and the privilege imparting device may impart the privilege by executing at least either a processing for increasing a probability to form the winning case in the lottery game, or a processing for increasing amount of the delivery at the moment of forming the winning case. According to this configuration, when the number of the second game media decreases, the probability that the winning case is formed in the lottery game executed as one of the basic game increases, or the amount of delivery when the winning case is formed increases. Consequently, even if the number of the second game media decreases, it is possible to make the player feel an expectation for obtaining more dividend than usual through the lottery game. Thereby, it is possible to impart the motive for sustaining the game to the player.

[0010]

In one configuration of the game machine according to the present invention, the first game medium may be a medal, the basic-game execution device may execute, as games included in the basic game, a pusher game in which the basic-game execution device, while pushing out a cluster of medals accumulated in the play field section by a pusher table with a back-and-forth motion in the play field section, delivers to the player as the dividend the medal ejected from a predetermined range of the play field section, and a lottery game in which the basic-game execution device executes a lottery processing to allow a winning case to occur in a case that the medal passes through a predetermined position in the play field section, while controlling win probability in accordance with a predetermined control law, and may deliver to the player the medal as the

dividend directly and indirectly in a case that the winning case is formed, the second game-medium supply system may supply the second game medium, recognizing that the predetermined situation has occurred in the basic game in a case that a predetermined winning case of game-medium delivery is formed in the lottery game, and the privilege imparting device may deliver the privilege by executing at least either a processing for increasing a probability to form a winning case of the game-medium delivery in the lottery game, a processing for increasing a probability to form the winning case in the lottery game, or a processing for increasing number of medals as the dividend at a moment of winning the winning case.

[0011]

According to this configuration, when the medal is ejected from the predetermined range of the play field section in the pusher game, the lottery game is executed, and the winning case is formed in the lottery game, the medal is delivered as the dividend. Additionally, when the winning case of game-medium delivery is formed in the lottery game, the second game medium is supplied to the play field section. By ejecting the second game medium from the play field section, a chance for obtaining dividend is imparted to the player. Then, when the number of the second game media existing in the play field section decreases, the probability to form the winning case of game-medium delivery increases, the probability to form the winning case increases, or the dividend number of the medals to be delivered in response to formation of the winning case increases. Consequently, even if the number of the second game media in the play field section decreases, it is possible to make the player feel the expectation for obtaining more dividend. Thereby, it is possible to impart the motive for sustaining the game to the player.

[0012]

In one configuration of the game machine of the present invention, the privilege imparting device, in a case that a situation is detected that the second game medium does not exist

in the play field section, may impart the privilege. According to this configuration, even if the situation occurs that no second game medium exists in the play field section, by imparting the privilege, it is possible to make the player feel the expectation for obtaining the dividend and possible to impart the motive for sustaining the game.

[0013]

In one configuration of the game machine of the present invention, the dividend chance imparting device may have a physical lottery system which takes the second game medium ejected from the play field section thereinto and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and may control the delivery of dividend to the player in association with a lottery result by the physical lottery system. In the game machine of this configuration, the second game medium is settled as a medium for a lottery by the physical lottery system, and the delivery of dividend to the player is controlled in association with the result of the physical lottery. As the lottery result of the physical lottery system depends on the physical operation of the medium, it is difficult to interpose the artifact by the game machine with respect to the lottery result. Therefore, the physical lottery system has a merit that it is easy to increase the expectation of the player for obtaining the dividend. On the contrary, when the number of the second game media existing in the play field section decreases, as the chance of lottery by the physical lottery system also decreases, the merit of the physical lottery system can not be performed satisfyingly, and thereby, it could occur that the motive of the player for sustaining the game is reduced. However, if it is configured to impart the privilege for the decrease of the number of the second game media, it is possible to impart the motive for sustaining of the game to the player until the moment when the number of the second game media increases.

EFFECT OF THE INVENTION

[0014]

AS mentioned above, according to the game machine of the present invention, by imparting a privilege tided to payment of dividend to a player when the number of the second game media decreases to over a predetermined number, it is possible to impart the expectation to obtain the dividend to the player, and thereby, it is possible to impart the motive for sustaining a game to the player and expect to improve the operation rate, and the profit performance and the like of the game machine.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

[FIG.1]A diagram showing an schematic configuration of a game machine according to one embodiment of the present invention.

[FIG.2]A perspective view showing a satellite unit and a station unit combined therewith.

[FIG.3]A diagram showing a flow of a medal in the station unit.

[FIG.4]A diagram showing a flow of a ball in the station unit.

[FIG.5]A perspective view showing a center unit.

[FIG.6]A block diagram showing an schematic configuration of a control system of the game machine.

[FIG.7] A flow chart showing processing to be executed by a host control unit and a station control unit to manage payout rates.

[FIG.8]A flow chart showing a game basic-control routine to be executed by the station control unit in response to a drop of medal.

[FIG.9]A diagram showing a game image displayed on a monitor of the station unit.

[FIG.10]A diagram showing details of a bingo game section provided in the game image shown in FIG.9.

[FIG.11]A flow chart showing a satellite lottery routine to be executed by the satellite control unit.

[FIG.12]A flow chart showing a win-probability determination routine to be executed by the host control unit.

[FIG.13]A diagram showing data of the number of wins held by

the host control unit.

[FIG.14]A flow chart showing a bingo game routine to be executed by the station control unit in response to a notification of a result of a satellite lottery.

[FIG.15]A diagram for explaining a way of rearrangement of numerals on a win line in the bingo game.

[FIG.16]A flow chart showing a center lottery routine to be executed by a center control unit.

[FIG.17]A flow chart showing a grand slot lottery routine to be executed by the host control unit.

[FIG.18]A flow chart showing a premier mode routine to be executed by the station control unit instead of the game basic-control routine.

[FIG.19]A diagram showing a schematic game image to be displayed on the monitor of the station at the moment of a premier mode.

[FIG.20]A flow chart showing a premier-mode-end control routine to be executed by the station control unit to determine the end of the premier mode.

[FIG.21]A flow chart showing a ball-count processing routine to be executed by the station control unit.

[FIG.22]A flow chart showing a empty mode routine to be executed by the station control unit.

BEST MODE FOR CARRYING OUT THE INVENTION

[0016]

Using FIGs.1 to 5, the outline of construction of game machine G of the present invention will be described. FIG.1 is an overhead view of the game machine G showing one embodiment of the present invention. The game machine G has one center unit CN, four satellite units SA, and six teen station units ST. Each satellite unit SA is placed such that the satellite units SA surround the center unit CN below the center unit CN, and each satellite unit SA is surrounded by four station units ST. Than is, the game machine G is configured such that the center unit CN is placed as the center, four satellite units SA are placed around the center unit CN, and further four station

units ST are placed around each of the satellite units. At the station unit ST, each of a so-called pusher game where a medal is used as a game medium and a digital lottery game associated with the pusher game is implemented as a basic game. At the satellite unit SA, a satellite lottery is performed in association with a game result of the digital lottery game at the station unit SA. At the center unit CN, a center lottery or a grand slot lottery is performed as a center game, in association with a game result of the digital lottery game at the station unit ST, or a lottery result of the satellite lottery at the satellite unit SA.

[0017]

FIG.2 shows one satellite unit SA and one station unit ST being combined therewith. The station unit ST has a left-right pair of operation sections 10 for the player's operation relating to the game, a play field section 12 where the medal pusher game is performed, a medal supply section 13 for supplying a medal M as the first game medium to the play field section 12, a ball drop section 14 for dropping a ball B as the second play medium to the play field section 12, a ball transfer section 15 for carrying the ball B to the satellite unit SA, and a station monitor 16 for displaying a game image and so on. The play field section 12 has a main table 20 and a sub table 21 which accumulate the medals M, and further has a pusher tables 22, 23 which slide forward and backward on the tables 20, 21 respectively. The medals M are accumulated such that the medals M are bed on the main table 20 and the sub table 21. The play field section 12 is shielded against the outside because of being surrounded by a partition wall such as a transparent board.

[0018]

In reference to FIG.3, the outline of a flow of the medal M in the station unit ST will be described. When a player drops the medal M from a medal drop slot (not shown) mounted in the operation section 10, the medal M falls down on either one of the medal hoppers 13a of the medal supply section 13 via a medal

shoot 17. In advance of the drop of medal by the player, the medals M have been delivered in each of medal ejection sections 18, which are placed on the right side and the left side of the station unit ST, and the medals M are held in each of the medal ejection sections 18 for a drop to the play field section 12. The medal M held in the medal ejection section 18 is transferred to a medal shooter 19 at the timing in synchronism with the drop of medal M by the player, and from the medal shooter 19 dropped onto the sub table 21. In addition, the direction of shooter 19 is changeable in the right-left direction by operating levers 10a mounted to the right side and the left side of operation sections 10.

