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(54) Title of Invention

ENTRANCE-REGULATING SYSTEM

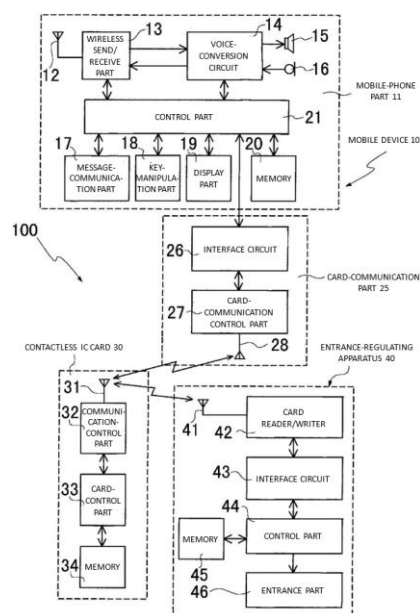
(57) Abstract

Object

To provide an entrance-regulating system in which not only can voice calls and data be sent and received, but also a reservation for a hotel, a theater, a movie theater, or the like can be made easily, a door can be opened and a room utilized easily, or the theater, movie theater, or the like can be entered and the performance or movie enjoyed.

Configuration

It comprises: a mobile device 10, to which are integrally provided: a mobile-phone part 11 having a function for voice calls, a function for data communication via a communication network, and a function for displaying data; and a card-communication part 25 comprising an antenna that sends and receives data to and from the mobile-phone part 11 and reads and writes from and to a contactless IC card 30; and an entrance-regulating apparatus 40 that wirelessly reads data that has been written from the card-communication part 25 of the mobile device 10 to the contactless IC card 30 and that concerns entrance passage, determines whether an entrance passage condition is satisfied, and controls an entrance part 46.



CLAIMS

1. An entrance-regulating system comprising:

a mobile device, to which are integrally provided: a mobile-phone part having a function for voice calls, a function for data communication via a communication network, and a function for displaying data; and a card-communication part comprising an antenna that sends and receives data to and from the mobile-phone part and reads and writes from and to a contactless IC card; and

an entrance-regulating apparatus that wirelessly reads data that has been written from the card-communication part of the mobile device to the contactless IC card and that concerns entrance passage, determines whether an entrance passage condition is satisfied, and controls an entrance part.

2. An entrance-regulating system comprising:

a mobile device to which are integrally provided: a mobile-phone part, which comprises a function for voice calls, a function for data communication via a communication network, and a function for displaying data; and an antenna for contactlessly reading and writing data;

an entrance-control card, which is incorporated freely mountable on and connected via a connector to the mobile-phone part and the antenna of the mobile device and is formed into a small-card type that sends and receives data to and from the mobile-phone part; and

an entrance-regulating apparatus, which contactlessly reads, via the antenna of the mobile device, data that has been written to the entrance-control card incorporated in the mobile device and that concerns entrance passage, determines whether an entrance passage condition is satisfied, and controls an entrance part.

3. The entrance-regulating system according to claim 1, wherein the mobile-phone part accesses a reservation server of a business operator via the communication network, performs data communication concerning entrance passage attendant with a reservation, and writes that data to the contactless IC card via the card-communication part.

4. The entrance-regulating system according to claim 2, wherein the mobile-phone part accesses a reservation server of a business operator via the communication network, performs data communication concerning entrance passage attendant with a reservation, and writes that data to the entrance-control card.

5. The entrance-regulating system according to claim 1, wherein the mobile-phone part reads reservation details written in the contactless IC card and displays such on a display part.

6. The entrance-regulating system according to claim 2, wherein the mobile-phone part reads reservation details written in the entrance-control card and displays such on the display part.

7. The entrance-regulating system according to claim 1 or 2, wherein the data concerning entrance passage is electronic-admission-ticket data for electronic-key data to unlock a lock or for admission.

