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(54) **PERIPHERAL DEVICE, PLAYING TIME MEASURING SYSTEM AND PLAYING TIME MEASURING DEVICE**

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Publication Classification

(51) **Int. Cl.**
A63F 9/24 (2006.01)

(52) **U.S. Cl.** **463/16**

(57) **ABSTRACT**

A peripheral device installed adjoining a gaming device, includes: a cumulative counting module which cumulatively counts a time for which a game is played by a player; a judging module which judges whether or not an accumulative continuous time has reached an upper limit time; a display capable of displaying at least a two-dimensional code; and a display controller which, when it is judged by the judging module that the accumulative continuous time has reached the upper limit time, displays on the display a two-dimensional code in which is encoded information for notifying an exterior of the fact.

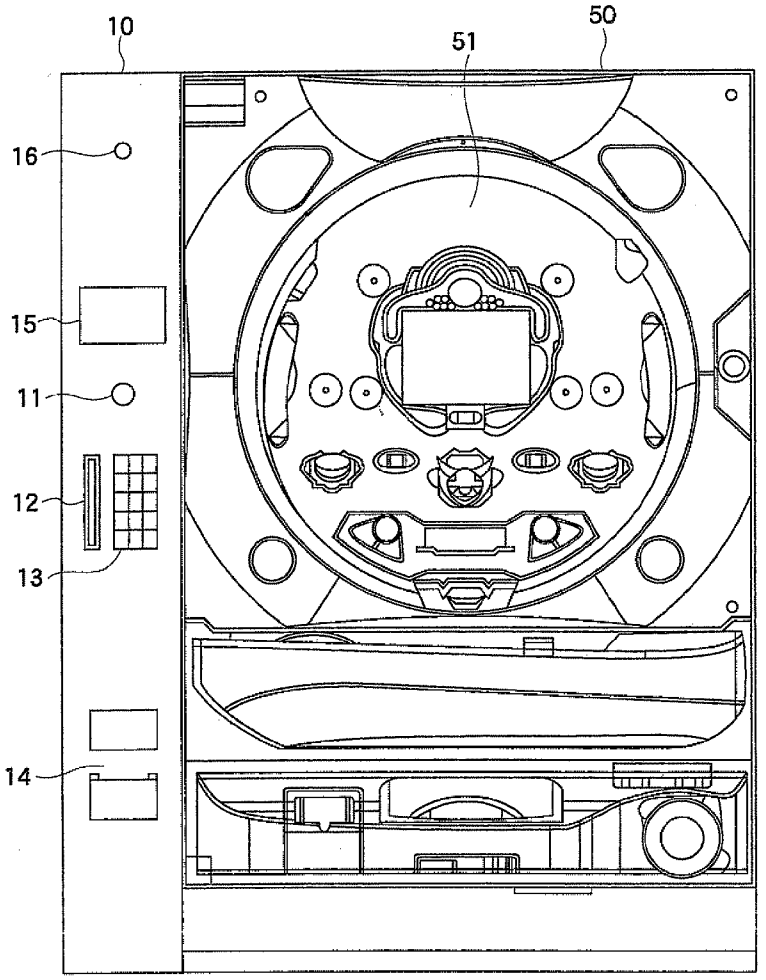


Fig. 1

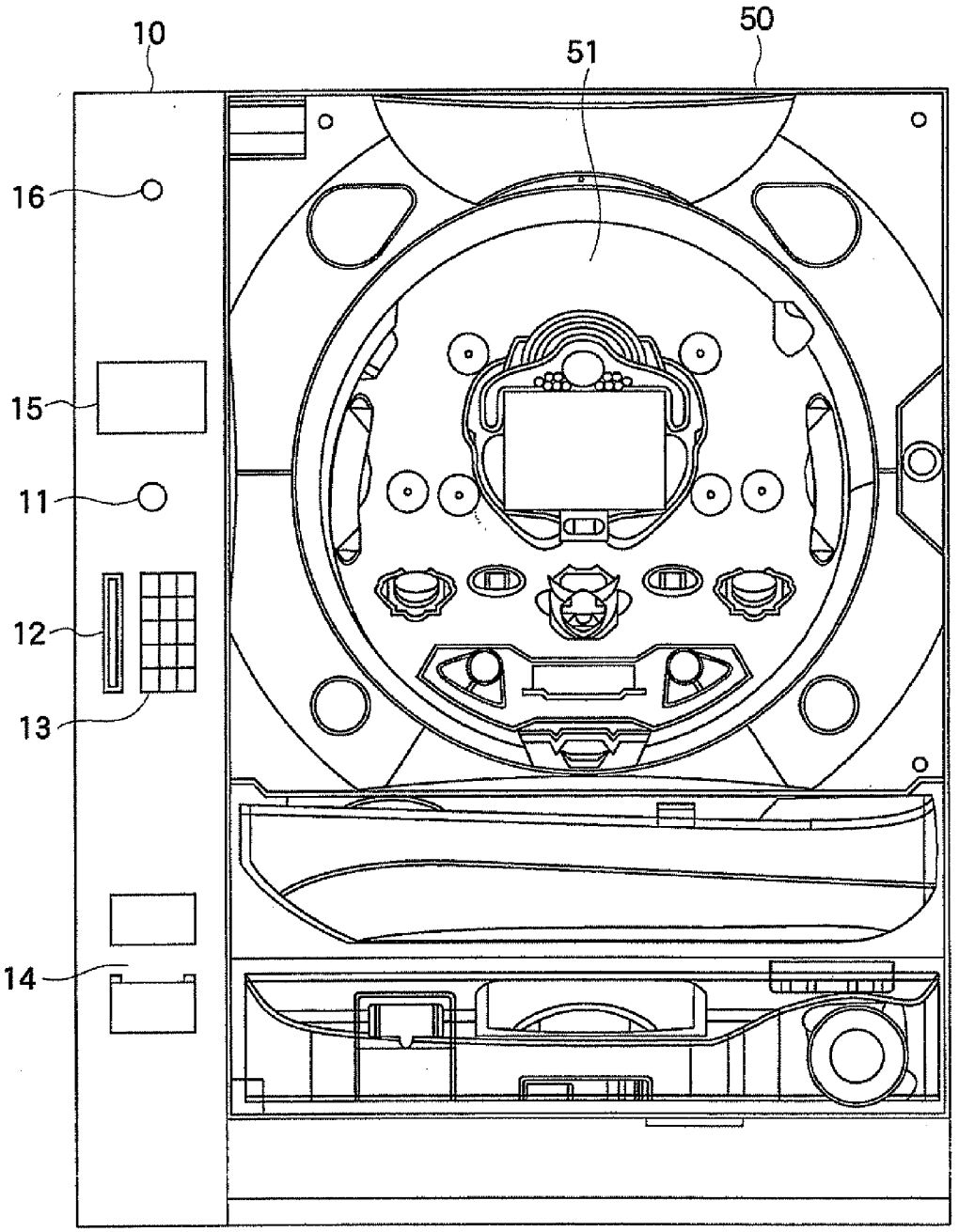


Fig. 2A

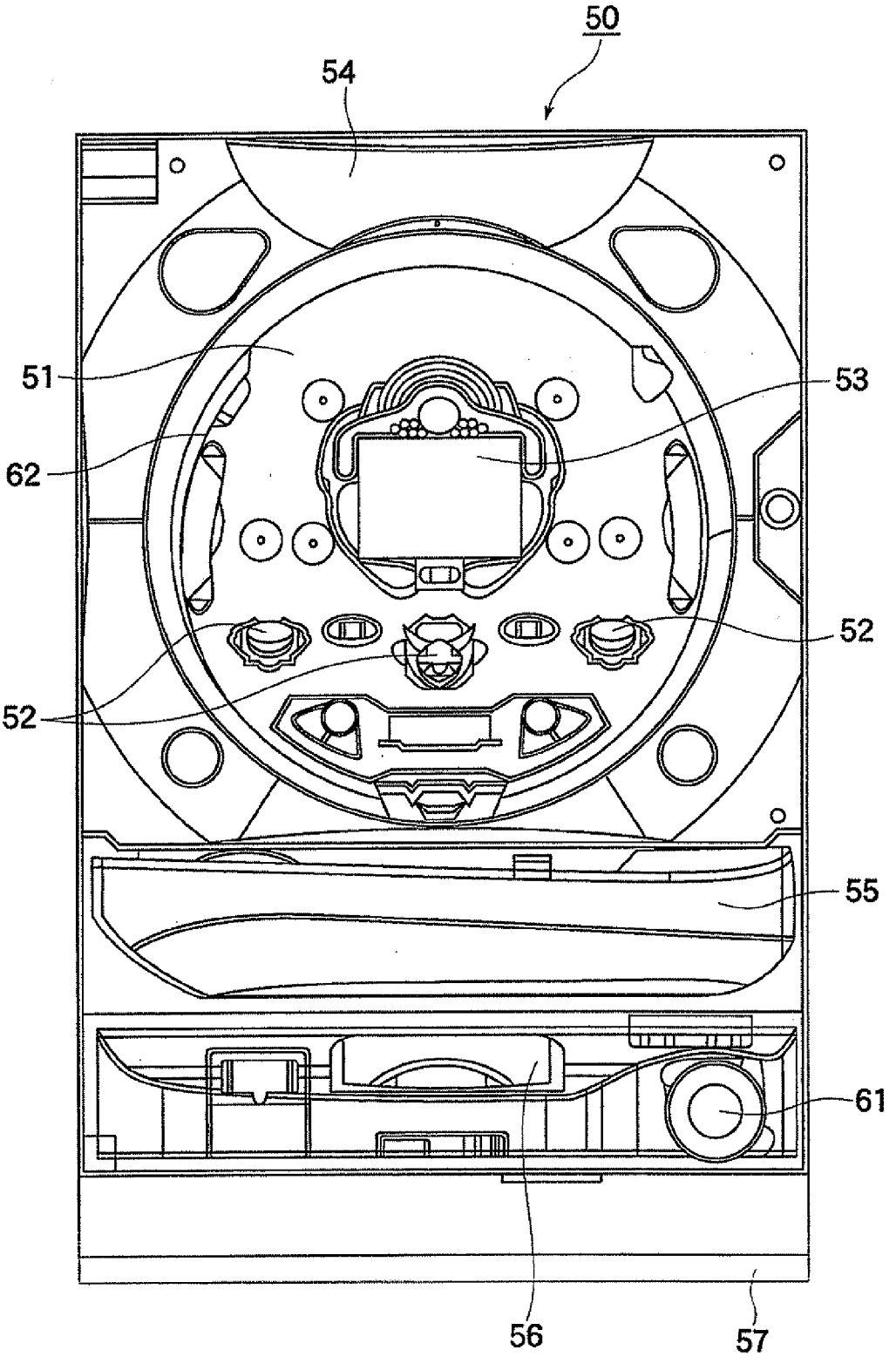


Fig. 2B

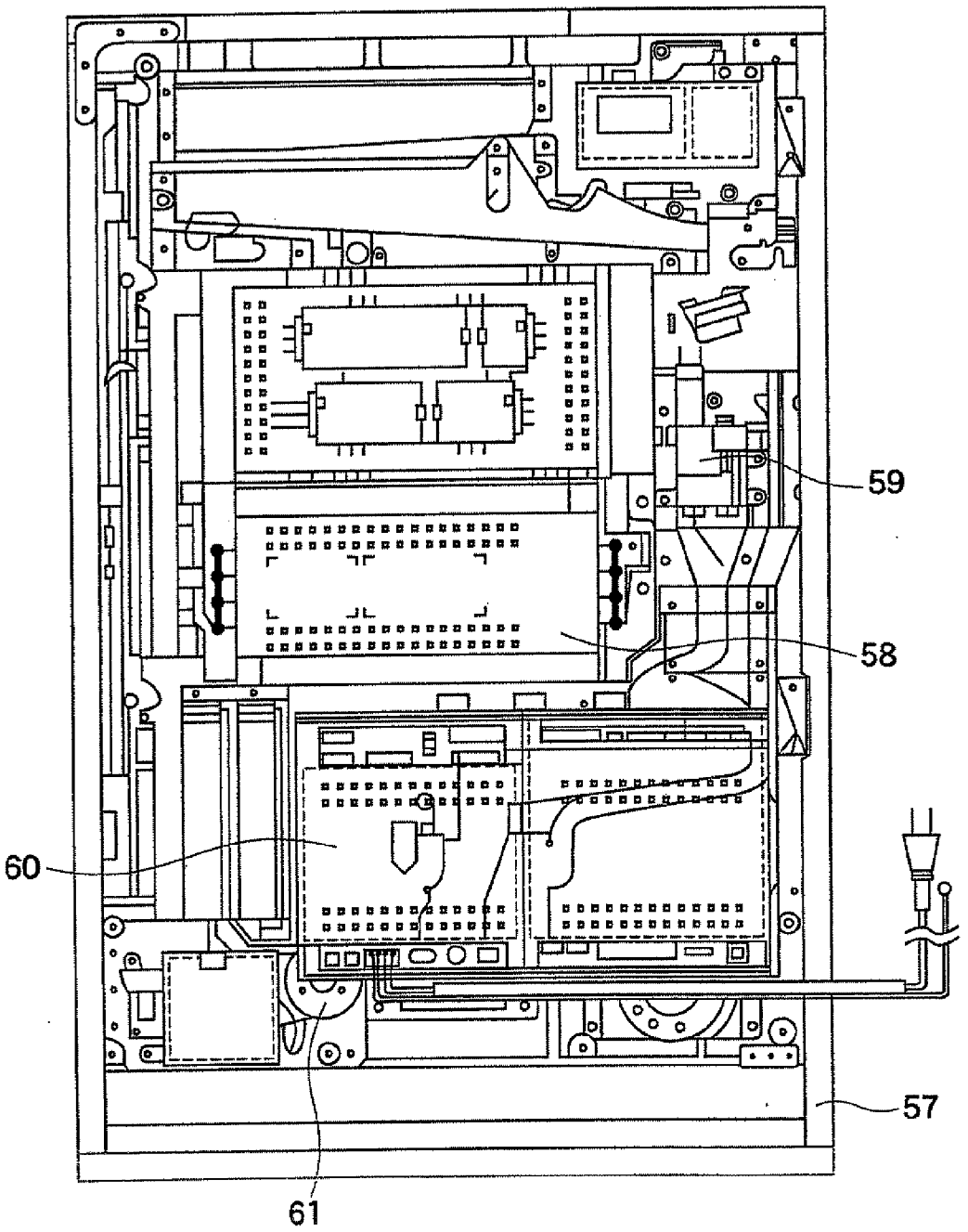


Fig. 3

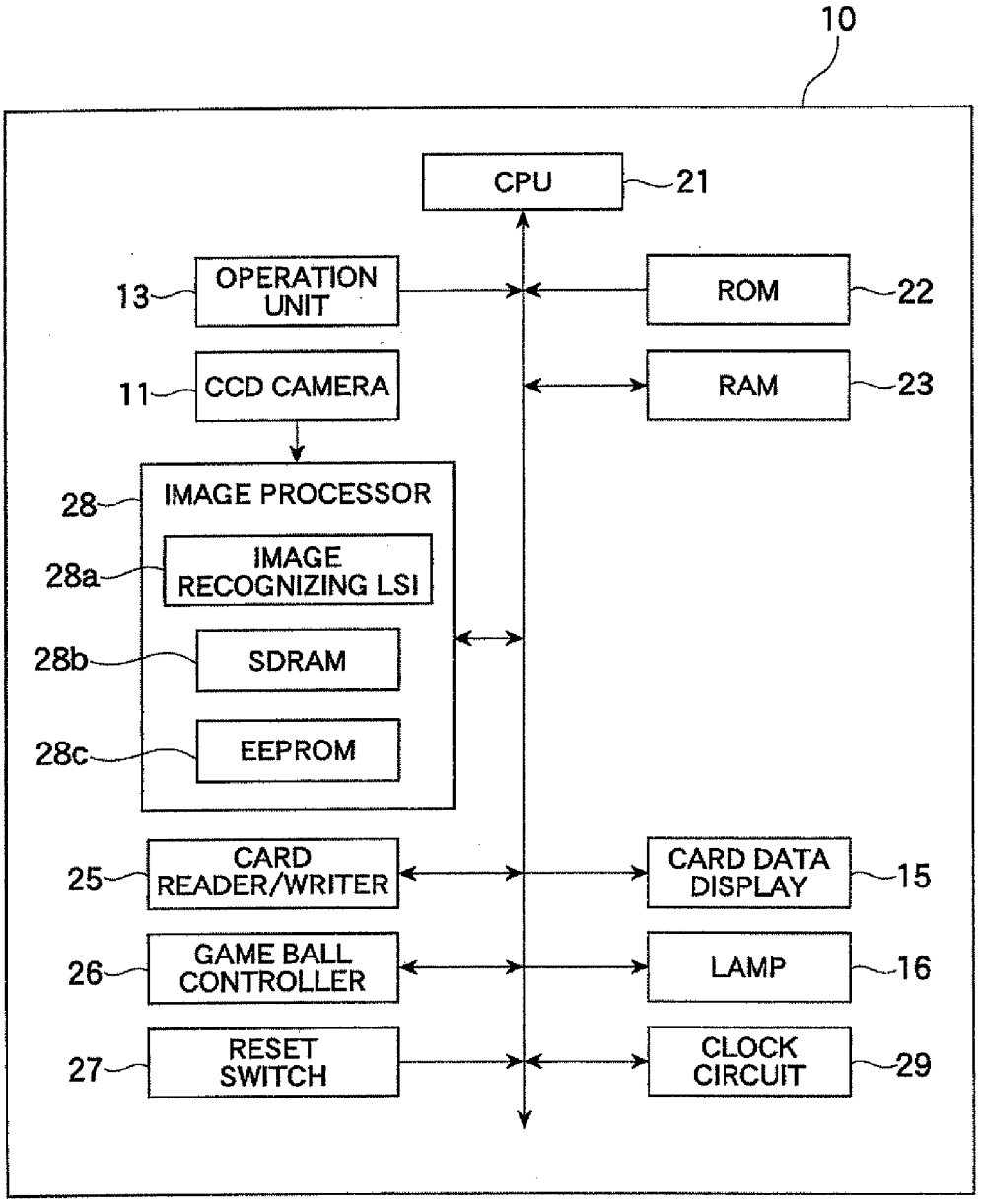

10
CPU
21
13
OPERATION UNIT
ROM
22
11
CCD CAMERA
RAM
23
28
IMAGE PROCESSOR
28a
IMAGE RECOGNIZING LSI
28b
SDRAM
28c
EEPROM
25
CARD READER/WRITER
CARD DATA DISPLAY
15
26
GAME BALL CONTROLLER
LAMP
16
27
RESET SWITCH
CLOCK CIRCUIT
29

Fig. 4

JUDGMENT TABLE		
MEMBER IDENTIFICATION INFORMATION		POSSIBLE USAGE TIME
001	(GAME PANEL)	*****
002	(PRIZE DISPENSING DEVICE)	*****
003	(LIQUID CRYSTAL DISPLAY DEVICE)	*****
004	(CONTROL SUBSTRATE)	*****
005	(FRONT DOOR)	*****
006	(UPPER TRAY DEVICE)	*****
007	(LOWER TRAY DEVICE)	*****
008	(OUTER FRAME)	*****
009	(PAYOUT DEVICE)	*****
010	(POWER SOURCE DEVICE)	*****
011	(SHOOTING DEVICE)	*****
⋮		⋮

Fig. 5

PROCESS CONTENTS SELECTION TABLE		
MEMBER IDENTIFICATION INFORMATION	PROCESS CONTENTS	
	LAMP ILLUMINATION COLOR	LAMP ILLUMINATION PATTERN
001 (GAME PANEL)	RED	ILLUMINATE
002 (PRIZE DISPENSING DEVICE)	RED	FLICKER(ILLUMINATE ONE SECOND, EXTINGUISH ONE SECOND)
003 (LIQUID CRYSTAL DISPLAY DEVICE)	RED	FLICKER (ILLUMINATE THREE SECONDS, EXTINGUISH ONE SECOND)
004 (FRONT DOOR)	GREEN	ILLUMINATE
005 (UPPER TRAY DEVICE)	GREEN	FLICKER (ILLUMINATE ONE SECOND, EXTINGUISH ONE SECOND)
006 (LOWER TRAY DEVICE)	GREEN	FLICKER (ILLUMINATE THREE SECONDS, EXTINGUISH ONE SECOND)
007 (OUTER FRAME)	GREEN	FLICKER (ILLUMINATE ONE SECOND, EXTINGUISH THREE SECONDS)
008 (CONTROL SUBSTRATE)	BLUE	ILLUMINATE
009 (PAYOUT DEVICE)	BLUE	FLICKER (ILLUMINATE ONE SECOND, EXTINGUISH ONE SECOND)
010 (POWER SOURCE DEVICE)	BLUE	FLICKER (ILLUMINATE THREE SECONDS, EXTINGUISH ONE SECOND)
011 (SHOOTING DEVICE)	BLUE	FLICKER (ILLUMINATE ONE SECOND, EXTINGUISH THREE SECONDS)
⋮	⋮	

Fig. 6

STORAGE AREA	VALUE
CONTINUOUS TIME STORAGE AREA	CONTINUOUS TIME VALUE
STARTING TIME STORAGE AREA	STARTING TIME VALUE
ACCUMULATIVE CONTINUOUS TIME STORAGE AREA	ACCUMULATIVE CONTINUOUS TIME VALUE

Fig. 7

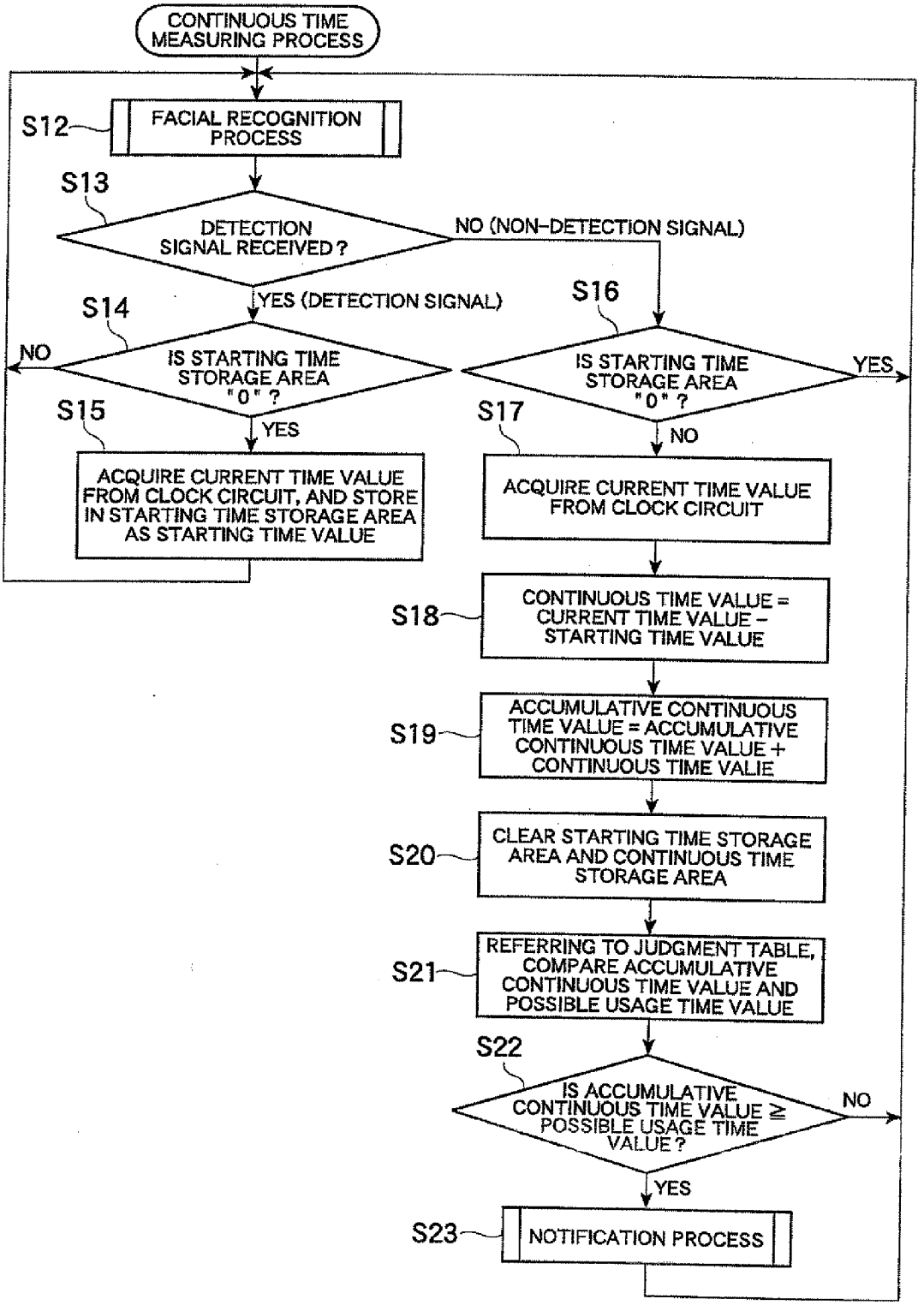

CONTINUOUS TIME MEASURING PROCESS
S12
FACIAL RECOGNITION PROCESS
S13
DETECTION SIGNAL RECEIVED?
NO (NON-DETECTION SIGNAL)
YES (DETECTION SIGNAL)
S14
IS STARTING TIME STORAGE AREA "0"?
NO
YES
S15
ACQUIRE CURRENT TIME VALUE FROM CLOCK CIRCUIT, AND STORE IN STARTING TIME STORAGE AREA AS STARTING TIME VALUE
S16
IS STARTING TIME STORAGE AREA "0"?
YES
NO
S17
ACQUIRE CURRENT TIME VALUE FROM CLOCK CIRCUIT
S18
CONTINUOUS TIME VALUE = CURRENT TIME VALUE − STARTING TIME VALUE
S19
ACCUMULATIVE CONTINUOUS TIME VALUE = ACCUMULATIVE CONTINUOUS TIME VALUE + CONTINUOUS TIME VALIE
S20
CLEAR STARTING TIME STORAGE AREA AND CONTINUOUS TIME STORAGE AREA
S21
REFERRING TO JUDGMENT TABLE, COMPARE ACCUMULATIVE CONTINUOUS TIME VALUE AND POSSIBLE USAGE TIME VALUE
S22
IS ACCUMULATIVE CONTINUOUS TIME VALUE ≧ POSSIBLE USAGE TIME VALUE?
NO
YES
S23
NOTIFICATION PROCESS