[0019]

The medal M dropped to the play field section 12 falls down on the sub table 21, and is accumulated there or rolls down from the sub table 21 to the main table 20. Because of pushing out the cluster of medals accumulated on the sub table 21 forwardly (the side where the player exists. Hereinafter, same meaning) by the back-and-forth motion of the pusher table 23, the medal M is pushed out from the front edge of the sub table 21, the medal M which ahs pushed out slides down in an incline section 24 to move to the main table 20, and are accumulated there. Because of pushing out the cluster of medals M accumulated on the main table 21 by the back-and-forth motion of the pusher table 22, the medal M falls down around the main table 20. The medal M which has fallen down is retrieved to a lift-up hopper 25 shown in FIG.2. Then, the same number of pieces of medals M as the medals having fallen down from the front edge of the main table 20 are delivered from the lift-up hopper 25 as the medals obtained by the player to a medal delivery section 11 mounted between the operation sections 10. As the medal delivery section 11 is placed at the outside of the partition wall covering the play field section 12, it is possible for the player to accept the medals M delivered to the medal delivery section 11.

[0020]

Returning to FIG.2, in the incline section 24, plural opening sections 24a, 24b, 24c are mounted as a checker through which the medal M passes (fall). When the medal M falls through any one of the opening section 24a, 24b, 24c while sliding down in the incline section 24, the passing through of the medal M is detected by a sensor, which is not shown. By using the detection signal as a trigger, the digital lottery game is started on the station monitor 16. The digital lottery game is one type of a slot game where three patterns are displayed on the station monitor 16 in a state that the patterns are aligned in a horizontal direction, and it is competed for whether the combination of the three patterns (pictures, symbols, numerals and so on) forms a predetermined winning case. A "BALL" is prepared as one of the winning cases of the digital lottery game. For example, in the case that three pictures of ball are displayed, the winning case "BALL" is formed. In the case that this winning case is formed, the ball B is dropped onto the main table 20 from the ball drop section 14. This supply of the ball B to the ball drop section 14 will be described. In this embodiment, different two kinds of balls, that is, a normal ball B1 and a special ball B2 are prepared as the ball B. However, when it is not necessary to discriminate each of them, each is referred to as the ball B.

[0021]

The ball B dropped onto the main table 20 are pushed out gradually toward the front of the main table 20 together with the medals M, due to the back-and-forth motion of the pusher table 22. When the ball B falls down from the front edge of the main table 20, the ball B which has fallen down is transferred to the satellite unit SA by the ball transfer section 15. FIG. 4 shows a transfer route of ball B by the ball transfer section 15. The ball B which has fallen down from the main table 20 is taken into a ball lifter 27 via a ball duct 26. The ball lifter 27 sends up the taken ball B along a slope 28 to transfer the ball B to the end (the top) of the slope 28. At the satellite unit SA, the satellite lottery is performed by utilizing the

ball B which has been transferred to the end of slope 28.
[0022]

As shown in FIG.2, the satellite unit SA comprises a bingo stage 30, a ball carrier 40 mounted at the outer circumference of the bingo stage 30, a pair of ball supply systems 50A, 50B placed around the bingo stage 30, and a pair of ball drop systems 60A, 60B placed across the bingo stage 30 from the ball supply systems 50A, 50B. The bingo stage 30 is driven to rotate around an axis of vertical direction in a predetermined direction by a driving system which is not shown. The upper surface of the bingo stage 30 is divided into an outer circumference section 32A and an inner circumference section 32B by a fence 31 in the shape of ring. In the sections 32A, 32B, winning prize pockets 32a, 33a in the shape of round each of which has a diameter allowing the ball B to pass through are mounted, such that each of the winning prize pockets 32a, 33a penetrates the bingo stage 30. To the outer circumference section 32A, ten winning prize pockets 32a are provided, and to the inner circumference section 32B, five winning prize pockets 33a are provided. To each of the winning prize pockets 32a, 33a, a number or a picture to be a choice in the satellite lottery is assigned. To each of the winning prize pockets 32a in the outer circumference section 32A, any one of numbers from one to nine and a word "JP chance" is alternatively assigned. In this embodiment, "JP" is used as an abbreviation of a word indicating "jack pot", that is, a big win. On the other hand, to each of three winning prize pockets 33a in the inner circumference section 32B, three numbers which are properly combined from the numbers of one to nine are assigned, and to each of remaining two winning prize pockets 33a, the word "JP chance" is assigned.
[0023]

The ball carrier 40 is capable of moving along the outer circumference of the bingo stage 30. The ball carrier 40 transfers the ball B from the ball supply system 50A, 50B to the ball drop section 14 in each station unit ST, and transfers the ball B from the ball transfer section 15 in each station

unit ST to the ball drop system 60A, 60B. The ball B, which has passed trough any one of the winning prize pockets 32a, 33a of the bingo stage 30 is guided selectively depending on the kind thereof to the below portion of ball supply system 50A, 50B. For example, the normal ball B1 is guided to the ball supply system 50A, and the special ball B2 is guided to the ball supply system 50B. The ball supply system 50A, 50B takes the guided balls B into a screw feeder 51 to transfer the balls B upward, and delivers the balls B reaches the top end of the screw feeder 51 one by one from an ejection section 52. Linking with the delivery of the ball B from the ejection section 52, the ball carrier 40 moves just below the ejection section 52. Thereby, the ball B ejected from the ball ejection section 52 is passed to a fork 41 of the ball carrier 40. The ball carrier 40 which has accepted the ball B from the ball supply system 50A, 50B moves along the outer circumference of the bingo stage 30 up to the ball drop system 14 of the station unit ST to which the ball B should be transferred. After that, as the fork 41 is inclined outward, the ball B is delivered to the top end of a slope 14a of the ball drop section 14. The delivered ball B slides along the slope 14a, and is dropped onto an arbitrary position in the main table 20 via a drop-position selection system 14b.

[0024]

On the other hand, in the case that the ball B is transferred to the ball transfer section 15 of the station unit ST, the ball carrier 40 moves to the inner side of the slope 28 of the ball transfer section 15 where the ball B has been transferred to accept the ball B from the slope 28. After that, the ball carrier 40 transfers the ball B to the position of the ball drop system 60A or 60B. It is associated with the kind of ball B that the ball B should be transferred to which one of the ball drop systems 60A or 60B. For example, in the case of the normal ball B1, the ball carrier 40 transfers the ball B1 to the ball drop system 60A, and on the other hand, in the case of the special ball B2, the ball carrier 40 transfers the

ball B2 to the ball drop system 60B.

[0025]

Each of the ball drop system 60A, 60B comprises a ball lifter 61 and a ball guide 62. The ball lifter 61 is capable of reciprocating motion in an up-and-down direction. In the case that the normal ball B1 is transferred from the ball carrier 40 to the ball drop system 60A, the ball lifter 61 of the ball drop system 60A goes down. After that, the fork 41 of the ball carrier 40 is inclined toward the side of ball lifter 61, and thereby, the ball B1 is passed to the ball lifter 61 from the ball carrier 40. The ball lifter 61 which has accepted the ball B1 goes up to the top end of the ball guide 62. After that, the ball lifter 61 is inclined to make a down slope toward the ball guide 62. Thereby, the normal ball B1 is passed to the ball guide 62. The normal ball B1 which has been passed to the ball guide 62 is dropped to the outer circumference section 32 of the bingo stage 30 from the top end of the ball guide 62. In the case that the special ball B2 is transferred from the ball carrier 40 to the ball drop system 60B, the ball lifter 61 of the ball drop system 60B goes down to pass the ball B2 from the ball carrier 40 to the ball lifter 61. After that, the ball lifter 61 operates in a manner similar to the ball drop system 60A, and thereby the special ball B2 is passed to the ball guide 62 of the ball drop system 60B. The special ball B2 which has been passed to the ball guide 62 is dropped to the inner circumference section 33 of the bingo stage 30 from the top end of the ball guide 62.

