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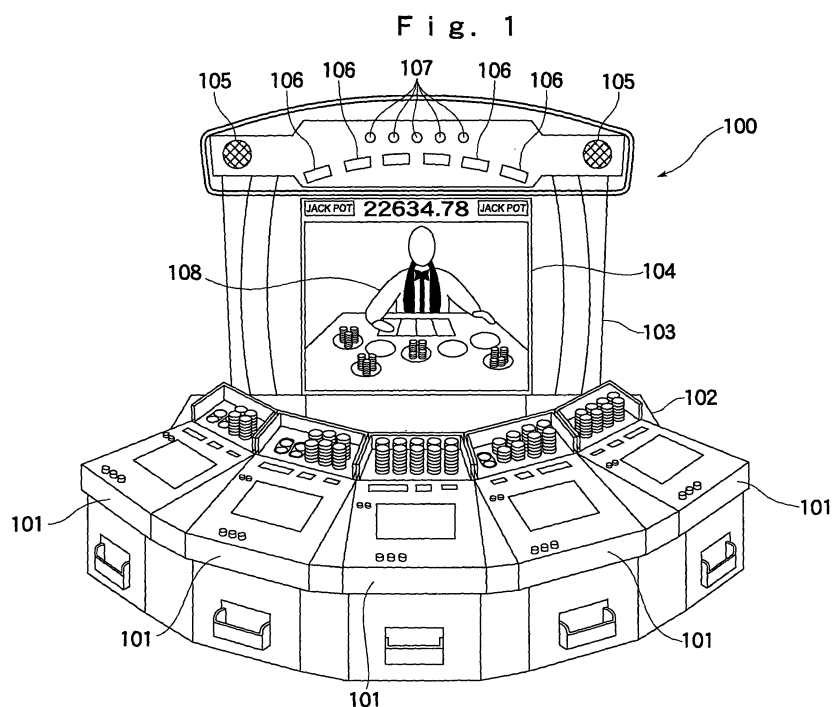
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(54) **Gaming machine**

(57) To guide a player showing an interest in a gaming machine, and encourage a use of the gaming machine, thereby increasing a customer gathering capability and increasing an operating rate of the gaming machine.

A gaming machine enabling a plurality of players to play an identical game simultaneously includes: a plurality of player terminals at which a player carries out an input for a game; a front display and/or a speaker which executes an effect accompanying a game; a seating con-

dition detector which detects whether or not a player terminal has an empty seat; an observer detector which detects whether or not an observer, who is a person other than a player playing the game, exists; and a guiding effect selection section which, in the event that an existence of an empty seat is detected by the seating condition detector, and an existence of an observer is detected by the observer detector, selects an effect for guiding the observer to one of the empty seats, and causes the front display and/or the speaker to execute the selected effect.



## Description

### RELATED APPLICATION

**[0001]** This application claims the priority of Japanese Patent Application No. 2005-340858 filed on November 25, 2005, which is incorporated herein by reference.

### BACKGROUND OF THE INVENTION

#### 1. Technical Field

**[0002]** The present invention relates to a gaming machine, and more specifically to a gaming machine which changes an effect created by an image or a sound in accordance with a behavior of a player.

#### 2. Related Art

**[0003]** Due to a recent proliferation of a casino and a game center, an opportunity for the player to enjoy a game on a variety of gaming apparatuses has increased.

**[0004]** In the casino and game center in which such a wide variety of gaming apparatuses are disposed, in order to increase an operating rate and increase a profit for each gaming apparatus, a technique is necessary for gathering players and causing them to use the game apparatuses.

**[0005]** As a technology for gathering the players, a gaming apparatus has been proposed which, for example, when the game is not being played, being a gaming apparatus in which a demonstration picture is displayed on a display, changes the demonstration picture in accordance with a game history, thereby provoking an interest and feeling of involvement in the game, and provoking a desire to play the game, thus achieving an increase in a customer gathering capability (for example, JP-A-2005-111090 (Paragraphs [0010] and [0014])).

**[0006]** However, in order to enable a player to enjoy a game on a gaming apparatus smoothly and skillfully, it is necessary to become accustomed to the game and an operation etc. of the gaming apparatus. For that reason, it is common for the player to play again on a gaming apparatus having a playing method to which he or she is accustomed, while a new player who has never used the gaming apparatus hesitates to play a new game in the event that another player, who is accustomed to the gaming apparatus, is playing. However, unless it is possible to gather such new players, it is not possible to increase an operating rate of the gaming apparatus.

### SUMMARY OF THE INVENTION

**[0007]** An object of the invention is to achieve an increase in a customer gathering capability, and an increase in an operating rate of a gaming machine, by guiding a player who shows an interest in the gaming machine, and encouraging a use of the gaming machine.

**[0008]** In order to achieve the object, the invention includes the features described hereafter.

**[0009]** The invention is proposed as a gaming machine which enables a plurality of players to play an identical game simultaneously. The gaming machine is a gaming machine including: a plurality of player terminals (also known as satellites or stations) at which a player carries out an input for a game; and a controller which executes a control of the player terminals and a control of a game progress, wherein the controller includes a processor, an ROM and an RAM, wherein, by the processor executing a program stored in the ROM, the controller is caused to operation as: an effect executing unit (for example, a front display and/or a speaker) which executes an effect accompanying the game; a first detecting module (for example, a seating condition detector) which detects whether or not a player terminal has an empty seat; a second detecting module (for example, an observer detector) which detects whether or not an observer, who is a person other than a player playing the game, exists; and an effect selection module (for example, a guiding effect selection section) which, in the event that an existence of an empty seat is detected by the first detecting module, and an existence of an observer is detected by the second detecting module, selects an effect for guiding the observer to the empty seat, and causes the effect execution module to execute the selected effect.

**[0010]** Such a gaming machine, by executing an effect inviting an observer on a periphery of the gaming machine, who has an interest in the game but is unable to participate, to the game and providing an incentive to participate in the game, increases a customer gathering capability of the gaming machine, and increases an operating rate of a whole of the gaming machine.

**[0011]** Also, in the gaming machine, the invention is also established by having a configuration whereby the first detecting module determines whether or not the player terminal has an empty seat by determining whether or not a credit has been inserted in the player terminal.

**[0012]** Also, in the gaming machine, the invention is also established by having a configuration whereby the effect selection module, under a condition that the credit has not been inserted in all the player terminals, selects an effect for guiding the observer.

**[0013]** Also, in the gaming machine, the invention is also established by having a configuration whereby the effect selection module, in the event that a plurality of player terminals with an empty seat exists, selects an effect for guiding the observer to a player terminal with an empty seat which fulfils a prescribed condition as a playing environment.

**[0014]** Also, in the gaming machine, the invention is also established when a player terminal with an empty seat fulfilling the prescribed condition is a player terminal where, of player terminals on both sides, at least one has an empty seat.

**[0015]** Additional objects and advantage of the invention will be set forth in the description which follows, and

in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE INVENTION OF THE DRAWINGS

**[0016]** The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention, and together with the general description given above and the detailed description of the embodiments given below, serve to explain the principals of the invention.

Fig. 1 is an external perspective view of a gaming machine;

Fig. 2 is a perspective view of a player terminal;

Fig. 3 is a block diagram showing a control system of the gaming machine;

Fig. 4 is a perspective view showing an example of an up-down mechanism;

Fig. 5 is a perspective view showing another example of the up-down mechanism;

Fig. 6 is a perspective view showing still another example of the up-down mechanism;

Fig. 7 is a functional block diagram showing a configuration example of the gaming machine;

Fig. 8 is a functional block diagram showing a configuration example of a main controller;

Fig. 9 is a diagram showing an example of an effect pattern table;

Fig. 10 is a functional block diagram showing a configuration example of the player terminal;

Fig. 11 is a view showing a screen example displayed on a front display;

Fig. 12 is a flowchart showing an operation example of the gaming machine; and

Fig. 13 is a flowchart showing another operation example of the gaming machine.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0017]** Hereafter, a description will be given of an embodiment of the invention while referring to the drawings.

### 1. An external appearance of a gaming machine

**[0018]** Fig. 1 shows an external view of a gaming machine according to the embodiment of the invention. As shown in the figure, a gaming machine 100 includes a table 102 on which player terminals 101 called satellites are disposed in an approximate fan shape, and a panel 103 mounted in a rear of the table 102. In an example shown in the figure, five player terminals 101 are disposed in a fan shape facing the panel 103.

**[0019]** The panel 103 is equipped with a front display 104, which is a display device such as a liquid crystal display device, speakers 105, lamps 106 and LED's 107. The front display 104, as well as relaying information related to a whole of a game in which players operating the player terminals 101 participate to each player simultaneously, displays an effect image in response to an action of each player. The front display 104 is designed to display a notification of a start of a bet reception time, a notification of a bet finishing time, a notification of a game outcome and the like, by an animation of a dealer 108. Also, the front display 104 displays an effect which guides the players by means of an animation of the dealer 108.

**[0020]** Fig. 2 shows an enlarged view of the player terminal 101. Hereafter, a description will be given, while referring to Fig. 2, of the player terminal 101. The player terminal 101 includes in a top surface a liquid crystal display 201 for providing information related to the game to the player. The liquid crystal display 201, being covered by a transparent touch sensitive screen 202, configures an input interface in conjunction with an input interface screen displayed by the liquid crystal display 201.

**[0021]** A button group 203, which is a plurality of buttons, such as a payout button, a bet button etc., which a player uses in the game, is disposed in front of the player's liquid crystal display 201. Also, a coin slot 204, for the player to insert a game currency medium such as a coin, a medal or a chip (referred to hereafter simply as a "coin"), is provided to the right of the button group 203. A bill acceptor 205, for the player to insert a bill, is provided below the coin slot 204. A coin sensor (not shown) being disposed inside the coin slot 204, when a coin is inserted in the coin slot 204, a coin detection signal is sent to the player terminal 101 via the coin sensor. Also, a bill sensor (not shown) being disposed inside the bill acceptor 205, when a bill is inserted in the bill acceptor 205, a bill detection signal is sent to the player terminal 101 via the bill sensor.

**[0022]** A camera 109, for capturing a movement of a player using a relevant player terminal 101, is provided at a rear (a side near the panel 103) of the player's liquid crystal display 201, and a sound sensor 110, for capturing an utterance of the player using the relevant player terminal 101, is provided at a side near to the player. The camera 109 transmits image data of the player and an observer, while the sound sensor 110 transmits sound data including the utterance of the player and the observer. The image data and sound data are sent to a main controller, to be described hereafter, and used for a seating condition and an observer detection.

**[0023]** A coin tray 206 being provided in a lower front portion of the player terminal 101, in the event that the player depresses the payout button, which is one of the button group 203, a number of coins corresponding to all or a part of a credit value belonging to the player stored in the player terminal 101 is ejected from the coin tray 206, enabling the player to take possession of them.

**[0024]** A transparent acrylic panel 207 is provided in

an inverted, squared U-shape beyond the liquid crystal display 201 (on the panel 103 side), and a three-dimensional model chip presentation section 208 is provided in an area surrounded by the transparent acrylic panel 207. The three-dimensional model chip presentation section 208 includes three-dimensional model chips 209, a presentation section plate 211, on which are provided apertures 210 for the three-dimensional model chips 209 to project from an interior of the player terminal 101 to an exterior, or to store the projected three-dimensional model chips 209 in the interior of the player terminal 101, and an up-down mechanism (to be described hereafter) for raising and lowering the three-dimensional model chips 209.