DETAILED DESCRIPTION OF THE INVENTION

[0001]

INDUSTRIAL FIELD OF USE

The present invention relates to an entrance-regulating system that enables a reservation for a hotel, a theater, a movie theater, or the like to be made using the functions of a mobile phone and, based on that reservation, enables passage through the door of a hotel room or the entrance of a theater or a movie theater.

[0002]

RELATED ART

Attendant with progress in the technologies of mobile communications, mobile phones have been made ever more

lightweight and compact and become able to send and receive not only voice calls but data as well; consequently mobile phones are owned by many people and have greatly spread throughout the marketplace. In addition, systems have been proposed in recent years in which the authentication of a person can be performed safely and reliably using an IC card or the like, and thereby the person can pass through an entrance contactlessly.

[0003]

On the other hand, in the case of making a reservation for a hotel stay, for example, a person requests a reservation for a room by directly telephoning a hotel in the region where they wish to stay and then confirming the desired dates, room availability, fee, and the like; on the reservation date, the person proceeds to the hotel counter, goes through a check-in procedure, and receives a key that opens the room door. In addition, in the case of making a reservation at a theater or a movie theater, in the same manner, the person telephones the desired theater or movie theater or telephones a ticket agency, confirms the performance details, the desired performance date, the fee, and the like, requests a reservation, proceeds to the theater, the movie theater, or the ticket agency to directly pay the fee and receive their ticket in advance or remits the fee and has their ticket mailed to them in advance, and then enters the theater or the movie theater using that ticket.

[0004]

PROBLEMS TO BE SOLVED BY THE INVENTION

When making a reservation for a hotel stay using a conventional telephone or the like, the check-in procedure must be performed at the hotel counter to receive the key. In addition, when making a reservation for a theater, a movie theater, or the like, it is necessary to pay the fee and receive the ticket in advance. If it were possible to make a reservation for a hotel stay by using the data send/receive function of a mobile phone to access the reservation server of the hotel operator, to receive in advance, on the mobile-phone side, data corresponding to a key for opening the door of a room reserved in advance, and to open the door of the room using the data corresponding to that key, then the reserved room could be easily utilized without having to proceed to the hotel counter. In addition, in the same manner, if it were possible to make a reservation for a theater, a movie theater, or the like using the data send/receive function of a mobile phone to access the reservation server of the business operator of the theater or the movie theater, to receive in advance, on the mobile-phone side, data corresponding to a ticket with which the person can pass through the entrance of the theater or the movie theater, and to pass through the theater or the movie theater using the data corresponding to that ticket, then the performance or the movie could be easily enjoyed.

[0005]

The present invention was conceived considering the above-mentioned circumstances and an object of the present invention is to provide an entrance-regulating system in which not only can voice calls and data be sent and received, but a reservation for a hotel, a theater, a movie theater, or the like can be made easily, data corresponding to a key that opens a hotel room or corresponding to a ticket for entering a theater, a movie theater, or the like can be received in advance, and thereby the door can be opened and the room utilized easily, or

the theater, movie theater, or the like can be entered and the performance or movie enjoyed.

[0006]

MEANS FOR SOLVING THE PROBLEMS

To achieve the aforementioned objects, the invention recited in claim 1 is characterized in that it comprises: a mobile device, to which are integrally provided: a mobile-phone part having a function for voice calls, a function for data communication via a communication network, and a function for displaying data; and a card-communication part comprising an antenna that sends and receives data to and from the mobile-phone part and reads and writes from and to a contactless IC card; and an entrance-regulating apparatus that wirelessly reads data that has been written from the card-communication part of the mobile device to the contactless IC card and that concerns entrance passage, determines whether an entrance passage condition is satisfied, and controls an entrance part. The mobile device, which received in advance data, based on a reservation, concerning entrance passage, writes that data from the card-communication part to the contactless IC card, and the entrance-regulating apparatus takes in that data from the contactless IC card; thereby, entrance passage becomes possible and making a reservation also becomes easy.