[0026]

The center unit CN, as shown in FIG. 5, has a center monitor 70, a grand roulette 71, and a grand ball drop system 72. The grand roulette 71 is driven to rotate at a predetermined speed in one direction by a driving system which is not shown. Plural winning prize pockets 71a are disposed at the periphery of the grand roulette 71. To each of the winning prize pockets 71a, the number (or the multiple number) of the medals M or each kind of modes is assigned as a winning case. When the center game

starts, the grand ball 73 for the grand roulette is dropped to the outer circumference of the grand roulette 71 from the ball drop system 72. While oscillating at the periphery of the grand roulette 71 according to the rotation of the grand roulette 71, the grand ball 73 enters any one of the winning prize pockets 71a. The privilege is imparted to the player depending on the winning prize pocket 71a which the grand ball 73 has entered.
[0027]

Additionally, in each of the station unit ST, the satellite unit SA, and the center unit CN, illumination devices and sound devices are provided as rendering devices to raise the game mode. As the illumination devices, for example, in the station, plural LEDs (light emitting diodes) are provided along a transfer route from the drop of medals M up to the the ejection of medal M to the play field 12. In the satellite unit SA, lamps are provided so that such illumination is obtained from the lower portion of the bingo stage 30 as the ring-shaped illumination the center of which is the rotation axis of the bingo stage 30. The winning prize pockets 71a of the grand roulette 71 in the center unit CN is fringed with plural LEDs. Speakers are provided as the sound devices, effect sounds and BGM (back ground music) are output properly from the speakers. As shown in FIG.1, at each area between the satellite units SA of the game machine G, a spacer SA is provided. Under each spacer SP, a moving light L and a speaker for show time are provided.
[0028]

Next, the configuration of control system of the game machine will be described. As shown in FIG.6, in the game machine G, as a computer unit for controlling operations of the game machine G, a host control unit 100, a host PC ("PC" is an abbreviation word of a personal computer. "PC" is the same meaning hereinafter.)110, a center PC 120, a center control unit 130, a satellite control unit 140 and a station control unit 150 are mounted. Each one satellite control unit 140 is mounted to each one satellite unit SA as a configuration element

of the satellite unit SA. Each one station control unit 150 is mounted to each one station unit ST as a configuration element of the station unit ST. Namely, in the whole of game machine G, four satellite control units 140 and six teen station control units 150 are provided. The above mentioned units 110 to 150 connects with each other via a line for LAN 160, and thereby the units 110 to 150 can communicate information necessary for controlling various games or lotteries to each other. In addition, a so-called star connection in which plural hubs are arranged at appropriate positions can be adopted to the line for LAN 160.

[0029]

The host control unit 100 executes a whole management, a unified control and the like for the game machine G. The host PC 110 controls operations of a main-body rendering section 111 of the game machine G. In the main-body rendering section 111, rendering devices which belong to neither the center unit CN, the satellite unit SA, nor the station unit ST, such as the moving lights L and the speakers on the spacers SP, are included. The center PC 120 executes a display control of the center monitor 70.

[0030]

The center control unit 130 controls to execute the center game and rendering in the game using the center unit CN, as operating a center drive section 132 and a center rendering section 133, based on the state of the center unit CN detected by the sensors 131. In the sensors 131, a win sensor for detecting whether the grand ball 73 enters each one of the winning prize pockets 71a in the grand roulette 71 is included. For example, a proximity switch, a reflection-type optical sensor, or a transmission-type optical sensor can be adopted to the win sensor. In the center drive section 132, drive devices, such as a motor for driving the rotation of grand roulette 71 and an actuator for driving the grand ball drop system 72, are included. In the center rendering section 133, rendering devices unique to the center unit CN, such as the lamps

and the speakers, are included.

[0031]

The satellite control unit 140 controls to execute the satellite lottery, the transfer of ball B, the rendering in the game using the satellite unit SA, as operating the satellite drive section 142 and the satellite rendering section 143 based on the state of satellite unit SA detected by the sensors 141. In the sensors 141, win sensors for detecting whether or not the ball B has passed trough in each of the winning prize pockets 32a, 33a in the bingo stage 30, and a carrier position sensor for detecting the position of the ball carrier 40 in a circumferencial direction are included. For example, a proximity switch, a reflection-type optical sensor, or a transmission-type optical sensor can be adopted to the win sensor. In the satellite drive section 142, the following drive devices are included: a motor for driving the rotation of grand roulette 71; an actuator for driving the ball carrier 40 along the outer circumference of the bingo stage 30; an actuator for operating the fork 41 of the ball carrier 40; actuators for driving the screw feeder 51 of the ball supply systems 50A, 50B and the ball ejection section 52 respectively; and an actuator for driving the ball lifter 61 of the ball drop system 60A, 60B to go up. In the satellite rendering section 143, the rendering devices unique to the satellite unit SA, such as the lamps and the speakers, are included.

[0032]

The station control unit 150 controls the pusher game and the digital lottery game to be executed at the station unit ST and the rendering of game using the station unit ST, as operating the station drive section 152 and the station rendering section 153 based on the state of station unit ST detected by the sensors 151. Further, the station control unit 150 executes a display control of the station monitor 16. In the sensors 151, medal sensors for detecting the medal M, ball sensors for detecting the ball B, position sensors for detecting the position of movable portion such as the lever 10a, and the

pusher tables 22, 23.

[0033]

In the medal sensors, the following sensors are included: a medal drop sensor for detecting a drop of medal M from the medal drop slot; a medal ejection sensor for detecting the ejection of medal M from the medal ejection section 18; a checker sensor for detecting a fall of medal M to the opening sections 24a to 24c as the checker; a fall medal sensor for detecting the medal M which has fallen down from the front edge of the main table 20; a medal delivery sensor for detecting the medal M which has been delivered to the medal delivery section 11 from the lift up hopper 25; and the like. Similar to the medal sensor in the already-known medal game machine, a proximity switch, an optical sensor, a micro switch and the like can be adopted to the above sensors. In the ball sensors, the following sensors are included: a ball drop sensor for detecting that the ball B has been dropped from the ball drop section 14; a ball fall sensor for detecting the ball B which has fallen down from the main table 20 to be passed to the ball transfer section 15; and the like. The ball fall sensor also functions as a sensor for discriminating the kind of ball B, that is, which kind of the ball B has fallen, the normal ball B1 or the special ball B2. The discrimination of the kind of ball B can be realized by adopting to the ball fall sensor, which outputs different signals depending on the kind of ball B1, B2. For example, when any one of either the ball B1 or ball B2 is a resin product and another one is a metal product, it is possible to discriminate the kind of ball B1, B2 by using a metal sensor. When the reflection rates of the balls B1 and B2 are different from each other, a reflection-type optical sensor is adopted to the ball fall sensor to discriminate the kind of ball B depending on the strength of output signal from the sensor. As the ball fall sensor discriminates the kind of ball B, it is possible to specify the ball drop system 60A, 60B to which the ball carrier 40 should transfer the ball B.

[0034]

In the station drive section 152, a drive device for each of the medal hopper 13a and the lift up hopper 25, an actuator for realizing the medal-ejection operation of the medal ejection section 18, drive devices, such as motors, for reciprocating the pusher tables 22, 23, an actuator for operating the drop-position selection system 14b of the ball drop system 14, a drive device for driving the ball lifter 27 of the ball transfer section 15, and the like. In the station rendering section 153, rendering device unique to the station unit ST such as lamps and speakers are included.

[0035]

Next, in reference to FIGs.7 to 20, various processing to be executed in the game machine G will be described. First, the management of payout rate in the game machine G will be described. In the game machine G in this embodiment, each station control unit 150 counts the number of the dropped medals M and the number of the delivered medals M in each station unit ST, and calculates the payout rate at appropriate intervals for each station unit ST. When the number of the dropped medals M detected in a predetermined calculation period by the medal drop sensor is referred to as NSTin, and the number of the delivered medals M detected in the same period by the medal delivery sensor is referred to as NSTout, by calculating a percentage of the value to be obtained by dividing the latter by the former NSTout/NSTin, it is possible to specify the payout rate POst in the present situation of the station unit ST in the predetermined calculation term. However, when the game machine G has functions for executing a processing such that the number of the medals M which have been deposited from a player can be held as a credit number of medals M, the medals M are dropped to the play field section 12 from the medal ejection section 18 in exchange for a withdrawal from the credit number and the delivery of medals M is treated by increasing the credit number, the subtracted number from the credit number should be added to the the number of the dropped medals NSTin and the added number to the credit number of should be added to the number

of the delivered medals NSTout to calculate the payout rate POst.

[0036]

In the game machine G of this embodiment, so that the payout rate POst of each of the station units ST is moderately equalized, the processing shown in FIG.7 is executed under a linkage between the host control unit 100 and the station control unit 150. Namely, the host control unit 100 executes at moderate intervals, a routine for management of entire payout rate, and in synchronism with this, each of the station control unit 150 executes a routine for management of individual payout rate. When these routines are started, firstly, at step S11 the station control unit 150 notifies the host control unit 100 of the payout rate POst which has been calculated by the station control unit 150. Receiving this, the host control unit 100 obtains the payout rate POst of each station unit ST at step S21, and subsequently at step S22, the host control unit 100 calculates the entire payout rate POall to notify each station control unit 150 of the calculation result. The entire payout rate POall can be, for example, a simple average of the payout rates POst of the station units ST.

[0037]

The station control unit 150 obtains the payout rate POall from the host control unit 100 at step S12, and subsequently at step S13, the station control unit 150 determines the target payout rate POsttgt of the own station unit ST based on the difference between the own payout rate POst and the entire payout rate POall. In each station control unit 150, a standard target payout rate POsttgt is set as an initial value in advance. Then, each station control unit 150 controls properly a win probability (rate of forming a winning case in the digital lottery game and the like, so that the payout rate POst to be calculated by the station control unit 150 itself is controlled to approach to the initial value of the target payout rate POsttgt. Further, at step S13, when the difference between the own payout rate POst and the entire payout rate POall is getting

bigger than an allowable range, the station control unit 150 modifies the target payout rate POsttgt so as to decrease the difference. For example, in the case that the own payout rate POst is higher than the entire payout rate POall, the target payout rate POsttgt is set to be lower than the initial value. The target payout rate POsttgt is modified as mentioned above, and thereby, it is possible to reduce a dispersion of the payout rates POst in the station units ST.