**[0025]** The three-dimensional model chips 209, being a model of a pile of chips, are manufactured by molding a resin or the like. It is acceptable that one three-dimensional model chip presentation section 208 has a plurality of three-dimensional model chips 209 of differing units. For example, it is acceptable that three-dimensional model chips representing a pile of chips worth one credit each, three-dimensional model chips representing a pile of chips worth ten credits each, three-dimensional model chips representing a pile of chips worth one hundred credits each, and so on are prepared.

**[0026]** The three-dimensional model chips 209 are raised and lowered by the up-down mechanism in accordance with a number of chips by which the player operating the player terminal 101 on which the three-dimensional model chip presentation section 208 is provided is in credit with the gaming machine 100, that is, an owned credit value. For example, in the event that the player currently has an owned credit value of "251", the three-dimensional model chips representing a pile of chips worth one credit each are raised or lowered so as to project from the presentation section plate 211 to a height equivalent to a thickness of one chip, and a raising or lowering of the three-dimensional model chips representing a pile of chips worth ten credits each is carried out so that they project from the presentation section plate 211 to a height equivalent to a thickness of five chips, while a raising or lowering of the three-dimensional model chips representing a pile of chips worth a hundred credits each is carried out so that they project from the presentation section plate 211 to a height equivalent to a thickness of two chips.

**[0027]** All the players, as well as being able to ascertain promptly and intuitively the player's owned credit value by looking at a height to which the three-dimensional model chips 209 project from the presentation section plate 211, can experience a sense of reality just as though actual chips are increasing and decreasing in front of their eyes.

**[0028]** Fig. 3 is a schematic block diagram showing an example of an internal structure of the gaming machine 100. A main controller 301 is stored in the gaming machine 100. The main controller 301 is configured of an information processor (for example, a microcomputer)

which executes a game program and a peripheral device. The main controller 301, being connected to each player terminal 101 in such a way as to enable two-way communication with them, receives a notification of a player selection such as a number of chips bet, a betting option and the like from each player terminal 101, starts an execution of a game in the event that prescribed conditions have been met, determines the outcome of the game, and notifies each player terminal 101 of a result. Each player terminal 101 carries out an increase or a reduction of the owned credit value of the relevant player in accordance with the notification from the main controller 301. For example, in the event that the player wins the game, each player terminal 101, in accordance with the notification from the main controller 301, adds a credit value equivalent to a number of chips obtained to the owned credit value, and updates a memory while, in the event that the player loses the game, each player terminal 101, in accordance with the notification from the main controller 301, subtracts a credit value equivalent to a number of chips bet from the owned credit value, and updates the memory.

**[0029]** Also, the main controller 301 also carries out a transmission of an image signal to be displayed on the front display 104, a drive control of the lamps 106 and the LED's 107, and a drive control of the speakers 105.

**[0030]** Also, the main controller 301 receives image data and sound data from the camera 109 and the sound sensor 110 provided on each player terminal 101. Although one each of the camera 109 and the sound sensor 110 are displayed representatively, a number of cameras 109 and sound sensors 110 equivalent to a number of player terminals 101 are provided on the gaming machine 100.

**[0031]** An up-down mechanism 302 and a light source 303 are connected to the player terminal 101.

The up-down mechanism 302, being a module for raising and lowering the three-dimensional model chips 209, uses, in the embodiment, a stepping motor as a raising and lowering power, but it is also acceptable that it is a regular motor combined with a position controlling mechanism.

**[0032]** A description will be given of a specific configuration of the up-down mechanism 302, while referring to Fig. 4.

**[0033]** The up-down mechanism 302 shown in Fig. 4 includes a rotation drive shaft 402 attached to a stepping motor 401, abutment members 403<sub>1</sub> to 403<sub>5</sub>, secured to the rotation drive shaft 402, which rotate along with a rotation of the rotation drive shaft 402, arms 405<sub>1</sub> to 405<sub>5</sub> pivotably attached by a support shaft 404 in a position in which one end is in abutment with abutment surfaces 403<sub>1</sub>P to 403<sub>5</sub>P which include the abutment members 403<sub>1</sub> to 403<sub>5</sub>, and tables 406<sub>1</sub> to 406<sub>5</sub> attached to the other end of the arms 405<sub>1</sub> to 405<sub>5</sub>. The three-dimensional model chips 209 are secured in place on an upper surface of the tables 406<sub>1</sub> to 406<sub>5</sub>. Also, the tables 406<sub>1</sub> to 406<sub>5</sub>, being guided by a slide rail 407, are regulated in such a way that the three-dimensional model chips

209 pass correctly through the apertures 210.

**[0034]** In the example shown in Fig. 4, being a configuration raising and lowering five kinds of three-dimensional model chips 209, five each of the abutment members 403<sub>1</sub> to 403<sub>5</sub>, the abutment surfaces 403<sub>1</sub>P to 403<sub>5</sub>P, the arms 405<sub>1</sub> to 405<sub>5</sub> and the tables 406<sub>1</sub> to 406<sub>5</sub> are prepared, and described with subindexes attached in order to distinguish between them, but hereafter, in a case in which it is not necessary to distinguish, they will be marked simply as an abutment member 403, an abutment surface 403P, an arm 405 and a table 406, without attaching a subindex.

**[0035]** Next, a description will be given of an operation of the up-down mechanism 302 shown in Fig. 4.

**[0036]** When the stepping motor 401 driven by the player terminal 101 causes the rotation drive shaft 402 to rotate, the abutment member 403 rotates. As this rotation progresses, the abutment surface 403P comes into abutment with an end of the arm 405. In the embodiment, the abutment surface 403<sub>5</sub>P makes the earliest abutment with an end of the arm 405<sub>5</sub>, followed in an order of the abutment surface 403<sub>4</sub>P, the abutment surface 403<sub>3</sub>P, the abutment surface 403<sub>2</sub>P and the abutment surface 403<sub>1</sub>P making abutment with an end of the corresponding arms 405<sub>4</sub> to 405<sub>1</sub>.

**[0037]** After the abutment surface 403P has made abutment with the end of the arm 405, as the abutment member 403 rotates further, the abutment surface 403P pushes down the end of the arm 405.

**[0038]** The arm 405 of which one end has been pushed down pivots around the support shaft 404 so that the other end is pushed in an upward direction. As a result, the table 406 secured to the other end is also pushed in an upward direction, and the three-dimensional model chips 209 mounted on the table 406 rise along with it. As a result, in accordance with a degree of rotation of the rotation drive shaft 402 caused by the stepping motor 401, it is possible to expose a part or a whole of the three-dimensional model chips 209 by causing them to pass through the aperture 210 and project from the presentation section plate 211.

**[0039]** Also, by causing the stepping motor 401 to rotate in a reverse direction, it is possible to temporarily store a part or the whole of the three-dimensional model chips 209 projected from the presentation section plate 211 beneath the presentation section plate 211.

**[0040]** In the configuration example shown in Fig. 4, as a formation of the abutment members 403<sub>1</sub> to 403<sub>5</sub> is fixed in such a way that a timing at which the abutment surfaces 403<sub>1</sub>P to 403<sub>5</sub>P make abutment with the end of the corresponding arms 405<sub>1</sub> to 405<sub>5</sub> differs, the three-dimensional model chips 209 on a right side in the figure start to rise the earliest, followed by the three-dimensional model chips 209 on the right side to the three-dimensional model chips 209 on a left side starting to rise in order. Using this property, by giving each of the three-dimensional model chips 209 on a farthest right end a low value (for example, one credit per chip), increasing

a value of each chip as they progress to the left (for example, five credits, ten credits, a hundred credits, a thousand credits per chip), and distinguishing the three-dimensional model chips by color and pattern, it is possible to express a wide range of owned credit values, such as one to a hundred thousand credits, by an amount of projection of the three-dimensional model chips 209.

**[0041]** Next, another configuration example of the up-down mechanism 302 is shown in Figs. 5 and 6. Fig. 5 is a perspective view of a basic unit of the another configuration example of the up-down mechanism 302. One up-down mechanism 302 is configured by collecting a plurality of the basic units.

**[0042]** In the basic unit of the up-down mechanism 302, a table 503 is attached to a rotation drive shaft 502 rotationally driven by a stepping motor 501.

**[0043]** As in the previously described example, the three-dimensional model chips 209 are mounted on an upper surface of the table 503. The three-dimensional model chips 209 being formed of a left and right hollow semi-cylinder stuck together to make one set of three-dimensional model chips 209, Fig. 5 shows one side of the hollow semi-cylinder before sticking together. Although not shown, it is the same as the previously described example in that the three-dimensional model chips 209 rise and descend in such a way as to project from or retreat into the aperture 210 in the presentation section plate 211.

**[0044]** A nut 504 is secured to an underneath of the table 503. A screw thread and a screw groove (not shown) being formed on an outer periphery of the rotation drive shaft 502, the nut 504 and the rotation drive shaft 502 are screwed together.

**[0045]** The table 503 is regulated so as not to rotate along with a rotation of the rotation drive shaft 502. For example, it is acceptable to provide a guide rail, as in the previously described example, and regulate the rotation of the table 503 (a movement in an upward and downward direction is not regulated), or to bring it into slidable abutment with an interior wall or the like of the gaming machine 100, and regulate the rotation of the table 503 (the movement in the upward and downward direction is not regulated).

**[0046]** By causing the rotation drive shaft 502 to rotate, the table 503 is threadably advanced and retracted. That is, by controlling a rotation drive of the stepping motor 501, it is possible to control a rising and descending of the table 503, that is, of the three-dimensional model chips 209 mounted on it.

**[0047]** Fig. 6 is a perspective view showing an example of a case in which the up-down mechanism 302 is configured using a plurality of the basic units. In the example of the up-down mechanism 302, it is configured of a line of five basic units on which one set of the three-dimensional model chips 209 is mounted, and a line of five basic units on which one set of the three-dimensional model chips 209 is mounted. As each basic unit has a stepping motor 501, it is possible to carry out an up-down

control of the three-dimensional model chips 209 for each basic unit independently.

**[0048]** For this reason, when using an up-down mechanism 302 with this kind of configuration, it is possible not only to use the rising and descending of the three-dimensional model chips 209 to display the owned credit value, but also to cause it to carry out another display, for example, to operate in order to carry out an effect such as causing the three-dimensional model chips 209 to rise and fall like a swelling of a wave, from right to left, or from left to right, in the event of the player of the player terminal acquiring a large win.

**[0049]** Returning to Fig. 3, the description of the outline configuration of the gaming machine 100 will be continued.

**[0050]** The player terminal 101, being connected to the light source 303, controls a light emitting operation of the light source 303. The light source 303, being a circuit having a light emitting source such as a plurality of LED's, functions as a light source which can emit different colors (for example, red, blue, green, white etc.) and change a luminance. Light emitted from the light source 303 is guided by the transparent acrylic panel 207, and emitted to an exterior of the gaming machine 100, in particular in a direction visually confirmed by the player.

## 2. A configuration example of the main controller

**[0051]** Next, a description will be given of a configuration example of the main controller 301, while referring to Fig. 7. Fig. 7 is a block diagram of the gaming machine 100, centered around the main controller 301.

**[0052]** The main controller 301, being basically configured to have as its nucleus a microcomputer 705, which includes a CPU 701, an RAM 702, an ROM 703, and a bus 704 for carrying out a reciprocal data transmission between them, the ROM 703 and the RAM 702 are connected to the CPU 701 via the bus 704. Various kinds of program, data table and the like for carrying out processes necessary for a controlling of the gaming machine 100 are stored in the ROM 703. Also, the RAM 702 is a memory which temporarily stores various data calculated by the CPU 701.

**[0053]** The microcomputer 705, or more specifically the CPU 701, being connected to an image processing circuit 707 via an I/O interface 706, the image processing circuit 707 is connected to the front display 104, and controls a drive of the front display.