[0007]

The invention recited in claim 2 is characterized in that it comprises: a mobile device to which are integrally provided: a mobile-phone part, which comprises a function for voice calls, a function for data communication via a communication network, and a function for displaying data; and an antenna for contactlessly reading and writing data; an entrance-control card, which is incorporated freely mountable on and connected via a connector to the mobile-phone part and the antenna of the mobile device and is formed into a small-card type that sends and receives data to and from the mobile-phone part; and an entrance-regulating apparatus, which contactlessly reads, via the antenna of the mobile device, data that has been written to the entrance-control card incorporated in the mobile device and that concerns entrance passage, determines whether an entrance passage condition is satisfied, and controls an entrance part. The mobile device, which received in advance data, based on a reservation, concerning entrance passage, writes that data to the entrance-control card, and the entrance-regulating apparatus takes in that data from the entrance-control card; thereby, entrance passage becomes possible and making a reservation also becomes easy.

[0008]

The invention recited in claim 3 is characterized in that the mobile-phone part accesses a reservation server of a business operator via the communication network, performs data communication concerning entrance passage attendant with a reservation, and writes that data to the contactless IC card via the card-communication part. The contactless IC card can be easily read by the card-communication part.

[0009]

The invention recited in claim 4 is characterized in that the mobile-phone part accesses a reservation server of a business operator via the communication network, performs data communication concerning entrance passage attendant with a reservation, and writes that data to the entrance-control card. The entrance-control card, which is incorporated freely mountable, can be easily read by the mobile device.

[0010]

The invention recited in claim 5 is characterized in that the mobile-phone part reads reservation details written in the contactless IC card and displays such on a display part. The reservation details in the contactless IC card are displayed on the display part, and thereby can be easily known.

[0011]

The invention recited in claim 6 is characterized in that the mobile-phone part reads reservation details written in the entrance-control card and displays such on the display part. The reservation details in the entrance-control card are displayed on the display part, and thereby can be easily known.

[0012]

The invention recited in claim 7 is characterized in that the data concerning entrance passage is electronic-admission-ticket data for electronic-key data to unlock a lock or for admission. If it is electronic-key data, then a door or the like can be unlocked; if it is electronic-admission-ticket data, then the venue can be entered via the entrance.

[0013]

MODES FOR CARRYING OUT THE INVENTION

The present invention is specifically explained below, with reference to one illustrated embodiment. FIG. 1 to FIG. 3 are drawings that explain an entrance-regulating system according to a first embodiment of the present invention, wherein: FIG. 1 is a block diagram that explains the configuration of a mobile device, a contactless IC card, and the entrance-regulating system; FIG. 2 is a drawing that explains the configuration of a network; and FIG. 3 is a drawing that explains memory regions of a contactless IC card.

[0014]

In these drawings, an entrance-regulating system 100 according to the present embodiment comprises: a mobile device 10; a contactless IC card 30, which can contactlessly read and write data; and an entrance-regulating apparatus 40, which can read data that has been written to the contactless IC card 30, determine whether a passage condition is satisfied, perform passage control of an entrance part 46, and write necessary data; in addition, a mobile-communication network 1, which includes the mobile device 10, comprises a base station 2, an exchange 3, an information-transfer system 4, a gateway 5, etc. and is connected to a communication network 6, to which are connected: a reservation server 7 and a database 8 of a business operator or the like, which receive a reservation that is in the contactless IC card 30 used in the entrance-regulating apparatus 40 and, based on the reservation, manages data concerning entrance-passage permission, reservation status, and the like; and a clearing house 9 of a bank or the like. In addition, the reservation server 7 is connected to the entrance-regulating apparatus 40 and manages the usage status thereof.