[0038]

Next, in reference to FIG.8, the control for games in the station unit ST will be described. In each station unit ST, while the pusher tables 22, 23 repeats the back-and-forth motion at predetermined intervals, the medal M is dropped to the play filed section 12 in response to the drop of medals M from the medal drop slot. Thereby the pusher game is performed. FIG.8 shows a flow chart of a game basic-control routine to be executed by the station control unit 150 in response to the detection of the drop of medal M from the medal drop slot. In the game basic-control routine shown in FIG.8, firstly at step S101, the station control unit 150 executes necessary processing to drop the medals M to the play field section 12. The flow of the medal M at this moment is as explained in reference to FIG.3.

[0039]

At next step S102, the station control unit 150 determines whether or not the medal M has entered any one of the opening sections 24a to 24c as the checker. In the case of entering the checker, the station control unit 150 advances to step S103 to start the slot lottery in the digital lottery game. Namely, the station control unit 150 displays a game image 200 shown in FIG.9 on the station monitor 16, and the patterns to be displayed at changeable display sections 201a, 201b, 201c respectively are selected by using random numbers or the like, the changeable display sections 201a, 201b, 201c being aligned in a lateral direction in the game image 200. The processing for determining the patterns can be executed based on a control law similar to that of a general slot machine. Then the station

control unit 150 displays the selected patterns at the changeable display sections 201a, 201b, 201c respectively while adding a predetermined rendering effect (such as animation) to the patterns. Moreover, a bingo game section 210 is also provided in the game image 200, and this will be described later.
[0040]

After the slot lottery ends, the station control unit 150 advances to step S104 to determine whether the combination of the three patterns selected by the slot lottery is a losing case or not, and, in the case of the losing case, the station control unit 150 ends the routine of this time. On the other hand, in the case of not the losing case at step S104, that is, in the case of forming a winning case at the slot lottery, the station control unit 150 advances to step S105 and thereafter to execute the processing in accordance with the kind of winning case. Namely, the station control unit 150, firstly at step S105, determines whether the winning case "BALL" has been formed or not. When the winning case "BALL" has been formed, the station control unit 150 advances to step S106 to deliver (drop) the normal ball B1 to the play field section 12. Namely, the delivery of the normal ball B1 is requested to the satellite control unit 140. In response to the request, the satellite control unit 140 ejects the normal ball B1 from the ball supply system 50A, and delivers the normal ball B1 to the slope 14a of the ball drop section 14 in the station unit ST by the ball carrier 40. In synchronism with the delivery of the normal ball B1, the station control unit 150 operates the drop-position selection system 14b of the ball drop system 14 to drop the normal ball B1 to a propter position of the play field section 12. After completing the drop of normal ball B1, the station control unit 150 ends the routine of this time.
[0041]

When the winning case "BALL" has not been formed at step S105, the station control unit 150 advances to step S107 to determine whether or not the winning case "ORDINARY PATTERN" has been formed in the slot lottery. In the case of forming

the winning case "ORDINARY PATTERN", the station control unit 150 advances to step S108 to execute the processing for supplying from the medal supply section 13 to the play field section 12, the number of the medals M which corresponds to the winning case "ORDINARY PATTERN". Hereinafter, a delivery of medal M means a delivery of medal M from the lift-up hopper 25 to the medal delivery section 11, and a supply of medal M means a supply of medal M from the medal supply section 13 to the play field section 12. A route for the supply of medal M from the medal supply section 13 can be only a route via the medal ejection section 18 and the medal shooter 19, but for the moment when a big amount of medals M are supplied to the play field section 12 at one time, it can be configured that the medals M are supplied via the other routes.

[0042]

Subsequently at step S109, the station control unit 150 sets the mode of slot lottery to be a normal mode, and after that, ends the routine of this time. The mode of slot lottery will be described later. In the case that the winning case "ORDINALY PATTERN" has not been formed at step S107, the station control unit 150 advances to step S110 to determine whether or not the winning case "PROBABILITY-OSCILLATION PATTERN" has been formed. In the case that the winning case "PROBABILITY-OSCILLATION PATTERN" has been formed, the station control unit 150 advances to step S111 to supply to the play field section 12, the medals M, the number of which corresponds to "probability-oscillation pattern". Subsequently at step S112, the station control unit 150 sets the mode of slot lottery to be a probability-oscillation mode, and after that, ends the routine of this time. The probability-oscillation mode is a mode where the probability of forming the winning cases in the slot lottery is increased in comparison with the normal mode. Namely, when the winning case "PROBABILITY-OSCILLATION PATTERN" has been formed, at step S112, the probability-oscillation mode is started, or continued. Then, in the case that the winning case "ORDINARY PATTERN" is formed

during the probability-oscillation mode, by the processing of step S109, the probability-oscillation mode is ended.

[0043]

In the case that the winning case "PROBABILITY-OSCILLATION PATTERN" has not been formed at step S110, the station control unit 150 advances to step S113 to determines whether or not the winning case "BINGO FEATURE" has been formed. In the case that the winning case "BINGO FEATURE" has been formed, the station control unit 150 advances to step S114 to execute the bingo-card-feature setting processing. The bingo-card-feature setting processing is a processing to change an expectation value of player with respect to the number of the delivered medals M, by changing player's privilege in a bingo game to be executed by a combination of the satellite lottery performed in the satellite unit SA and a bingo card 211 displayed at the bingo game section 210 shown in FIG.9.

[0044]

In FIG.10, the bingo game section 210 is expandedly shown. In the bingo game section 210, the bingo card 211 is shown. The bingo card 211 has nine boxes which are arranged in the shape of matrix having three lines and three rows. In each box, a given number from 1 to 9 is disposed. These numbers correspond to the numbers assigned to the winning prize pockets 32a, 33a of the bingo stage 30 in the satellite unit SA. When in the satellite lottery, the ball B falls down to any one of winning prize pockets 32a or 33a, the number assigned to the winning prize pockets 32a, 33a becomes valid. When the three valid numbers are aligned in either a vertical direction, a lateral direction or a diagonal direction of the bingo card 211, the bingo is formed, and the number of the medals displayed in the odds display area 212 are supplied to the play field section 12. At the left side and at the bottom side of the bingo card 211, a bingo feature display area 213 is provided. In the bingo feature display area 213, feature display sections 214a to 214h are provided in association with lines in a lateral direction, lines in a vertical direction, and lines in a diagonal

direction of the bingo card 211 respectively. In each of the feature display sections 214a to 214h, when the bingo has been formed, namely three valid numbers are arranged at the corresponding line, a picture depending on a privilege to be imparted to the player in addition to a supply of the number of the medals M displayed in the odds display area 212, is shown. Any one of these privileges directly or indirectly links with the delivery of medals to a player, and the influences of the privileges to the pay out rate are different from each other. In this embodiment, the addition of a bonus number of medals to the number of the medals displayed odds display area 212, the drop of the normal ball B1 or the special ball B2 to the play field section 12, the imparting of "JP chance" and the like are prepared as the privileges. In the example shown in FIG.10, the picture indicating the drop of special ball B2 appears in the feature display sections 214a, 214e respectively, the picture indicating the drop of normal ball B1 appears in the feature display section 214b, 214d, 214f, 21h respectively, and the picture indicating the imparting of "JP chance" appears in the feature display section 214c. Consequently, for example, when three valid numerals are aligned in a lateral direction at the top line in the bingo card 211, the special ball B2 is dropped to the play field section 12 because of formation of the bingo.

[0045]

In the bingo-card-feature setting processing at step S114 shown in FIG.8, the privilege to be imparted to a player at the moment of forming the bingo is changed by adding newly or changing the picture (privilege) to be allowed to appear at any one of the feature display sections 214a to 214h. Thereby, it is possible to control the payout rate of medals. For example, in the case that the present payout rate POst is lower than the target payout rate POsttgt, if a privilege the influence of which for a direction of increasing the payout rate is big, namely, a privilege linking with a delivery of bigger number of medals is selected within privileges prepared in advance by

priority in comparison with the other privileges, it is possible for the payout rate POst to approach the target payout rate POsttgt more earlier. On the contrary, in the case that the present payout rate POst is higher than the target payout rate POsttgt, if a privilege the influence of which for a direction of increasing the payout rate is small, namely, a privilege linking with a delivery of comparatively smaller number of medals is selected within privileges prepared in advance by priority in comparison with the other privileges, it is possible for the payout rate POst to approach the target payout rate POsttgt more earlier. For selecting these privileges, for example, the measure of each influence for the payout rate caused by each privilege is qualified, and the probability to select each of the privileges is basically set depending on the qualified value. When the payout rate should be controlled to increase, the probability to select the privilege which has a bigger influence for the payout rate (the influence to a direction of increasing the payout rate) is made higher than the basic setting. On the contrary, when the payout rate should be controlled to decrease, the probability to select the privilege which has a smaller influence to the payout rate is made higher than the basic setting. When the feature setting processing completes at step S114, the station control unit 150 ends the routine of this time.