Fig. 8

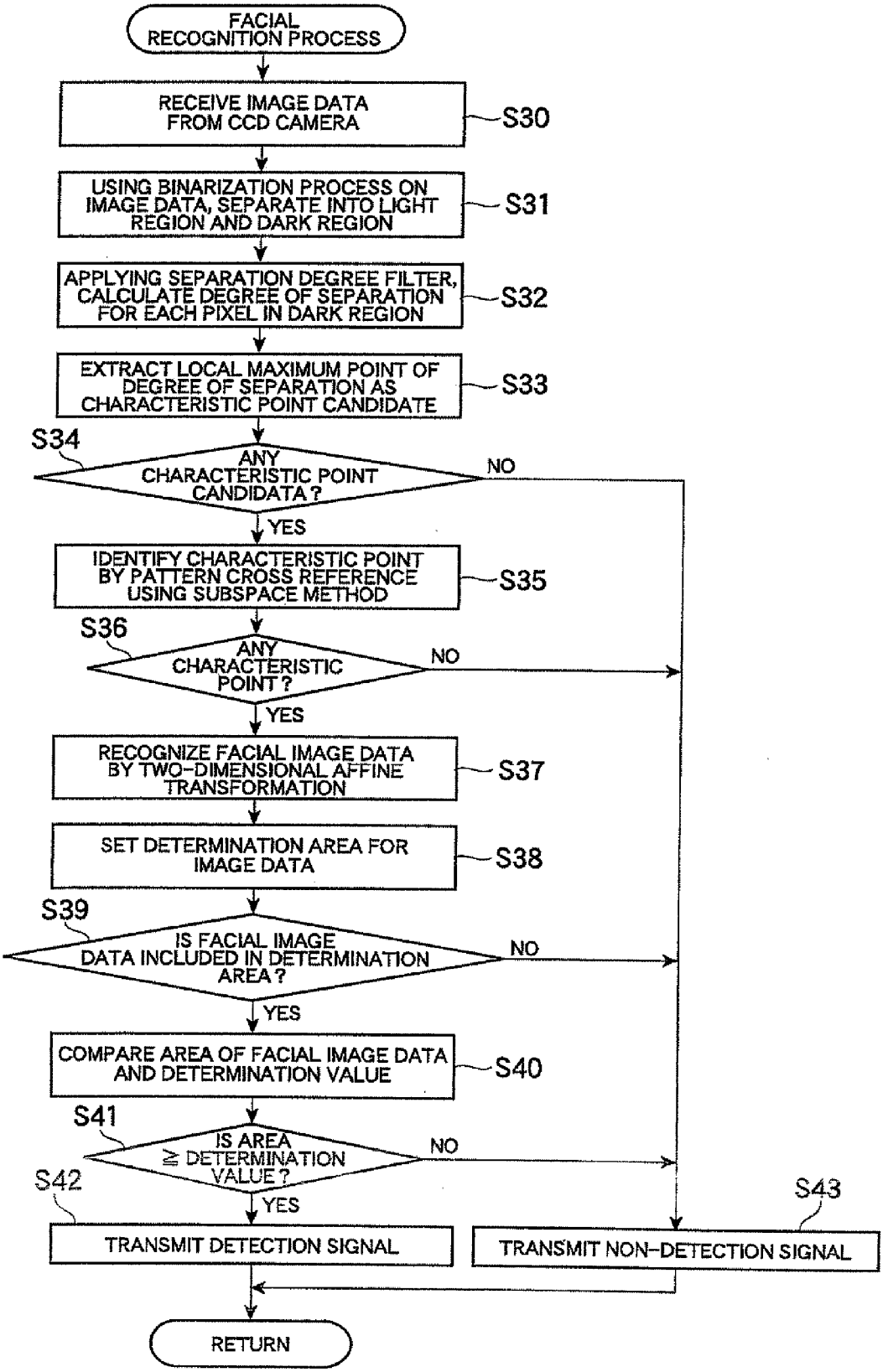

FACIAL RECOGNITION PROCESS
RECEIVE IMAGE DATA FROM CCD CAMERA
S30
USING BINARIZATION PROCESS ON IMAGE DATA, SEPARATE INTO LIGHT REGION AND DARK REGION
S31
APPLYING SEPARATION DEGREE FILTER, CALCULATE DEGREE OF SEPARATION FOR EACH PIXEL IN DARK REGION
S32
EXTRACT LOCAL MAXIMUM POINT OF DEGREE OF SEPARATION AS CHARACTERISTIC POINT CANDIDATE
S33
S34
ANY CHARACTERISTIC POINT CANDIDATA?
NO
YES
IDENTIFY CHARACTERISTIC POINT BY PATTERN CROSS REFERENCE USING SUBSPACE METHOD
S35
S36
ANY CHARACTERISTIC POINT?
NO
YES
RECOGNIZE FACIAL IMAGE DATA BY TWO-DIMENSIONAL AFFINE TRANSFORMATION
S37
SET DETERMINATION AREA FOR IMAGE DATA
S38
S39
IS FACIAL IMAGE DATA INCLUDED IN DETERMINATION AREA?
NO
YES
COMPARE AREA OF FACIAL IMAGE DATA AND DETERMINATION VALUE
S40
S41
IS AREA ≧ DETERMINATION VALUE?
NO
YES
S42
TRANSMIT DETECTION SIGNAL
S43
TRANSMIT NON-DETECTION SIGNAL
RETURN