[0015]

The mobile device 10 is integrally provided with: a mobile-phone part 11, which has a function that is capable of conducting normal voice calls, a function that sends and receives data to and from the reservation server 7 via the mobile-communication network 1 and the communication network 6, and a function that displays data; and a card-communication part 25, which reads data from the contactless IC card 30, writes data to the contact card 30, and sends and receives data to and from the mobile-phone part 11.

[0016]

The mobile-phone part 11 comprises an antenna 12, a wireless send/receive part 13, a voice-conversion circuit 14, a

speaker 15, a microphone 16, a message-communication part 17, a key-manipulation part 18, a display part 19, memory 20, a control part 21, etc. The wireless send/receive part 13 performs frequency conversion on send data, which is input from the voice-conversion circuit 14 and the message-communication part 17, to convert the send data to a send signal of a prescribed wireless frequency for wirelessly sending to the base station 2, sends such from the antenna 12, performs frequency conversion of a reception signal, which is received by the antenna 12 from the base station 2, and outputs that reception signal to the voice-conversion circuit 14 and the message-communication part 17. The voice-conversion circuit 14 comprises a coding part, which is for voice conversion, and a time-division, connection-processing part, both of which are not shown, outputs the received voice signal to the speaker 15 and, as the send signal, outputs to the wireless send/receive part 13 the voice input from the microphone 16. The message-communication part 17 is a portion that performs a process of: constructing, into a send signal, an information request to the mobile-communication network 1 or the reservation server 7, sending that send signal to the wireless send/receive part 13, receiving, from the wireless send/receive part 13, a reply to that request, and outputting such to the display part 19, etc. The key-manipulation part 18 is portion that comprises keys for various operations, keys for inputting characters and alphanumeric characters, and the like. The display part 19 is a portion that comprises a liquid-crystal display device for displaying black and white or color and displays characters input by the key-manipulation part 18, menus for selection, or received data. The memory 20 is a portion that temporarily stores data that has been read from the contactless IC card 30 or for which an inquiry request has been made to the database 8, or data for writing to the contactless IC card 30. The control part 21 is a portion that controls all the above-mentioned parts and controls the transfer of send/receive data, control data, etc. [0017]

The card-communication part 25 comprises an interface circuit 26, a card-communication control part 27, an antenna 28, etc. The card-communication control part 27 is a portion that performs communication control for reading data from the contactless IC card 30 and writing data to the contactless IC card 30 via wireless coupling between the antenna 28 and an antenna 31 of the contactless IC card 30. The interface circuit 26 is a circuit for sending and receiving, between the control part 21 of the mobile-phone part 11 and a card-communication control part 24, data that is to be written and data that has been read. [0018]

The contactless IC card 30 is, for example, an IC card, which is stored in a case having a thin-plate card shape, is provided with a circuit on a board (not shown), has a sealed structure, and has standardized dimensions; the contactless IC card 30 comprises the antenna 31, a communication-control part 32, a card-control part 33, memory 34, etc. and, in response to a wireless, contactless transmission (call) from the entrance-regulating apparatus 40 or the mobile device 10, starts a process to store data and send necessary data to the entrance-regulating apparatus 40 or the mobile device 10. The antenna 31 is a coil suited to the wireless coupling between an antenna 41 of the entrance-regulating apparatus 40 and the antenna 28 of the card-communication part 25. The communication-control part 32 is a portion that controls the sending and receiving of data, via the antenna 31, between the entrance-regulating apparatus 40 and the mobile device 10. The memory 34 stores routines that perform processes with respect to calls from the entrance-regulating apparatus 40 and the mobile device 10 and, as shown in FIG. 3, has a reservation-details storage region and

an entrance-passages-permission-details storage region. For example, in the situation of a hotel reservation or the like, data related to the reservation details such as the hotel name, the check-in and check-out dates, the desired room requirements (single or twin, etc.), the fee, and the room number, are stored in the reservation-details storage region; and in the situation of a theater or the like, data related to the reservation details such as the theater name, the reservation date, the name of program to be presented, the admission fee, etc. are stored in the reservation-details storage region; data corresponding to an electronic key for opening the door of a hotel room number or data corresponding to an electronic-admission ticket for enabling passage through the entrance of a theater, a movie theater, or the like are stored in the entrance-passages-permission-details storage region. The card-control part 33 is a portion that uses routines stored in the memory 34 to perform processes such as reading and writing data. [0019]