[0046]

In the case that the winning case "BINGO FEATURE" has not been formed at step S113 in FIG.8, the station control unit 150 advances to step S115 to determine whether or not the winning case "DIRECT SATELLITE" has been formed. In the case that the winning case "DIRECT SATELLITE" has been formed, the station control unit 150 advances to step S123. On the other hand, in the case that the winning case "DIRECT SATELLITE" has not been formed, the station control unit 150 advances to step S116 to recognize that the winning case "DIRECT CENTER" has been formed. Subsequently at step S123, the station control unit 150 requests to execute the center lottery to the center control unit 130,

and after that, ends the routine of this time. In this case, as the ball B is not transferred to the ball transfer section 15, the ball B1 is delivered from the ball supply system 50A to the ball carrier 40, and the ball B1 is transferred to the ball drop system 60A to execute the satellite lottery.

[0047]

When the medal M has not entered the checker at step S102 in FIG.8, the station control unit 150 advances to step S120 to determine whether or not the ball B has fallen down from the main table 20. When the ball B has not fallen, the station control unit 150 ends the routine of this time. On the other hand, when the ball B has fallen, the station control unit 150 advances to step S121 to determine whether or not the ball B which has fallen is the special ball B2 or not. The way of determining the kind of ball B is as explained about the sensors 151 in FIG.6. In the case that the ball B which has fallen is the special ball B2, the station control unit 150 advances to step S122 to determine that the satellite lottery should be executed at the inner circumference section 33 of the bingo stage 30. On the other hand, in the case that the ball B which has fallen is not the special ball B2, the station control unit 150 advances to step S123 to determine that the satellite lottery should be executed at the outer circumference section 32 of the bingo stage 30. After determining the area where the satellite lottery should be executed, the station control unit 150 advances to step S124 to request the satellite lottery to the satellite control unit 140. In this case, the station control unit 150 also provides the satellite control unit 140 with information indicating whether the satellite lottery should be executed at the outer circumference section 32 or the inner circumference section 33. After requesting the satellite lottery, the station control unit 150 ends the routine of this time. In addition to the request of the satellite lottery, the station control unit 150 controls the operations of ball transfer section 15 so that the ball B which has fallen is transferred to the end of the slope 28.

[0048]

FIG.11 shows a flow chart of a satellite lottery routine to be executed by the satellite control unit 140 in response to the request of the satellite lottery from the station control unit 150. In the satellite lottery routine, firstly at step S201, the satellite control unit 150 determines whether or not the satellite lottery should be executed at the outer circumference section 32 or at the inner circumference section 33, in reference to the information provided from the station control unit 150. In the case of executing at the outer circumference section 32, the satellite control unit 140 advances to step S202 to control the operations of the ball carrier 40 and the ball drop system 60A so that the ball B (the normal ball B1 in this case) transferred by the ball transfer section 15 of the station unit ST is dropped to the outer circumference section 32 from the ball drop system 60A. On the other hand, in the case of executing the satellite lottery at the inner circumference section 33, the satellite control unit 140 advances to step S203 to control the operations of the ball carrier 40 and the ball drop system 60B so that the ball B (the special ball B2 in this case) transferred by the ball transfer section 15 of the station unit ST is dropped to the inner circumference section 33 from the ball drop system 60B.

[0049]

After dropping the ball B, the satellite control unit 140 advances to step S204 to detect which of the winning prize pockets 32a (or 33a) the dropped ball B has fallen into, based on the detection signal of the win sensor included in the sensors 141. Subsequently at step S205, the satellite control unit 140 determines whether or not the winning prize pocket 32a (or 33a) into which the ball B has fallen is a JP-chance pocket, that is, a winning prize pocket where the word "JP chance" are represented. Then in the case of the JP-chance pocket, the satellite control unit 140 advances to step S206 to request the center lottery to the center control unit 130. In the case when the winning prize pocket is not the JP-chance pocket, the

processing of step S206 is skipped.

[0050]

At next step S207, the satellite control unit 140 notifies the host control unit 100 and the station control unit 150 (note that, the station control unit 150 which has requested the satellite lottery.) of the number or the word of the winning prize pocket 32a (or 33a) which the ball B has fallen into. After the notification, the satellite control unit 140 ends the satellite lottery routine.

[0051]

FIG.12 shows a flow chart of a win-probability determination routine to be executed by the host control unit 100 in response to the notification of the number or the word of the winning prize pocket from the satellite control unit 140. The probability of fall of the ball B (the ease of fall of the ball B) for each winning prize pocket 32a, 33a in the bingo stage 30 is not equalized to each other because of influence of mechanical error. This routine is executed to recognize the dispersion of the probabilities and reflect the dispersion to the control of the game. In this routine, firstly at step S301, the host control unit 100 updates the number-of-win data in response to the notification of the winning-prize-pocket number from the satellite control unit 140. The number-of-win data is stored data that, for example as shown in FIG.13, each number for winning prize pocket (the numerals of 1 to 9 and "JP")assigned to each winning prize pocket 32a, 33a and each number-of win N1 to N9, Njp indicating the number of wins for each number for winning prize pocket are associated with each other. The number-of-win is counted within a proper sampling period (for example, 1000 times of lotteries in the past). For example, when the notification that the ball B1 has entered the winning prize pocket 32a which the number "1" is assigned to in the satellite lottery is received, one is added to the number-of-win N1 for the pocket number "1", and one is subtracted from the number-of-win Nx for the pocket number x (x is any one of the numerals 1 to 9 or jp) corresponding to

the oldest lottery chance in the sampling period.

[0052]

Next, at step S302 the host control unit 100 calculates the win probability for each pocket number. The calculation is for obtaining a value that the number-of-win N1 to N9, Njp for each pocket number is divided by the number of lotteries within the sampling period. It is possible to omit the calculation about the win possibility of the pocket mumber JP corresponding to "JP chance". Subsequently at step S302, the host control unit 100 notifies the station control unit 150 of the calculated win probability of each pocket number, and after that, ends the routine of this time. The station control unit 150 which is the destination of notification at step S303 is the station control unit 150 of each of four station units ST combined with the satellite unit SA having the satellite control unit 140 which has notified of the result of satellite lottery. Namely, the win-probability determination routine is individually executed for each one unit including one of the satellite unit SA and four of the station units ST combined therewith.

[0053]

FIG.14 shows a flow chart of a bingo game routine to be executed by the station control unit 150 at the moment when the number for winning prize pocket is notified from the satellite control unit 140. In the bingo game routine, firstly at step S131 the station control unit 150 validates on the bingo card 211, the same number as the number for winning prize pocket 32a, 33a notified from the satellite control unit 140. However, in the case that the winning prize pocket is "JP chance", the validation is not executed.

[0054]

Subsequently at step S132, the station control unit 150 determines whether or not the bingo has been formed on the bingo card 211, that is, three valid numbers has been aligned on one line. When the bingo has been formed, the station control unit 150 advances to step S133 to supply to the play field section

12 as a prize of forming bingo, the number of the medals M obtained by adding the number of bingo WIN and the number of repeat WIN. The number of bingo WIN is the number displayed at the odds display area 212 shown in FIG.10. The number of repeat WIN is the number displayed at the repeat-number display area 215 shown in FIG.10. The repeat-number will be described later. Moreover, at step S133, the station control unit 150 imparts to the player, the privilege corresponding to the picture appearing in the display section of the line or row where the bingo has been formed (referred to as the win line hereinafter.), within the feature display sections 214a to 214h in the bingo game section 210. In this embodiment, for example, the privilege is imparted, such as the addition of the number of the delivered medals, the drop of ball B, the imparting of "JP chance" or the like. The imparting of "JP chance" is a request of the center lottery in a manner similar to the case when the processing advances from step S205 to step S206 in FIG.12.