Fig. 9A

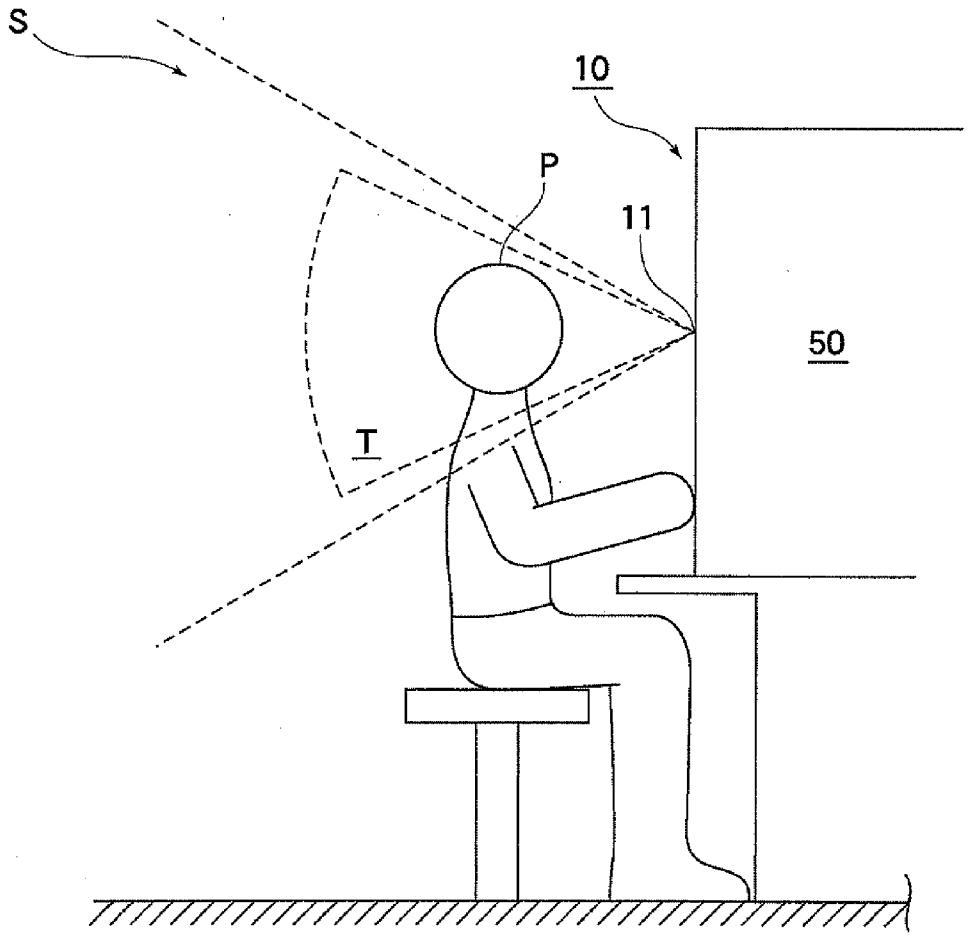


Fig. 9B

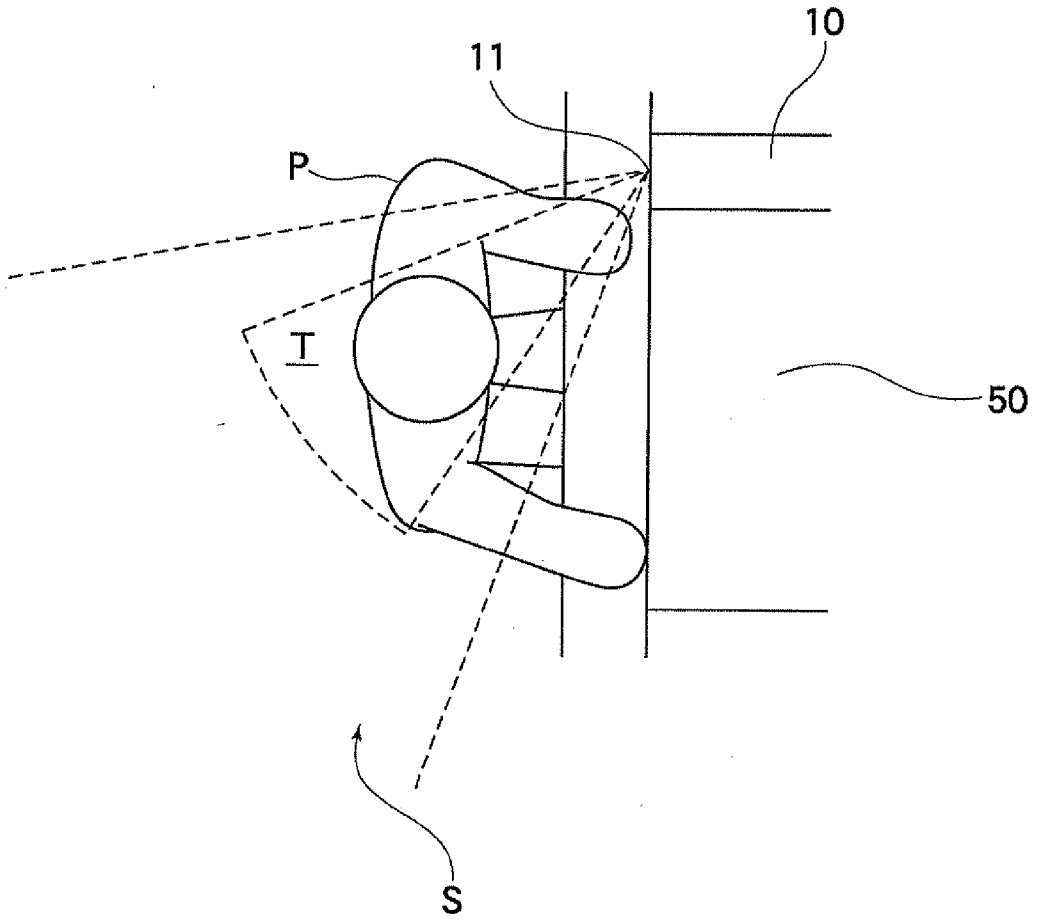


Fig. 10A

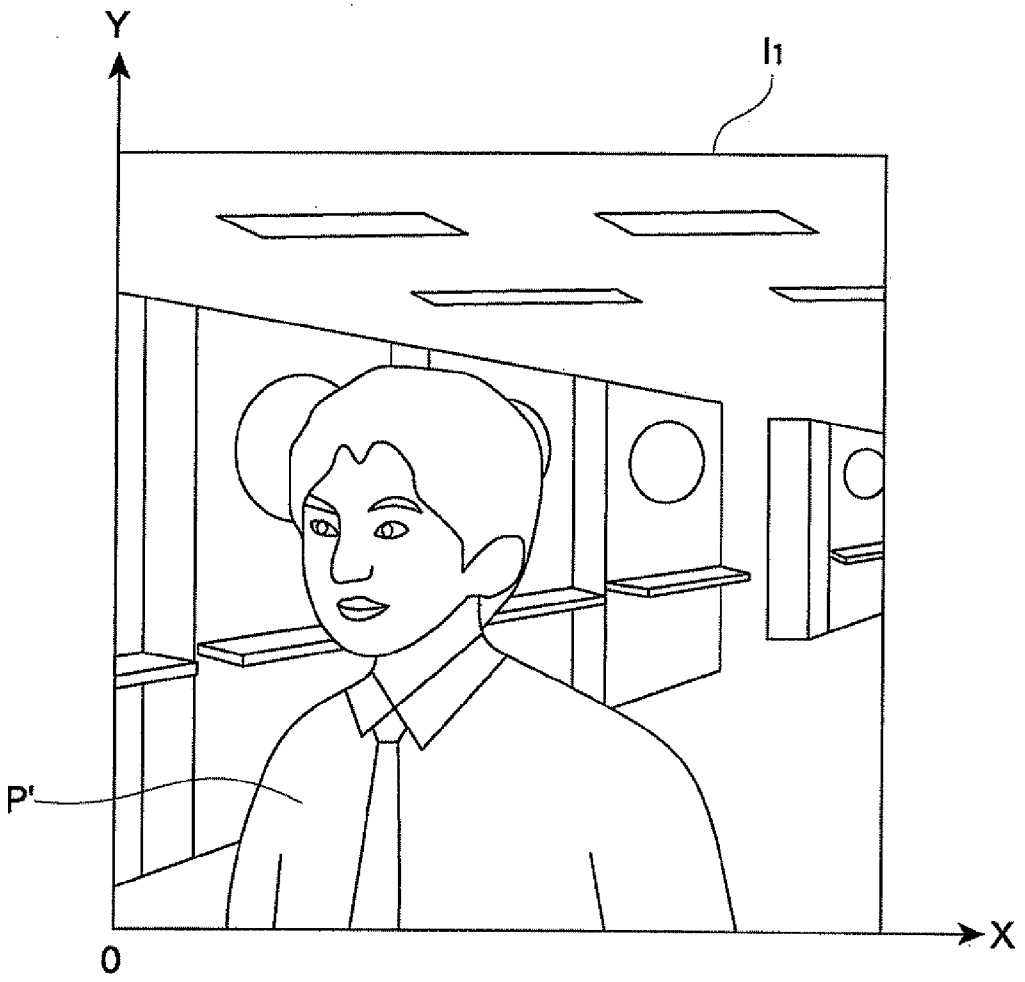


Fig. 10B

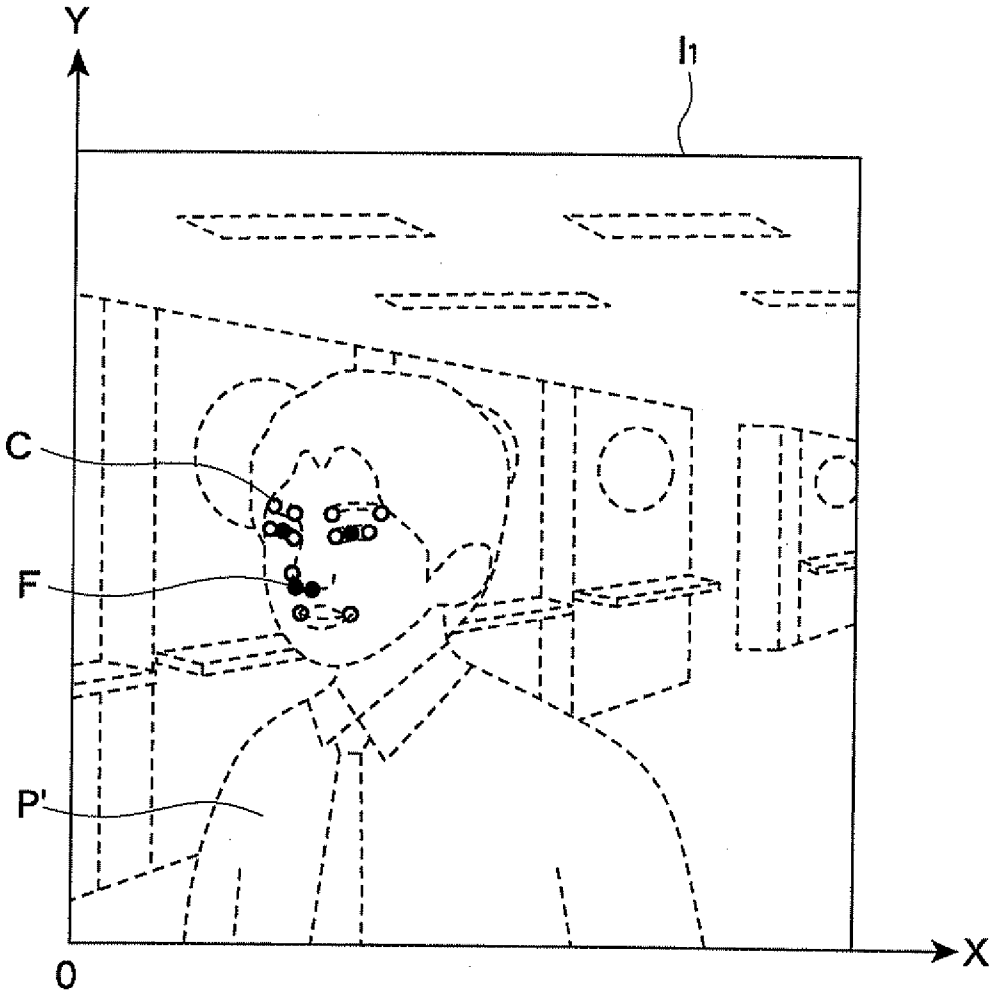


Fig. 10C

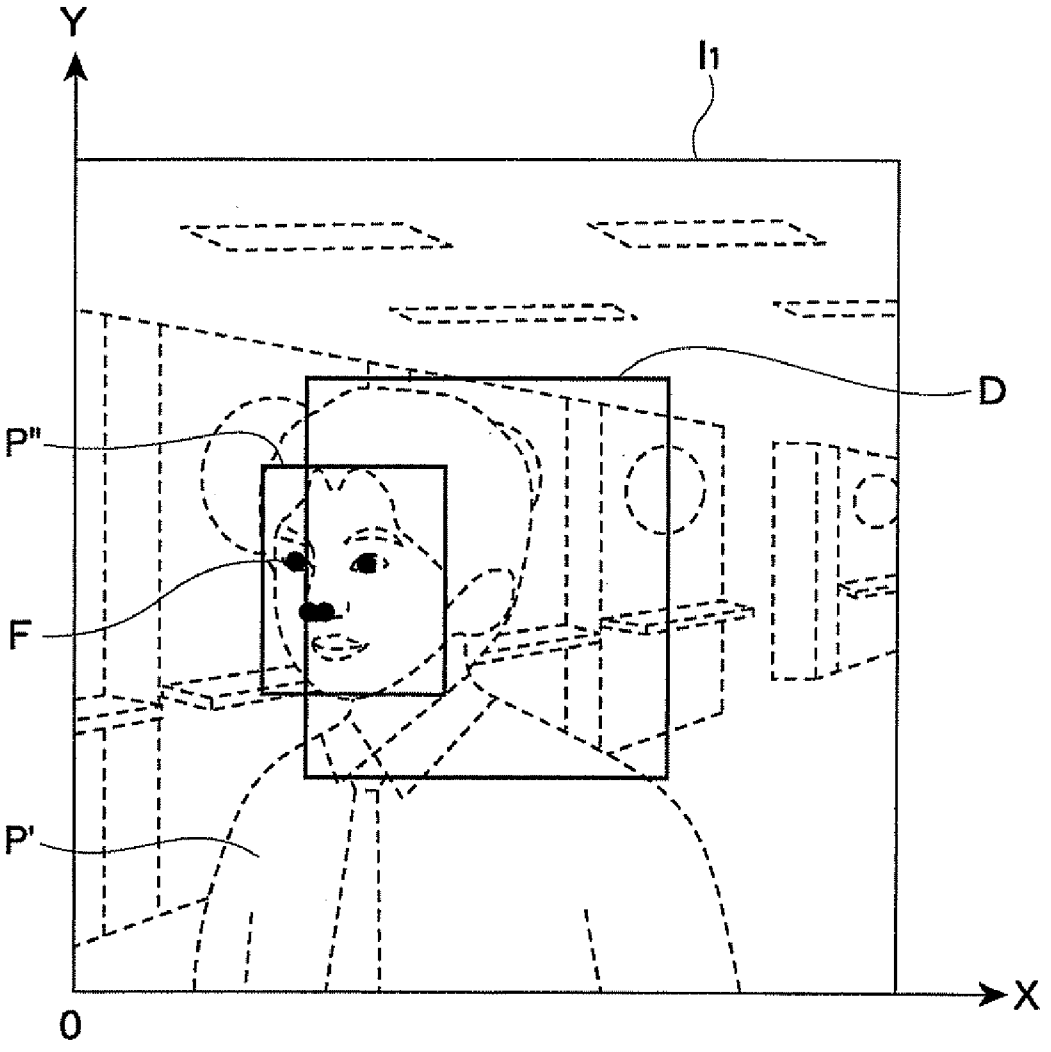


Fig. 11A

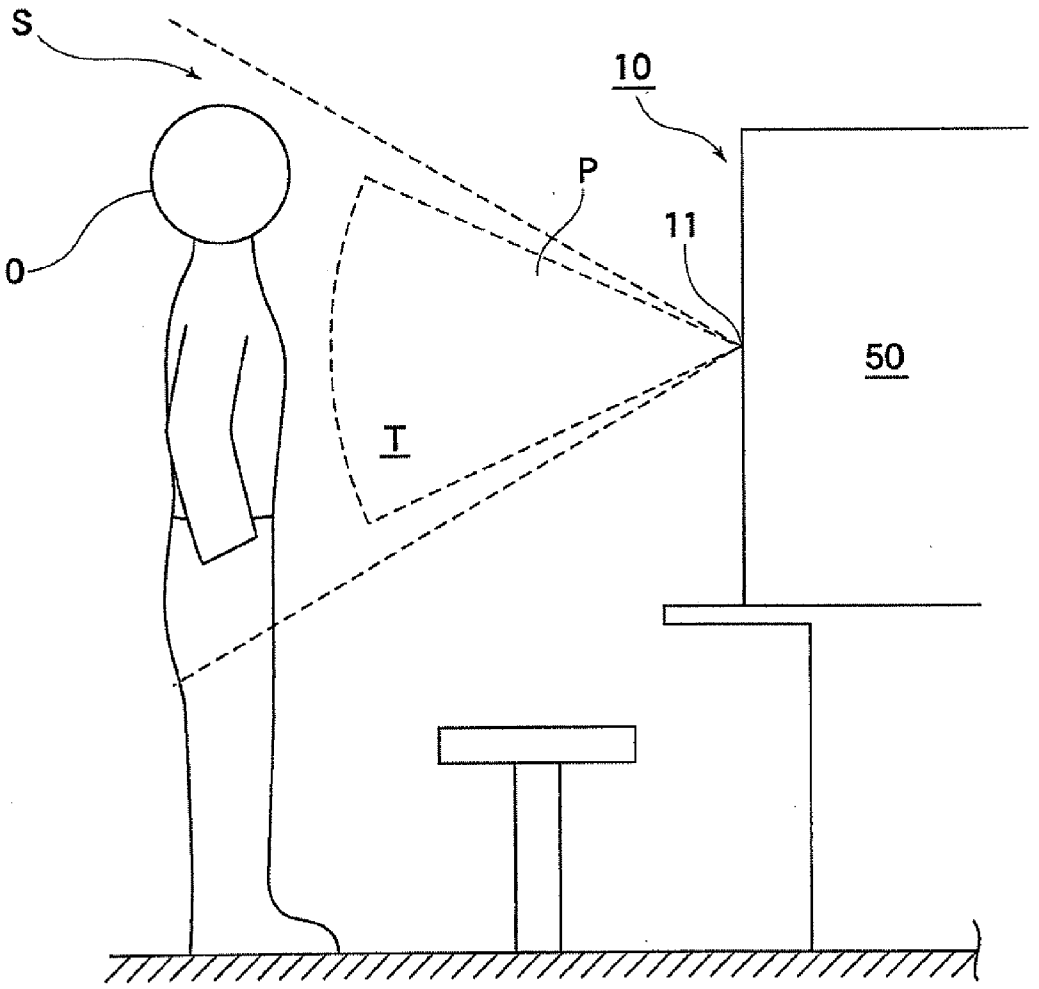


Fig. 11B

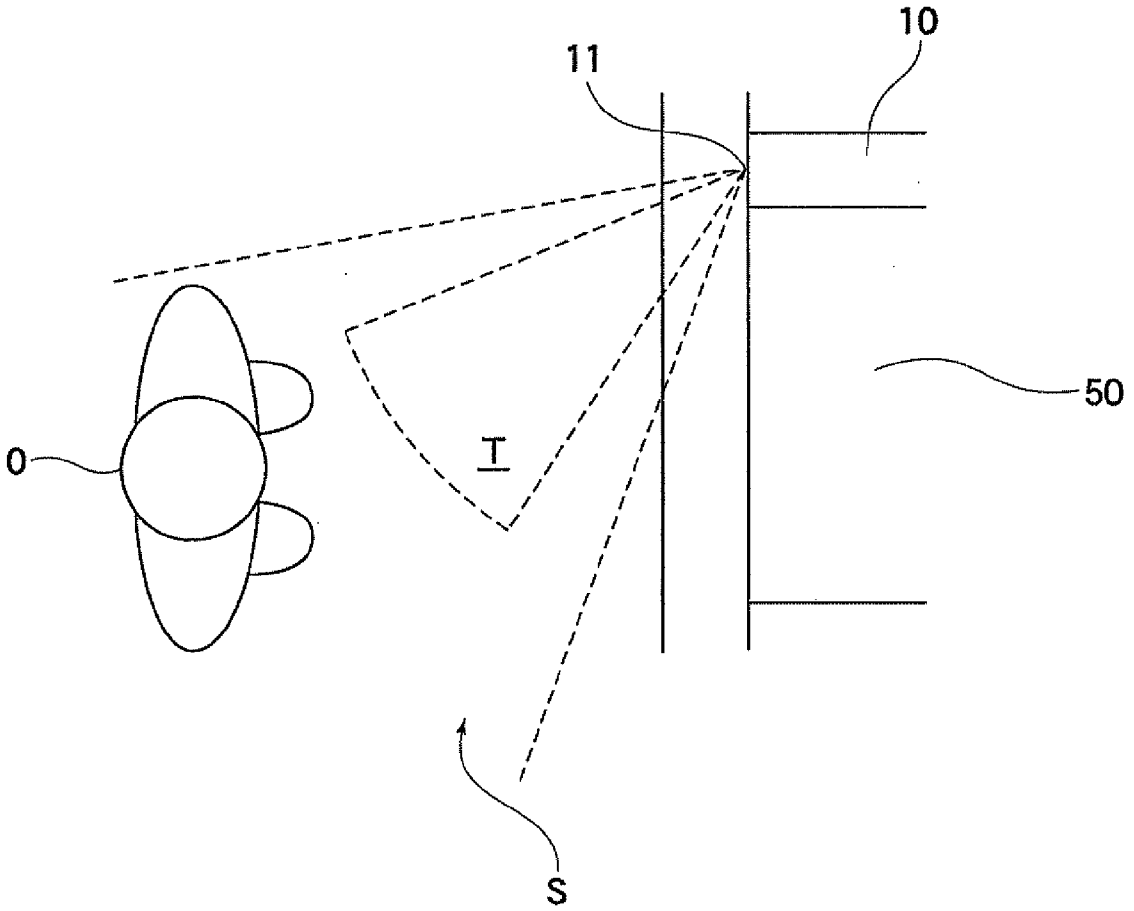


Fig. 12A

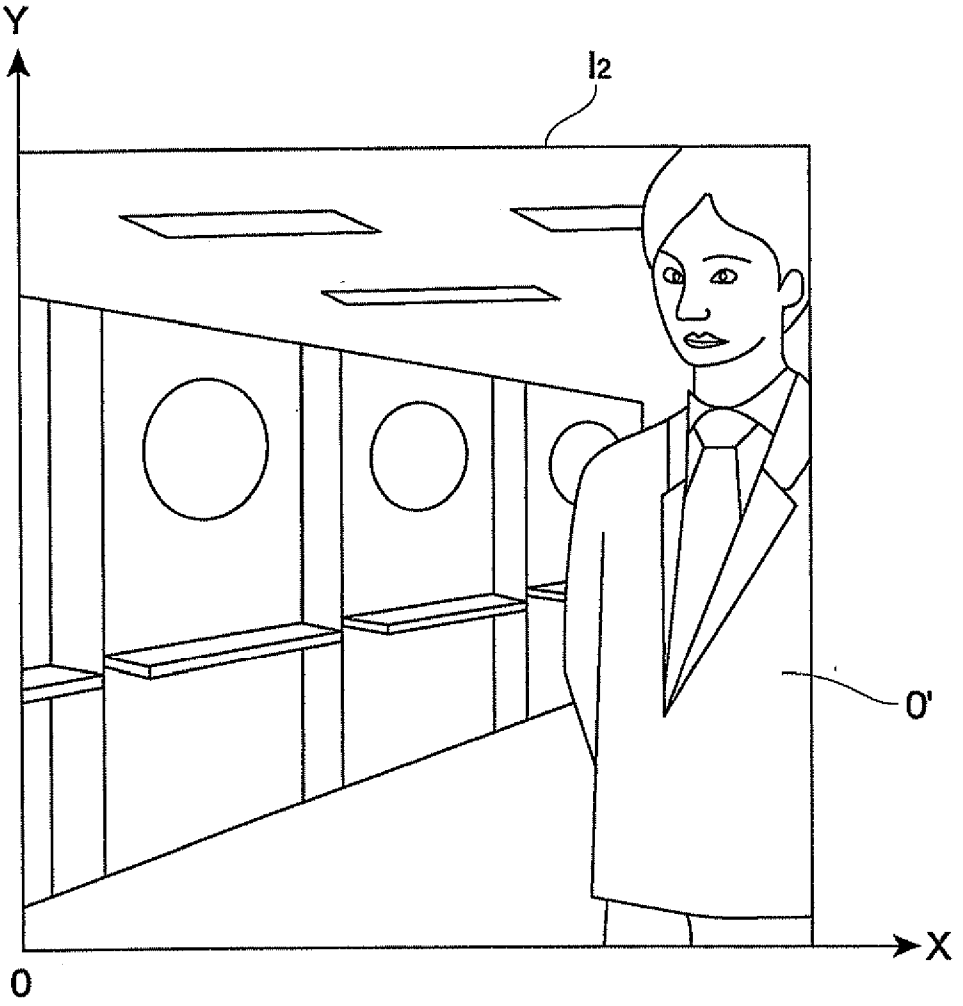


Fig. 12B

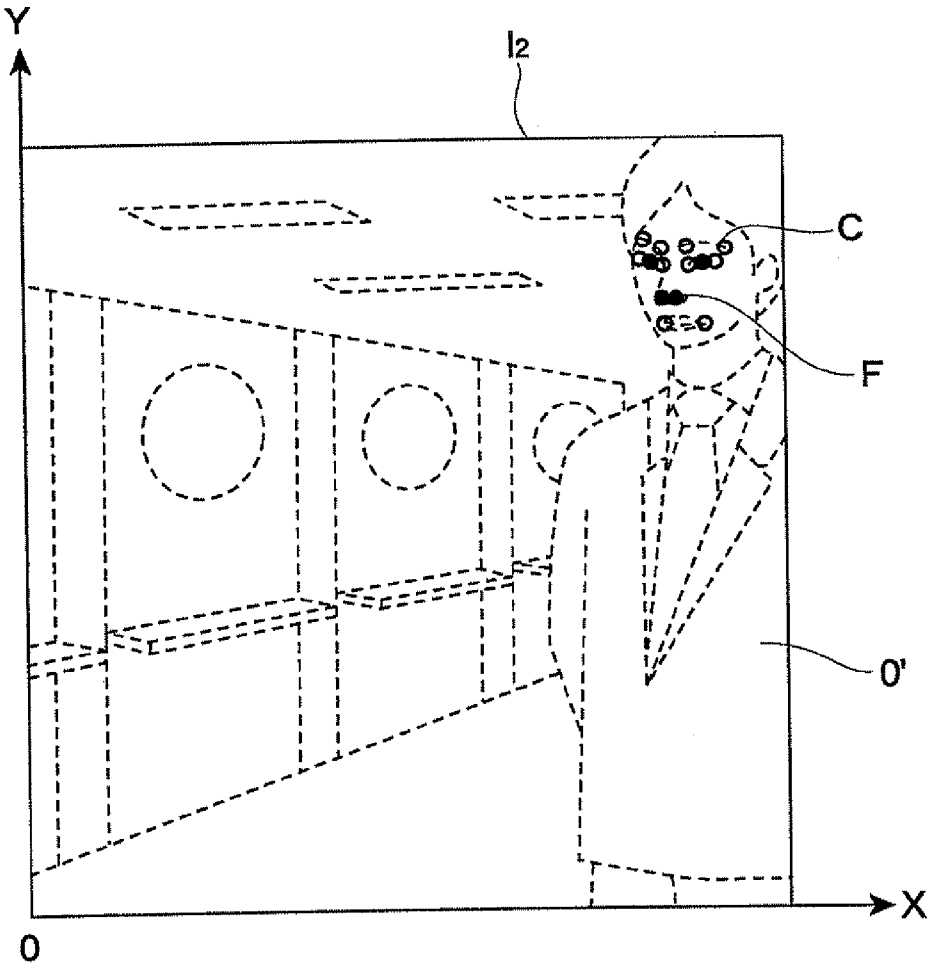


Fig. 12C

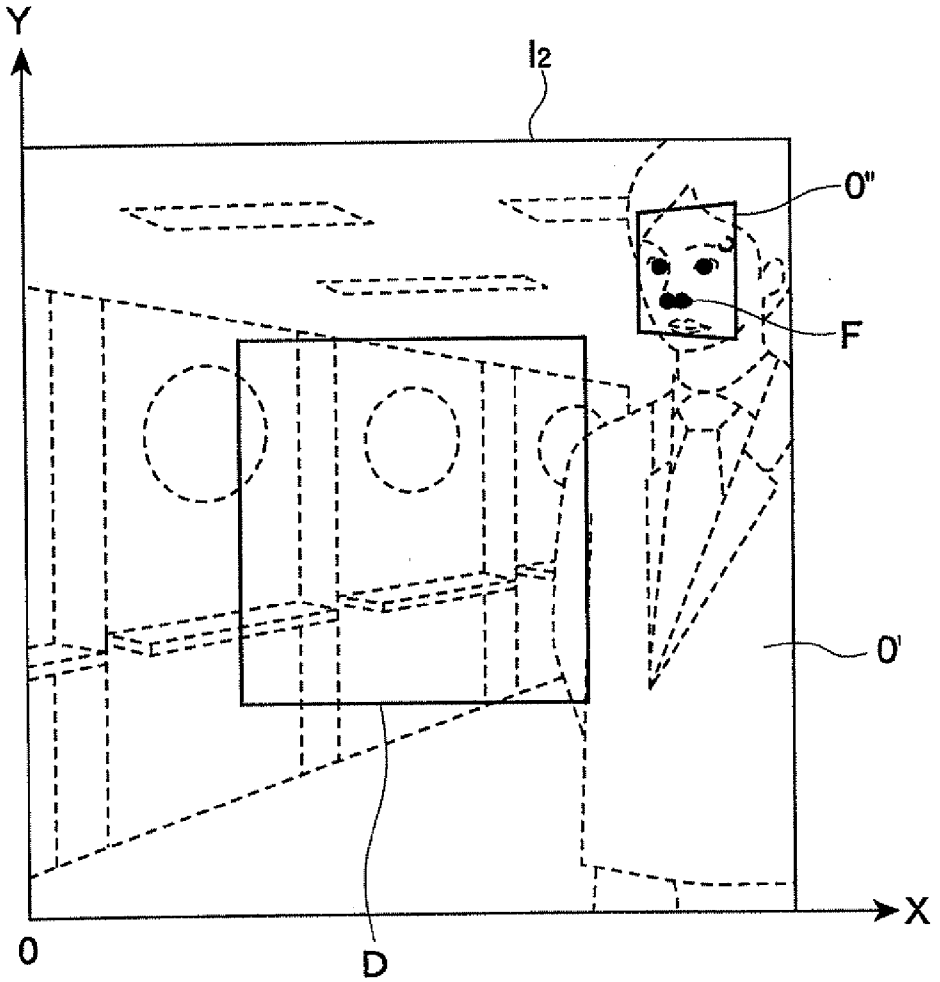


Fig. 13

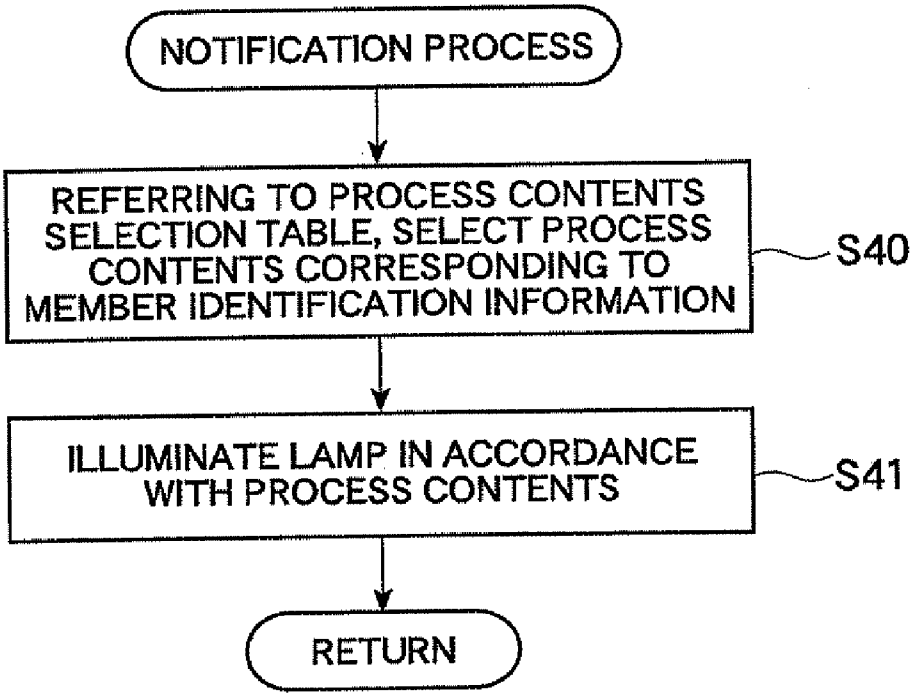

NOTIFICATION PROCESS
REFERRING TO PROCESS CONTENTS SELECTION TABLE, SELECT PROCESS CONTENTS CORRESPONDING TO MEMBER IDENTIFICATION INFORMATION
S40
ILLUMINATE LAMP IN ACCORDANCE WITH PROCESS CONTENTS
S41
RETURN

Fig. 14

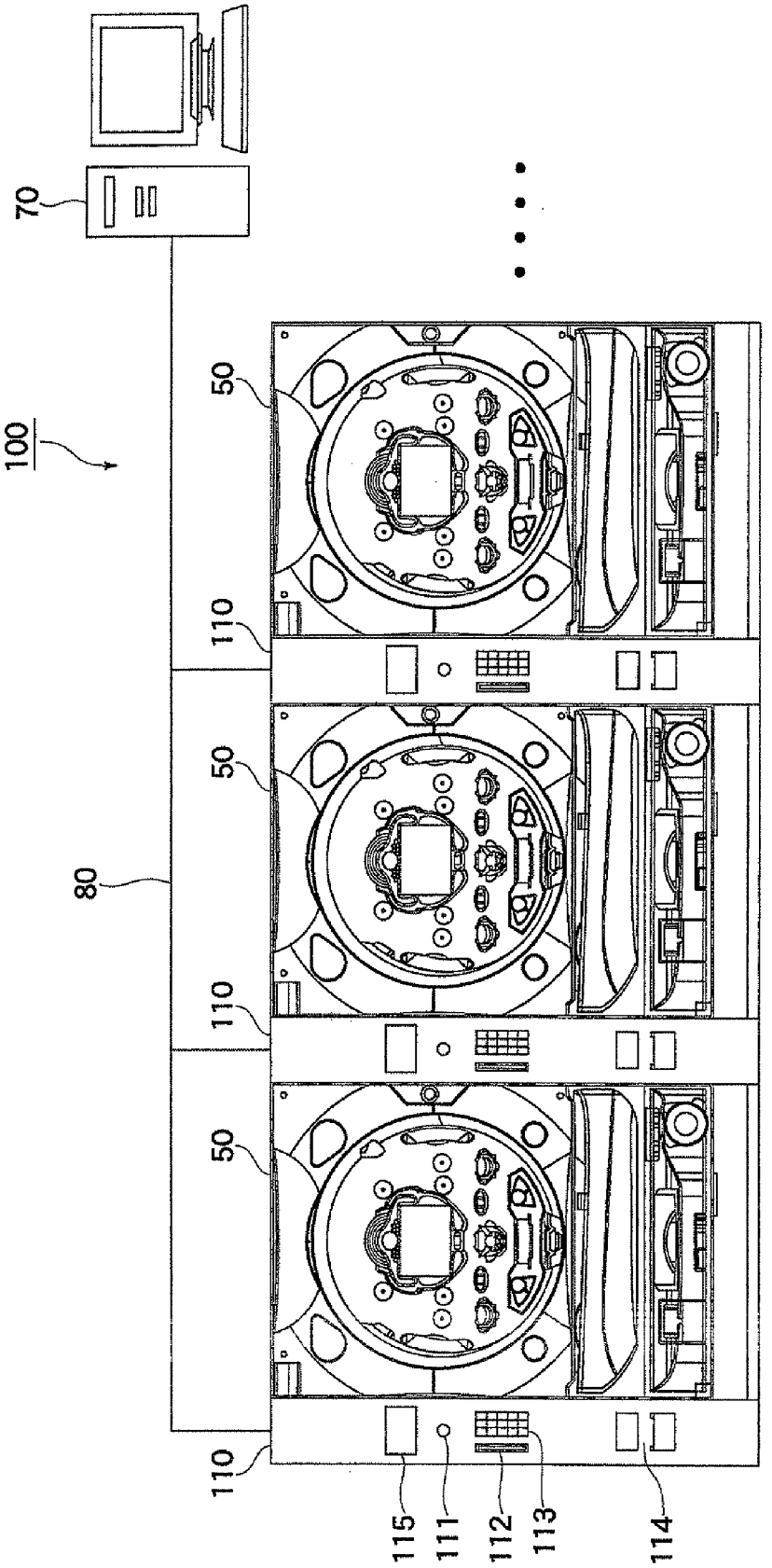


Fig. 15

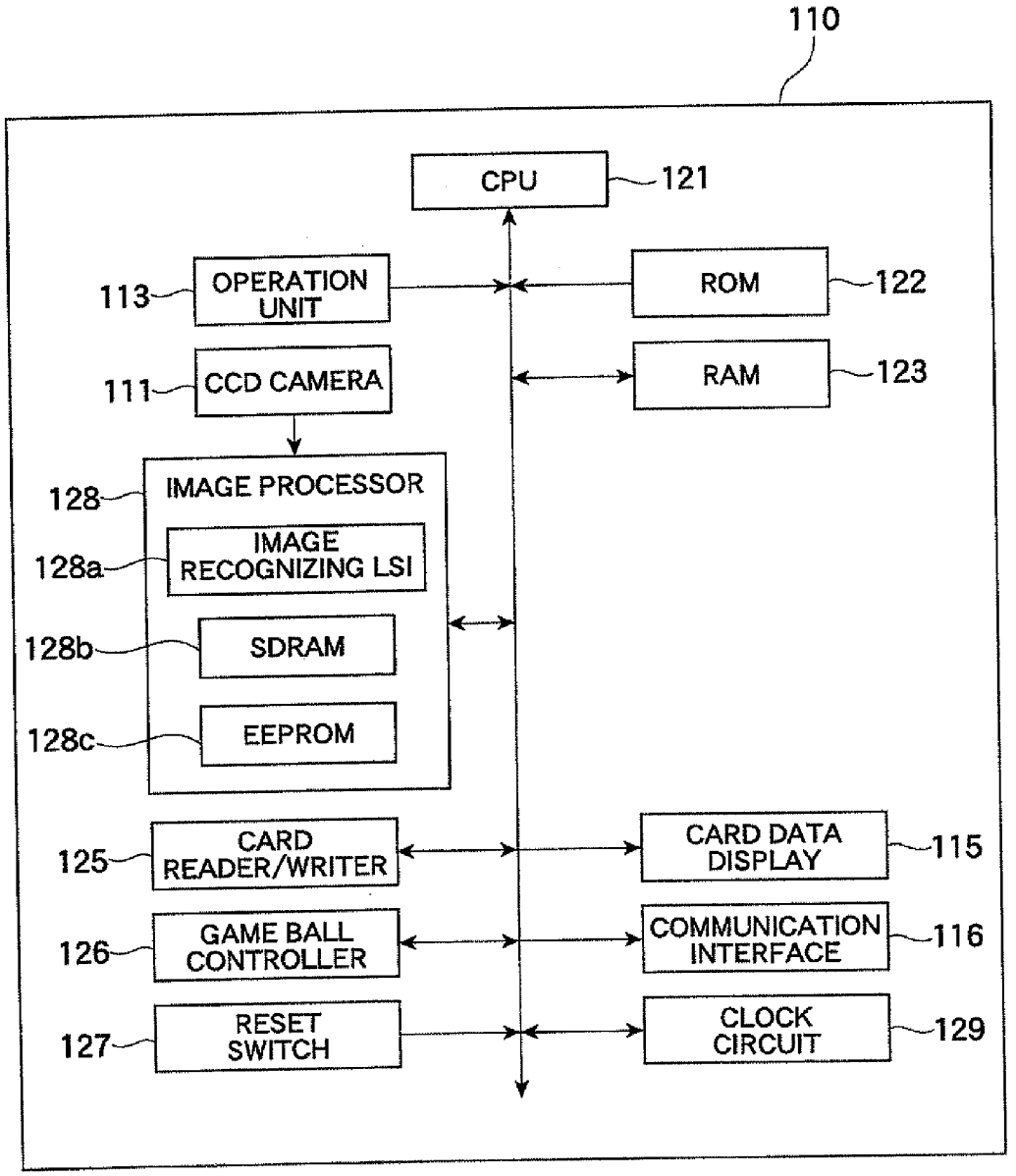

110
CPU
121
113
OPERATION UNIT
ROM
122
111
CCD CAMERA
RAM
123
128
IMAGE PROCESSOR
128a
IMAGE RECOGNIZING LSI
128b
SDRAM
128c
EEPROM
125
CARD READER/WRITER
CARD DATA DISPLAY
115
126
GAME BALL CONTROLLER
COMMUNICATION INTERFACE
116
127
RESET SWITCH
CLOCK CIRCUIT
129