For example, in the situation of a hotel, the entrance-regulating apparatus 40 is a portion that controls the key-opening/key-closing of a room door; in addition, in the situation of a theater, a movie theater, or the like, the entrance-regulating apparatus 40 is a portion that controls admission permission of an entrance; the entrance-regulating apparatus 40 comprises the antenna 41, a card reader/writer 42, an interface circuit 43, a control part 44, memory 45, an entrance part 46, etc. The card reader/writer 42 is a portion that controls the reading of data from the contactless IC card 30 and the writing of data to the contactless IC card 30 via the wireless coupling between the antenna 41 and the antenna 31 of the contactless IC card 30. The interface circuit 43 is a circuit for sending and receiving, between the card reader/writer 42 and the control part 44, data to be written and data that has been read. The memory 45 is a portion that stores a routine for controlling the entrance part 46, the state or usage status of the entrance part 46, etc. The entrance part 46 is a key portion of a door, the opening and closing of which is controlled by the control part 44, or is an entrance open/close part, a guidance-display part, an indicator lamp, a speaker, etc. The control part 44 is a portion that performs data processing such as controlling the entrance part 46 by determining, using a routine stored in the memory 45, whether entrance passage is possible, managing the usage status, etc. It is noted that the entrance-control apparatus 40 is connected to the reservation server 7, and the usage status thereof is managed. [0020]

Next, a data send/receive example and a display example for a hotel reservation using the contactless IC card 30 according to the first embodiment of the present invention will be explained. FIG. 4 is a drawing that explains a data send/receive example for a hotel reservation, and FIG. 5 is a drawing for explaining an example of a display on a mobile device for a hotel reservation. [0021]

First, it is assumed that the contactless IC card 30 is, for example, a card provided by a hotel operator or the like for a reservation. [0022]

First, as shown in FIG. 4, when the power supply on the mobile device 10 side is turned on, authentication between the mobile device 10 and the mobile-communication network 1 is performed in accordance with a prescribed procedure. Next, a menu, which has been formed hierarchically, is displayed on the display part 19 of the mobile device 10; when a hotel reservation menu is selected by the manipulation of the key-manipulation part 18, narrowed-down data of the hierarchical menu is sent from the mobile device 10 side to the mobile-

communication network 1, and the state transitions to a prompt state for the input of a city name; when a city name is selected on the mobile device 10 side, that data is sent to the mobile-communication network 1, and the state next transitions to a prompt state that prompts for the input of the check-in/check-out dates; then, when the check-in/check-out dates are entered on the mobile device 10 side, that data is sent to the mobile-communication network 1. That is, as shown in FIG. 5, when 'ABC Hotel' is selected within the selection screen, i.e., 'Own-Station Telephone Number', 'Sound-Related Function', and 'ABC Hotel', of the initial menu, the following City selection menu for the ABC Hotel is transitioned to. On the City selection menu screen, 'Hokkaido', 'Tohoku', 'Kanto', 'Tokyo', 'Koshinetsu', and 'Chubu' are displayed as the city names where affiliated hotels of the ABC Hotel exist; here, when 'Tokyo' is selected, 'Shinjuku', 'Shibuya', 'Ikebukuro', 'Ginza', and 'Shinagawa' are displayed as the geographical names that focus on the Tokyo geographical region; here, when 'Ginza' is selected, the following input menu screen for the check-in/check-out dates is transitioned to. Here, for example, if '5/12 13:00' is selected as the check-in date and '5/14 10:00' is selected as the check-out date, then the reservation server 7 of the hotel operator is accessed via the mobile-communication network 1, and an inquiry regarding room-availability information is made to the database 8.