**[0054]** The image processing circuit 707 includes a program ROM, an image ROM, an image control CPU, a work RAM, a VDP (Video Display Processor), a video RAM, etc.. An image control program related to a display on the front display 104, and various selection tables, are stored in the program ROM. Also, image configuration data for forming an image such as, for example, dot data, polygon data and texture data for forming an image on the front display 104, are stored in the image ROM. Also, the image control CPU, based on parameters set by the

CPU 701, in accordance with the image control program stored in advance in the program ROM, determines an image to be displayed on the front display 104 from among the image configuration data stored in advance in the image ROM. The image configuration data includes moving picture data for changing an expression and action of the dealer 108 to be displayed on the front display 104 in accordance with a progress and condition of the game.

**[0055]** Also, the work RAM is configured as a temporary memory when executing the image control program with the image control CPU. Also, the VDP generates image data corresponding to display details determined by the image control CPU, and transmits them to the front display 104. The video RAM is configured as a temporary memory when forming the image with the VDP.

**[0056]** The image processing circuit 707 has a function by which it synthesizes image data of a background image and an image of the dealer 108, generates image data in which the dealer 108 is facing the player backed by the background data, and transmits them to the front display 104.

**[0057]** Furthermore, the microcomputer 705, or more specifically the CPU 701, being connected to the speakers 105 via a sound circuit 708, the speakers 105, based on an output signal from the sound circuit 708, generate various sound effects, background music, a synthesized sound corresponding to an utterance of the dealer 108, a sampling sound or the like when carrying out various effects.

**[0058]** Also, the microcomputer 705, or more specifically the CPU 701, being connected to the camera 109 and the sound sensor 110 provided on each player terminal 101, receive image data and sound data. Although one each of the camera 109 and the sound sensor 110 are displayed representatively, a number of cameras 109 and sound sensors 110 equivalent to a number of player terminals 101 are provided on the gaming machine 100.

**[0059]** Also, the microcomputer 705, or more specifically the CPU 701, is connected to the lamps 106 and the LED's 107 via a lamp drive circuit 709. The lamps 106 and the LED's 107, being disposed in a large quantity on a front of the gaming machine 100, are controlled as to illumination, when carrying out the various effects, by the lamp control circuit 709 based on a drive signal from the CPU 701.

**[0060]** Also, each player terminal 101 being connected to the microcomputer 705, or more specifically the CPU 701, via a communication interface 710, a two-way communication can be carried out between the CPU 701 and the player terminals 101. As the CPU 701, by means of the communication interface 710, can carry out a transmission and reception of a command, a transmission and reception of a request and the like with each player terminal 101, the main controller 301 and the main player terminals 101 cooperate in controlling a progression of the game.

### 3. A function of the main controller

**[0061]** A function of the main controller 301 according to the embodiment is realized mainly by the microcomputer 705, or more specifically the CPU 701, executing a program stored in the ROM 703. Hereafter, functions realized by the microcomputer 705, or more specifically the CPU 701, executing a program will be described.

**[0062]** Fig. 8 is a functional block diagram of the main controller 301. In the example shown in the diagram, the CPU 701 functions as a process management section 801, a game executing section 802 which carries out an exchange of data with the process management section 801, a seating condition detector 803, an observer detector 804, and a guiding effect selection section 805.

#### 3.1. The process management section

**[0063]** The process management section 801 carries out an overall control over an operation of each circuit in the main controller 301 as well as the game executing section 802, the seating condition detector 803, the observer detector 804, and the guiding effect selection section 805. More specifically, the process management section 801 receives various signals, commands, requests and so on from each player terminal 101 and, in accordance with the received signals etc., commands the game executing section 802, the seating condition detector 803, the observer detector 804, and the guiding effect selection section 805 to start up and carry out a process.

**[0064]** Also, the process management section 801, while carrying out a communication with each player terminal 101, judges a start, execution and finish of the game and, based on the judgment, sends a command, a request, a notification etc. to each player terminal 101.

**[0065]** Also, the process management section 801 transmits an image generation command to the image control circuit 707 such as to cause it to display an effect image, including the dealer 108, on the front display 104. Also, in order to carry out an effect in accordance with a progress condition of the game, it transmits a drive command to the lamp drive circuit 709 and the sound drive circuit 708, causes them to drive the lamps 106, LED's 107 and speakers 105, and execute an effect by means of a light and a sound.

**[0066]** The game executing section 802, the seating condition detector 803, the observer detector 804, and the guiding effect selection section 805 controlled by the process management section 801 have the kind of functions described hereafter. 3.2. The game executing section

**[0067]** The game executing section 802, by operating in conjunction with each player terminal 101, has a function of executing a main game of the gaming machine 100.

**[0068]** The game executing section 802, being started up by a game start judgment of the process management

section 801, executes a game program stored in advance in the ROM 703 and, in conjunction with each player terminal 101, causes the player to play the game.

**[0069]** Also, the game executing section 802 transmits an image display instruction to the image processing circuit 707 such as to cause it to display a game image, which changes constantly along with the progress of the game, on the front display 104. Based on the instruction, the image processing circuit 707 generates image data using the background image, stripes or the like stored in the image ROM, and displays an image based on the image data on the front display 104.

#### 3.3. The seating condition detector

**[0070]** The seating condition detector 803 determines, for each player terminal 101, whether or not a player is currently playing, and stores a determination result as seating condition information in a seating condition information memory 806, which is a prescribed storage area in the RAM 702.

**[0071]** As a method of determining whether or not the player is playing, a method can be considered by which in the event that, according to a notification from each player terminal 101, a credit has been inserted in the respective player terminal 101, it is determined that a player is sitting at the player terminal 101, while in the event that no credit has been inserted, it is determined that no player is sitting at the player terminal 101, that is, a seat is empty.

**[0072]** Also, as another determination method, as well as determining based on a presence or otherwise of the kind of credit insertion described heretofore, it is also acceptable to determine, in the event that it is detected by the camera 109 or the sound sensor 110 that somebody is occupying the player terminal 101, that a player is sitting at the player terminal 101, while in the event that there is no such detection, it is determined that the seat is empty.

**[0073]** The seating condition detector 803 updates seating condition information regularly or as required.

#### 3.4. The observer detector

**[0074]** The observer detector 804 has a function of determining whether or not an observer exists in a periphery of the gaming machine 100. Herein, "an observer" refers to a person, being a person positioned in a proximity or the periphery of the gaming machine 100, who is not operating the player terminal 101.

**[0075]** The observer detector 804 in the embodiment detects a person positioned in the proximity or the periphery of the player terminal 101 by analyzing image data transmitted from the camera 109 and, in the event that somebody is present, determines that the person detected is an observer in the event that nobody is sitting at the relevant player terminal.

**[0076]** Also, the observer detector 804 carries out a

sound recognition process on sound data transmitted from the sound sensor 110, and determines a presence or otherwise of an observer based on utterance details obtained as a result of the sound recognition. For example, the observer detector 804, on carrying out a sound recognition process on sound data, determines whether or not a keyword, for example, a word related to a game or a place such as "let's play", "here" or "there", suggesting that a speaker is an observer is included in the utterance details obtained as the result of the sound recognition and, in the event that nobody is sitting at the relevant player terminal when that kind of keyword is detected, determines that an observer exists.

### 3.5. The guiding effect selection section

**[0077]** The guiding effect selection section 805 has a function by which, on receiving the determination result from the observer detector 804, in the event that an observer has been detected, it refers to storage details of the seating condition information memory 806 to determine whether or not there is an empty seat. In the event that there is an empty seat at any of the player terminals 101, the guiding effect selection section 805 chooses a best player terminal 101 from among those with the empty seats, and carries out an image display on the front display 104 such as to carry out an effect guiding the detected observer to the chosen player terminal 101.

**[0078]** A selection of effect data is carried out by, for example, preparing in advance an effect pattern table 807 in the ROM 703. The effect pattern table 807 stores a plurality of kinds of effect pattern in accordance with a position of an observer and a position of the chosen player terminal 101 with the empty seat. The effect patterns are data for use in instructing the image processing circuit 707 to create an action, an expression etc. of the dealer 108 to be displayed on the front display 104, and instructing the sound circuit 708 to transmit vocalized contents of the dealer 108, background music, sound effects etc..

**[0079]** Fig. 9 is a diagram showing a data configuration example of the effect pattern table 807. The effect pattern table 807 is a table configured in such a way that, when an observer position detected by the observer detector 804, and a player terminal 101 chosen as the one to be guided to by the guiding effect selection section 805, are fixed, one moving picture data file is specified.

**[0080]** The effect pattern table 807 has one record R1, R2, R3 up to R25 for each combination of an observer position and a player terminal 101 to be guided to. Each record includes an observer position field 901 which stores the observer position, a guiding objective player terminal field 902 which stores an identification number of the player terminal 101 to be guided to, and an effect pattern file field 903 which stores a name (a bus name) of a moving picture data file correlated to a combination of the observer position and the player terminal. In the example, the observer position is specified according to the player terminal 101 in a position nearest to the ob-

server, but it is also acceptable to carry out a specification of the observer position by another method (an angle or a coordinate position with respect to a reference).

**[0081]** To give a description of a record R1, in a case in which the observer position is a player terminal 101 to which an identification number "001" is allotted (for example, a player terminal on a left end when facing the gaming machine), and the player terminal to be guided to is also the player terminal 101 to which the identification number "001" is allotted, a moving picture data file with an effect pattern file name "annai.001.001" is specified as data for a guiding effect to be executed later. The moving picture data is such that, first, the dealer 108 turns a face and eyes toward the player terminal 101 with the identification number "001", and speaks to the observer who should be positioned there, then, as well as the dealer 108 extending a hand in a direction of the player terminal 101 with the identification number "001", which is the player terminal 101 to be guided to, urging the observer to sit down, a sound is simultaneously transmitted from the speakers 105 saying "Would the customer watching like to play in this seat?".

**[0082]** By means of the effect pattern table 807, whatever position the observer is in, and whichever player terminal 101 is a guiding objective, moving picture data for an appropriate guidance is selected.

**[0083]** Returning to Fig. 8, the description of the main controller 301 will be continued.

**[0084]** In the embodiment, the guiding effect selection section 805 first looks for, as a good seat, a player terminal 101 with an empty seat which has an empty seat on both sides and, failing that, a player terminal 101 with an empty seat which has an empty seat on one side. This is in order that the player can play without feeling cramped.

**[0085]** The guiding effect selection section 805 selects an effect pattern, from the plurality of effect patterns stored in the effect pattern table 807, in accordance with the observer position and the position of the chosen player terminal 101 with the empty seat, and notifies the process management section 801 of the effect pattern. The process management section 801 which receives the notification issues a command to the image processing circuit 707 and the sound circuit 708 so that they carry out an image display and a sound transmission in accordance with the effect pattern, whereon the image processing circuit 707 and the sound circuit 708 execute a display of a moving picture image and a transmission of a sound, which are guiding effects, in accordance with the command.

**[0086]** This completes the description of the configuration and functions of the main controller 301.

### 4. A configuration example of the player terminal

**[0087]** Next, a description will be given of a configuration example of the player terminal 101, while referring to Fig. 10. Fig. 10 is a functional block diagram showing



a control system of the player terminal 101.

**[0088]** The player terminal 101 being basically configured to have as its nucleus a microcomputer 1005, which includes a CPU 1001, an RAM 1002, an ROM 1003, and a bus 1004 for carrying out a reciprocal data transmission between them, the ROM 1003 and the RAM 1002 are connected to the CPU 1001 via the bus 1004. Various kinds of program, data table and the like for carrying out processes necessary for a controlling of the player terminal 101, for example, an operation control of the up-down mechanism 302, an on/off control of the light source and the like, are stored in the ROM 1003. Also, the RAM 1002 is a memory which temporarily stores various data calculated by the CPU 1001.