Fig. 16

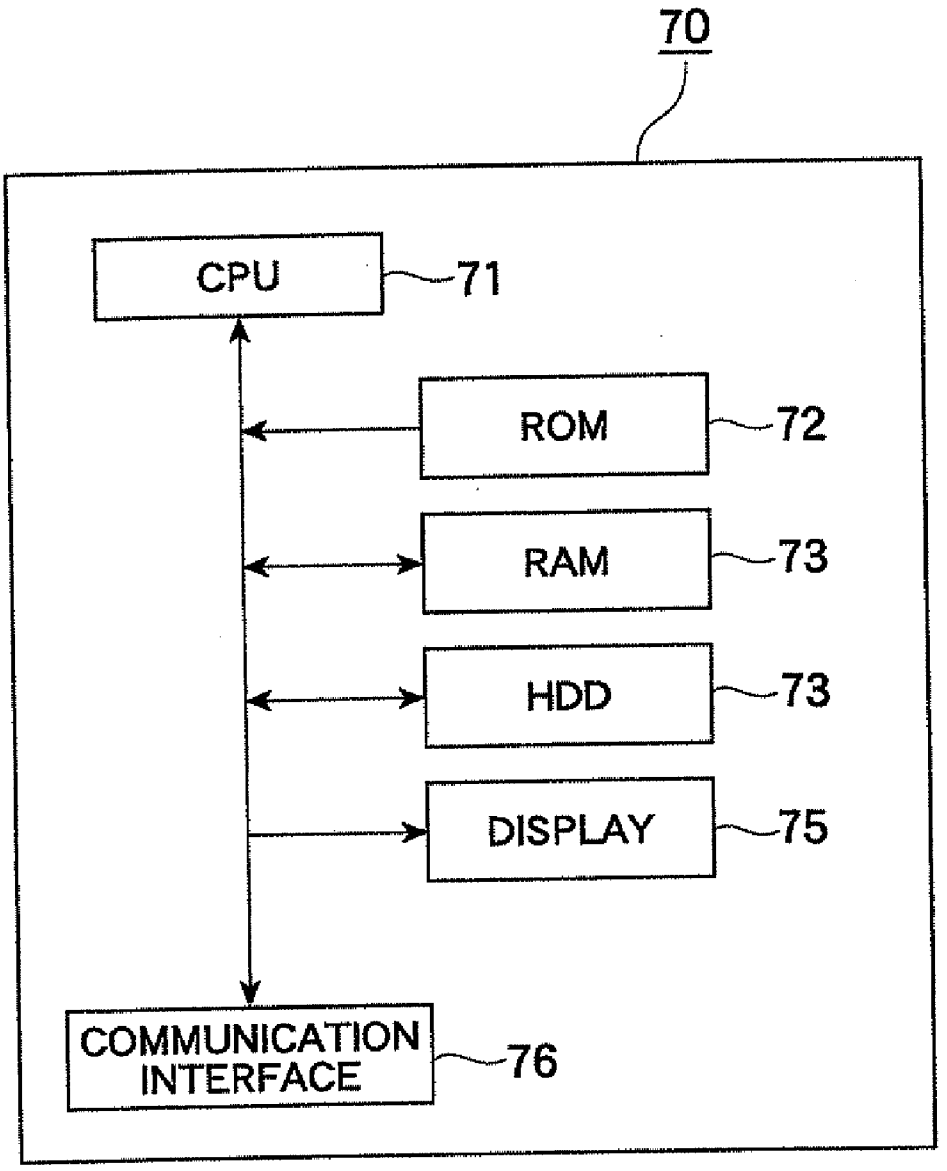

70
CPU
71
ROM
72
RAM
73
HDD
73
DISPLAY
75
COMMUNICATION INTERFACE
76

Fig. 17

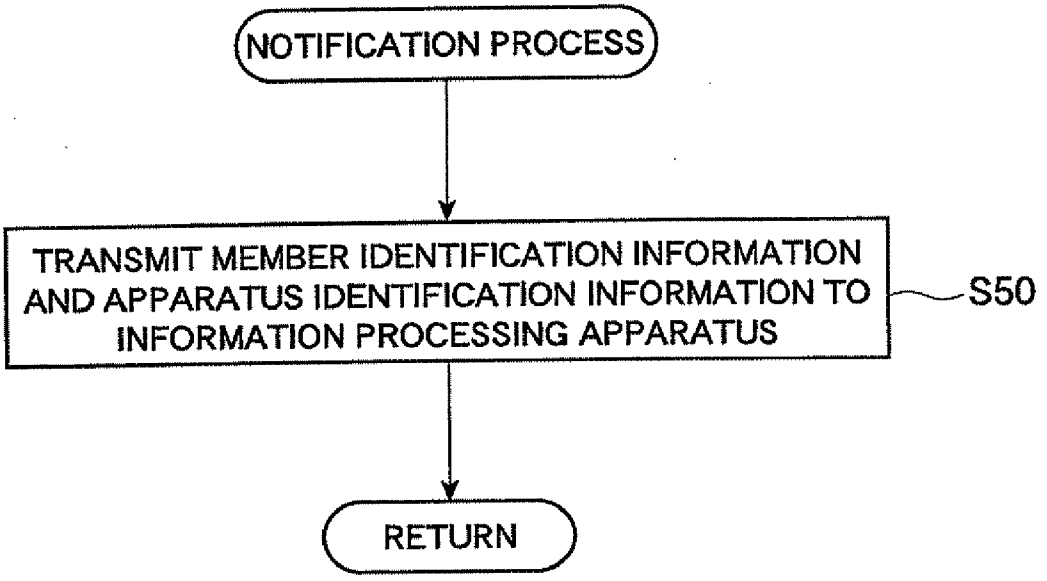

NOTIFICATION PROCESS
TRANSMIT MEMBER IDENTIFICATION INFORMATION AND APPARATUS IDENTIFICATION INFORMATION TO INFORMATION PROCESSING APPARATUS
S50
RETURN

Fig. 18

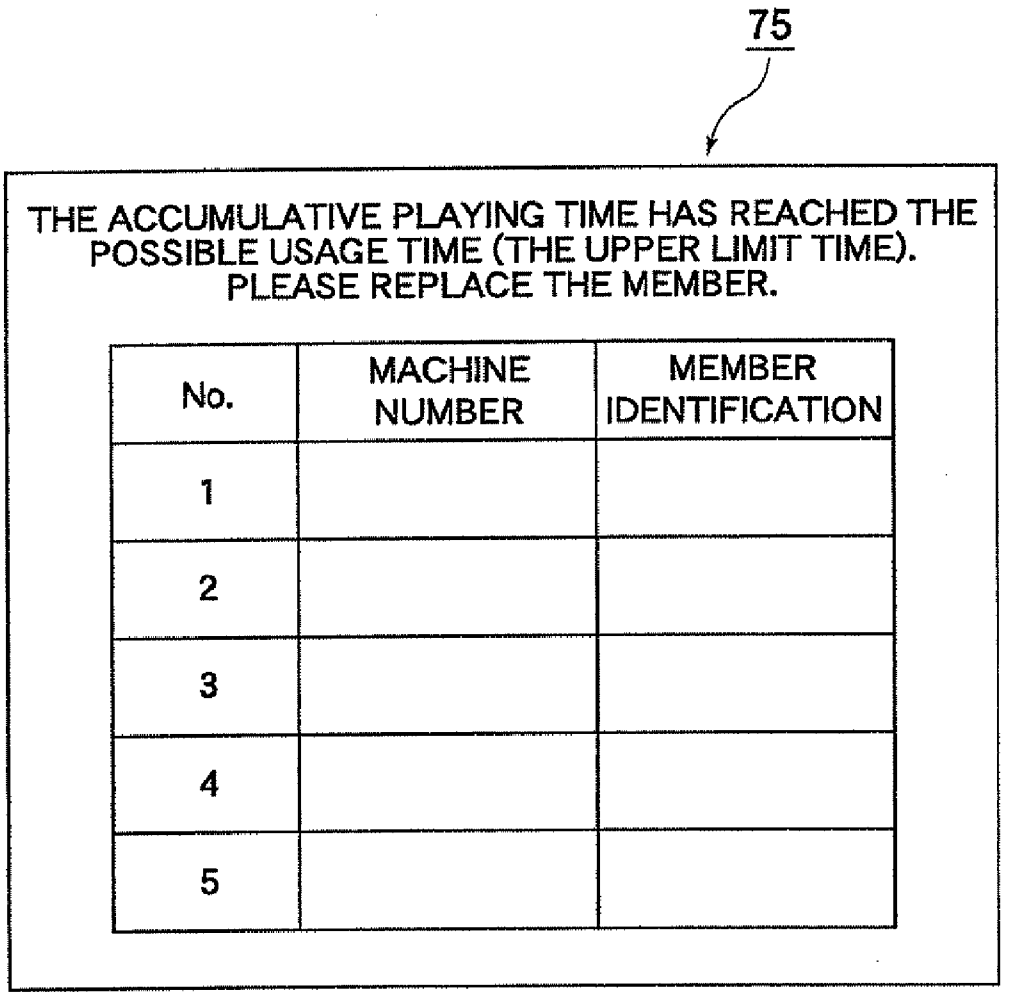

75
THE ACCUMULATIVE PLAYING TIME HAS REACHED THE POSSIBLE USAGE TIME (THE UPPER LIMIT TIME). PLEASE REPLACE THE MEMBER.
No.
MACHINE NUMBER
MEMBER IDENTIFICATION
1
2
3
4
5

Fig. 19

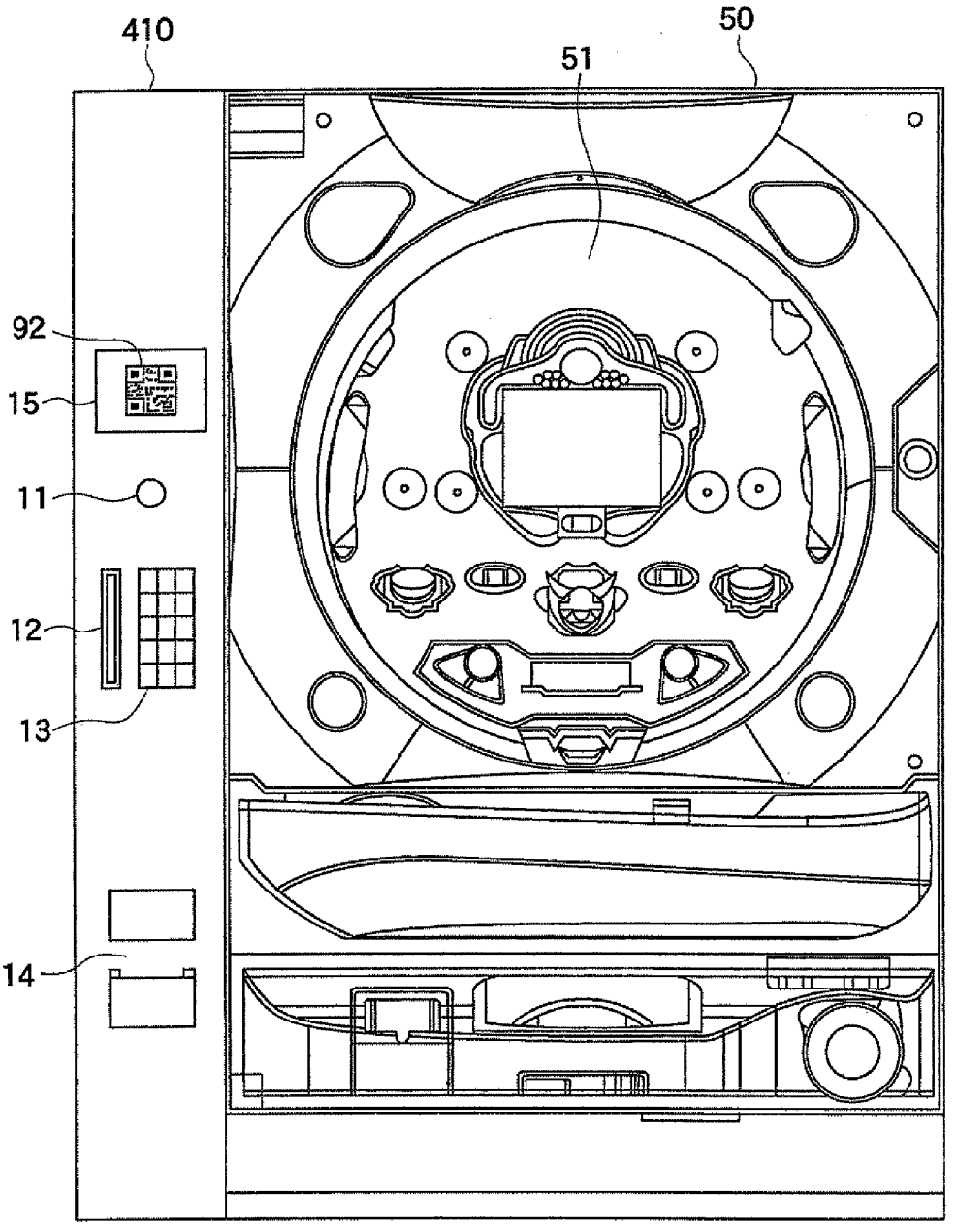


Fig. 20

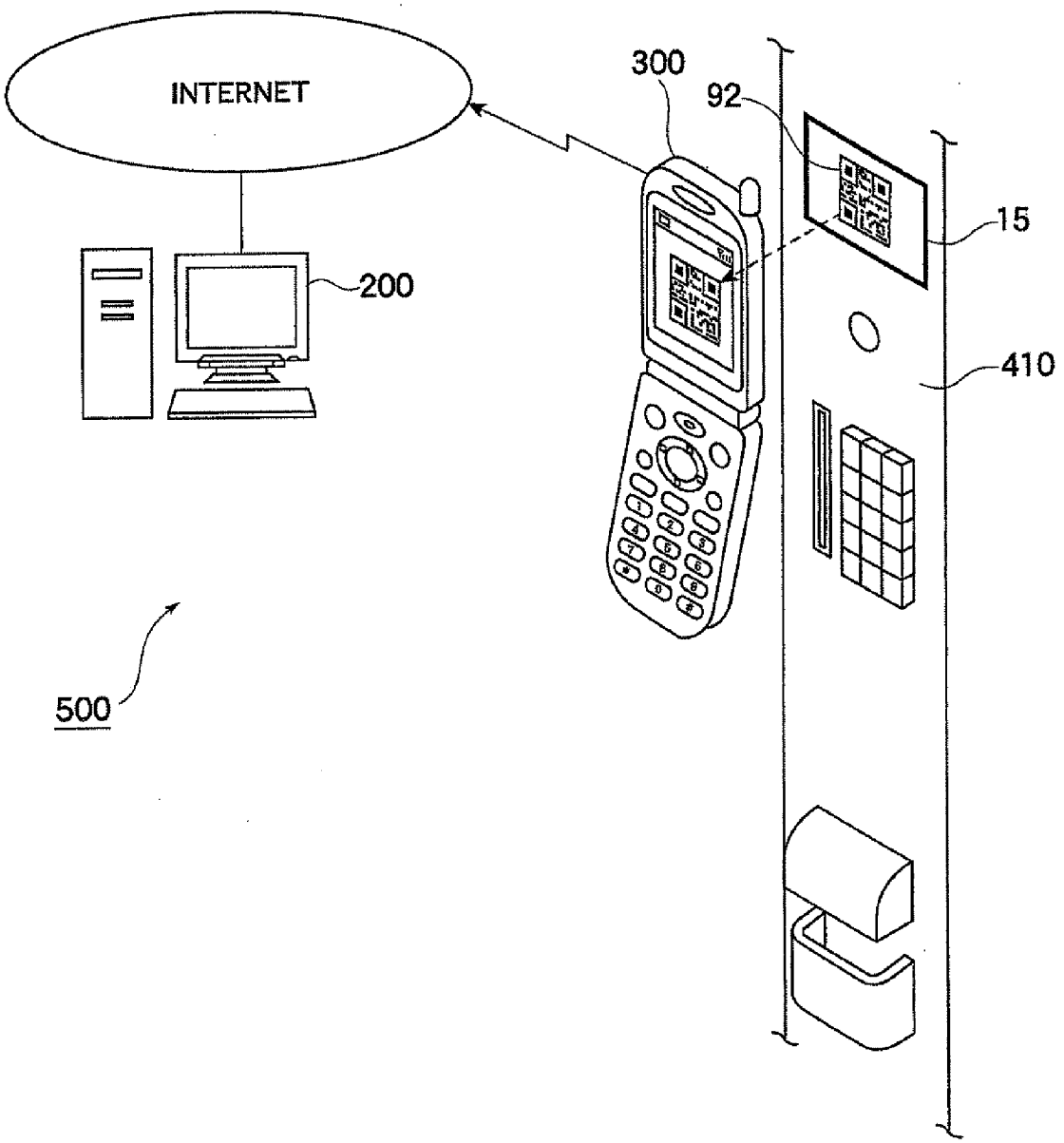


Fig. 21

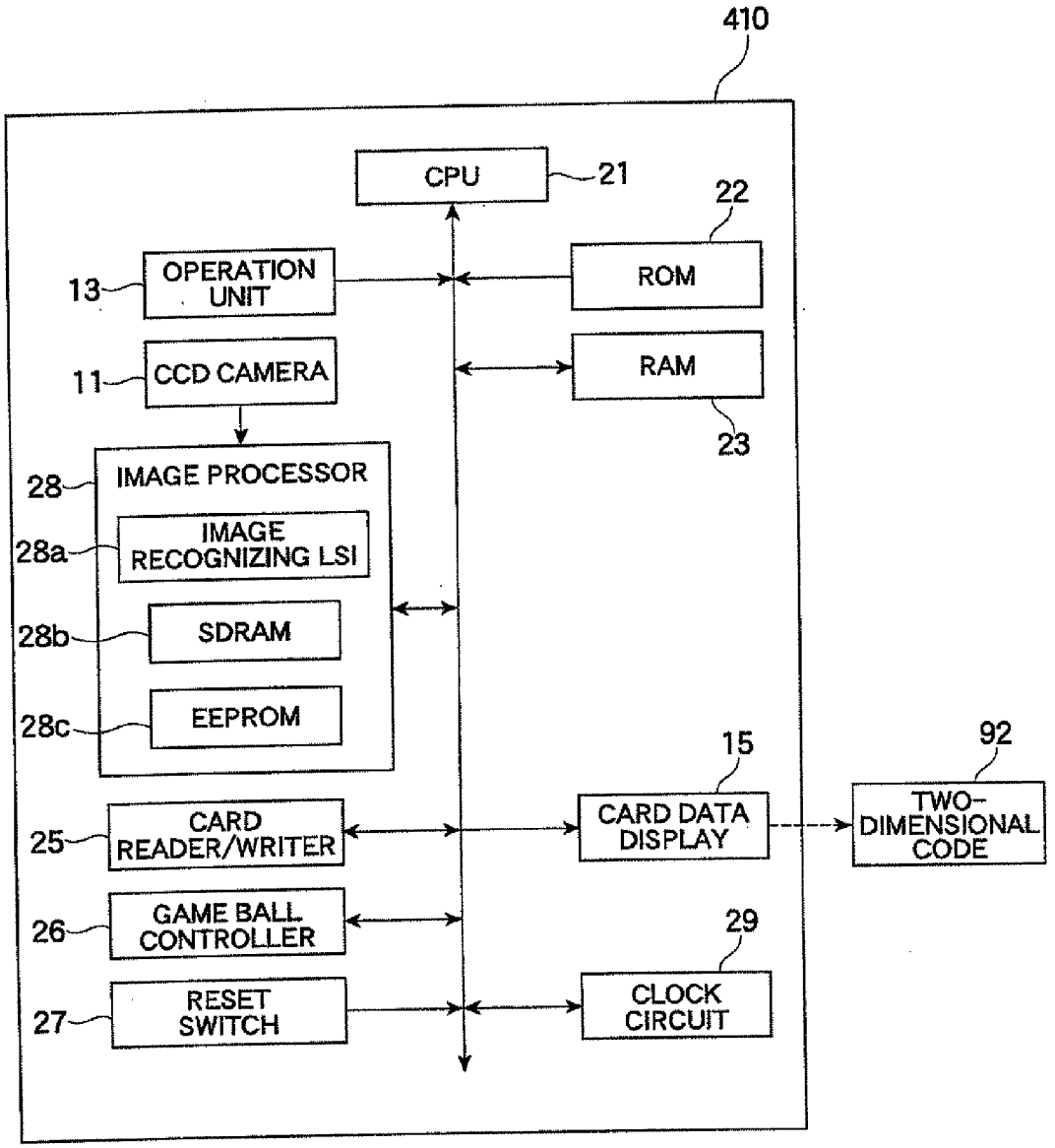

410
CPU
21
22
ROM
13
OPERATION UNIT
11
CCD CAMERA
RAM
23
28
IMAGE PROCESSOR
28a
IMAGE RECOGNIZING LSI
28b
SDRAM
28c
EEPROM
15
92
CARD DATA DISPLAY
TWO-DIMENSIONAL CODE
25
CARD READER/WRITER
26
GAME BALL CONTROLLER
29
27
RESET SWITCH
CLOCK CIRCUIT

Fig. 22

PROCESS CONTENTS SELECTION TABLE		
MEMBER IDENTIFICATION INFORMATION		MAKER'S WEBSITE ADDRESS
001	(GAME PANEL)	・・・
002	(PRIZE DISPENSING DEVICE)	・・・
003	(LIQUID CRYSTAL DISPLAY DEVICE)	・・・
004	(FRONT DOOR)	・・・
005	(UPPER TRAY DEVICE)	・・・
006	(LOWER TRAY DEVICE)	・・・
007	(OUTER FRAME)	・・・
008	(CONTROL SUBSTRATE)	・・・
009	(PAYOUT DEVICE)	・・・
010	(POWER SOURCE DEVICE)	・・・
011	(SHOOTING DEVICE)	・・・
⋮		⋮

Fig. 23

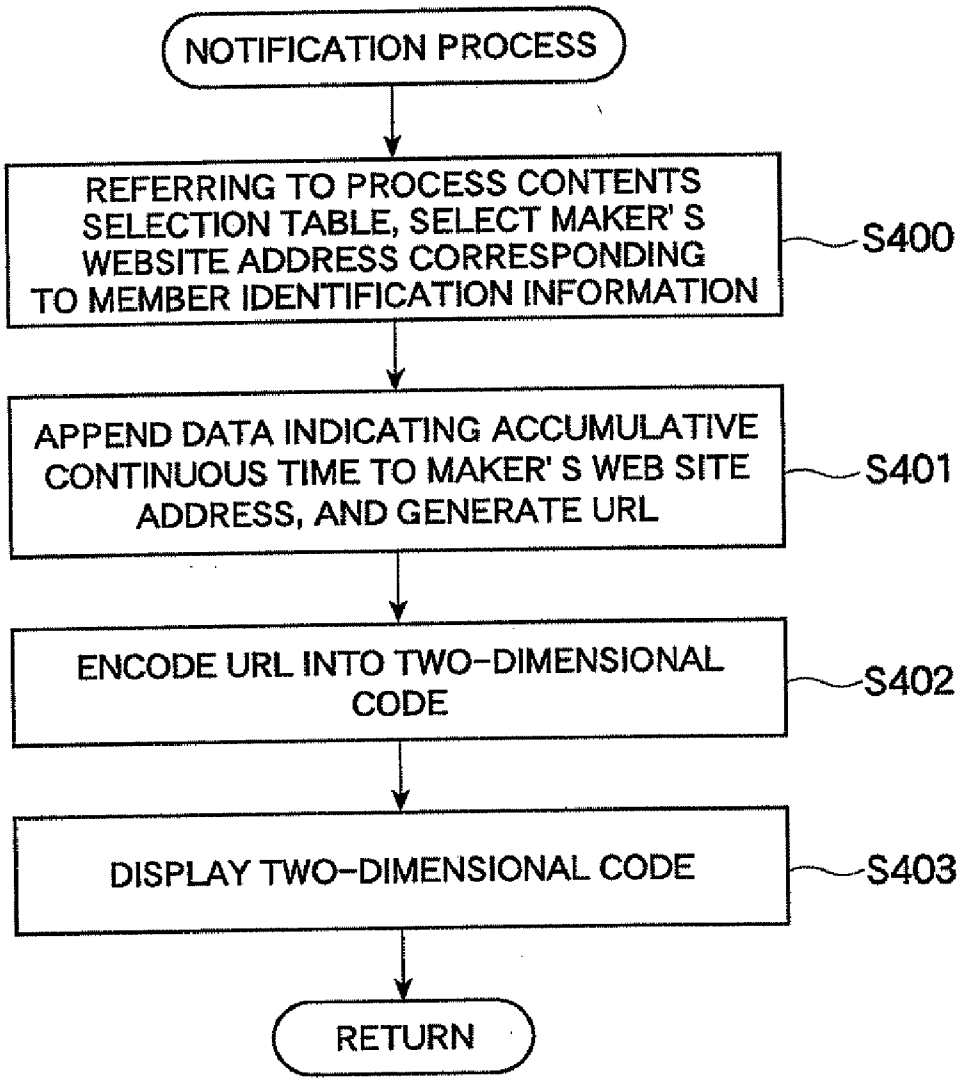

NOTIFICATION PROCESS
REFERRING TO PROCESS CONTENTS SELECTION TABLE, SELECT MAKER' S WEBSITE ADDRESS CORRESPONDING TO MEMBER IDENTIFICATION INFORMATION
S400
APPEND DATA INDICATING ACCUMULATIVE CONTINUOUS TIME TO MAKER' S WEB SITE ADDRESS, AND GENERATE URL
S401
ENCODE URL INTO TWO-DIMENSIONAL CODE
S402
DISPLAY TWO-DIMENSIONAL CODE
S403
RETURN