[0023]

Next, as shown in FIG. 4, the reservation server 7, which received the inquiry from the mobile-communication network 1 side, searches the database 8 for room-availability information at the requested check-in and check-out dates and sends that room-availability information to the mobile-communication network 1 side. Here, on the mobile-communication network 1 side, the room-availability information is processed into data that is suited to display on the mobile device 10 side and then transferred to the mobile device 10. On the mobile device 10 side, the room-availability information is received and displayed on the display part 19. That is, as shown in FIG. 5, for example, 'Single ¥18,000', 'Twin ¥23,000', 'Superior Twin ¥35,000', and 'Royal Twin ¥80,000' are displayed as the room-availability information. Next, when, for example, 'Twin ¥23,000' is selected from the screen on which the desired room-availability information is displayed on the mobile device 10 side, as shown in FIG. 4, that selection information is sent to the reservation server 7; then, the reservation server 7, which received the selection information, sends the desired room requirement to the mobile device 10 side. That is, as shown in FIG. 5, 'Twin Room No. 1432' as the desired room, 'FirstName LastName', 'Check-in 5/12 13:00', 'Check-out 5/14 10:00', 'Normal Fee ¥46,000', 'Member Discount ¥9,200', and 'Fee ¥36,800' are displayed on the mobile device 10 side. Here, on the mobile device 10 side, when the displayed desired room requirement is confirmed and a reservation is selected, information related to the reservation is sent to the reservation server 7.

[0024]

Next, as shown in FIG. 4, the reservation server 7, which received the reservation information, issues, together with the desired room requirements, electronic-key data for unlocking the entrance-regulating apparatus 40, which constitutes the door of the desired room thereof, and sends such to the mobile device 10 side; on the mobile device 10 side, when this electronic-key data has been received, electronic-key reception confirmation is performed. That is, as shown in FIG. 5, when a reservation is selected on the mobile device 10 side, 'Based on your reservation, the key for Room No. 1432 will now be sent to you.' is displayed as the delivery of the electronic key, after which 'After confirming receipt of your

key, please press the F button to confirm receipt.' is displayed. The reservation server 7, which received the reception confirmation from the mobile device 10 side, registers the reservation details in the database 8 and in the electronic-key management system.

[0025]

Next, the mobile device 10, which received the reservation details and the electronic-key data, registers that data temporarily in the memory 20, then reads data from the memory 20 based on control of the control part 21, and sends such from the interface circuit 26 of the card-communication part 25 via the card-communication control part 27 and the antenna 28; that data is taken in, from the antenna 31 via the communication-control part 32 of the contactless IC card 30, to the card-control part 33, and is then stored in the memory 34. The reservation details are recorded in the reservation-details storage region of the memory 34, and the electronic-key data is recorded in the entrance-passage-permission-details storage region of the memory 34. As shown in FIG. 4, by using the contactless IC card 30, which contains the electronic-key data, it becomes possible to unlock the door of the reserved room.

[0026]

Next, the operation of using the above-mentioned contactless IC card 30 to unlock the entrance-regulating apparatus 40, which constitutes the key portion of the room door, will be explained.

[0027]

First, when the contactless IC card 30 is held up within the communication area, in which the antenna 41 of the entrance-regulating apparatus 40 is provided, communication via the wireless coupling between the antenna 41 of the entrance-regulating apparatus 40 and the antenna 31 of the contactless IC card 30 is started, the card reader/writer 42 reads data from the contactless IC card 30, and that data is taken into the control part 44 via the interface circuit 43. Based on the data that was taken in, the control part 44 determines that it is the correct card and determines the reservation details and the electronic-key data; based on whether unlock-enabled conditions are satisfied, the control part 44 controls the entrance part 46 corresponding to the key portion. If the unlock conditions are satisfied, then the key portion of the entrance part 46 is unlocked, and thereby the door can be opened. The entrance-regulating apparatus 40 stores, in the memory 45, the data related to the reservation details and the usage status of the contactless IC card 30, sends such to the reservation server 7 either periodically or when the data is updated, and, based on the reservation, manages the usage status.