**[0089]** The microcomputer 1005, or more specifically the CPU 1001, being connected to a liquid crystal panel drive circuit 1007 via an I/O interface 1006, the liquid crystal panel drive circuit 1007, being connected to the liquid crystal display 201, controls a drive of the liquid crystal display 201.

**[0090]** Also, the microcomputer 1005, or more specifically the CPU 1001, being connected to a touch sensitive screen drive circuit 1008 via the I/O interface 1006, the touch sensitive screen drive circuit 1008 transmits coordinate data for a contact position on the transparent touch sensitive screen 202.

**[0091]** A hopper 1014 is connected to the microcomputer 1005, or more specifically the CPU 1001, via a hopper drive circuit 1009. When a drive signal is transmitted from the CPU 1001 to the hopper drive circuit 1009, the hopper 1014 pays out a prescribed number of coins from the coin tray 206. Also, a coin detector 1015 is connected to the CPU 1001 via a payout completion signal circuit 1010. The coin detector 1015 being disposed inside the coin tray 206, when detecting that the prescribed number of coins has been paid out from the coin tray 206, a coin payout detection signal is transmitted from the coin detector 1015 to the payout completion signal circuit 1010, based on which the payout completion signal circuit 1010 transmits a payout completion signal to the CPU 1001.

**[0092]** Also, the microcomputer 1005, or more specifically the CPU 1001, is connected to a stepping motor control circuit 1011 which rotationally drives the stepping motor 401 (or 501) for driving the up-down mechanism 302. When a motor drive signal is transmitted from the CPU 1001 to the motor control circuit 1011, the stepping motor 401 (or 501) is rotationally driven by the stepping motor control circuit 1011. By this means, the up-down mechanism 302 operates, carrying out a raising and lowering of the three-dimensional model chips 209.

**[0093]** Furthermore, the microcomputer 1005, or more specifically the CPU 1001, is connected to an LED drive control circuit 1012 for driving the light source 303. In the embodiment, the light source 303 including a plurality of LED's, the LED drive control circuit 1012, in response to an LED drive command from the CPU 1001, supplies drive power to the LED from among all the LED's which is the subject of the drive command. By this means, it is

possible to carry out an on/off control of the LED's in a desired aspect under the control of the CPU 1001.

**[0094]** In the embodiment, the light source 303 including five red LED's, five blue LED's and five white LED's, the LED drive control circuit 1012 is configured as a circuit which can selectively supply power in such a way as to individually and independently turn on and off the five red LED's, the five blue LED's and the five white LED's.

**[0095]** Furthermore still, the microcomputer 1005, or more specifically the CPU 1001, being connected to the main controller 301 via a communication interface 1013, a two-way communication can be carried out between the CPU 1001 and the main controller 301. The CPU 1001 can carry out a transmission and reception etc. of a command, a request, data and the like with the main controller 301, and the main controller 301 and the player terminals 101 cooperate in controlling a progression of the main game.

## 5. A screen example

**[0096]** Next, a description will be given of a screen example of the gaming machine 100.

**[0097]** Fig. 11 is a view showing a screen example displayed on the front display 104 of the gaming machine 100. In the example, the dealer 108 composed by computer graphics is displayed. The game processing section 802, by issuing a command to the image processing circuit 707, controls a display of the front display 104 so that the dealer 108 performs an action such as dealing cards to each player, collecting chips from a losing player and distributing chips to a winning player, in accordance with a progress of the game. The player can play a game while feeling that a dealer actually exists, so a game with a greater sense of reality is effected.

**[0098]** Also, the dealer 108 displayed on the front display 104, as previously described, is also used in the guiding effects for guiding the observer.

## 6. An operation example

**[0099]** In the case of the gaming machine 100, while a game process is executed by the game executing section 802, a selection and execution of the observer guiding effects are carried out by the seating condition detector 803, the observer detector 804 and the guiding effect selection section 805.

**[0100]** Hereafter, a description will be given, while referring to Fig. 12, of the selection and execution of the observer guiding effects in the gaming machine 100. Fig. 12 is a flowchart showing an observer guiding effects selection and execution process, which is one part of an operation example of the gaming machine 100.

**[0101]** In the event that certain conditions are fulfilled, the gaming machine 100, or more specifically the main controller 301, carries out the process shown in Fig. 12. The certain conditions are, for example, that a certain game has finished and a start of a next game is being

awaited.

**[0102]** In the process shown in Fig. 12, firstly, the main controller 301, or more specifically the seating condition detector 803, is started up, whereon the seating condition detector 803, by enquiring into a presence or otherwise of an inserted credit in each player terminal 101, and/or analyzing the image data transmitted from the camera 109 and the sound data transmitted from the sound sensor 110, carries out a seating condition information update (S1201), which is a process updating the seating condition information. The updated latest seating condition information is overwritten and stored in the seating condition information memory 806.

**[0103]** When the seating condition information update (S1201) is completed, the observer detector 804 is started up in place of the seating condition detector 803.

**[0104]** The started up observer detector 804, firstly, refers to the latest seating condition information stored in the seating condition information memory 806, and determines whether or not there is an empty seat (S1202). If it is determined that there is no empty seat (S1202, No), the observer detector 804 notifies the process management section 801 that the process is to be finished, whereon the process management section 801 finishes a whole process without doing anything.

**[0105]** Meanwhile, if it is determined that there is an empty seat (S1202, Yes), the observer detector 804 determines whether or not an observer exists (S1203). Specifically, the observer detector 804 determines the presence or otherwise of an observer based on the image data transmitted from the camera 109, the sound data transmitted from the sound sensor 110, and the latest seating condition information stored in the seating condition information memory 806.

**[0106]** If it is determined that no observer exists (S1203, No), the observer detector 804 notifies the process management section 801 that the process is to be finished, whereon the process management section 801 finishes the whole process without doing anything.

**[0107]** Meanwhile, if it is determined that an observer exists (S1203, Yes), the observer detector 804 starts up the guiding effect selection section 805. The started up guiding effect selection section 805 chooses the best player terminal 101 with an empty seat based on the latest seating condition information stored in the seating condition information memory 806 (S1204). Although there are various opinions regarding what kind of seat to choose as the best seat, the invention is established regardless of an opinion by which the best seat is chosen.

**[0108]** Next, the guiding effect selection section 805 causes the player terminal with the empty seat chosen in S1204 to execute observer guiding effects such as to urge the observer to sit at the relevant player terminal 101 (S1205). More specifically, the guiding effect selection section 805 selects a most appropriate effect pattern, from the effect pattern table 807, in accordance with the observer position and the position of the chosen player terminal with the empty seat, and notifies the process

management section 801 of the effect pattern. The process management section 801 which receives the notification issues a command to the image processing circuit 707 and the sound circuit 708 so that they carry out an image display and a sound transmission in accordance with the effect pattern. The image processing circuit 707 and the sound circuit 708 execute a display of a moving picture image and a transmission of a sound, which are guiding effects, in accordance with the command.

**[0109]** In this way, the gaming machine 100, in the event that there is an observer watching the game, carries out effects guiding the observer to a more comfortable seat, thus enabling an increase in an operating rate of a whole of the gaming apparatus.

## 7. Other

**[0110]** 1. Although, in the embodiment described heretofore, the seating condition, and the presence or otherwise of an observer, are determined by the camera 109 and the sound sensor 110, the invention is also established by detecting the seating condition, and the presence or otherwise of an observer, by providing a pressure sensitive sensor or an infra-red sensor in a stool (chair) installed in the player terminal 101, or in a periphery of the gaming machine 100.

**[0111]** 2. Although, in the embodiment described heretofore, the configuration is such that the camera 109 is provided in each player terminal 101, the invention is also established by having a configuration carrying out a seating condition detection and an observer determination at each player terminal by providing just one camera, which captures all the player terminals 101 in a filming range, and carrying out an image analysis of a peripheral area of each player terminal 101 from image data transmitted by the camera.

## 8. Another embodiment

**[0112]** Hereafter, a description will be given of another embodiment of a selection and execution of observer guiding effects in the gaming machine 100, while referring to Fig. 13. Fig. 13 is a flowchart showing an example of an observer guiding effects selection and execution process, which is one part of the operation example of the gaming machine 100.

**[0113]** The gaming machine 100, or more specifically the main controller 301, carries out the process shown in Fig. 13 when, for example, a situation is such that a certain game has finished and a start of a next game is being awaited.

**[0114]** In the process shown in Fig. 13, firstly, the main controller 301, or more specifically the seating condition detector 803, is started up, whereon the seating condition detector 803, as well as enquiring into a presence or otherwise of an inserted credit in each player terminal 101, by analyzing as necessary image data transmitted from the camera 109 and sound data transmitted from the

sound sensor 110, carries out a seating condition information update (S1301), which is a process updating the seating condition information. The updated latest seating condition information is overwritten and stored in the seating condition information memory 806.

**[0115]** When the seating condition information update (S1301) is completed, the observer detector 804 is started up in place of the seating condition detector 803.

**[0116]** The started up observer detector 804, firstly, refers to the latest seating condition information stored in the seating condition information memory 806, and determines whether or not all of the player terminals 101 have an empty seat (S1302). If it is determined that not all of the player terminals 101 have an empty seat (S1302, No), the observer detector 804 notifies the process management section 801 that the process is to be finished, whereon the process management section 801 finishes a whole process without doing anything.

**[0117]** Meanwhile, if it is determined that all of the player terminals 101 have an empty seat (S1302, Yes), the observer detector 804 determines whether or not an observer exists (S1303). Specifically, the observer detector 804 determines the presence or otherwise of an observer based on the image data transmitted from the camera 109, the sound data transmitted from the sound sensor 110, and the latest seating condition information stored in the seating condition information memory 806.

**[0118]** If it is determined that no observer exists (S1303, No), the observer detector 804 notifies the process management section 801 that the process is to be finished, whereon the process management section 801 finishes the whole process without doing anything.

**[0119]** Meanwhile, if it is determined that an observer exists (S1303, Yes), the guiding effect selection section 805 starts up, and executes observer guiding effects such as to urge the observer to sit at the player terminal 101 (S1304).

**[0120]** At this time, the guiding effect selection section 805, in the event that all the player terminals 101 have an empty seat, selects a most appropriate effect pattern, for example, one which invites an observer to a seat while emphasizing a fun of a game, from the effect pattern table 807, and notifies the process management section 801 of the effect pattern. The process management section 801 which receives the notification issues a command to the image processing circuit 707 and the sound circuit 708 so that they carry out an image display and a sound transmission in accordance with the effect pattern. The image processing circuit 707 and the sound circuit 708 execute a display of a moving picture image and a transmission of a sound, which are guiding effects, in accordance with the command.

**[0121]** In this way, in the embodiment, in the event that all the player terminals 101 have an empty seat, an operating rate of the gaming apparatus can be increased by carrying out effects to enthusiastically invite an observer to the player terminal 101 of the gaming machine.

**[0122]** To recapitulate the advantages obtained by the

respective embodiments of the present invention, they are as follows.

(1) By executing the effect inviting the observer on the periphery of the gaming machine, who has an interest in the game but is unable to participate, to the game and providing the incentive to participate in the game, increases the customer gathering capability of the gaming machine, and increases the operating rate of the whole of the gaming machine.

(2) The gaming machine can carry out the determination of the empty seat without being equipped with the special sensor.

(3) By executing the effect enthusiastically inviting the observer on the periphery of the gaming machine with no player, who has the interest in the game but is not participating, to participate in the game, the customer gathering capability of the gaming machine is increased, and the operating rate of the whole of the gaming machine is increased.