Fig. 24

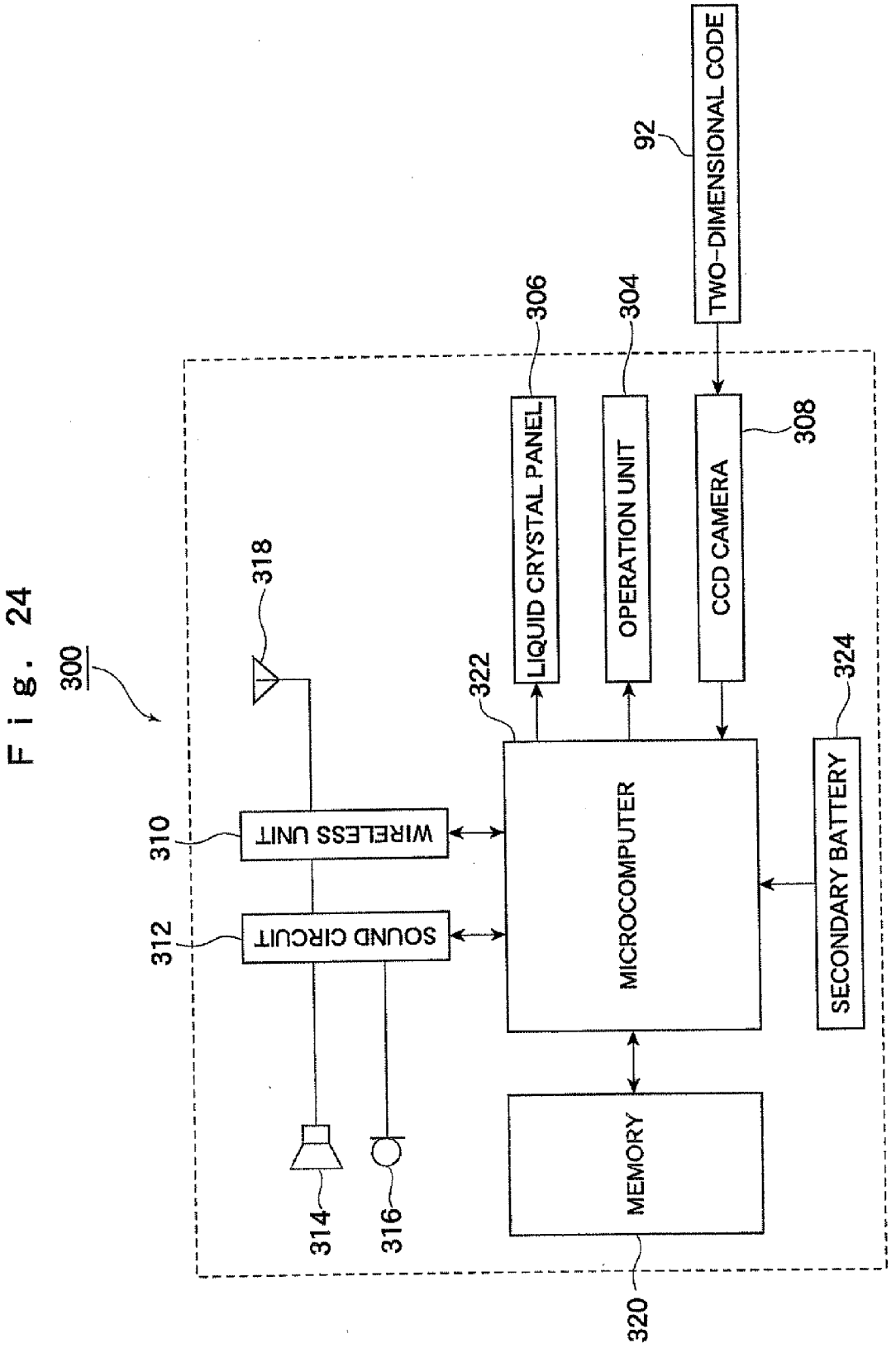

300
318
310
WIRELESS UNIT
312
SOUND CIRCUIT
314
316
322
MICROCOMPUTER
MEMORY
320
306
LIQUID CRYSTAL PANEL
304
OPERATION UNIT
308
CCD CAMERA
92
TWO-DIMENSIONAL CODE
324
SECONDARY BATTERY

Fig. 25

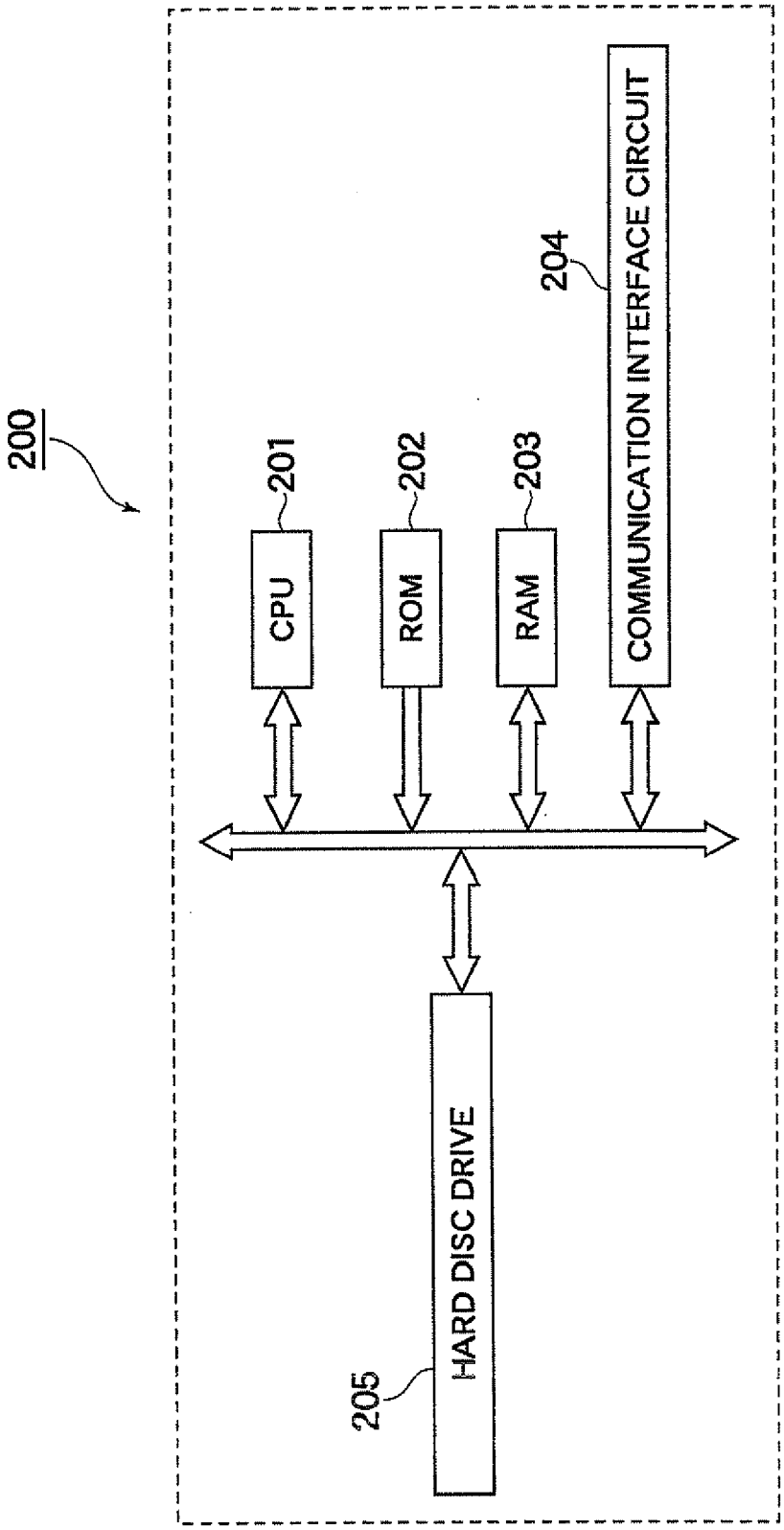

200
201
CPU
202
ROM
203
RAM
204
COMMUNICATION INTERFACE CIRCUIT
205
HARD DISC DRIVE

Fig. 26

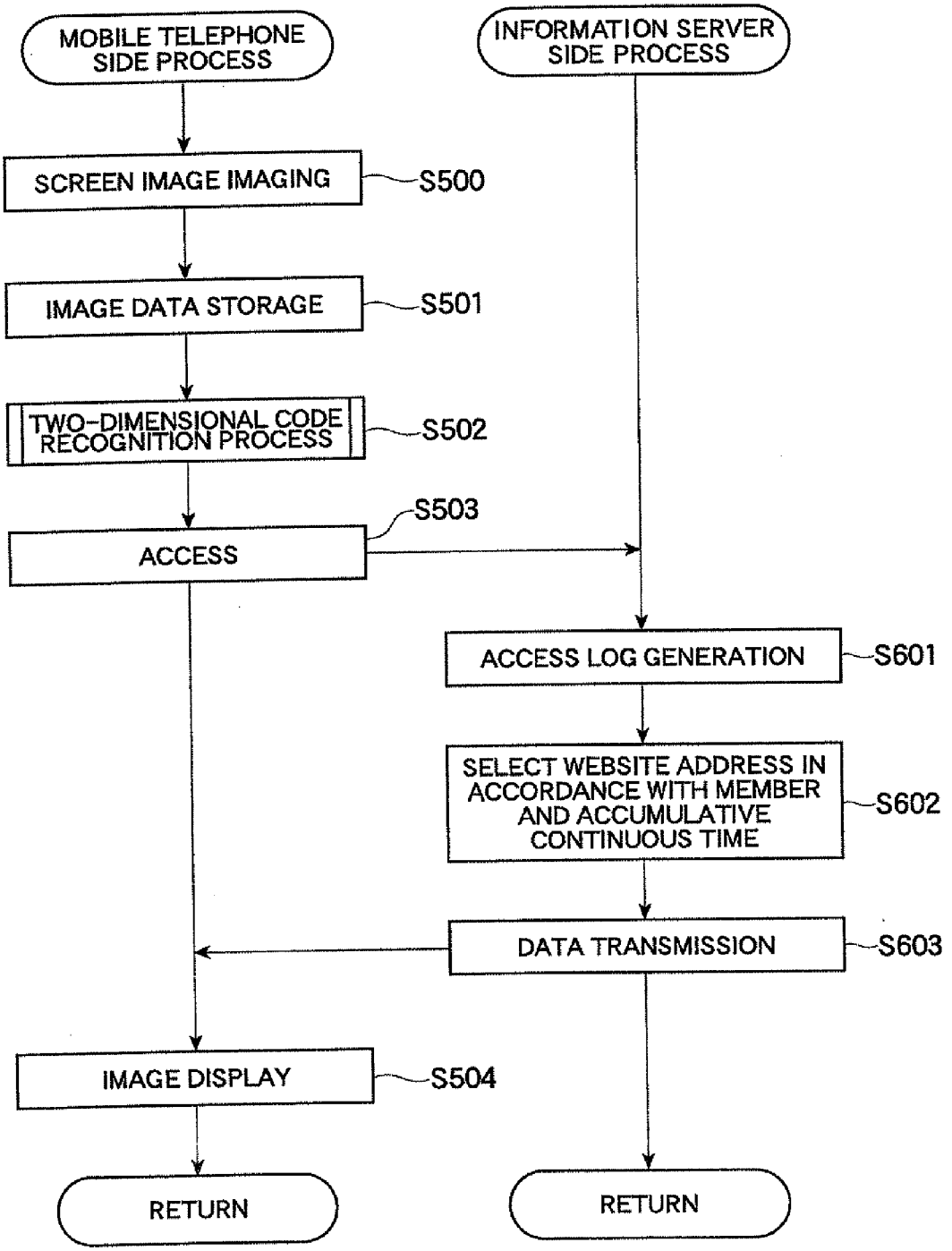

MOBILE TELEPHONE SIDE PROCESS
INFORMATION SERVER SIDE PROCESS
SCREEN IMAGE IMAGING
S500
IMAGE DATA STORAGE
S501
TWO-DIMENSIONAL CODE RECOGNITION PROCESS
S502
S503
ACCESS
ACCESS LOG GENERATION
S601
SELECT WEBSITE ADDRESS IN ACCORDANCE WITH MEMBER AND ACCUMULATIVE CONTINUOUS TIME
S602
DATA TRANSMISSION
S603
IMAGE DISPLAY
S504
RETURN
RETURN

Fig. 27

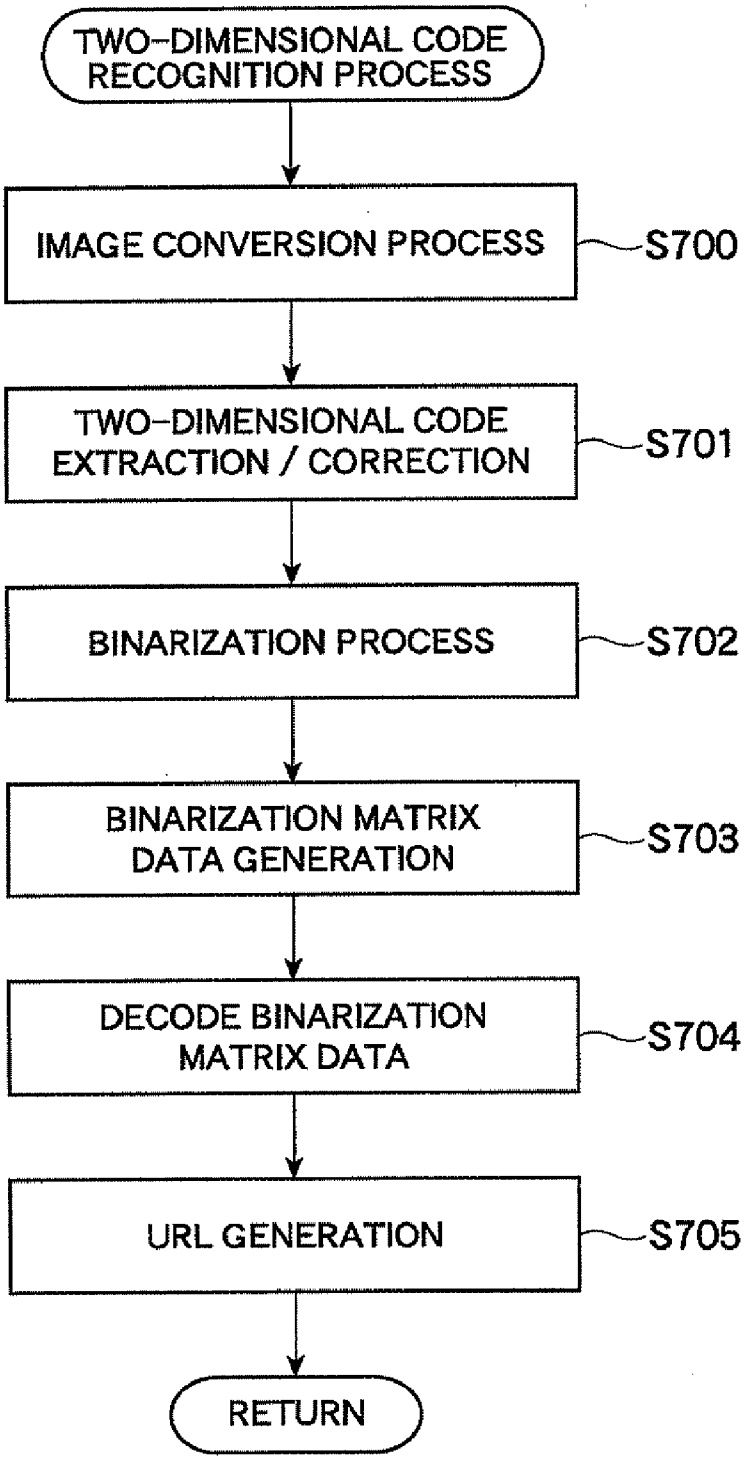
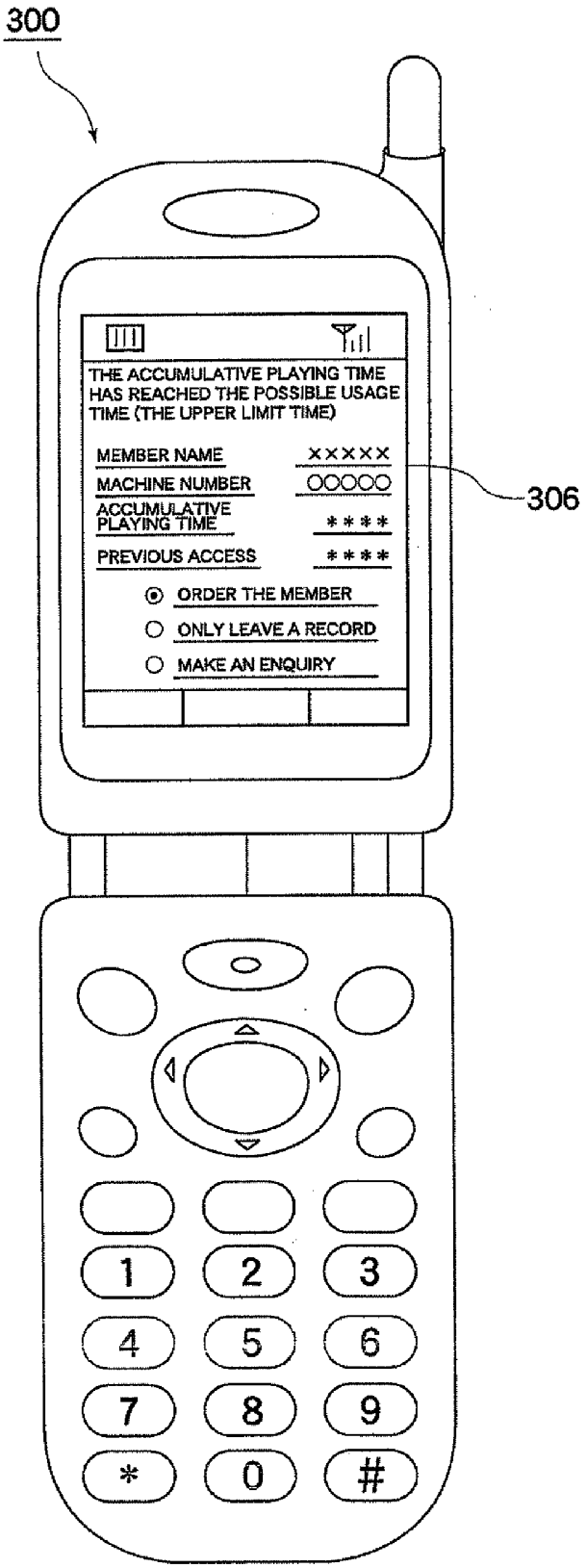

TWO-DIMENSIONAL CODE RECOGNITION PROCESS
IMAGE CONVERSION PROCESS
S700
TWO-DIMENSIONAL CODE EXTRACTION / CORRECTION
S701
BINARIZATION PROCESS
S702
BINARIZATION MATRIX DATA GENERATION
S703
DECODE BINARIZATION MATRIX DATA
S704
URL GENERATION
S705
RETURN

Fig. 28


300
THE ACCUMULATIVE PLAYING TIME HAS REACHED THE POSSIBLE USAGE TIME (THE UPPER LIMIT TIME)
MEMBER NAME
XXXXX
MACHINE NUMBER
OOOOO
ACCUMULATIVE PLAYING TIME
****
PREVIOUS ACCESS
****
ORDER THE MEMBER
ONLY LEAVE A RECORD
MAKE AN ENQUIRY
306
1
2
3
4
5
6
7
8
9
*
0
#

PERIPHERAL DEVICE, PLAYING TIME MEASURING SYSTEM AND PLAYING TIME MEASURING DEVICE

RELATED APPLICATION

[0001] This application is based upon and claims the priority from a prior Japanese patent application No. 2005-256319 filed on Dec. 9, 2005, and a prior Japanese patent application No. 2006-235340 filed on Aug. 31, 2006, in Japan, entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Technical Field

[0003] The present invention relates to a peripheral device (for example, a sandwiched device) installed adjoining a gaming device, a playing time measuring system furnished with the peripheral device and a management server installed in a game arcade, a casino etc., and a playing time measuring device provided on the gaming device or on the peripheral device installed adjoining the gaming device.

[0004] 2. Related Art

[0005] To date, in a game arcade, a casino, etc. in which a gaming device such as a pachinko, a slot machine or any gaming machines is installed, a type of machine has been replaced at a frequency of approximately once in two to four months, and a used gaming device has been disposed of as industrial waste or general waste. However, in recent years, a waste gaming device such as the pachinko, the slot machine or any gaming machines has become a big problem.

[0006] The gaming device being manufactured from a variety of materials such as wood, glass, a metal, a synthetic resin, an electronic part and an electrical wire, a certain amount of dismantling is necessary when discarding the used gaming device, so a fee is paid to a dismantler, and the dismantling and discarding are commissioned. However, it being difficult for an installer of the gaming device to pick out a responsible dismantler, there is a dismantler who piles used gaming devices outdoors and leaves them.

[0007] For this reason, a system has been tried recently by which a manufacturer, while renting a gaming device of a new type to the game arcade, the casino etc., collects the used gaming device, removes a usable part etc. from the used gaming device, and reuses it. In the event that this kind of system is operated, an efficient use of resources is achieved, and an occurrence of waste is suppressed. However, in order to operate this kind of system, it is necessary to accurately ascertain a usage time of a member configuring the gaming device.

[0008] Herein, for example, in the gaming device, while measuring an operating time of a game ball shooting device, by counting an accumulative operating time of the game ball shooting device furnished on each gaming device in a management server connected to each gaming device via a communication line, a system exists which judges whether or not a member configuring a game ball should be replaced (for example, refer to JP-A-2003-245454). According to a system described in JP-A-2003-245454, as it is possible to accurately ascertain the usage time of the member configuring the gaming device, it is possible to prevent a problem occurring due to the member being used beyond a possible usage time (a durability time) of the member, and an increase in waste due to the member being discarded before reaching the possible usage time.

[0009] However, in the system described in JP-A-2003-245454, as it is necessary to provide an interface on a gaming device for transmitting a signal from the gaming device to a management server indicating an operating time of a game ball shooting device, and change a setting of the gaming device to enable a communication of the signal, there has been a fear of a dishonest behavior such as an access to a control substrate provided on the gaming device or a use of a magnet occurring. From a point of view of a game arcade, a casino etc., as a considerable loss is incurred in the event that the dishonest behavior or the use of the magnet occurs, there has been a problem that it is difficult to introduce a system with which there is a fear of this kind of behavior occurring.