[0055]

At next step S135, the station control unit 150 resets the feature on the win line, that is, erases the privilege corresponding to the win line. After that, the station control unit 150 advances to step S136 to obtain the win probability of each pocket number notified from the host control unit 100. Subsequently at step S137, the station control unit 150 rearranges the numbers on the win line, in reference to the win possibilities of pocket numbers and the difference between the payout rate POst and the target payout rate POsttgt. For example, the following will describe about the case shown in FIG.15, where the center line in the bingo card has become the win line, the numerals on the win line are 7, 6, and 4, and the win probabilities P7, P6, and P4 corresponding to the numerals 7, 6, and 4 respectively have a relation such as P7>P6>P4. In the rearrangement processing at step S137, the sequence of these three numerals arranged on the win line is predetermined. The box placed at the center in the bingo card is a box included

in any lines of vertical direction, lateral direction and diagonal direction. When a numeral the win probability of which is high is placed at this box, the probability to form the bingo increases relatively in comparison with a case that a numeral the win probability of which is low is placed at the box. Then, in the rearrangement processing at step S137, in the case that the target payout rate POsttgt is enough higher than the actual payout rate POst, the number 7 having the highest win probability is disposed at the central box, and the other numerals are assigned to the right and the left boxes respectively. Thereby, it is possible to increase the probability to form the bingo. On the other hand, when the target payout rate POsttst is enough lower than the actual payout rate POst, the numeral 4 having the lowest win probability is disposed at the central box, and the other numerals are assigned to the right and the left boxes respectively. Aforementioned, due to the rearrangement of the numerals depending on the win probabilities to change the probability to form the bingo, it is possible to make the payout rate POst approach the target payout rate POsttgt more earlier. [0056]

Returning to FIG.14, the description continues. After rearranging the numerals on the win line, the station control unit 150 ends the routine of this time. Additionally, each numeral on the win line after the rearrangement, becomes an initial state where the numeral is invalid. On the other hand, when the bingo has not been formed at step S132, the station control unit 150 advances to step S140 to determine whether or not the winning prize pocket is "REPEAT". In the case that the numeral notified in the satellite lottery has been already valid on the bingo card 211, it is determined to be "REPEAT". When it is determined to be "REPEAT", the station control unit 150 advances to step S141 to increase a repeat step by one step, that is, change the repeat WIN number displayed at the repeat-number display area 215 to a one-step bigger value. In the example in FIG.10, the repeat WIN number gradually increases

such as 10, 20, 40 in accordance with the repeat number of 1, 2, 3 respectively. At the moment of forming the bingo, the repeat WIN number of medals according to the repeat number are supplied to the play field section 12 (refer to step S133).
[0057]

Subsequently at step S412, the station control unit 150 delivers the normal ball B1 to the play field section 12. This processing can be the same as step S106 in FIG.16. After delivering the normal ball B1, the station control unit 150 ends the routine of this time. In the case that the winning-prize-pocket number is not "REPEAT" at step S140, the station control unit 150 advances step 143 to supply the predetermined number of medals M, and after that, ends the routine of this time.
[0058]

FIG.16 shows a flow chart of a center lottery routine to be executed by the center control unit 130 in response to the request of the center lottery. The center lottery is requested, in the case that the bingo feature which is imparted at step S133 in FIG.14 is "JP chance", as well as at step S117 in FIG.8 and at step S206 in FIG.11. In the center lottery routine, firstly the center control unit 130 executes the center lottery at step S401. Namely, while rotating the ground roulette 71, the center control unit 130 makes the grand-ball drop system 72 drop the grand ball 73. Subsequently at step S402, the center control unit 130 determined whether or not the grand ball 73 has entered the winning prize pocket 71a defined as a JP prize pocket. In the case that it takes a somewhat long time from the drop of grand ball 73 to the enter of the ball, it is possible to stop the processing ones at the moment of the drop of the grand ball 73, and restart the processing in FIG.16 by a trigger which is a detection that the grand ball 73 has been taken into any one of winning prize pocket 71a in the grand roulette 71.
[0059]

In the case that the grand ball 73 has been taken into the JP prize pocket at step S402, the center control unit 130

advances to step S403 to instruct the station control unit 150 which has requested the center lottery, to supply to the play field section 12, the medals the number of which corresponds to the JP win. After instructing the medal supply, the center control unit 130 ends the routine of this time. Note that, in the case that the center lottery is requested from the satellite control unit 140, it is the station control unit 150 which has requested the satellite lottery to the satellite control unit 140 that is the destination to be notified of the instruction of medal supply. On the other hand, in the case that the grand ball 73 has not been taken into the JP prize pocket at step S402, the center control unit 130 advances to step S404 to determine whether or not the grand ball 73 has been taken into the winning prize pocket 71a defined as the grand slot pocket. In the case that the grand ball 73 has been taken into the grand slot pocket, the center control unit 130 advances to step S405 to request the host control unit 100 to execute the grand slot lottery, and after that, ends the routine of this time.

[0060]

In the case that the grand ball 73 has not been taken into the grand slot pocket at step S404, the center control unit 140 advances to step S406 to instruct the station control unit 150 to supply to the play field section 12, the medals M the number of which corresponds to the center lottery. The number of the medals M to be supplied in this case is enough smaller than the number instructed at step S403. It is possible to instruct different number of medals depending on the kind of winning prize pocket 71a into which the grand ball 73 has been taken. The destination to be notified of the medal-supply instruction is the same as the case of step S403. After instructing the medal supply, the center control unit 130 ends the routine of this time.

[0061]

FIG.17 shows a flow chart of a grand-slot-lottery routine to be executed by the host control unit 100 in response to the request (of step S405 in FIG.16) of the grand slot lottery from

the center control unit 130. In the grand slot lottery routine, firstly the host control unit 100 executes the grand slot lottery at step S501. The grand slot lottery is a slot lottery where it is competed whether or not a combination of three patterns forms a winning case like the digital lottery game executed on the station monitor 16 in the station unit ST. The game image of the grand slot lottery is displayed on the center monitor 70 via the center PC 120. For determining the combination of patterns in the grand slot lottery, in other words, for determining the win probability in the grand slot lottery, the entire payout rate POall calculated in the processing in FIG.7 may be referred.

[0062]

After executing the grand slot lottery, the host control unit 100 advances to step S502 to determine whether or not the winning case "PREMIER MODE" has been formed in the grand slot lottery. In the case that the winning case "PREMIRE MODE" has been formed, the host control unit 100 advances to step S503 to request the station control unit 150 to shift to the premier mode. The destination of the request in this case is the station control unit 150 which has requested to the center control unit 130, the center lottery which has caused the request of the grand slot lottery at step S405 in FIG.16. After requesting the shift to the premier mode, the host control unit 100 ends the routine of this time.

[0063]

In the case that the winning case "PREMIER MODE" has not been formed at step S502, the host control unit 100 advances to step S504 to determine whether or not the winning case "SATELLITE GAME" has been formed. In the case that the winning case "SATELLITE GAME" has been formed, the host control unit 100 advances to step S505 to request the satellite control unit 140 which has requested the center lottery to execute a predetermined center game. After the request, the host control unit 100 ends the routine of this time. The satellite control unit 140 which has been requested to execute the satellite game

executes the satellite game in accordance with a predetermined procedure, and instructs the station control unit 150 (the same as the destination of request at step S503) to supply the number of the medals M depending on the game result.

[0064]

In the case that the winning case "SATELLITE GAME" has not been formed at step S504, the host control unit 100 advances to step S506 to determine whether or not the winning case "MEDAL WIN" has been formed. In the case that the winning case "MEDAL WIN" has been formed, the host control unit 100 advances to step S507 to instruct the station control unit 150 to supply medals the number of which is obtained by adding the number of the medals corresponding to the winning case "MEDAL WIN" to the JP number of medals (the supplied number of medals instructed at S403 in FIG.16). In this case, the destination of direction is also the same as the case of step S503. After requesting the medal supply, the host control unit 100 ends the routine of this time.

[0065]

In the case that the winning case "MEDAL WIN" has not been formed at step S506, the host control unit 100 advances to step S508 to request the center control unit 130 to re-execute the center lottery. In response to this, the center control unit 130 re-executes the center lottery in FIG.16. After requesting the re-execution of the center lottery, the host control unit 100 ends the routine of this time.

[0066]

FIG.18 shows a flow chart of a premier mode routine to be executed by the station control unit 150 in the case that the shift to the premier mode has been requested from the host control unit 100 (the case of step S503 in FIG.17). This routine is executed instead of the game basic-control routine in FIG.8, in the case that the drop of medal M to the play field section 12 has been detected. Namely, at the moment of executing the premier mode, the game control based on the game basic-control routine is not executed. Additionally, in the case that the premier mode is executed, the game image 220 shown in FIG.19

instead of the game image 200 shown in FIG.9 is displayed on the station monitor 16. The game image 220 resembles the game image 200 in a point that three changeable display sections 201a, 201b, 201c are aligned in the lateral direction. However, the game image 220 is different from the game image 200 in a point that a continuation-condition display section 221 is provided instead of the bingo game section 210. At the continuation-condition display section 221, the numerals 1 to 9 are aligned in the lateral direction, and each of them is displayed in a different state depending on whether the numeral is valid or invalid for continuing the premier mode. In FIG.19, a round symbol is given to each valid numeral, and a symbol "x" is given to each invalid numeral.

[0067]

In the premier mode routine, firstly the station control unit 150 executes the medal drop processing at step S151, and subsequently at step S152, determines whether or not the medals M has entered the checker. When the medals M has entered the checker, the station control unit 150 advances to step S153 to execute the slot lottery as the digital lottery game executed on the station monitor 16. The winning case of this time is limited to a case that three same numerals appear. Additionally, the win probability is set to be higher than the one at step S103 in FIG.8. Subsequently at step S154, the station control unit 150 determines whether or not the combination of patterns obtained in the slot lottery is a losing case, and in the case of forming the losing case, ends the routine of this time.