(4) The player newly coming into contact with the gaming machine is made to feel able to play the game in the pleasant environment, the repeater rate (the rate of repeatedly using the gaming machine) of the gaming machine is increased, the customer gathering capability of the gaming machine is further increased, and the operating rate of the whole of the gaming machine is further increased.

(5) As at least one side is the empty seat, the user, who is the observer, invited to play can enjoy playing the game in the spacious environment, as a result of which the repeater rate (the rate of repeatedly using the gaming machine) of the gaming machine is increased, the customer gathering capability of the gaming machine is further increased, and the operating rate of the whole of the gaming machine is further increased.

(6) In the event that there is the observer watching the game, it is possible to increase the operating rate of the whole of the gaming machine by carrying out the effect inviting the observer to play the game.

(7) In the event that there is the observer watching the game, the operating rate of the whole of the gaming machine is increased by carrying out the effect inviting the observer to the pleasanter seat. Also, by causing the observer to play the game in the pleasant environment, it is possible to increase the player repeating rate (the rate of playing on the gaming machine again), and further increase the operating rate of the whole of the gaming machine.

**[0123]** Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the ap-

pending claims and their equivalents.

## Claims

1. A gaming machine comprising:
  - a plurality of player terminals at which a player carries out an input for a game; and
  - a controller which executes a control of the player terminals and a control of a game progress, the gaming machine enabling a plurality of players to play an identical game simultaneously, wherein

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the controller is caused to operation as:

  - effect executing unit which executes an effect accompanying the game;
  - first detecting means which detects whether or not a player terminal has an empty seat;
  - second detecting means which detects whether or not an observer, who is a person other than a player playing the game, exists; and
  - effect selection means which, in the event that an existence of an empty seat is detected by the first detecting means, and an existence of an observer is detected by the second detecting means, selects an effect for guiding the observer to the empty seat, and causes the effect execution means to execute the selected effect.

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2. The gaming machine according to claim 1, wherein the first detecting means determines whether or not the player terminal has an empty seat by determining whether or not a credit has been inserted in the player terminal.
 

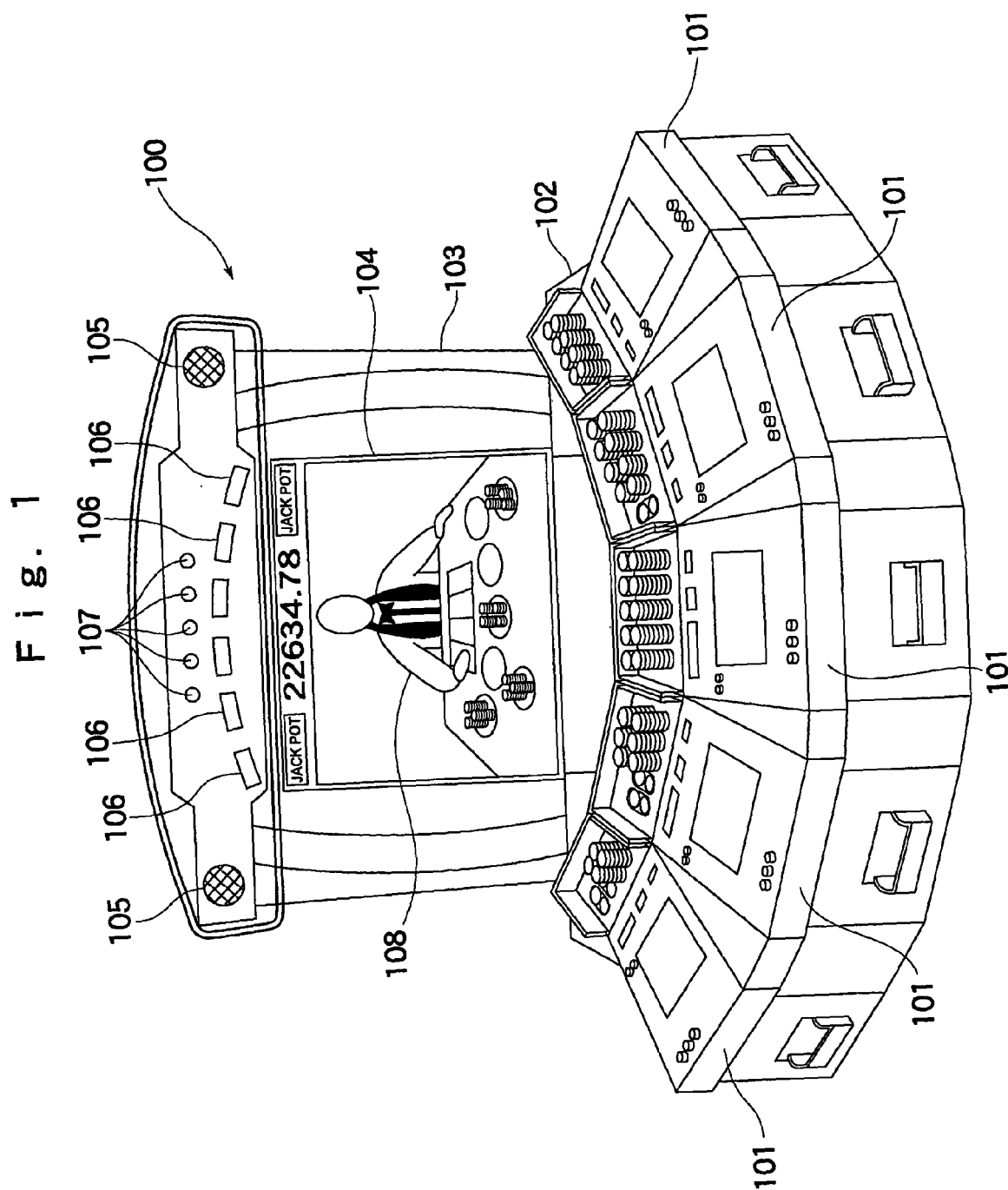
35
3. The gaming machine according to either of claims 1 and 2, wherein
  - the effect selection means, under a condition that the credit has not been inserted in all the player terminals, selects an effect for guiding the observer.

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4. The gaming machine according to any one of claim 1 to claim 3, wherein
  - the effect selection means, in the event that a plurality of player terminals with an empty seat exists, selects an effect for guiding the observer to a player terminal with an empty seat which fulfils a prescribed condition.

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5. The gaming machine according to claim 4, wherein the player terminal with the empty seat which fulfils the prescribed condition is a player terminal where, of player terminals on both sides, at least one has an empty seat.
 