SUMMARY OF THE INVENTION

[0010] The invention, being conceived with the heretofore described problem in mind, has an object of providing a peripheral device, a playing time measuring system and a playing time measuring device which enable an accurate ascertainment of a usage time of a member configuring a gaming device, without increasing a fear that a dishonest behavior or a use of a magnet will occur.

[0011] In order to achieve the object, according to a first aspect of the present invention, there is provided a peripheral device installed adjoining a gaming device, including: a display capable of displaying at least a two-dimensional code; and a display controller which carries out a process displaying the two-dimensional code on the display.

[0012] According to a second aspect of the invention, there is provided the peripheral device of the first aspect, further including: a cumulative counting module which cumulatively counts a time for which a game is played by a player; and a judging module which carries out a process judging whether or not an accumulative continuous time, which is a result of the counting by the cumulative counting module, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time, wherein the display controller, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process displaying a two-dimensional code, in which information for notifying an exterior of the matter is encoded, on the display.

[0013] According to a third aspect of the invention, in the peripheral device of the second aspect, the cumulative counting module includes: an imaging module which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; a determination module which carries out a process determining whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module; a measuring module which measures a continuous time for which it is determined by the determination module that the facial image data are included in the image data; and a counting module which cumulatively counts the continuous time measured by the measuring module.

[0014] According to a fourth aspect of the invention, there is provided a peripheral device installed adjoining a gaming device, including: an imaging module which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; a determination module which carries out a process determining whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module; a measuring module which measures a continuous time for which it is determined by the determination module that the facial image data are included in the image data; a counting module which cumulatively counts the continuous time measured by the measuring module; a judging module which carries out a process judging whether or not an accumulative continuous time, which is a result of the counting by the counting module, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time; and a notification processing module which, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process notifying an exterior of the matter.

[0015] According to a fifth aspect of the invention, in the peripheral device of the fourth aspect, the upper limit time is a possible usage time fixed for members configuring the gaming device.

[0016] According to a sixth aspect of the invention, there is provided a peripheral device installed adjoining a gaming device, including: an imaging module which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; a determination module which carries out a process determining whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module; a measuring module which measures a continuous time for which it is determined by the determination module that the facial image data are included in the image data; a counting module which cumulatively counts the continuous time measured by the measuring module; a judgment table storage module which stores a judgment table in which are correlated member identification information fixed for each of a plurality of members configuring the gaming device, and a possible usage time fixed for each member; a judging module which carries out a process judging whether or not an accumulative continuous time, which is a result of the counting by the counting module, has reached any of the possible usage times included in the judgment table fixed as a subject of comparison with the accumulative continuous time; and a notification processing module which, in the event that it is judged by the judging module that the accumulative continuous time has reached any of the possible usage times, executes a process, which differs according to the member identification information correlated to the possible usage time, as a process notifying an exterior of the matter.

[0017] According to a seventh aspect of the invention, there is provided the peripheral device of the fourth aspect, further including: a lamp, wherein the notification processing module, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process which illuminates the lamp.

[0018] According to an eighth aspect of the invention, in the peripheral device of the sixth aspect, the notification processing module includes: a display capable of displaying at least a two-dimensional code; and a display controller which, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process notifying the exterior of the matter.

[0019] According to a ninth aspect of the invention, there is provided the peripheral device of the fourth aspect, further including: a communication module for carrying out a communication via a communication line with an management server furnished in a game arcade, a casino etc. in which a plurality of the gaming devices is installed; and a device identification information storage module which stores device identification information allotted to the peripheral device, wherein, in the event that it is judged by the notification processing module and the judging module that the accumulative continuous time has reached the upper limit timer a process is carried out by the communication module which transmits the device identification information stored in at least the device identification information storage module to the management server.

[0020] According to a tenth aspect of the invention, there is provided a playing time counting system provided on a peripheral device installed adjoining a gaming device, including: an imaging module which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; a determination module which carries out a process determining whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module; a measuring module which measures a continuous time for which it is determined by the determination module that the facial image data are included in the image data; a counting module which cumulatively counts the continuous time measured by the measuring module; a judging module which carries out a process judging whether or not an accumulative continuous time, which is a result of the counting by the counting module, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time; and a notification processing module which, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process notifying an exterior of the matter.

[0021] According to an eleventh aspect of the invention, there is provided a playing time measuring device provided on a gaming device or on a peripheral device installed adjoining the gaming device, including: an imaging module which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; a determination module which carries out a process determining whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module; a measuring module which measures a continuous time for which it is determined by the determination module that the facial image data are included in the image data; a counting module which cumulatively counts the continuous time measured by the measuring module; a judging module which carries out a process judging whether or not an accumulative continuous time, which is a result of the

counting by the counting module, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time; and a notification processing module which, in the event that it is judged by the judging module that the accumulative continuous time has reached the upper limit time, carries out a process notifying an exterior of the matter.

[0022] 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

[0023] The accompanying drawings, which are incorporated in and constitute apart 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.

[0024] FIG. **1** is a front view schematically showing a peripheral device (for example, a sandwiched device) according to a first embodiment, and a gaming device installed adjoining the peripheral device;

[0025] FIG. **2**A is a front view schematically showing the gaming device shown in FIG. **1**, while FIG. **2**B is a rear view schematically showing the gaming device shown in FIG. **1**;

[0026] FIG. **3** is a block diagram showing an internal configuration of the peripheral device shown in FIG. **1**;

[0027] FIG. **4** shows an example of a judgment table according to the first embodiment;

[0028] FIG. **5** shows an example of a process contents determination table according to the first embodiment;

[0029] FIG. **6** shows an example of various kinds of storage area according to the first embodiment;

[0030] FIG. **7** is a flowchart showing a sub-routine of a continuous time measuring process according to the first embodiment;

[0031] FIG. **8** is a flowchart showing a sub-routine of a facial recognition process according to the first embodiment;

[0032] FIG. **9**A is a side view showing an aspect of a player playing a game on the gaming device, while FIG. **9**B is a plan view thereof;

[0033] FIG. **10**A is a view schematically showing image data acquired by imaging the aspect shown in FIG. **9**, FIG. **10**B is a view schematically showing image data for which characteristic points have been recognized, and FIG. **10**C is a view schematically showing image data for which facial image data have been recognized;

[0034] FIG. **11**A is a side elevation showing an aspect of an onlooker looking at a gaming device **50**, while FIG. **11**B is a plan view thereof;

[0035] FIG. **12**A is a view schematically showing image data acquired by imaging the aspect shown in FIG. **11**, FIG. **12**B is a view schematically showing image data for which the characteristic points have been recognized, and FIG. **12**C is a view schematically showing image data for which the facial image data have been recognized;

[0036] FIG. **13** is a flowchart showing a sub-routine of a notification process according to the first embodiment;

[0037] FIG. **14** is a network configuration diagram schematically showing a playing time measuring system according to a second embodiment;

[0038] FIG. **15** is a block diagram showing an internal configuration of a peripheral device shown in FIG. **14**;

[0039] FIG. **16** is a block diagram showing an internal configuration of a management server shown in FIG. **14**;

[0040] FIG. **17** is a flowchart showing a sub-routine of a notification process according to the second embodiment;

[0041] FIG. **18** shows an example of an image displayed on a display furnished on the management server shown in FIG. **14**;

[0042] FIG. **19** is a front view schematically showing a peripheral device according to a third embodiment, and a gaming device installed adjoining the peripheral device;

[0043] FIG. **20** is a network configuration diagram showing an example of an information provision system according to the third embodiment;

[0044] FIG. **21** is a block diagram showing an internal configuration of the peripheral device shown in FIG. **19**;

[0045] FIG. **22** shows an example of a process contents selection table according to the third embodiment;

[0046] FIG. **23** is a flowchart showing a sub-routine of a notification process according to the third embodiment;

[0047] FIG. **24** is a block diagram showing an internal configuration of a mobile telephone shown in FIG. **20**;

[0048] FIG. **25** is a block diagram showing an internal configuration of an information server shown in FIG. **20**;

[0049] FIG. **26** is a flowchart showing a process carried out in the mobile telephone and the information server configuring the information provision system according to the third embodiment;

[0050] FIG. **27** is a flowchart showing a two-dimensional code recognition process called up and executed in step S**502** of the process shown in FIG. **26**; and

[0051] FIG. **28** shows an example of a screen displayed on the mobile telephone when the process of step S**504** shown in FIG. **26** is carried out.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A First Embodiment

[0052] FIG. **1** is a front view schematically showing a peripheral device (for example, a sandwich device **10**) according to a first embodiments and a gaming device (for example, a gaming device **50**) installed adjoining the peripheral device. Although, in the embodiment, a description is

given of a case in which the gaming device is a pachinko, there being no particular limitation as to the gaming device in the invention, it is possible to propose, for example, a slot machine or any gaming machines.

[0053] A sandwiched device **10** is installed adjoining a gaming device **50**. A lamp **16**, a card data display **15**, a CCD camera **11**, a card insertion slot **12** and an operation unit **13**, as well as a game ball supply unit **14**, are provided, in order from a top, on a front surface of the sandwiched device **10**.

[0054] A card (for example, a prepaid card) for receiving a provision of a game ball is inserted in the card insertion slot **12**. The card data display **15** displays data stored in the card inserted in the card insertion slot **12**. The operation unit **13** is used when carrying out an operation in order for a player to receive a supply of the game ball. The game ball supply unit **14** supplies the game ball to the player by discharging the game ball in response to an operation by the player of the operation module **13**.

[0055] The CCD camera **11** is installed, at a height approximately the same as a center portion of a game panel **51** furnished on the gaming device **50**, facing in a direction in which it is possible to image in front of the gaming device **50**. The CCD camera **11** functions as an imaging module in the invention. The lamp **16**, being capable of illumination in a plurality of colors, includes a plurality of LED's. Also, although not shown, a reset switch **27** is provided on a rear surface of the sandwiched device **10**. The reset switch **27** is a switch which is operated by an employee of a game arcade, a casino etc. in order to reset an accumulative continuous time, to be described hereafter, to 0.

[0056] In the invention, as long as the sandwiched device is installed adjoining the gaming device, it is not limited to the example. It is also acceptable to have a configuration in which a bill is used in place of the card, and it is also acceptable to have a configuration which directly supplies a game medium, such as the game ball or a medal, to a top tray etc. furnished on the gaming device.

[0057] Also, in the first embodiment, a description is given of a case in which notification is given that the accumulative continuous time has reached an upper limit by an illumination of the lamp **16**, but the invention is not limited to this example. For example, it is also acceptable that a two-dimensional code is displayed on a display furnished on the sandwiched device when the accumulative continuous time reaches the upper limit. Regarding the sandwiched device which displays the two-dimensional code, a detailed description will be given hereafter as a third embodiment.

[0058] FIG. **2**A is a front view schematically showing the gaming device shown in FIG. **1**, while FIG. **2**B is a rear view schematically showing the gaming device shown in FIG. **1**.

[0059] As shown in FIG. **2**A, the front surface of the gaming device **50** is equipped with the game panel **51** on which are installed a plurality of prize dispensing devices **52** and a guide rail **62**, and a liquid crystal display device **53** is installed in the center portion of the game panel **51**. Also, a front door **54** is provided on a front surface of the game panel **51**. An upper tray device **55** being provided below the game panel **51**, a lower tray device **56** is provided beneath it. In the figure, **57** indicates an outer frame of the gaming device **50**, while **61** indicates a shooting device for shooting the game ball. As shown in FIG. **2**B, a control substrate **58**, a discharge device **59**, a power source device **60** and the shooting device **61** are provided on a rear surface of the gaming device **50**. The gaming device **50** and the sandwiched device **10** both being independent, no transmission and reception of data is carried out between the gaming device **50** and the sandwiched device **10**.

[0060] Of the members **51** to **62** which configure the gaming device **50**, the game panel **51** equipped with the guide rail **62**, the prize dispensing devices **52**, the front door **54** and the upper tray device **55** are, normally, members for which a design changes along with a change in a machine type, while the control substrate **58** is a member for which a stored program, data and the like to be stored change along with the change in the machine type. Consequently, it can be said that these members are difficult to reuse. Meanwhile, the liquid crystal display device **53**, the lower tray device **56**, the outer frame **57**, the discharge device **59**, the power source device **60** and the shooting device **61** are, normally, not members for which a design and the like change along with a change in a machine type. Consequently, it can be said that these members are easy to reuse. In the invention, so that a possible usage time is set only for members which can be reused or members which are easy to reuse, it is acceptable to fix a necessity or otherwise of setting the possible usage time for each member in accordance with a possibility or otherwise, or a degree of difficulty, of reusing, and it is also acceptable to fix the necessity or otherwise of setting the possible usage time for each member regardless of the possibility or otherwise, or the degree of difficulty, of reusing. Also, it is also acceptable that a possible usage time is set for the gaming device itself.

[0061] FIG. **3** is a block diagram showing an internal configuration of the sandwiched device shown in FIG. **1**.

[0062] The sandwiched device **10** includes a CPU **21**, an ROM **22** and an RAM **23**.

[0063] The ROM **22**, being a nonvolatile memory, stores a program executed by the CPU **21**, and data etc. used when the CPU **21** carries out a process. The RON **22** stores a judgment table (refer to FIG. **4**) and a process contents selection table (refer to FIG. **5**), to be described hereafter. The ROM **22** functions as a judgment table storage module. The RAM **23**, being a volatile memory, temporarily stores data corresponding to a process result etc. of the CPU **21**. The RAM **23** has a storage area (refer to FIG. **6**), to be described hereafter.

[0064] The operation unit **13**, an image processor **28**, a card reader/writer **25**, a game ball controller **26** and the reset switch **27** are connected to the CPU **21**. Also, the image processor **28** is connected to the CCD camera **11**. The CCD camera **11** functions as the imaging module.

[0065] When an operation place (a button) is operated by a player, the operation unit **13** transmits a signal in accordance therewith to the CPU **21**. The CCD camera **11**, being installed in such a way as to image a prescribed area in front of the gaming device **50**, transmits image data acquired by an imaging. As a timing of the imaging, it is acceptable that it is either continuous or intermittent.

[0066] The image processor **28**, by recognizing characteristic points from the image data transmitted from the CCD camera **11**, determines whether or not facial image data indicating a person's face is included in the image data. The

image processor **28** functions as a determination module. In the embodiment, a pupil and a nostril are used as the characteristic points.

[**0067**] The image processor **28** includes an image recognizing LSI **28***a*, an SDRAM **28***b* and an EEPROM **28***c*. The image recognizing LSI **28***a*, although not shown, includes, for example, a module equipped with a coprocessor capable of a paratactic processing of a plurality of data for one command, a DRAM, a DMA controller, and an affine transformation module. The image data transmitted from the CCD camera **11** is temporarily stored in the SDRAM **28***b*. The EEPROM **28***c* stores a facial recognition program, and a filter, a pattern and the like for recognizing the characteristic points. Furthermore, the EEPROM **28***c* stores area prescription data, which prescribes an area (a determination area) for determining whether or not a position of the facial image data in the image data is an appropriate position, and a determination value which is a subject of a comparison with an area of the facial image data.

[**0068**] The image processor **28** carries out a following process in order to recognize a face of the player.

[**0069**] When the image data transmitted from the CCD camera **11** is stored in the SDRAM **28***b*, the image recognizing LSI **28***a* sets a threshold and, based on the threshold, carries out a binarization process to separate the image data into a light region and a dark region. As a process for setting the threshold, it is possible to suggest a modal method, a p-tile method, a discrimination analysis binarization method and the like. Next, applying a separation degree filter for each pixel included in the dark region, the degree of separation is calculated by changing a radius of the separation degree filter. Continuing, a local maximum point of the degree of separation is extracted as a characteristic point candidate. At this time, a dark region in which a whole or a part of an exterior edge formation approximates a circle or an ellipse qualifies as the characteristic point candidate. Specifically, as well as the pupil and nostril described heretofore, a nose tip, an oral end, a inner corner of an eye, an outer corner of an eye, a corner of an eyebrow, a background noise etc. are included. Next, a pattern cross reference using a subspace method is carried out, and the characteristic point is identified from among the characteristic point candidates based on a position and a formation of the characteristic point candidates. Next, by means of a two-dimensional affine transformation with the characteristic point as a reference, a position and a size of a facial area are normalized, and facial image data are identified from the image data. Next, based on the determination area prescription data, the image recognizing LSI **28***a* judges whether or not the position of the facial image data is included in the determination area, and also judges whether or not an area of the facial image data is equal to or greater than the determination value.

[**0070**] The image processor **28**, based on a result of carrying out the process heretofore described, carries out one of the processes A to D described hereafter.

[**0071**] A. In the event that it has not been possible to extract the characteristic point candidates from the image data, or in the event that it has not been possible to identify the characteristic point from the characteristic point candidates, the image processor **28** determines that the facial image data is not included in the image data. In this case, the image processor **28** transmits a non-detection signal to the CPU **21**.

[**0072**] B. In the event that it is judged that the position of the facial image data is not included in the determination area, the image processor **28** determines that the facial image data are included in the image data, but that the facial image data exist in an inappropriate position (a position in which the face would not normally exist when the player is playing the game). In this case, the image processor **28** transmits the non-detection signal to the CPU **21**.

[**0073**] C. In the event that it is judged that the area of the facial image data is not equal to or greater than the determination value, the image processor **28** determines that the facial image data are included in the image data, but that the facial image data exist in an inappropriate position. In this case, the image processor **28** transmits the non-detection signal to the CPU **21**.

[**0074**] D. In the event that it is judged that the position of the facial image data is included in the determination area, and that the area of the facial image data is equal to or greater than the determination value, it is determined that the facial image data exist in an appropriate position in the image data (a position in which the face could normally exist when the player is playing the game). In this case, the image processor **28** transmits a detection signal to the CPU **21**.

[**0075**] The card reader/writer **25** carries out a reading of data from a card inserted in the card insertion slot **12**, and a writing of data onto the card.

[**0076**] The game ball controller **26**, based on the data read from the card reader/writer **25**, calculates a number of game balls to be supplied to the player, and carries out a process discharging the game balls via the game ball supply unit **14**.

[**0077**] The reset switch **27**, when operated by the player, transmits a prescribed signal to the CPU **21**. The CPU **21** which receives the signal resets the accumulative continuous time value stored in the storage area (refer to FIG. **6**) of the RAM **23** to "0".

[**0078**] The card data display **15**, the lamp **16** and a clock circuit **29** are connected to the CPU **21**. The data read from the card reader/writer **25** etc. are displayed on the card data display **15**. The lamp **16**, being controlled by the CPU **21**, is illuminated in a prescribed color.

[**0079**] FIG. **4** shows an example of the judgment table.

[**0080**] Member identification information allotted to each member **51** to **62** configuring the gaming device **50**, and a possible usage time (a durability time) fixed for each member, are correlated in the judgment table. The judgment table is stored in the ROM **22** as data. The ***** in the figure indicates a possible usage time value.

[**0081**] FIG. **5** shows an example of the process contents determination table.

[**0082**] The member identification information allotted to each member **51** to **62**, and process contents fixed for each member **51** to **62**, are correlated in the process contents determination table. The process contents include an illumination color of the lamp **16** and an illumination pattern of

the lamp **16**. The process contents determination table is stored in the ROM **22** as data.

[**0083**] FIG. **6** shows an example of the data storage area in the RAM **23**.

[**0084**] A starting time value is stored in a starting time storage area. The starting time value is a value indicating a time at which a detection signal is received when a value of the starting time storage area is "0" (a condition in which it has no starting time value stored therein). The starting time value is a value supplied from the clock circuit **29** at the relevant time. The starting time value indicates a time at which a recognition of the player's face is started.

[**0085**] A continuous time value is stored in a continuous time storage area. The continuous time value is a value indicating a difference between a time value and the starting time value at a time when the non-detection signal is received from the image processor **23** in the event that the starting time value is stored in the starting time storage area. The continuous time value indicates a time (a period) from the player's face being recognized to it ceasing to be recognized.

[**0086**] An accumulative continuous time value is stored in an accumulative continuous time storage area. The accumulative continuous time value is a value obtained by cumulatively adding the continuous time values.

[**0087**] Next, a description will be given of processes carried out in the sandwiched device **10** using FIGS. **7** to **13**.

[**0088**] FIG. **7** is a flowchart showing a sub-routine of a continuous time measuring process according to the first embodiment.

[**0089**] First, the CPU **21** causes the image processor **28** to carry out a facial recognition process (step S**12**). The image processor **28** carries out the facial recognition process, and transmits the detection signal or the non-detection signal to the CPU **21**. A detailed description of the facial recognition process will be given hereafter.

[**0090**] Next, the CPU **21** determines whether the signal received from the image processor **28** is the detection signal or the non-detection signal (step S**13**).

[**0091**] If it is determined that a detection signal has been received from the image processor **28**, the CPU **21** determines whether or not the starting time storage area in the RAM **23** is "0" (the condition in which it has no starting time value stored therein) (step S**14**).

[**0092**] If it is determined that the starting time storage area is not "0", the process is returned to step S**12**. Meanwhile, if it is determined that the starting time storage area is "0", a present time value is acquired from the clock circuit **29**, and stored in the starting time storage area as the starting time value (step S**15**). Subsequently, the process is transferred to step S**12**.

[**0093**] In step S**13**, if it is determined that the signal received from the image processor **28** is not the detection signal (it is the non-detection signal), the CPU **21** determines whether or not the starting time storage area in the RAM **23** is "0" (the condition in which it has no starting time value stored therein) (step S**16**).

[**0094**] If it is determined that the starting time storage area is "0", the process is returned to step S**12**.

[**0095**] If it is determined that the starting time storage area is not "0", the CPU **21** acquires the present time value from the clock circuit **29** (step S**17**).

[**0096**] Next, the CPU **21** calculates a difference between the present time value acquired in step S**17** and the starting time value stored in the starting time storage area, and stores it in the continuous time storage area as the continuous time value (step S**18**). In this way, in the sandwiched device **10**, the CPU **21** measures the continuous time by repeatedly executing the processes of steps S**12** to S**15** when receiving the detection signal from the image processor **28**, and subsequently executing the processes S**16** to S**18** when receiving the non-detection signal from the image processor **28** (step S**13**; no). At this time, the CPU **21** functions as a measuring module.

[**0097**] After the process of step S**18**, the CPU **21** adds the continuous time value stored in the continuous time area and the accumulative continuous time value stored in the accumulative continuous time area, and overwrites and stores a sum in the accumulative continuous time area (step S**19**). In this process, if the accumulative continuous time value is not stored in the accumulative continuous time area, the CPU **21** stores the continuous time value in the accumulative continuous time area as the accumulative continuous time value. If the accumulative continuous time value is already stored in the accumulative continuous time area, in step S**19**, the accumulative continuous time value stored in the accumulative continuous time area is extracted, the continuous time value stored in the continuous time area is added to the accumulative continuous time value, and an accumulative continuous time value acquired as a result thereof is stored in the accumulative continuous time storage area. When carrying out the process of step S**19**, the CPU **21** functions as a counting module which counts the continuous time cumulatively.

[**0098**] Next, the CPU **21** clears the starting time storage area and the continuous time storage area to "0" (step S**20**). Continuing, the CPU **21**, referring to the judgment table stored in the ROM **22** (refer to FIG. **4**), compares the accumulative continuous time value and the possible usage time value (step S**21**). In this process, the CPU **21** sequentially compares the possible usage time value correlated to each member identification number and the accumulative continuous time value stored in the accumulative continuous time storage area. Next, the CPU **21** determines whether or not the accumulative continuous time value is equal to or greater than the possible usage time value (step S**22**). In this process, if the accumulative continuous time value is equal to or greater than any one or more possible usage time value, it is determined that the accumulative continuous time value is equal to or greater than the possible usage time value. When executing the processes of steps S**21** to S**22**, the CPU **21** functions as a judging module which carries out a process judging whether or not the accumulative continuous time has reached the possible usage time (an upper limit time).

[**0099**] If it is determined that the accumulative continuous time value is less than the possible usage time value, the process is returned to step S**12**. Meanwhile, if it is determined that the accumulative continuous time value is equal to or greater than the possible usage time value, the CPU

carries out a notification process (step S23). In step S23, the CPU **21** functions as a notification processing module. A detailed description of this process will be given hereafter.

[0100] FIG. **8** is a flowchart showing a sub-routine of the facial recognition process according to the first embodiment. The sub-routine is a process which is carried out in the image processor **28**.