[0068]

On the other hand, at step S154, in the case of not forming the losing case, the station control unit 150 advances to step S155 to supply to the play field section, the medals M the number of which is depending on the winning case formed in the slot lottery. Subsequently at step S156, the station control unit 150 switches the state of winning numeral, three of which have appeared, between valid sate and invalid sate. For example, as shown in FIG.19, in the case that three of numeral 3 have

appeared to form a winning case, the state of numeral 3 is switched between valid sate and invalid sate. For example, in FIG.19, as the round symbol is given to the numeral 3 at the continuation-condition display section 221, when three of numeral 3 appear, the sate of numeral 3 is switched from valid sate to invalid sate. According to this, the state of numeral 3 displayed at the continuation-condition display section 221 is switched from the sate with the round symbol to the sate with the symbol "x". After switching between valid sate and invalid sate, the station control unit 150 ends the routine of this routine.

[0069]

On the other hand, in the case that the medals M has not entered the checker at step S152, the station control unit 150 advances to step S160 to determine whether or not the ball B has fallen down from the main table 20. In the case that the ball B has not fallen, the station control unit 150 ends the routine of this routine. On the other hand, in the case that the ball B has fallen, the station control unit 150 advances to step S161 to determine whether or not the ball B which has fallen is the special ball B2. The determination of the kind of ball B is as explained with respect to the sensors 151 in FIG.6. In the case that the ball B which has fallen is the special ball B2, the station control unit 150 advances to step S162 to determine that the satellite lottery should be executed at the inner circumference section 33 of the bingo stage 30. On the other hand, the ball B which has fallen is not the special ball B2, the station control unit 150 advances to step S163 to determine that the satellite lottery should be executed at the outer circumference section 32 in the bingo stage 30. After determining the section where the satellite lottery should be executed, the station control unit 150 advances to step S164 to request the satellite lottery to the satellite control unit 140. In this case, the station control unit 150 also provides to the satellite control unit 140, the information specifying which section the satellite lottery should be executed, the

outer circumference section 32 or inner circumference section 33. After requesting the satellite lottery, the station control unit 150 ends the routine of this time. In addition to the request of satellite lottery, the station control unit 150 controls the operation of the ball transfer section 15, so that the ball B which has fallen is transferred to the end of slope 28.

[0070]

The satellite control unit 140, to which the satellite lottery is requested by the processing at step S164 in FIG.18, executes the satellite lottery in accordance with the procedure shown in FIG.11. The station control unit 150 receives the result of the satellite lottery, and executes a premier-mode-end control routine shown in FIG.20. This routine is for a control whether the premier mode is continued or ended. At the first step S171, the station control unit 150 obtains the number of winning prize pocket notified from the satellite control unit 140. At next step S172, the station control unit 150 determines whether or not the winning prize pocket obtained at step S171 is "JP", namely, whether or not the ball B has entered the JP chance pocket. When the winning -prize-pocket number is "JP", the station control unit 150 advances to step S173 to end the premier mode, and returns to the game basic-control shown in FIG. 8. After that, the station control unit 150 ends the routine of this time. Note that, the station control unit 150 only ends the premier mode here. In the case that the "JP chance" in the satellite lottery occurs, the processing advances to the center lottery and after in FIG.16.

[0071]

In the case that the winning-prize-pocket number is not "JP" at step S172 in FIG.20, the station control unit 150 advances to the step S174 to determine whether or not the winning-prize-pocket number is the invalid numeral. The invalid numeral used here is the numeral to which the symbol "x" is given at the continuation-condition display section 221.

Then, in the case that the winning-prize-pocket number is equal to the invalid number, the station control unit 150 advances to step S173. In the case that the winning-prize-pocket number is not the invalid number, the station control unit 150 skips step S173 to end the routine of this time. According to the above routine, the premier mode ends, when the ball has fallen into the winning prize pocket the number of which is equal to the invalid numeral in the satellite lottery, or when the processing advances to the center lottery because the JP chance has occurred in the satellite lottery. Accordingly, in the case that the number of winning prize pocket, into which the ball B has fallen in the satellite lottery is equal to the valid numeral, the premier mode continues.

[0072]

The station control unit 150 further has a function for changing the game contents of the station control unit ST based on the number of the balls B existing in the play field section 12. Concretely, in the case that the number of the balls B existing in the play field section 12 is zero, namely, the ball B dose not exist in the play field section 12, the station control unit 150 executes the processing for increasing the expectation value of the medal obtainment of the player. Hereinafter, the contents of processing will be explained in reference to FIG.21 and FIG.22.

[0073]

FIG.21 shows a flow chart of a ball-count processing routine to be executed by the station control unit 150 to detect the number of the balls B existing in the play field section 12. The station control unit 150, while the medal game is executed in the station unit ST, repeatedly executes the routine in FIG.21 at a predetermined interval. In the ball-count processing routine, firstly at step S181, the station control unit 150 determines whether or not the ball has dropped onto the play field section 12. This determination can be realized by using the ball drop sensor of the ball sensors included in the sensors 151. However, not using the sensors, it is possible

to determine whether or not the ball B has dropped depending on whether or not the drop of ball B has been instructed, namely, whether or not either the processing at step S106 in FIG.8 or the processing at step S142 in FIG.14 has been executed between the moment of executing the routine in FIG.21 of the prior time and the moment of executing the routine of this time.

[0074]

In the case that it is determined that the ball B has been dropped, the station control unit 150 advances to step S182 to add one to the counting value of the ball counter to memorize the number of the balls B. After that, the station control unit 150 ends the routine of this time. The ball counter may be a virtual counter retained in a RAM and the like in the station control unit 150. On the other hand, at step S181, in the case that it is determined that the ball B has not been dropped, the station control unit 150 advances to step S183 to determine whether or not the fall of the ball B from the play field section 12 has been detected. The determination can be realized by using the ball fall sensor of the ball sensors included in the sensors 151. In the case that it is determined that the ball B has not fallen, the station control unit 150 ends the routine of this time. On the other hand, in the case that the ball has fallen, the station control unit 150 advances to the step S184 to subtract one from the counting value of the ball counter. At the next step S185, the station control unit 150 determines whether or not the number of the balls B memorized in the ball counter is zero. In the case that the number of the balls B is zero, the station control unit 150 advances to step S186 to instruct to start an empty mode, and after that, ends the routine of this time. At the moment when the empty mode starts, the start of the empty mode can be notified to the player, for example, by displaying a special image on the station monitor 16. On the other hand, in the case that the number of the balls B is not zero, the station control unit 150 skips step S186 and ends the routine of this time.

[0075]

In the case that the start of empty mode is instructed at step S186 in FIG.21, the station control unit 150 executes an empty mode routine shown in FIG.22 instead of the game basic-control routine in FIG. 8. Namely, the station control unit 150, in the case that the drop of medal M to the play field section 12 has been detected, executes the routine in FIG.22 instead of the game basic-control routine in FIG.8.

[0076]

In the empty-mode routine in FIG. 22, firstly at step S191, the station control unit 150 executes the medal drop processing, and subsequently at step S192, determines whether or not the medal M has entered the checker. In the case that the medal M enters the checker, the station control unit 150 advances to step S193 to execute the slot lottery as the digital lottery game executed on the station monitor 16. Note that, in the slot lottery, two kinds of winning case are set, that is, a winning case "BALL" which means the drop of ball B, and a winning case "MEDAL" which means the supply of medal M to the play field section 12. Additionally, the probability to win the winning case "BALL" is set to be higher than the probability to win the winning case "BALL" in the slot lottery executed in accordance with the game basic-control routine in FIG.8. Moreover, the probability to win the winning case "MEDAL" is set to be higher than the probability to win the winning case "ORDINARY PATTERN" in the slot lottery executed in accordance with the game basic-control routine in FIG.8. In essence, the win probabilities are set so that the player's expectation value for obtaining medals is made higher than the expectation value of the slot lottery executed in the game basic-control routine.

[0077]

Subsequently at step S194, the station control unit 150 determines whether or not the winning case "BALL" has been won. In the case of winning the "BALL", the station control unit 150 advances to step S195 to request to deliver the normal ball B1 to the satellite control unit 140. In response to the request, the satellite control unit 140 makes the ball supply system 50A

eject the normal ball B1, and delivers the ball B1 to the slope 14a of the ball drop section 14 in the station unit ST by using the ball carrier 40. In synchronism with the delivery of the normal ball B1, the station control unit 150 operates the drop-position selection system 14b of the ball drop section 14 to drop the normal ball B1 to a proper position in the play field section 12. When the drop of normal ball B1 is completed, the station control unit 150 advances to step S196 to end the empty mode. Namely, by the delivery of the normal ball B1, the empty mode is ended. Thereby, the station control unit 150 returns to the game basic-control routine in FIG. 8. After executing the processing at step S196, the station control unit 150 ends the routine of this time.