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F i g. 2

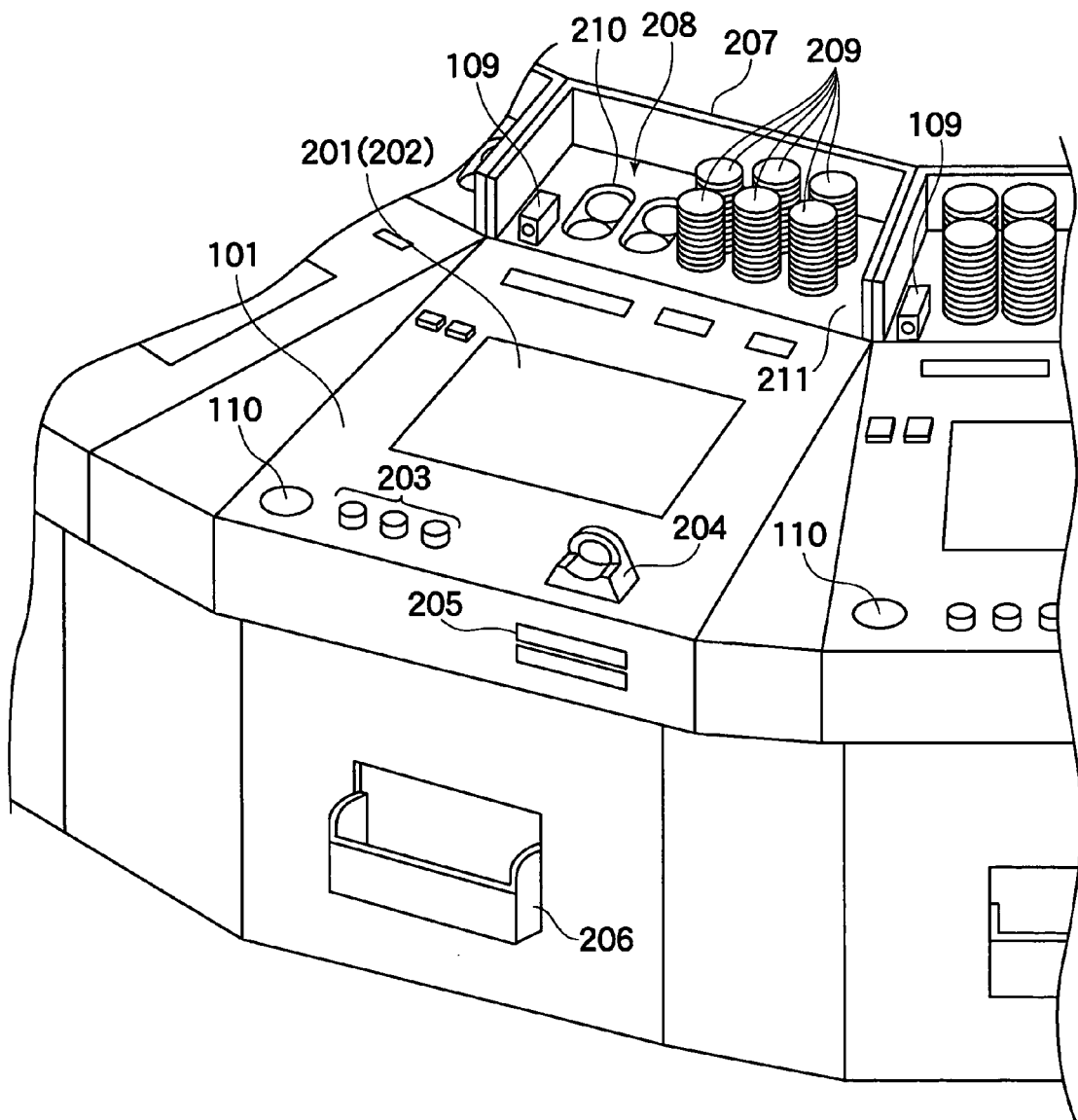


Fig. 3

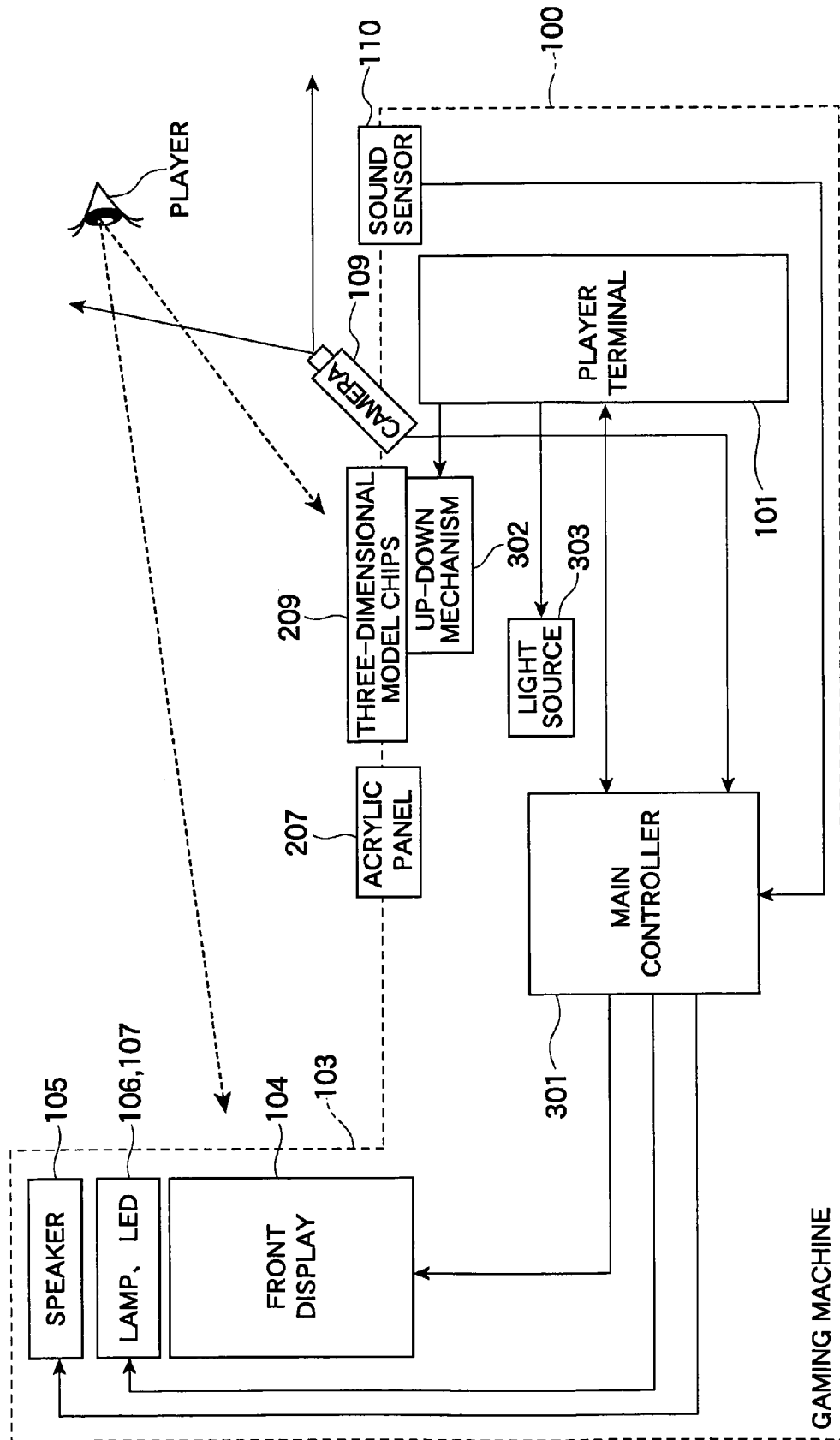
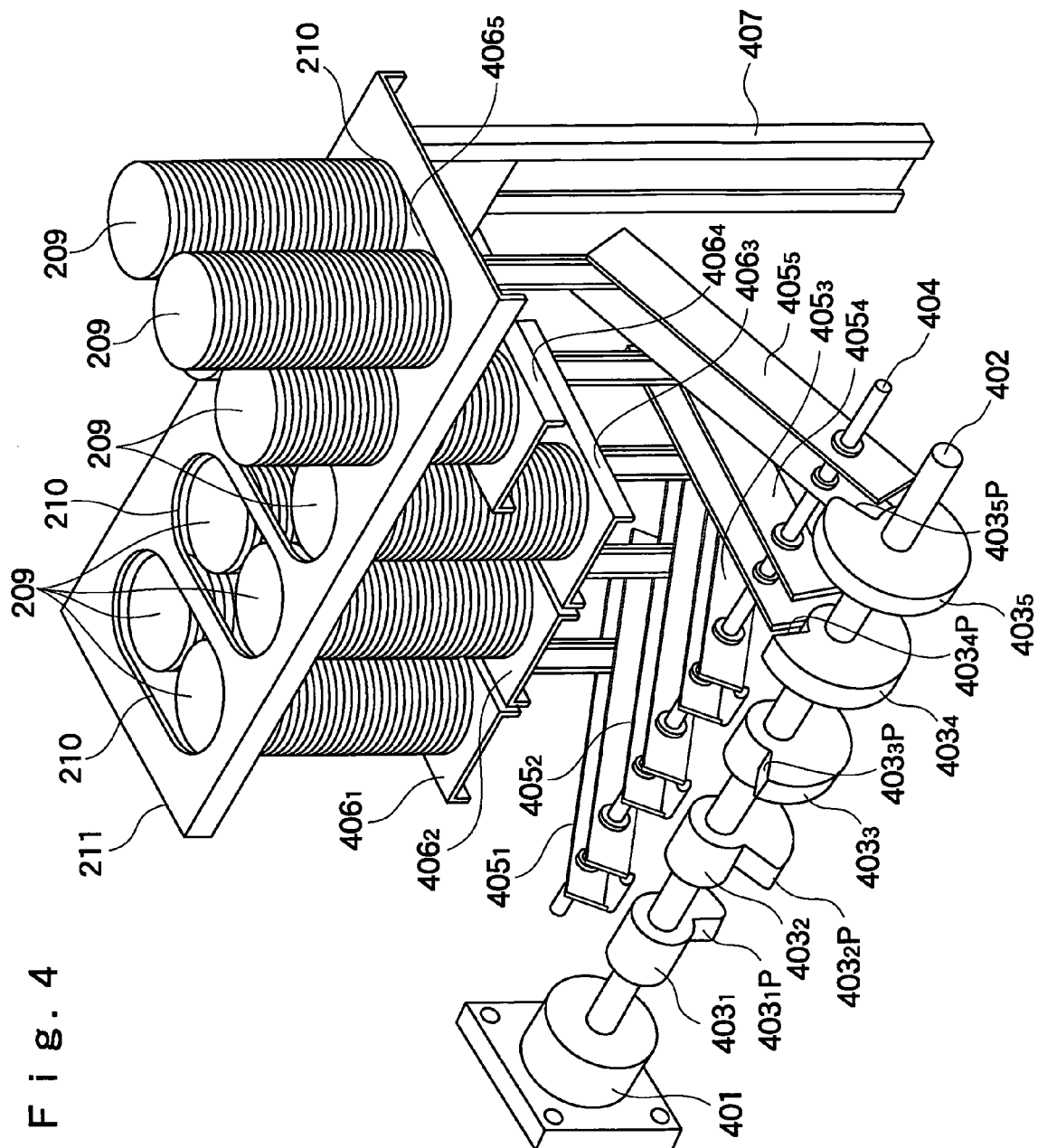
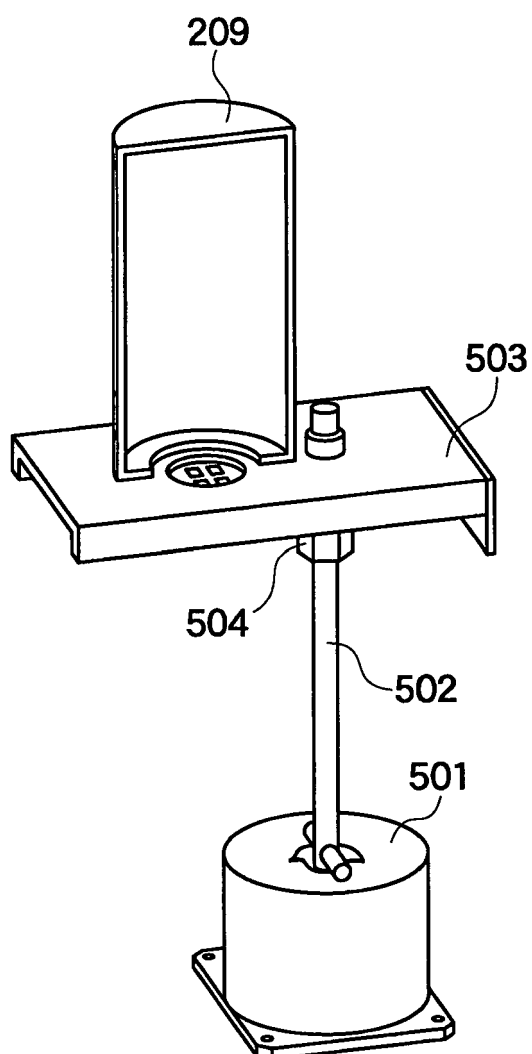