[0101] First, image data is received from the CCD camera **11** (step S30). The received image data is stored in the SDRM **28***b*. The image recognizing LSI **28***a*, using the binarization process on the image data, separates the image data into the light region and the dark region (step S31). If the facial image data is included in the image data, a portion corresponding to a skin of the face, particularly a flat portion, is included in the light region. Meanwhile, a portion of the face other than that is included in the dark region.

[0102] Next, the image recognizing LSI **28***a* applies the separation degree filter for each pixel of the dark region, calculates the degree of separation by changing the radius of the separation degree filter (step S32), and carries out a process extracting the local maximum point of the degree of separation as the characteristic point candidate (step S33). Continuing, the image recognizing LSI **28***a* determines whether or not the characteristic point candidate exists in the image data (step S34). In step S34, if the characteristic point candidate is equal to or less than a prescribed number, it is acceptable to determine that the characteristic point candidate does not exist. If it is determined that the characteristic point candidate does not exist, the image recognizing LSI **28***a* transmits the non-detection signal to the CPU **21** (step S43), and the sub-routine is completed.

[0103] If it is determined that the characteristic point candidate exists, the image recognizing LSI **28***a* carries out a process recognizing the characteristic points (the pupil and the nostril) by the pattern cross reference using the subspace method (step S35).

[0104] Next, the image recognizing LSI **28***a* determines whether or not the characteristic point exists in the image data (step S36). In step S35, if the characteristic point is equal to or less than a prescribed number, it is acceptable to determine that the characteristic point does not exist. If it is determined that the characteristic point does not exist in the image data, the image recognizing LSI **28***a* transmits the non-detection signal to the CPU **21** (step S43), and the sub-routine is completed. If it is determined that the characteristic point exists in the image data, the image recognizing LSI **28***a* recognizes the facial image data included in the image data by means of the two-dimensional affine transformation (step S37).

[0105] Next, the image recognizing LSI **28***a* sets the determination area in the image data based on the determination area prescription data stored in the EEPROM **28***c* (step S38). Continuing, the image recognizing LSI **28***a* determines whether or not the facial image data is included in the determination area (step S39). In the process, if even one portion of the facial image data is included in the determination area, the image recognizing LSI **28***a* determines that the facial image data is included in the determination area.

[0106] If it is determined that the facial image data is not included in the determination area, the image recognizing LSI **28***a* transmits the non-detection signal to the CPU **21** (step S43), and the sub-routine is completed.

[0107] If it is determined that the facial image data is included in the determination area, the image recognizing LSI **28***a* compares the determination value stored in the EEPROM **28***c* and an area of the facial image data (step S40), and determines whether or not the area is equal to or greater than the determination value (step S41).

[0108] If the area of the facial image data is equal to or greater than the determination value, the image recognizing LSI **28***a* transmits a detection signal to the CPU **21** (step S42), and the sub-routine is completed. Meanwhile, if the area of the facial image data is not equal to or greater than the determination value, the image recognizing LSI **28***a* transmits the non-detection signal to the CPU **21** (step S43), and the sub-routine is completed.

[0109] A description will be given of the facial recognition process shown in FIG. **8** using FIGS. **9**A to **12**C.

[0110] FIG. **9**A is a side elevation showing an aspect of the player playing the game on the gaming device **50**, while FIG. **9**B is a plan view thereof.

[0111] The CCD camera **11** furnished on the sandwiched device **10** installed adjacent to the gaming device **50** is installed facing in a direction imaging in front of the gaming device **50**. S indicates a field of view from the CCD camera **11**. Consequently, a thing included in the field of vision S is imaged by the CCD camera **11**. T is an area of which a distance from the CCD camera **11** is within a prescribed value. P indicates a player playing the game on the gaming device **50**. A face of the player P is included in the area T.

[0112] The determination area described heretofore is an area in which at least one portion of the facial image data is included in the image data when at least one portion of the face of the player P is included in the area T. Consequently, in the event that at least one portion of the face of the player P is included in the area T, at least one portion of the facial image data is included in the determination area. Contrarily, in the event that the face of the player P is not included at all in the area T, the facial image data is not included in the determination area.

[0113] The determination value described heretofore is a minimum value of an area in the image data which the facial image data can feasibly occupy when at least one portion of the face of the player P is included in the area T. Consequently, in the event that at least one portion of the face of the player P is included in the area T, the area of the facial image data is equal to or greater than the determination value. Contrarily, in the event that the face of the player P is not included at all in the area T, the area of the facial image data is less than the determination value.

[0114] FIG. **10**A is a view schematically showing image data acquired by imaging the aspect shown in FIGS. **9**A and **9**B, FIG. **10**B is a view schematically showing image data for which the characteristic point has been recognized, and FIG. **10**C is a view schematically showing image data for which the facial image data have been recognized.

[0115] On the aspect of the player P playing the game on the gaming device **50** shown in FIGS. **9**A and **9**B being imaged by the CCD camera **11**, image data I1 shown in FIG. **10**A is transmitted from the CCD camera **11**, and input into

the image processor **28** (step S**30**). Image data P' indicating the player P is included in the image data I**1**.

[**0116**] When characteristic point candidates C are extracted by carrying out the processes of steps S**31** to S**33** on the image data I**1** shown in FIG. **10**A, and characteristic points F are recognized from the characteristic points C by carrying out the process of step S**35**, it is as shown in FIG. **10**B.

[**0117**] In the figure, the characteristic points C are shown as white circles, and the characteristic points F as black circles.

[**0118**] When the processes of steps S**37** to S**40** are carried out on the image data I**1** shown in FIG. **10**B, it is as shown in FIG. **10**C.

[**0119**] In the figure, P" indicates the facial image data of the player P, while D indicates the determination area. One portion of the facial image data P" is included in the determination area D. Also, although not shown, an area of the facial image data P" is equal to or greater than the determination value.

[**0120**] Consequently, in the event that the image data I**1** shown in FIG. **10**A is input from the CCD camera **11** into the image processor **28**, the image processor **28** transmits the detection signal to the CPU **21**.

[**0121**] FIG. **11**A is a side view showing an aspect of an onlooker looking at the gaming device **50**, while FIG. **11**B is a plan view thereof.

[**0122**] O indicates the onlooker standing and looking at the gaming device. A face of the onlooker O is not included in the area T.

[**0123**] FIG. **12**A is a view schematically showing image data acquired by imaging the aspect shown in FIGS. **11**A and **11**B, FIG. **12**B is a view schematically showing image data for which the characteristic points have been recognized, and FIG. **12**C is a view schematically showing image data for which the facial image data have been recognized.

[**0124**] On the aspect of the onlooker O looking at the gaming device **50** shown in FIGS. **11**A and **11**B being imaged by the CCD camera **11**, image data I**2** shown in FIG. **12**A is transmitted from the CCD camera **11**, and input into the image processor **28** (step S**30**). Image data O' indicating the onlooker O is included in the image data I**2**.

[**0125**] When characteristic point candidates C are extracted by carrying out the processes of steps S**31** to S**33** on the image data I**2** shown in FIG. **12**A, and characteristic points F are recognized from the characteristic points C by carrying out the process of step S**35**, it is as shown in FIG. **12**B.

[**0126**] In the figure, the characteristic points C are shown as white circles, and the characteristic points F as black circles.

[**0127**] When the processes of steps S**37** to S**40** are carried out on the image data I**2** shown in FIG. **12**B, it is as shown in FIG. **12**C.

[**0128**] In the figure, O" indicates the facial image data of the onlooker O. The facial image data O" is not included at all in the determination area D. Also, an area of the facial image data O" is smaller than the area of the facial image data P", and less than the determination value.

[**0129**] Consequently, in the event that the image data I**2** shown in FIG. **12**A is input from the CCD camera **11** into the image processor **28**, the image processor **28** transmits the non-detection signal to the CPU **21**.

[**0130**] In the way described heretofore, the image processor **28**, when carrying out the processes of steps S**30** to S**36**, functions as a determination module which determines whether or not the facial image data are included in the image data.

[**0131**] In the event that it is determined that the facial image data are included in the image data as a result of carrying out the processes of steps S**30** to S**36**, the image processor **28** furthermore, when carrying out the processes of steps S**37** to S**41**, functioning as the determination module, determines whether or not the facial image data exist in the prescribed area (in the embodiments the determination area) of the image data, and determines whether or not the area of the facial image data is equal to or greater than the prescribed value (in the embodiment, the determination value).

[**0132**] In the way described heretofore, in the invention, when the determination module (the image processor **28**) determines that the facial image data are included in the image data transmitted from the imaging module (the CCD camera **11**), it is preferable that it further determines whether or not the facial image data exist in the prescribed position in the image data. This is because as, by determining whether or not the facial image data are included in the prescribed position, it is possible to clearly distinguish between a player who is actually playing the game and a person (for example, an onlooker) who is being imaged by the imaging module but is not playing the game, it becomes possible to more accurately measure an accumulative playing time.

[**0133**] Also, in the invention, when the determination module (the image processor **28**) determines that the facial image data are included in the image data transmitted from the imaging module (the CCD camera **11**), it is preferable that it further determines whether or not the area of the facial image data is equal to or greater than the prescribed value. This is because as, by determining whether or not the area of the facial image data is equal to or greater than the prescribed value, it is possible to recognize whether or not a person (for example, the player) in front of the gaming device is equal to or more than a prescribed distance away from the imaging module and, it being thereby possible to clearly distinguish between a player who is actually playing the game and a person (for example, the onlooker) who is being imaged by the imaging module but is not playing the game, it becomes possible to more accurately measure the accumulative playing time.

[**0134**] FIG. **13** is a flowchart showing a sub-routine of a notification process according to the first embodiment. The sub-routine is called up and executed in step S**23** in the sub-routine shown in FIG. **7**.

[**0135**] First, the CPU **21**, referring to the process contents determination table stored in the ROM **22** (refer to FIG. **5**), selects process contents correlated to member identification

information for which a possible usage time equal to or less than the accumulative continuous time has been fixed (step S40).

[0136] For example, when a possible usage time fixed for member identification information "001" (the game panel 51) is X (a time), if an accumulative continuous time Y (the time) is equal to or greater than X, the CPU 21, in step S40, referring to the process contents determination table, selects a lamp illumination color "red" and a lamp illumination pattern "illumination" as the process contents. Also, when a possible usage time fixed for member identification information "002" (the prize dispensing devices 52) is W (the time), if the accumulative continuous time Y (the time) is equal to or greater than W, the CPU 21, in step S40, referring to the process contents determination table, selects the lamp illumination color "red" and a lamp illumination pattern "flash (illumination one second; flash one second)" as the process contents.

[0137] In the event that there exists a plurality of items of member identification information for which a possible usage time equal to or less than the accumulative continuous time has been fixed, it is acceptable to select process contents correlated to any one of the items of member identification information, and it is also acceptable to select process contents correlated to all of the relevant items of member identification information.

[0138] Next, the CPU 21 carries out a process to illuminate the lamp 16 in accordance with the process contents selected in step S40 (step S41). At this time, the CPU 21, functioning as the notification processing module, carries out the process to illuminate the lamp 16.

[0139] Also, in the event that the member identification information for which the possible usage time equal to or less than the accumulative continuous time has been fixed is "001" (the game panel 51), the CPU 21 causes the lamp 16 to be illuminated in a red color while, in the event that the member identification information for which the possible usage time equal to or less than the accumulative continuous time has been fixed is "002" (the prize dispensing devices 52), the CPU 21 causes the lamp 16 to flash in a red color. In this way, the CPU 21 executes differing processes for the member identification information for which the possible usage time equal to or less than the accumulative continuous time has been fixed. In the event that there exists a plurality of items of member identification information for which a possible usage time equal to or less than the accumulative continuous time has been fixed, it is acceptable to execute a process correlated to any one of the items of member identification information, and it is also acceptable to execute processes correlated to all of the relevant items of member identification information. Also, in the event of executing processes correlated to all of the relevant items of member identification information, for example, it is acceptable to execute the processes correlated to the member identification information sequentially at a prescribed interval. After the process of step S41, the CPU 21 completes the sub-routine.

[0140] It is acceptable to complete the illumination of the lamp 16 after a prescribed time from a start of the illumination has elapsed, and it is also acceptable to complete it when the reset switch 27 is depressed.

[0141] As described heretofore, according to the sandwiched device 10 according to the first embodiment, the continuous time for which the facial image data is included in the image data which can be acquired by the CCD camera 11 imaging the prescribed area in front of the gaming device 50 is counted cumulatively. Then, when the accumulative continuous time, which is a result of the counting, reaches the possible usage time (the upper limit time) fixed in the member identification information allotted to each member, the lamp 16 is illuminated in a differing color and/or pattern in accordance with the member identification information. Consequently, it being possible for the employee of the game arcade, the casino etc. to recognize which member has reached the upper limit of the possible usage time, it is possible to accurately ascertain the possible usage time of the member from the accumulative playing time, without increasing a fear that a dishonest behavior or a use of a magnet will occur.

A Second Embodiment

[0142] FIG. 14 is a network configuration diagram schematically showing a playing time measuring system according to a second embodiment.

[0143] A playing time measuring system 100 includes a plurality of sandwiched devices 110, and a management server 70 connected to each sandwiched device 110 via a communication circuit 80. A sandwiched device 110 being installed adjacent to each of a plurality of gaming devices 50 installed in the game arcade, the casino etc. (not shown), each sandwiched device 110 and the management server 70 are connected via the communication circuit 80. Although, in the embodiment, a description is given of a case in which the communication circuit 80 is wired, communication circuits in the invention include not only a wired one, but also a wireless one. The management server 70 functions as a first server.

[0144] A card data display 115, a CCD camera 111, a card insertion slot 112 and an operation unit 113, as well as a game ball supply unit 114, are provided, in order from a top, on a front surface of the sandwiched device 110. Unlike the sandwiched device 10 according to the first embodiment, no lamp is provided on the front surface of the sandwiched device 110. Also, as the card data display 115, the CCD camera 111, the card insertion slot 112 and the operation unit 113, as well as the game ball supply unit 114, are identical to the ones furnished on the sandwiched device according to the first embodiment, a description will be omitted here.

[0145] FIG. 15 is a block diagram showing an internal configuration of the sandwiched device shown in FIG. 14.

[0146] The sandwiched device 110 includes a CPU 121, and an ROM 122 and an RAM 123 are connected to the CPU 121. In addition to various kinds of program and data, a judgment table (refer to FIG. 4) and device identification information are stored in the ROM 122. The device identification information includes a code of a plurality of digits allotted individually to each sandwiched device 110. The ROM 122 functions as a device identification information memory which stores the device identification information allotted to the sandwiched device 110. The RAM 123 has a storage area (refer to FIG. 6). Also, the operation unit 113, an image processor 128 to which the CCD camera 111 is connected, a card reader/writer 125, a game ball controller 126, a reset switch 127, the card data display 115 and a clock circuit 129 are connected to the CPU 121. As they have a

configuration identical to those furnished on the sandwiched device according to the first embodiment, a description will be omitted here. Also, a communication interface **116** is connected to the CPU **121**. The communication interface **116** being for carrying out a communication with the management server **70** via the communication circuit **80**, the CPU **121** carries out a transmission and reception of data with the management server **70** by the communication interface **116** via the communication circuit **80**. The communication interface **116** functions as a communication module.

[**0147**] FIG. **16** is a block diagram showing an internal configuration of the management server shown in FIG. **14**.

[**0148**] The management server **70** includes a CPU **71**, and an ROM **72**, an RAM **73**, an HDD **74**, a display **75** and a communication interface **76** are connected to the CPU **71**.

[**0149**] Various kinds of program and data being stored in the ROM **72**, the CPU **71** reads and executes the programs, and carries out various kinds of process. Data showing a result etc. of the various kinds of process are temporarily stored in the RAM **73**. A machine number table (not shown), in which a machine number of a gaming device **50** and the device identification information of the sandwiched device **110** installed adjacent to the gaming device **50** are correlated, is stored in the HDD **74**.

[**0150**] The sandwiched device **110** according to the second embodiment carries out a continuous time measuring process, a facial recognition process and a notification process. Of these, the continuous time measuring process (refer to FIG. **7**) and the facial recognition process (refer to FIG. **8**) are processes which are identical to the processes carried out in the sandwiched device **10** according to the first embodiment, so a description will be omitted here, and a description will be given of the notification process.

[**0151**] FIG. **17** is a flowchart showing a sub-routine of the notification process according to the second embodiment. If it is determined that an accumulative elapsed time value is equal to or greater than a possible usage time (refer to FIG, **7**, step S**22**), the CPU **121** transmits member identification information to which a possible usage time equal to or less than the accumulative elapsed time is correlated, and the device identification information, by the communication interface **116**, to the management server **70** via the communication circuit **80** (step S**50**). Subsequently, the sub-routine is completed.

[**0152**] The CPU **71** of the management server **70**, on receiving the member identification information and the device identification information from the sandwiched device **110**, by the communication interface **76** via the communication circuit **80**, carries out a process to display the details on the display **75**.

[**0153**] FIG. **18** shows an example of an image displayed on a display furnished on the management server. An image stating "The accumulative playing time has reached the possible usage time (the upper limit time). Please replace the member." being displayed on the display **75**, a machine number and member identification are displayed correlated below it. The machine number is determined, based on the device identification information transmitted from the sandwiched device **110**, by referring to the machine number table stored in the HOD **74**. Also, the member identification corresponds to the member identification information.

[**0154**] In a playing time counting system according to the second embodiment, the sandwiched device **110** includes an imaging module (the CCD camera **111**) which constantly or intermittently images a prescribed area in a front of the gaming device **50**, and transmits image data acquired by imaging, a determination module (the image processor **128**) which determines whether or not the facial image data indicating a person's face are included in the image data, a measuring module (the CPU **121**) which measures a continuous time for which it is determined that the facial image data are included in the image data, a counting module (the CPU **121**) which cumulatively counts the consecutive timer a judging system (the CPU **121**) which carries out a process to judge whether or not an accumulative continuous time has reached the possible usage time (the upper limit time), and a notification processing module (the CPU **121**) which, when the accumulative continuous time has reached the possible usage time, transmits the device identification information and the member identification information to an exterior (the management server **70**). Also, in the playing time counting system according to the second embodiment, the management server **70** includes a notification processing module (the CPU **71**) which, based on the device identification information and the member identification information received from the sandwiched device **110**, displays an image on the display **75** showing that the accumulative continuous time has reached the possible usage time (refer to FIG. **18**).

[**0155**] According to the playing time counting system according to the second embodiment, the continuous time for which the facial image data are included in the image data acquired by the CCD camera **111** furnished on the sandwiched device **110** imaging the prescribed area in the front of the gaming device **50** is counted cumulatively and, when the accumulative elapsed time, which is a result of the counting, reaches the possible usage time (the upper limit time), the fact is transmitted to the management server **70**. For this reason, without going near the gaming device **50**, it is possible to confirm which member of which gaming device **50** has reached the possible usage time.

[**0156**] Also, according to the sandwiched device according to the second embodiment, when the accumulative continuous time reaches the possible usage time (the upper limit time), the device identification information is transmitted to the management server **70** furnished in the game arcade, the casino etc. Consequently, an employee of the game arcade, the casino etc., without going to a location of each gaming device **50**, by means of the management server **70**, can ascertain for all of the gaming devices **50** whether or not the accumulative continuous time has reached the possible usage time of the members configuring the gaming device **50**, thus enjoying great convenience.

A Third Embodiment

[**0157**] FIG. **19** is a front view schematically showing a sandwiched device according to a third embodiment, and a gaming device installed adjoining the sandwiched device.

[**0158**] FIG. **20** is a network configuration diagram showing an example of an information provision system according to the third embodiment.

[0159] Although, in the third embodiment too, a description is given of a case in which the gaming device is the pachinko, the gaming device is, of course, not limited to the pachinko in the invention. It is possible to propose, for example, a slot machine or any gaming machines as the gaming device according to the invention.

[0160] As shown in FIG. **19**, a sandwiched device **410** is installed adjoining a gaming device **50**. Apart from a fact that a lamp **16** is not provided, and that a two-dimensional code **92** is displayed on a card data display **15**, the sandwiched device **410** has an identical external configuration to that of the sandwiched device **10** according to the first embodiment. The card data display **15** functions as a display module capable of displaying at least a two-dimensional code.

[0161] In the third embodiment, when an accumulative continuous time, which is a result of counting a time for which a game has been played by a player, reaches a prescribed upper limit time, the two-dimensional code **92** into which is encoded a website address (a URL) of a member maker etc. is displayed on the card data display **15** of the sandwiched device **410**.

[0162] As shown in FIG. **20**, an information provision system **500** according to the third embodiment includes the sandwiched device **410**, a mobile telephone **300** equipped with CCD camera **308** (not shown, refer to FIG. **24**) as an imaging module, and an information server **200** capable of a wireless transmission and reception of data via the mobile telephone **300** and an internet.

[0163] As described heretofore, an employee of the game arcade, the casino etc. can image the two-dimensional code **92** displayed on the card data display **15** with the CCD camera **308** furnished on the mobile telephone **300**. The mobile telephone **300** recognizes a two-dimensional code from the image data acquired when the CCD camera **308** images the two-dimensional code **92**, and generates the website address (the URL) of the member maker etc. from the recognized two-dimensional code. Then, based on the address, it accesses the information server **200**. The information server **200** functions as a second server.

[0164] The information server **200**, after generating an access log in a hard disc drive **205** (not shown, refer to FIG. **25**), selects website data corresponding to the address from the hard disc drive **205**, and transmits the data to the hard disc drive **205**. As a result, it being possible for the employee of the game arcade, the casino etc. to easily ascertain information on the member by means of the mobile telephone **300**, it is also possible to smoothly issue an order etc. for the member.

[0165] Although, in the third embodiment, a description is given of a case in which a QR code (a registered trademark) is used as the two-dimensional code, the invention not being limited to this example, it is possible to use a two-dimensional code already in the public domain. Also, in the invention, it is also possible to use a one-dimensional code (a barcode) in place of the two-dimensional code.

[0166] In the third embodiment, a description is given of a case in which the employee of the game arcade, the casino etc. images the two-dimensional code **92** using the mobile telephone **300**. However, as long as it is possible to image the two-dimensional code, and possible to carry out a transmission and reception of data with the information server via a communication line, without being limited to the mobile telephone **300**, it is possible to propose, for example, a personal digital assistant, a dedicated mobile computer of the information provision system etc.

[0167] Also, in the third embodiment, a description is given of a case in which the mobile telephone **300** and the information server **200** carry out a wireless transmission and reception of data but, the invention not being limited to this example, it is also acceptable to carry out a wired transmission and reception. That is, a wired and a wireless transmission path are included in the communication line in the invention.

[0168] FIG. **21** is a block diagram showing an internal configuration of the sandwiched device shown in FIG. **19**.

[0169] As the sandwiched device **410**, apart from not being equipped with a lamp **16**, has an internal configuration identical to that of the sandwiched device **10** according to the first embodiment, a description will be omitted here. The ROM **22** has a process contents selection table (refer to FIG. **22**), to be described hereafter, in place of the process contents selection table shown in FIG. **5**. Also, the ROM **22** has a two-dimensional code generating program.

[0170] FIG. **22** shows an example of the process contents selection table.

[0171] Member identification information allotted to each member **51** to **62**, and a website address of a maker of each member **51** to **62**, are correlated in the process contents selection table. The website address of the maker differs for each member, even in the event that the maker is the same, and by accessing the relevant address, data for the member is transmitted to the information server **200**.

[0172] Next, a description will be given of processes carried out in the sandwiched device **410** according to the third embodiment.

[0173] The processes carried out in the sandwiched device **410** according to the third embodiment are identical to the processes carried out in the sandwiched device **10** according to the first embodiment, with the exception of a point that, of the processes carried out in the sandwiched device **10** according to the first embodiment (FIGS. **7** to **13**), a notification process (FIG. **23**), to be described hereafter, is carried out in place of the notification process shown in FIG. **13**. Consequently, a description will be given herein of the notification process carried out in the sandwiched device **410** according to the third embodiment.

[0174] FIG. **23** is a flowchart showing a sub-routine of the notification process according to the third embodiment.