[0078]

In the case that the winning case "BALL" has not been won at step S194 in FIG.22, the station control unit 150 advances to step S197 to determine whether or not the winning case "MEDAL" has been won in the slot lottery. In the case of winning the "MEDAL", the station control unit 150 advances to step S198 to execute the processing for supplying a predetermined number of medals M from the medal supply section 13 to the play field section 12. In this case, it is possible that the supplied medals M is the same as the number of the supplied medals M at step S108 in FIG.8, but more number of medals M can be supplied to the play field section 12. After supplying the medals M, the station control unit 150 returns to step S191. Note that, in the case that a negative determination results at step S192, or in the case that a negative determination results at step S197, the station control unit 150 returns to step S191.

[0079]

According to the above empty mode, in the case that the ball B does not exist in the play field section 12, the winning case "BALL" is formed with a higher probability than the probability that the normal ball B1 is dropped in the game basic-control routine and the normal ball B1 is dropped to the play field section 12. Consequently, in comparison to the case

of executing the game basic-control routine, it is possible to expect a reduce of the duration time of the state that the ball B does not exist in the play field section 12. Moreover, as the win probability to win the winning case "MEDAL" also increases, the expectation value of medal obtainment itself also gets higher than the expectation value in the state controlled by the game basic-control routine. Thereby, even if the ball B does not exist in the play field section 12, it is possible to impart the motivation of game continuation to the player. That makes the operating rate and the profit performance of the game machine G higher.

[0080]

In the above embodiment, the medal supply section 13 of the station unit ST corresponds to a first game-medium supply device. The configuration for executing the pusher game and the digital lottery game in the station unit ST corresponds to a basic-game execution device. The ball supply system 50A, 50B and the carrier 40 of the satellite unit SA, and the ball drop section 14 of the station unit ST for dropping the ball B to the play field section 12 correspond to a second game-medium supply device. The ball transfer section 15 of the station unit ST, the satellite unit SA, and the station control unit 150 for executing the satellite lottery by using the ball B and the bingo game responding to the lottery result of the satellite lottery correspond to a dividend-chance imparting device. The station control unit 150 functions as a medium number-of-pieces detection device by executing the routine in FIG.21, and functions as a privilege imparting device by executing the routine in FIG.22. Moreover, the satellite unit SA corresponds to the physical lottery system.

[0081]

The present invention is not limited to the above embodiment, but is possible to be executed in various embodiments. Proper change of the privilege which the privilege imparting device imparts and proper addition to the privilege can be allowed. In the case that the ball does not

exist, the privilege can be imparted by executing the slot lottery in the probability oscillation mode. The privilege can be imparted by changing the medal transfer route in the play field section 12 so that the medal M is easier to enter the opening section 24a, 24b, 24c as the checker. It is possible to issue some privilege with respect to the bingo feature. It is possible to impart the privilege by delivering to the play field section 12, the special ball B2 instead of the normal ball B1, in the case that the winning case "BALL" is won in the slot lottery.

[0082]

The basic game is not limited to the combination of the pusher game and the slot lottery, and can be changed variously as long as the a game is executed in association with the motion of the first game medium. For example, the pin ball or the like can be executed as the basic game. Also, it is possible to change variously the dividend chance to be imparted when the second game medium is ejected from the play field section. For example, responding to ejecting the second game medium from the play field section, it is possible to deliver the dividend without the lottery processing such as the second game medium.

[0083]

In the above embodiment, in the case that it is detected that the ball B does not exist in the play field section 12, the privilege is imparted, but the present invention is not limited to this embodiment. For example, in the case that the number of the balls B decreases to over a predetermined number which is 2 or more than 2, though the balls B remains in the play field section 12, it is possible to impart some privilege. By setting plural numerals as the predetermined numbers which are criteria for imparting the privilege, it is possible to impart the privilege in stages depending on decrease of the number of the balls B. In this case, it is possible to change to more advantageous privilege, as the number of pieces more decreases. Moreover, it is possible to change the predetermined number to be a criterion for imparting privilege,

as the predetermined number is allowed to be changed depending on the game situation, for example, a change of payout rate.

CLAIMS

1.A game machine comprising:

a first game-medium supply device for supplying a first game medium to a play field section based on an operation by a player;

a basic-game execution device for executing a basic game in association with an operation of the first game medium dropped to the play field section, and imparting to the player a dividend depending on a game result of the basic game;

a second game-medium supply device for supplying to the play field section a second game medium different in kind from the first game medium, in a case that a predetermined situation occurs in the basic game; and

a dividend chance imparting device for imparting a chance of obtaining dividend to the player, in a case that the second game medium is ejected from the play field section by an operation of the second game medium linked with the operation of the first game medium, wherein

the game machine further comprises:

a medium number-of-pieces detection device for detecting the number of the second game media existing in the game field; and

a privilege imparting device for imparting privilege to be tied with a delivery of the dividend to the player, in a case that the number of the second game media detected by the medium number-of-pieces detection device decreases to less than a predetermined number.

2. The game machine according to claim 1, wherein the privilege imparting device imparts the privilege by executing processing for increasing a probability that the predetermined situation is formed in the basic game.

3.The game machine according to claim 1, wherein

the basic-game execution device executes, as a game included in the basic game, a lottery game where a lottery processing in which the basic-game execution device executes a lottery processing to allow a winning case to occur in a case that the first game medium pass through a predetermined position in the play field section, while controlling win probability in accordance with a predetermined control law,

and delivers the dividend directly and indirectly to the player in a case that the winning case is formed, and

the privilege imparting device imparts the privilege by executing at least either a processing for increasing a probability to form the winning case in the lottery game, or a processing for increasing amount of the delivery at the moment of forming the winning case.

4.The game machine according to claim 1, wherein

the first game medium is a medal,

the basic-game execution device executes, as games included in the basic game, a pusher game in which the basic-game execution device, while pushing out a cluster of medals accumulated in the play field section by a pusher table with a back-and-forth motion in the play field section, delivers to the player as the dividend the medal ejected from a predetermined range of the play field section, and a lottery game in which the basic-game execution device executes a lottery processing to allow a winning case to occur in a case that the medal passes through a predetermined position in the play field section, while controlling win probability in accordance with a predetermined control law,

and delivers to the player the medal as the dividend directly and indirectly in a case that the winning case is formed,

the second game-medium supply system supplies the second game medium, recognizing that the predetermined situation has occurred in the basic game in a case that a predetermined winning case of game-medium delivery is formed in the lottery game, and

the privilege imparting device delivers the privilege by executing at least either a processing for increasing a probability to form a winning case of the game-medium delivery in the lottery game, a processing for increasing a probability to form the winning case in the lottery game, or a processing for increasing number of medals as the dividend at a moment of winning the winning case.

5.The game machine according to claim 1, wherein the privilege imparting device, in a case that a situation is detected that the second game medium does not exist in the play field section, imparts the privilege.

6.The game machine according to claim 1, wherein

the dividend chance imparting device has a physical lottery system which takes the second game medium ejected from the play field section thereinto and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and

controls the delivery of dividend to the player in association with a lottery result by the physical lottery system.

7.The game machine according to claim 2, wherein

the dividend chance imparting device has physical lottery system which takes the second game medium ejected from the play field section thereinto, and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and

controls the delivery of dividend to the player in association with a lottery result by the physical lottery system.

8.The game machine according to claim 3, wherein

the dividend chance imparting device has physical lottery system which takes the second game medium ejected from the play

field section thereinto, and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and

controls the delivery of dividend to the player in association with a lottery result by the physical lottery system.

9.The game machine according to claim 4, wherein

the dividend chance imparting device has physical lottery system which takes the second game medium ejected from the play field section thereinto, and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and

controls the delivery of dividend to the player in association with a lottery result by the physical lottery system.

10.The game machine according to claim 5, wherein

the dividend chance imparting device has physical lottery system which takes the second game medium ejected from the play field section thereinto, and selects at least one choice from a plurality of choices by imparting an physical operation to the second game medium, and

controls the delivery of dividend to the player in association with a lottery result by the physical lottery system.

INTERNATIONAL SEARCH REPORT

International application No
PCT/JP2007/052695

A CLASSIFICATION OF SUBJECT MATTER
A63F9/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A63F9/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2007
Kokai Jitsuyo Shinan Koho 1971-2007 Toroku Jitsuyo Shinan Koho 1994-2007

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
Y	JP 2006-81768 A (Konami Co., Ltd.), 30 March, 2006 (30.03.06), Par. Nos. [0029] to [0040]; Figs. 1 to 7 & WO 2006/030899 A1	1-10
Y	JP 2000-153055 A (Kabushiki Kaisha Sigma), 06 June, 2000 (06.06.00), Par. No. [0025] (Family: none)	1-10
Y	JP 2001-38037 A (Kabushiki Kaisha Sigma), 13 February, 2001 (13.02.01), Par. No. [0006] (Family: none)	1-10

23 10 08

☒ Further documents are listed in the continuation of Box C ☐ See patent family annex

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

Date of the actual completion of the international search	Date of mailing of the international search report
09 March, 2007 (09.03.07)	20 March, 2007 (20.03.07)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No	Telephone No

Form PCT/ISA/210 (second sheet) (April 2005)