Fig. 4





F i g . 5



F i g . 6

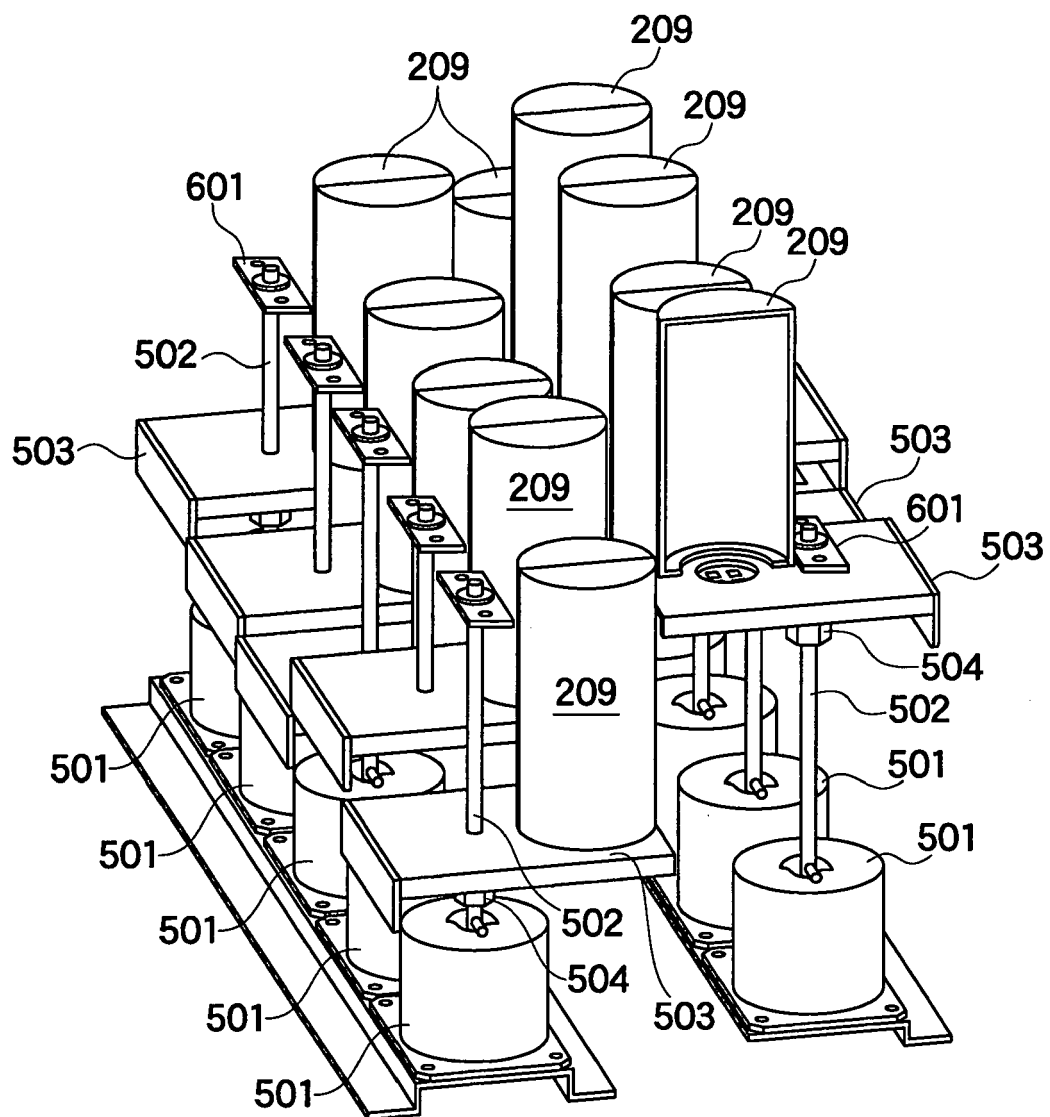


Fig. 7

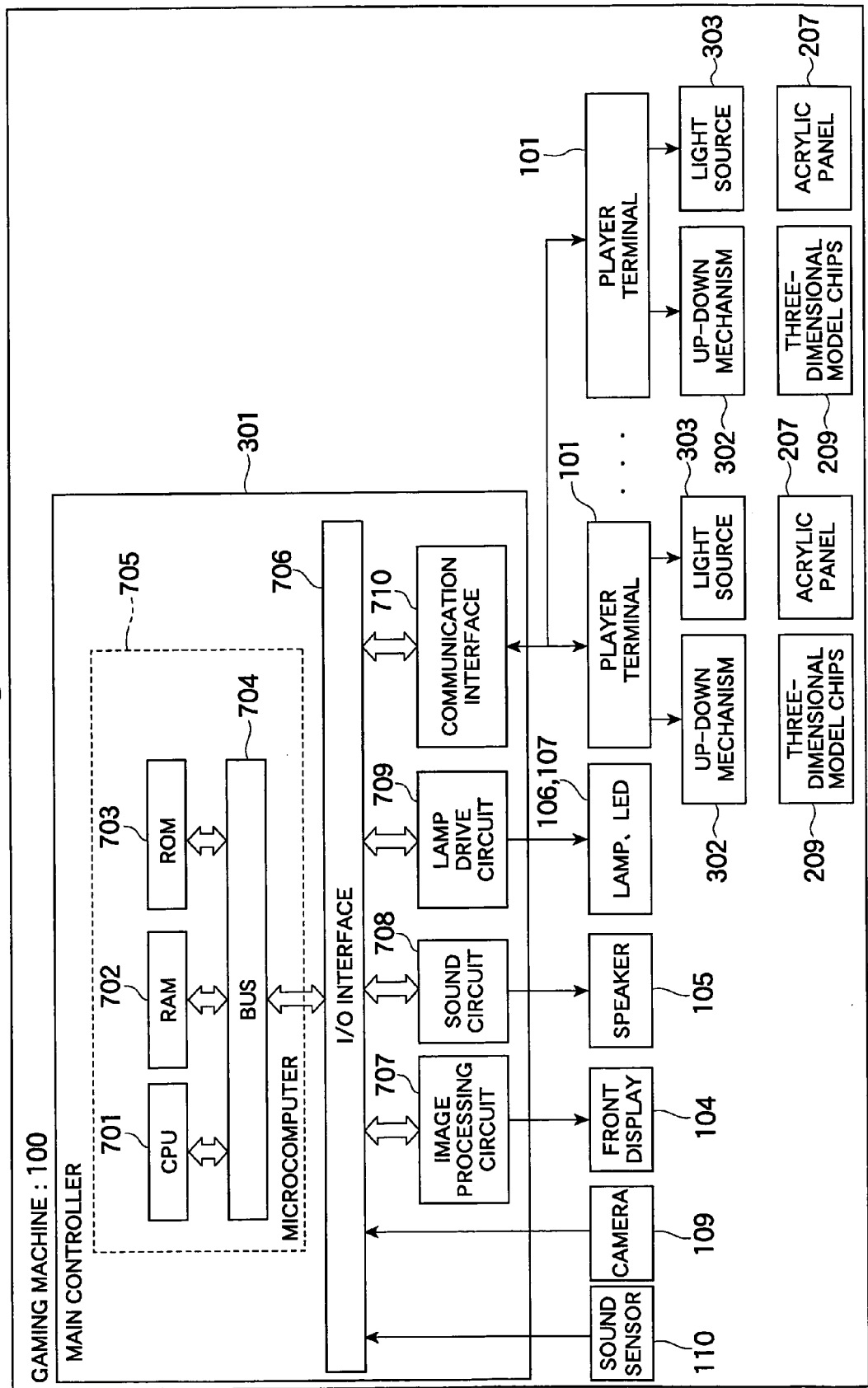
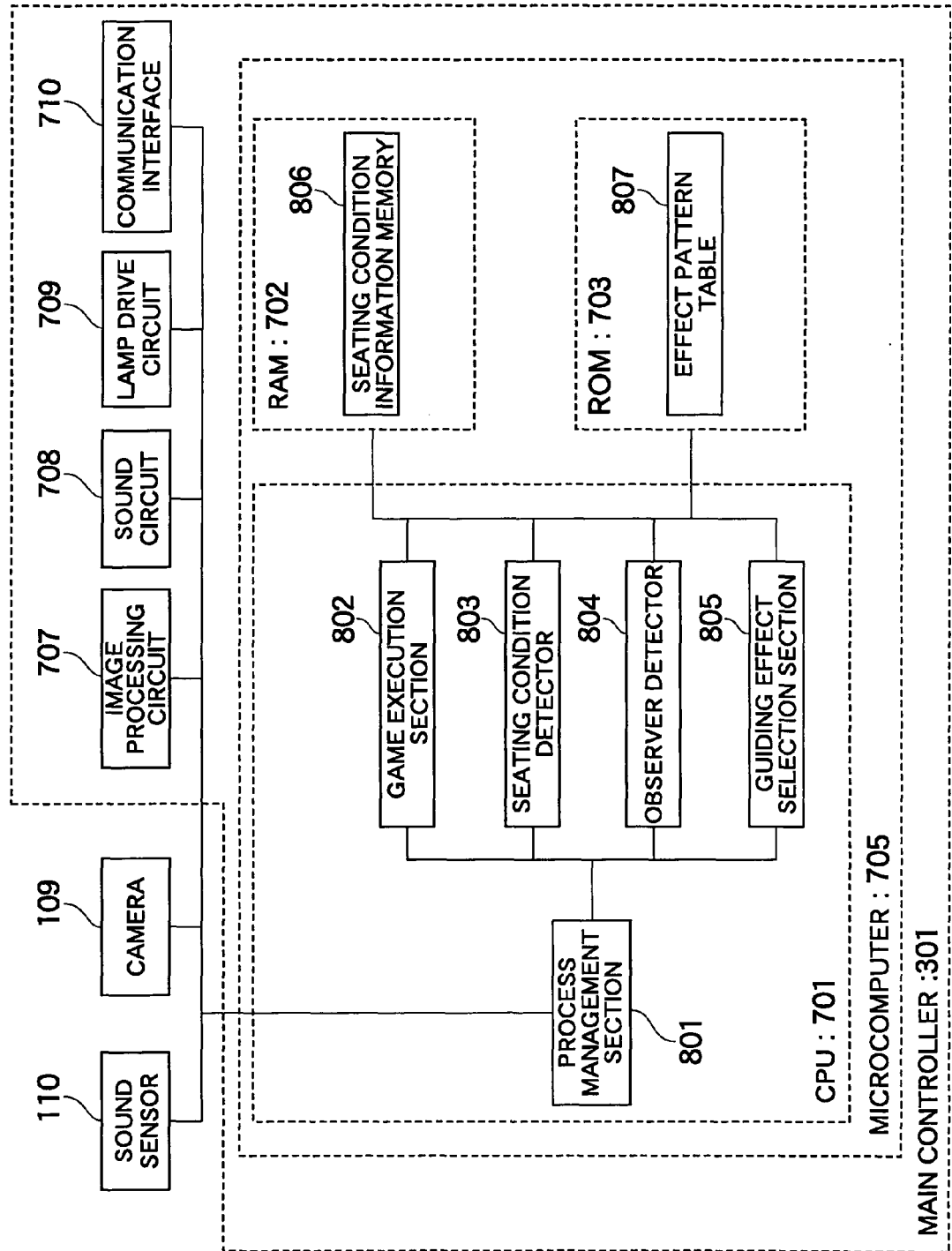


Fig. 8



F i g . 9

807

901                      902                      903

	OBSERVER POSITION	PLAYER TERMINAL TO BE GUIDED TO	EFFECT PATTERN FILE NAME
R1	001	001	annai.001.001
R2	001	002	annai.001.002
R3	001	003	annai.001.003
R4	001	004	annai.001.004
R5	001	005	annai.001.005
R6	002	001	annai.002.001
R7	002	002	annai.002.002
R8	002	003	annai.002.003
R9	002	004	annai.002.004
R10	002	005	annai.002.005
⋮	⋮	⋮	⋮
R25	005	005	annai.005.005