[0175] First, the CPU **21**, referring to the process contents selection table stored in the ROM **22** (refer to FIG. **22**), selects a maker's website address correlated to member identification information for which a possible usage time equal to or less than the accumulative continuous time has been fixed (step S**400**). Next, it appends data indicating the accumulative continuous time to the website address, and generates a URL for converting to the two-dimensional code (step S**401**). Next, the CPU **21** encodes the URL into the two-dimensional code (step S**402**). The encoding process includes a process compiling a mode identifier in accordance with a character type of the URL, a process compiling a

character number identifier in accordance with a number of characters of the URL, a process binarizing the URL, a process appending a termination pattern to data acquired by these processes, a process carrying out a codeword conversion of the data acquired by the process, a process compiling an error revision codeword based on the converted data, and appending it to the converted data, a process binarizing the data acquired by the process and distributing them in a matrix formation, a process applying a mask of a prescribed pattern to the distributed data, and a process appending format information which includes an error revision level and a mask identifier. Data indicating an acquired two-dimensional code are stored in the RAM **23**. Next, based on the data stored in the RAM **23**, the CPU **21** displays the two-dimensional code **92** (refer to FIG. **19** and FIG. **20**) on the card data display **15** (step S**403**).

[**0176**] FIG. **24** is a block diagram showing an internal configuration of the mobile telephone shown in FIG. **20**.

[**0177**] The mobile telephone **300** includes an operation unit **304**, a liquid crystal panel **306**, a CCD camera **308** as an imaging module, a wireless unit **310**, a sound circuit **312**, a speaker **314**, a microphone **316**, a transceiving antenna **318**, a nonvolatile memory **320**, a microcomputer **322** and a secondary battery **324**.

[**0178**] The wireless unit **310**, being controlled by the microcomputer **322**, transmits and receives an electric wave as a medium, via the transceiving antenna **318**, to a base station. The sound circuit **312**, as well as transmitting a reception signal, transmitted via the microcomputer **322** from the wireless unit **310**, to the speaker **314**, transmits a sound signal transmitted from the microphone **316** as a transmission signal to the wireless unit **310** via the microcomputer **322**.

[**0179**] The speaker **314** converts the reception signal transmitted from the sound circuit **312** into a reception sound and transmits it, while the microphone **316** converts a transmission sound emitted by an operator into a sound signal, and transmits it to the sound circuit **312**. The two-dimensional code **92** displayed on the sandwiched device **410** being imageable by the CCD camera **308**, image data acquired by imaging are stored in the nonvolatile memory **320**. Although, in the embodiment, a description is given of a case in which the CCD camera is used as the imaging module, the imaging module in the invention not being particularly limited, it is possible to propose a CMOS sensor camera and the like.

[**0180**] The nonvolatile memory **320** nonvolatilely stores various kinds of data and various kinds of program such as, for example, image data acquired by the CCD camera **308** imaging the two-dimensional code **92**, image data for a standby image, and music data for a ring tone. The secondary battery **324** supplies energy to each circuit. The microcomputer **322**, being configured of a CPU, an ROM and an RAM, carries out, for example, a process sending and receiving a telephone call, a process compiling, sending and receiving an electronic mail, an internet process etc. The microcomputer **322** carries out a sending and receiving of an electronic mail, and a transmission and reception of data by the internet, via the wireless unit **310** and the transceiving antenna **318**.

[**0181**] The microcomputer **322**, based on a prescribed instruction input via the operation unit **304**, downloads a prescribed program from the information server **200** via the internet, and stores it in the nonvolatile memory **320**. Then, the microcomputer **322**, by reading the program from the nonvolatile memory **320** and executing it, functions as in A and B described hereafter.

[**0182**] A. The microcomputer **322** recognizes the two-dimensional code from the image data acquired when the CCD camera **308** images the two-dimensional code **92**, and generates the URL from the recognized two-dimensional code.

[**0183**] B. The microcomputer **322** accesses the information server **200** based on the URL generated in A.

[**0184**] Although, in the embodiment, a description is given of a case in which the mobile telephone **300** downloads the program from the information server **200**, it is also acceptable that it is stored in advance (pre-installed) in the nonvolatile memory **320** of the mobile telephone **300**.

[**0185**] FIG. **25** is a block diagram showing an internal configuration of the information server shown in FIG. **20**.

[**0186**] The information server **200** includes a CPU **201** as an arithmetic processing unit, an ROM **202**, an RAM **203**, a communication interface circuit **204** for communicating via the mobile telephone **300** and the internet, and a hard disc drive **205**.

[**0187**] An access log (identification information of an access source, an access date and time, an accessed file name, a browser name, an operating system name, a number of received bytes, a number of transmitted bytes, a service condition code etc.) from the mobile telephone **300** is stored in the hard disc drive **205**. Also, website data being stored in the hard disc drive **205**, relevant website data are transmitted to the mobile telephone **300** when there is an access from the mobile telephone **300**.

[**0188**] FIG. **26** is a flowchart showing a process carried out in the mobile telephone and the information server configuring the information provision system according to the third embodiment.

[**0189**] First, the microcomputer **322** furnished on the mobile telephone **300**, based on an instruction input via the operation unit **304**, drives the CCD camera **308** as the imaging module, whereon the CCD camera **308** images the two-dimensional code **92** (refer to FIG. **19** and FIG. **20**) included in a screen image displayed on the card data display **15** of the sandwiched device **410** (step S**500**).

[**0190**] Subsequently, the microcomputer **322** stores image data acquired in step S**500** in the nonvolatile memory **320** (step S**501**). Next, the microcomputer **322** carries out a two-dimensional code recognition process (step S**502**), recognizes a two-dimensional code from the image data acquired in step S**500**, and generates a URL from the recognized two-dimensional code. A detailed description of the two-dimensional code recognition process will be given hereafter.

[**0191**] Next, the microcomputer **322** accesses the information server **200** based on the URL acquired by means of the two-dimensional code recognition process in step S**502** (step S**503**).

[**0192**] The CPU **201** furnished on the information server **200**, on receiving the access from the mobile telephone **300**

via the internet, generates the access log (step S**601**), and selects website data corresponding to a kind of member and the accumulative continuous time included as data in the URL (step S**602**). In this process, the CPU **201**, by selecting the website data corresponding to the URL, selects the website data corresponding to the kind of member and the accumulative continuous time. Then, the CPU **201** transmits the selected website data to the mobile telephone **300** (step S**603**).

[**0193**] The microcomputer **322** of the mobile telephone **300** stores the website data transmitted from the information server **200** in the nonvolatile memory **320**, and causes an image based on the website data to be displayed on the liquid crystal panel **306** (step S**504**).

[**0194**] FIG. **27** is a flowchart showing the two-dimensional code recognition process called up and executed in step S**502** of the process shown in FIG. **26**.

[**0195**] First, the microcomputer **322** carries out an image conversion process on the image data stored in the nonvolatile memory **320** (step S**700**). The image conversion process is a process which extracts, from the image data acquired by imaging, image data of an area in which the two-dimensional code is displayed, corrects a tilt and a distortion, converts them to a monochromatic image in accordance with a prescribed threshold, and acquires image data including a two-dimensional code viewed head on.

[**0196**] Next, the microcomputer **322** extracts the two-dimensional code from the image data acquired in step S**700**, and carries out a correction such as a noise removal (step S**701**). Next, the microcomputer **322** carries out a binarization process on the two-dimensional code acquired in step S**701**, replaces each dot configuring the two-dimensional code with a "0" or a"1" (step S**702**), and generates binary matrix data (step S**703**). Next, the microcomputer **322** decodes the binary matrix data (step S**704**), and generates the URL (step S**705**). Subsequently, the sub-routine is completed, and the process is moved to step S**503** in the flowchart shown in FIG. **26**.

[**0197**] As described heretofore, when the mobile telephone **300** accesses the information server **200** based on the URL acquired by imaging the two-dimensional code **92**, the website data corresponding to the URL is transmitted and, for example, a kind of image shown in FIG. **28** is displayed on the liquid crystal panel **306** of the mobile telephone **300**.

[**0198**] FIG. **28** shows an example of a screen displayed on the mobile telephone.

[**0199**] As well as a message stating "The accumulative playing time has reached the possible usage time (the upper limit time)", data such as a member name, a machine number, the accumulative playing time, and a previous access are displayed in a center portion of the liquid crystal panel **306**. Also, three options "Order the member", "Leave a record only" and "Make an enquiry" being provided, a smooth order of the member and communication with a member maker are possible.

[**0200**] In the playing time counting system in the invention, as long as the imaging module is furnished on the sandwiched device, there is no particular limitation as to whether the sandwiched device or the management server is equipped with each module configuring the system.

[**0201**] For example, it is acceptable that the sandwiched device is equipped with the imaging module, while the management server is equipped with the determination module, the measuring module, the counting module, the judging module and the notification processing module. In such a case, each sandwiched device transmits the image data acquired by imaging with the imaging module to the management server. The management server carries out a process which receives the image data from each sandwiched device, and determines whether or not the facial image data are included in the image data, a process which measures a continuous time for which the facial image data are included, a process which cumulatively counts the consecutive time, a process which judges whether or not the accumulative continuous time has reached the possible usage time (the upper limit time), and a process which notifies of a fact that the accumulative continuous time has reached the possible usage time.

[**0202**] Also, it is acceptable that the sandwiched device is equipped with the imaging module and the determination module, while the management server is equipped with the measuring module, the counting module, the judging module and the notification processing module. In such a case, each sandwiched device carries out a process determining whether or not the facial image data are included in the image data acquired by imaging with the imaging module. The management server receives a determination result from each sandwiched device, and carries out a process which measures a continuous time for which it is determined that the facial image data are included, a process which cumulatively counts the consecutive time, a process which judges whether or not the accumulative continuous time has reached the possible usage time (the upper limit time), and a process which notifies of the fact that the accumulative continuous time has reached the possible usage time.

[**0203**] Also, it is also acceptable that the sandwiched device is equipped with the imaging module, the determination module and the measuring module, while the management server is equipped with the counting module, the judging module and the notification processing module. In such a case, each sandwiched device determines whether or not the facial image data are included in the image data acquired by imaging with the imaging module, and measures a continuous time for which it is determined that the facial image data are included. The management server receives a measurement result from each sandwiched device, and carries out a process which cumulatively counts the consecutive time, a process which judges whether or not the accumulative continuous time has reached the possible usage time (the upper limit time), and a process which notifies of the fact that the accumulative continuous time has reached the possible usage time.

[**0204**] In the invention, it is also acceptable that a playing time measuring device provided on the gaming device, or on the sandwiched device installed adjoining the gaming device, is equipped with the imaging module, the determination module, the measuring module, the counting module, the judging module and the notification processing module. The playing time measuring device, not having a function as a sandwiched device, does not carry out a process concerned with a payout of a game medium such as a game ball, a process accepting a prepaid card, and the like. According to the playing time measuring device, it being possible to

accurately measure the accumulative playing time in the gaming device without carrying out a communication with the gaming device or the sandwiched device, by carrying out a process notifying the exterior, it is possible for the employee of the game arcade, the casino etc. to recognize that the accumulative playing time has reached the upper limit time. Consequently, it is possible to accurately ascertain the usage time of the member from the accumulative playing time, without increasing the fear that dishonest behavior or the use of a magnet will occur. Also, although the playing time measuring system described heretofore includes the sandwiched device and the management server connected via the communication line, it is acceptable in the invention that the playing time measuring system includes the playing time measuring device in place of the sandwiched device.

[0205] In the examples described heretofore, a description is given of a case in which a process illuminating the lamp is carried out as a process notifying of the fact that the accumulative continuous time has reached the possible usage time, and of a case in which the signal including the member identification information is transmitted to the exterior. However, in the invention, the process notifying of the fact that the accumulative continuous time has reached the possible usage time not being limited to these examples, it is also possible, for example, to display a prescribed image on a display in response to the fact that the accumulative continuous time has reached the possible usage time, and it is also acceptable to transmit a prescribed sound from a speaker in response to the fact that the accumulative continuous time has reached the possible usage time. In the sandwiched device or the playing time measuring device, in the case of carrying out the process notifying of the fact that the accumulative continuous time has reached the possible usage time, from a point of view of not having contents of the process known by the player, it is preferable to carry out the process of illuminating the lamp, or the process of transmitting the signal to the exterior (for example, the management server), as the process notifying of the fact that the accumulative continuous time has reached the possible usage time.

[0206] In the examples described heretofore, a description is given of a case using a method carrying out a pattern cross reference by means of a separation degree filter and a subspace method as a method of determining whether or not the facial image data is included in the image data. However, in the invention, a method of recognizing a person's face not being particularly limited, it is possible to propose an inherent face method, a restricted mutual subspace method, a method carrying out a Gabor Wavelet conversion and graph matching, or a method using a local characteristic comparison system by means of a multiple variation analysis method.

[0207] Although, in the examples described heretofore, a description is given of a case in which the gaming device is a pachinko, the gaming device in the invention not being particularly limited, it is possible to propose, for example, a slot machine or any gaming machines. The advantageous effects described in the embodiments of the invention being no more than most preferred ones arising from the invention, advantageous effects according to the invention are not limited to the ones described in the embodiments of the invention.

[0208] According to the first aspect of the invention, as the two-dimensional code is displayed on the display (for example, a liquid crystal display etc.) furnished on the peripheral device, by including, for example, information indicating a time for which a game has been played on the gaming device (hereafter, an accumulative playing time) in the two-dimensional code, it is possible to display a two-dimensional code indicating the accumulative playing time. In such a case, an employee of a game arcade, a casino etc., by imaging the two-dimensional code with a portable terminal (for example, a mobile telephone, a dedicated terminal and the like), can ascertain the accumulative playing time in the gaming device, and can accurately ascertain a usage time of a member from the accumulative playing time.

[0209] In a provisional case in which the accumulative playing time is transmitted from the gaming device via a communication line to a server of the game arcade, the casino etc., as it is impossible to transmit the accumulative playing time from the gaming device to the server when there is an interruption in communication, a member replacement time is overlooked, and there is a fear of causing a reduction in an operating rate due to a breakdown occurring. However, in a case of employing a configuration which notifies an exterior of the accumulative playing time by means of the two-dimensional code, it is possible to prevent an impossibility of transmitting the accumulative playing time due to the interruption in communication.

[0210] Also, in the event of carrying out the transmission of the accumulative playing time by means of a communication between the gaming device and the server, there is a fear in, for example, a large scale game arcade, casino etc. in which a large number of gaming devices are installed, of a burden being imposed on the communication, and a smooth transmission of various kinds of information being impeded. However, in the case of employing the configuration which notifies the exterior of the accumulative playing time by means of the two-dimensional code, there is no likelihood of the transmission of the accumulative playing time impeding the communication of other various kinds of information between the server and the gaming device.

[0211] According to the second aspect of the invention, the employee of the game arcade, the casino etc., by imaging the two-dimensional code, can ascertain the accumulative playing time in the gaming device, and can accurately ascertain the usage time of the member from the accumulative playing time. Also, it is possible to prevent the impossibility of transmitting the accumulative playing time due to the interruption in communication. Furthermore, there is no likelihood of the transmission of the accumulative playing time impeding the communication of other various kinds of information between the server and the gaming device.

[0212] In the two-dimensional code, for example, information indicating the accumulative continuous time, information indicating a machine number of the gaming device, information related thereto and the like are included in information notifying the exterior of a fact that the accumulative continuous time has reached the upper limit time, but it is preferable, furthermore, that a website address (a URL) of a member maker etc., and a website address etc, of an external contractor who specializes in carrying out a diagnosis of an aging etc. of a member, are included. This is

because it is possible to carry out a smooth replacement of a member without carrying out a search etc. for a point of contact.

[0213] According to the third aspect of the invention, the continuous time for which the facial image data is included in the image data acquired by the imaging module (for example, a CCD camera) imaging the prescribed area in front of the gaming device is cumulatively counted. Consequently, as will be described hereafter, it is possible to accurately ascertain the usage time of the member from the accumulative playing time.

[0214] According to the fourth aspect of the invention, the continuous time for which the facial image data is included in the image data acquired by the imaging module (for example, the CCD camera) imaging the prescribed area in front of the gaming device is cumulatively counted and, when the accumulative continuous time, which is a counting result, reaches the upper limit time, a process is carried out to notify the exterior of the fact. For that reason, in the peripheral device, without carrying out a communication with the gaming device, it is possible to accurately measure a time for which the game has been played on the gaming device (hereafter, the accumulative playing time) and, by means of the process notifying the exterior being carried out, the employee of the game arcade, the casino etc. can recognize that the accumulative playing time has reached the upper limit time. Consequently, it is possible to accurately ascertain the usage time of the member from the accumulative playing time, without increasing the fear that the dishonest behavior or the use of the magnet will occur.

[0215] As the peripheral device which measures the accumulative playing time without carrying out a communication with the gaming device, for example, a peripheral device can be considered which measures the accumulative playing time by, being equipped with a pyroelectric infrared sensor, detecting a player by means of the pyroelectric infrared sensor, and cumulatively counting a detection time. However, this kind of peripheral device and the peripheral device in the invention differ in the following points.

[0216] That is, with a gaming device equipped with the pyroelectric infrared sensor, as it cannot detect a specified part of a person, not only a player playing a game on the gaming device, but also a person who merely passes in front of the gaming device, a person who is standing in front of the gaming device and the like are detected by the pyroelectric infrared sensor. Consequently, it is difficult to measure an accurate accumulative playing time. In response to this, with the peripheral device in the invention, as the time for which a face of the player exists in the prescribed area in front of the gaming device is counted cumulatively, it is possible to arrange that the person who merely passes in front of the gaming device is not detected, and the person who is standing in front of the gaming device is not detected either. Consequently, by only detecting the person who is playing the game on the gaming device, it is possible to measure the accurate accumulative playing time.

[0217] According to the fifth aspect of the invention, when the accumulative continuous time reaches the possible usage time fixed for the members configuring the gaming device, a process is carried out which notifies the exterior of the fact, meaning that the employee of the game arcade, the casino etc. can easily recognize that the accumulative continuous time has reached the possible usage time.

[0218] According to the sixth aspect of the invention, every time the accumulative continuous time reaches any of the possible usage times fixed for a plurality of members configuring the gaming device, a notification is carried out which differs according to a type of member. Consequently, the employee of the game arcade, the casino etc. can easily ascertain the possible usage time of which member the accumulative continuous time has reached.

[0219] According to the seventh aspect of the invention, as the lamp is illuminated when the accumulative continuous time reaches the upper limit time, the employee of the game arcade, the casino etc. can easily recognize that the accumulative continuous time has reached the upper limit time.

[0220] According to the eighth aspect of the invention, the employee of the game arcade, the casino etc., by imaging the two-dimensional code with the portable terminal (for example, the mobile telephone, the dedicated terminal and the like) can ascertain the accumulative playing time in the gaming devices and can accurately ascertain the usage time of the member from the accumulative playing time. Consequently, it is possible to prevent the impossibility of transmitting the accumulative playing time due to the interruption in communication. Also, there is no likelihood of the transmission of the accumulative playing time impeding the communication of other various kinds of information between the server and the gaming device.

[0221] According to the ninth aspect of the invention, when the accumulative continuous time has reached the upper limit time, the device identification information is transmitted to the management server (for example, a shop personal computer) furnished in the game arcade, the casino etc. Consequently, the employee of the game arcade, the casino etc., without going to a location of each gaming device, by means of the management server, can ascertain for all of the gaming devices whether or not the accumulative continuous time has reached the possible usage time of the members configuring the gaming device, thus enjoying great convenience.

[0222] According to the tenth aspect of the invention, the continuous time for which the facial image data is included in the image data acquired by the imaging module furnished on the peripheral device imaging the prescribed area in front of the gaming device is cumulatively counted and, when the accumulative continuous time, which is the counting result, reaches the upper limit time, a process is carried out to notify the exterior of the fact. For that reason, in the peripheral device, without carrying out a communication with the gaming device, it is possible to accurately measure the accumulative playing time on the gaming device and, by means of the process notifying the exterior being carried out, the employee of the game arcade, the casino etc. can recognize that the accumulative playing time has reached the upper limit time. Consequently, it is possible to accurately ascertain the usage time of the member from the accumulative playing time, without increasing the fear that the dishonest behavior or the use of the magnet will occur.

[0223] According to the eleventh aspect of the invention, the continuous time for which the facial image data is included in the image data acquired by the imaging module imaging the prescribed area in front of the gaming device is cumulatively counted and, when the accumulative continuous time, which is the counting result, reaches the upper

limit time, a process is carried out to notify the exterior of the fact. For that reason, without carrying out a communication with the gaming device or the peripheral device, it is possible to accurately measure the accumulative playing time on the gaming device and, by means of the process notifying the exterior being carried out, the employee of the game arcade, the casino etc. can recognize that the accumulative playing time has reached the upper limit time. Consequently, it is possible to accurately ascertain the usage time of the member from the accumulative playing time, without increasing the fear that the dishonest behavior or the use of the magnet will occur.

[0224] According to aspects of the invention, it is possible to accurately ascertain the usage time of the member from the accumulative playing time, without increasing the fear that the dishonest behavior or the use of the magnet will occur.

[0225] 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 appended claims and their equivalents.

What is claimed is:

1. A peripheral device installed adjoining a gaming device, comprising:

a display capable of displaying at least a two-dimensional code; and

a processor which displays the two-dimensional code on the display.

2. The peripheral device according to claim 1, wherein

the processor furthermore cumulatively counts a time for which a game is played, judges whether or not an accumulative continuous time, which is a counting result, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time and, in the event that it is judged that the accumulative continuous time has reached the upper limit time, displays a two-dimensional code, in which information for notifying an exterior of the matter is encoded, on the display.

3. The peripheral device according to claim 2, further comprising:

an imaging device which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging, wherein

the processor furthermore determines whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging device, measures a continuous time for which it is determined that the facial image data are included in the image data, and cumulatively counts the continuous time measured.

4. A peripheral device installed adjoining a gaming device, comprising:

an imaging device which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; and

a processor which determines whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging module, measures a continuous time for which it is determined that the facial image data are included in the image data, cumulatively counts the continuous time measured, judges whether or not an accumulative continuous time, which is a counting result, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time and, in the event that it is judged that the accumulative continuous time has reached the upper limit time, notifies an exterior of the matter.

5. The peripheral device according to claim 4, wherein

the upper limit time is a possible usage time fixed for members configuring the gaming device.

6. The peripheral device according to claim 5 installed adjoining a gaming device, further comprising:

a memory storing a judgment table in which are correlated member identification information fixed for each of a plurality of members configuring the gaming device and a possible usage time fixed for each member, wherein

the processor judges whether or not the accumulative continuous time has reached any of the possible usage times included in the memory and, in the event that it is judged that the accumulative continuous time has reached any of the possible usage times, executes a process differing in accordance with the member identification information correlated to the possible usage time.

7. The peripheral device according to claim 4, further comprising a lamp, wherein

the processor, furthermore, in the event that it is judged that the accumulative continuous time has reached the upper limit time, illuminates the lamp.

8. The peripheral device according to claim 4, further comprising:

a display capable of displaying at least a two-dimensional code; wherein

the processor, furthermore, in the event that it is judged that the accumulative continuous time has reached the upper limit time, displays a two-dimensional code, in which information for notifying an exterior of the matter is encoded, on the display.

9. The peripheral device according to claim 4, further comprising:

a communication module for carrying out a communication via a communication line with a server furnished in a game arcade, a casino etc. in which a plurality of the gaming devices is installed; and

a memory which stores device identification information allotted to the peripheral device, wherein

the processor, furthermore, in the event that it is judged that the accumulative continuous time has reached the upper limit time, transmits at least the device identification information stored in the memory to the server through the communication module.

10. A playing time counting system provided on a peripheral device installed adjoining a gaming device, comprising:

an imaging device which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; and

a processor which determines whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging device, measures a continuous time for which it is determined that the facial image data are included in the image data, cumulatively counts the continuous time measured, judges whether or not an accumulative continuous time, which is a counting result, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time and, in the event that it is judged that the accumulative continuous time has reached the upper limit time, notifies an exterior of the matter.

11. A playing time measuring device provided on a gaming device or on a peripheral device installed adjoining the gaming device, comprising:

an imaging device which continuously or intermittently images a prescribed area in a front of the gaming device, and transmits image data acquired by imaging; and

a processor which determines whether or not facial image data indicating a person's face are included in the image data transmitted from the imaging device, measures a continuous time for which it is determined that the facial image data are included in the image data, cumulatively counts the continuous time measured, judges whether or not an accumulative continuous time, which is a counting result, has reached an upper limit time fixed as a subject of comparison with the accumulative continuous time and, in the event that it is judged that the accumulative continuous time has reached the upper limit time, notifies an exterior of the matter.

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