Fig. 10

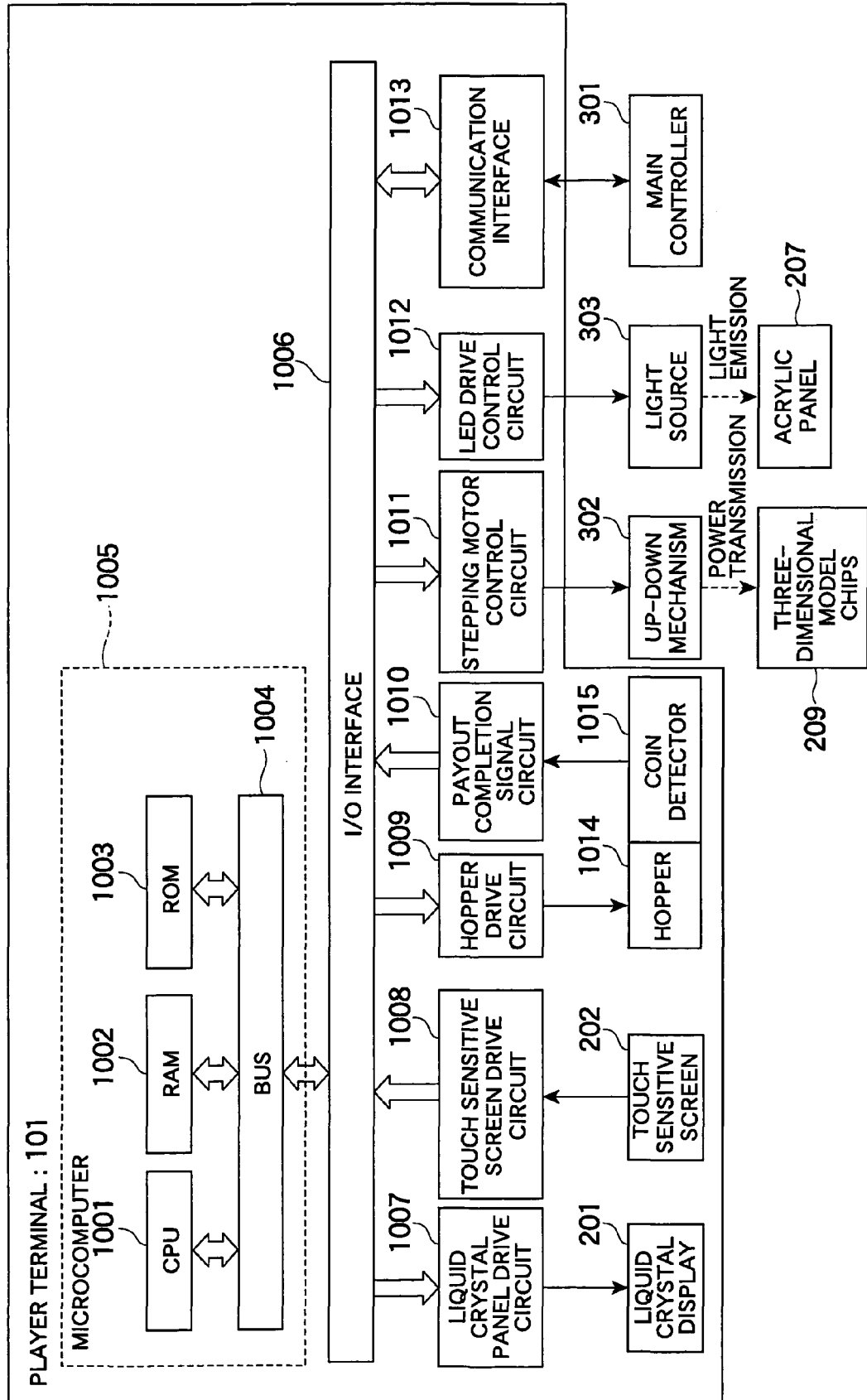
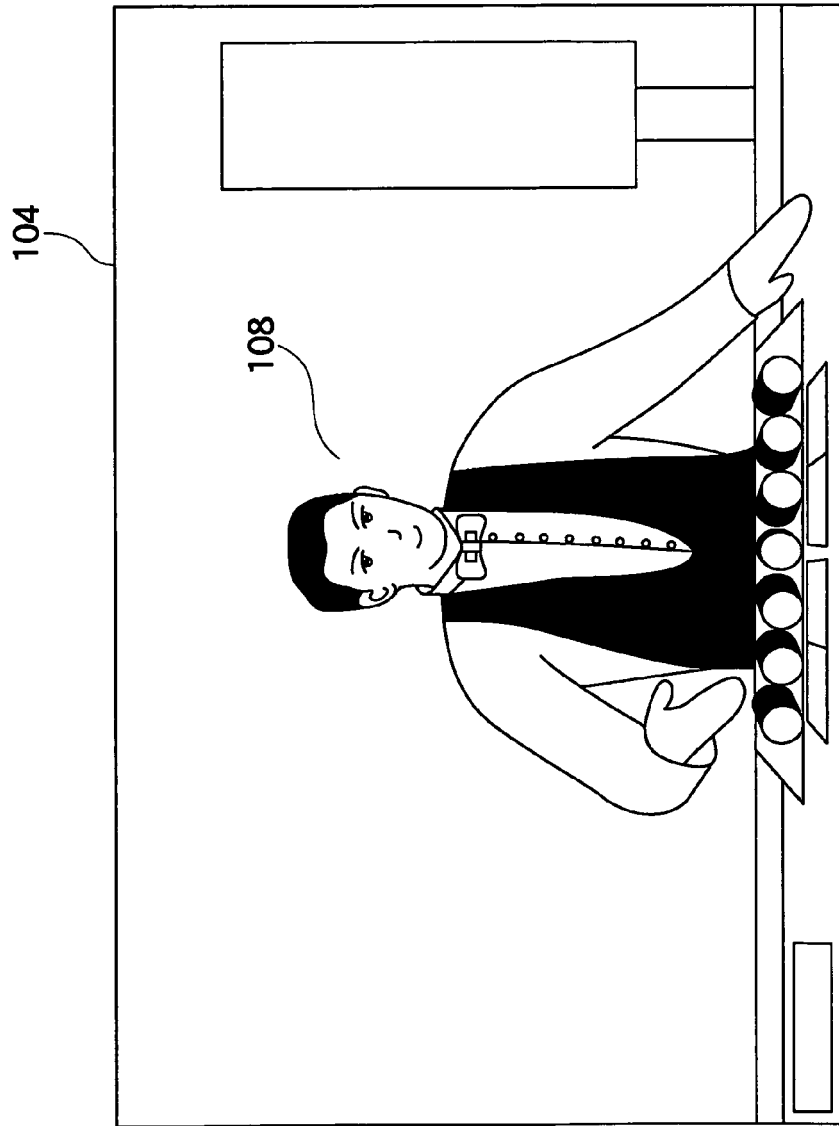
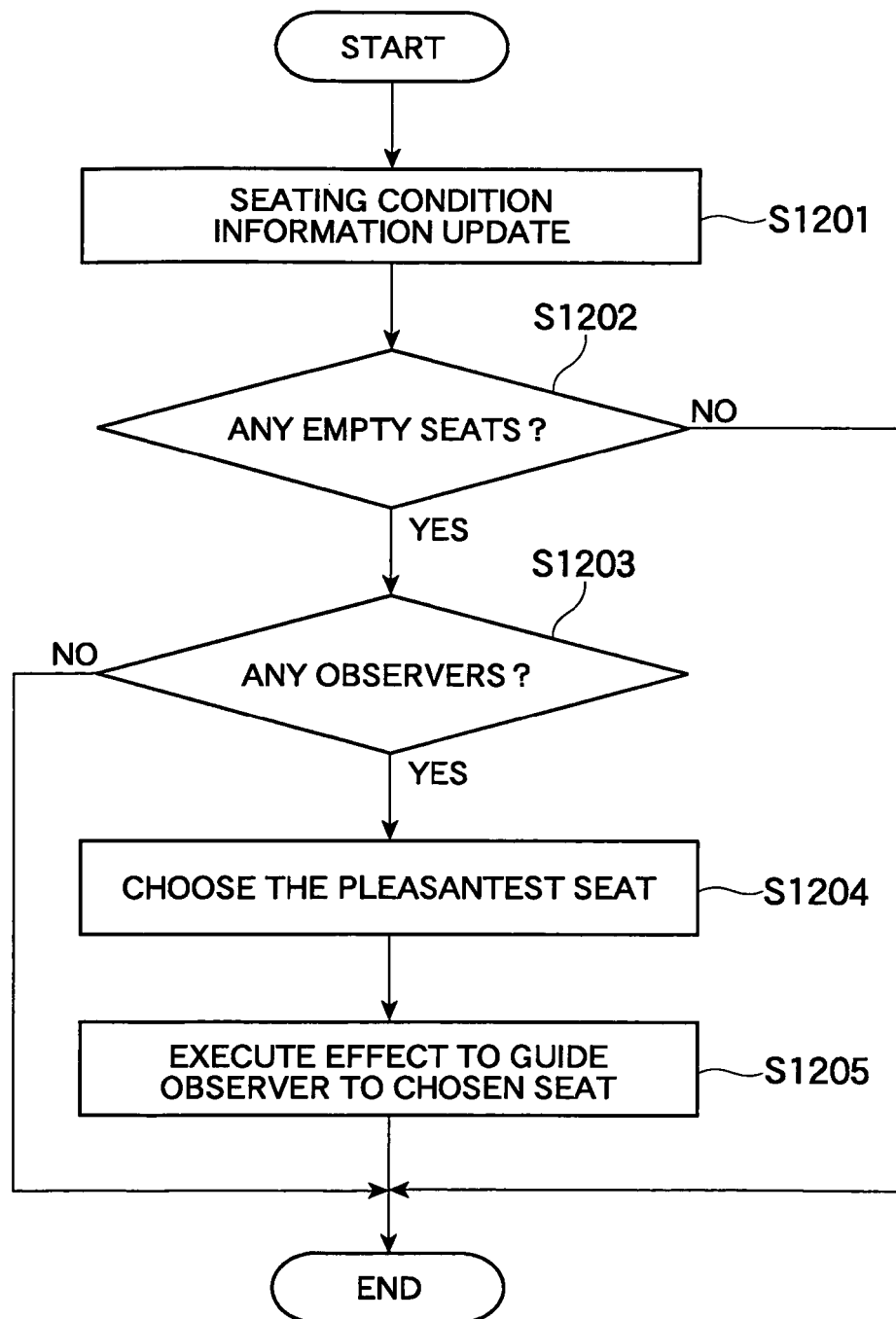


Fig. 11

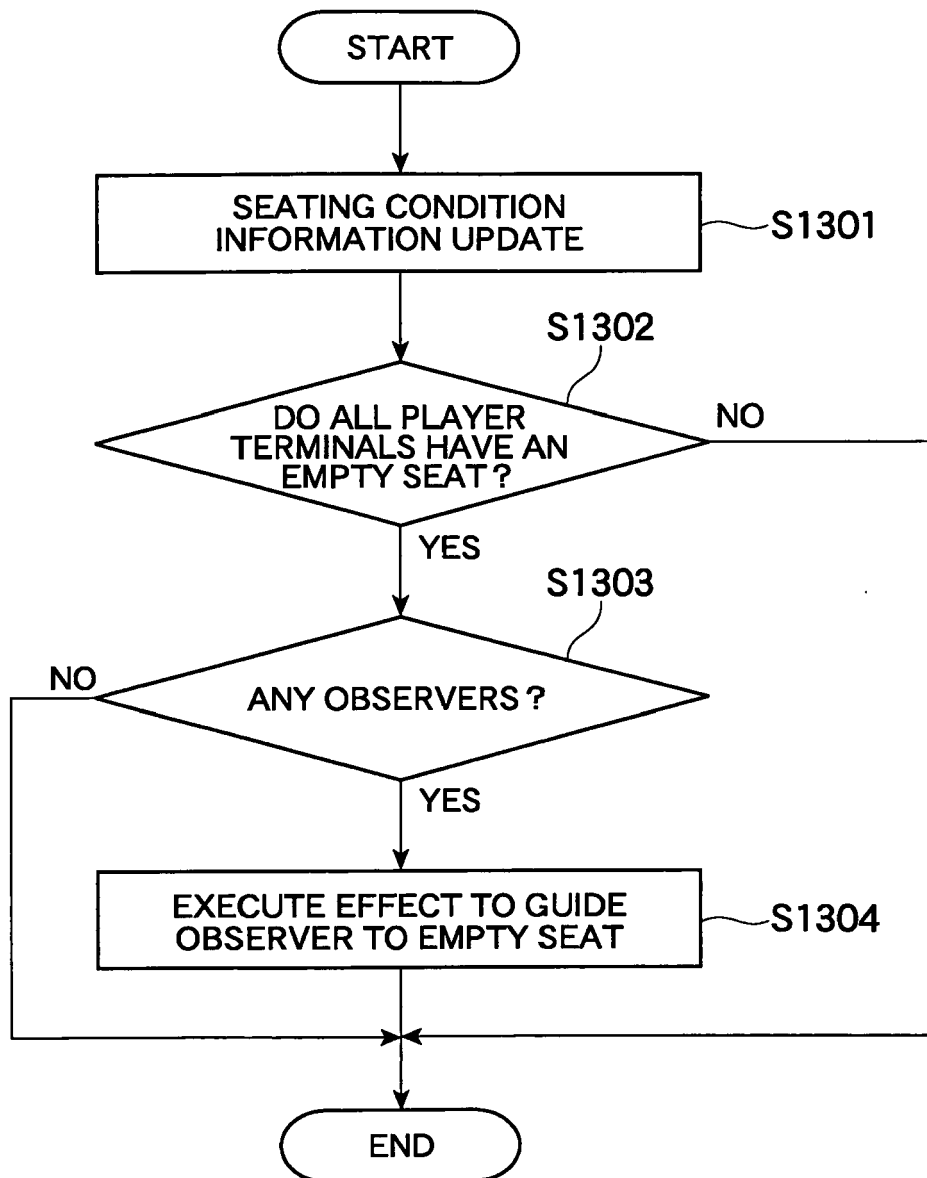


F i g . 12





F i g. 13





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 06 02 4342

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2004/072609 A1 (UNGARO MARK CURRAN [US] ET AL) 15 April 2004 (2004-04-15) * paragraphs [0011], [0027] - [0031]; figures 1,5 *	1-5	INV. G07F17/32
X	US 2003/070178 A1 (BOYD ROBERT A [US] ET AL) 10 April 2003 (2003-04-10) * the whole document *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			G07F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 March 2007	Examiner Verhoef, Peter
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 02 4342

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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20-03-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004072609 A1	15-04-2004	NONE	
US 2003070178 A1	10-04-2003	NONE	

**REFERENCES CITED IN THE DESCRIPTION**

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- JP 2005111090 A [0005]