[0028]

Next, in the situation in which the mobile device 10 reads data from the contactless IC card 30 for the purpose of displaying or the like, when the contactless IC card 30 is held up within the communication area, which is provided with the antenna 28 of the card-communication part 25, communication is started via the wireless coupling between the antenna 28 of the card-communication part 25 and the antenna 31 of the contactless IC card 30. Then, the card-control part 33 of the contactless IC card 30 sends the data, which was read from the memory 34, from the communication-control part 32 via the

antenna 31; the sent data is received by the card-communication control part 27 via the antenna 28 of the card-communication part 25, and that data is then taken into the control part 21 of the mobile-phone part 11 via the interface circuit 26 and stored in the memory 20. Because this data, which has been stored in the memory 20, can be read by the control part 21 and displayed by the display part 19, the reservation details can be displayed. In addition, when this contactless IC card 30 is used to have a meal at a restaurant or to shop at a store in the hotel, the charges therefor are written contactlessly and stored in the memory 34, or when a hotel telephone is used, the usage fee therefor is stored contactlessly or data sent from the reservation server 7 is stored; in doing so in advance, those charges can be included in the hotel bill when settling the bill during check-out.

[0029]

Next, as shown in FIG. 4, when check-out is to be performed and the Check-Out menu is called up on the mobile-communication network 1 side using the mobile device 10, the Check-Out menu is sent to the mobile device 10 and displayed on the mobile device 10. When a request for a bill at check-out is selected on the menu screen, that request is sent to the reservation server 7; the server 7, which received that request, calculates the settlement, including the reservation details stored in the database 8 as well as the charges for restaurants and the telephone used within the hotel, and sends to the mobile device 10 side a bill that includes a settlement list broken down by items thereof. The mobile device 10, which received the bill, displays the settlement list, issues confirmation, and sends confirmation of the bill details to the reservation server 7, after which the mobile-communication system 1 receives the confirmation, which ends the process. That is, as shown in FIG. 5, when 'Checkout' is selected in the menu, the following is displayed as the settlement list of the ABC Hotel: '5/12 ROOM ¥18,400 SERVICE ¥920 TAX ¥966 CAFEON ¥3,675 LOCAL CALLS ¥560' is displayed as the 5/12 room charge, service fee, tax, meal charge, and telephone fee, and '5/13 ROOM ¥18,400 SERVICE ¥920 TAX ¥966 CAFEON ¥1,575 OVERSEAS ¥8,570' is displayed therebelow as the 5/13 room charge, service fee, tax, meal charge, and international telephone fee. It is noted that the bill amount can be settled in cash at the hotel counter; however, for example, the reservation server 7 on the hotel side can debit, via a clearing house, a bank or the like at which the customer has preregistered.

[0030]

Next, a data send/receive example and a display example of a theater reservation or a movie-theater reservation using the contactless IC card 30 according to the first embodiment of the present invention will be explained. FIG. 6 is a drawing that explains a data send/receive example of a theater reservation or a movie-theater reservation, and FIG. 7 is a drawing that explains a display example for a theater reservation or a movie-theater reservation on a mobile device.

[0031]

First, it is assumed that the contactless IC card 30 is used as a card with which a reservation at a theater or a movie theater can be made. That is, a card is used that is provided for making a reservation with the business operator of a theater or a movie theater. In addition, the entrance-regulating apparatus 40 is an apparatus for regulating admission to a theater or a movie theater; for example, the entrance-regulating apparatus 40 contactlessly determines passage permission using the contactless IC card 30, and then opens and closes the entrance part 46. The reservation server 7 is the server of the business operator of the theater or the movie theater, and information,

such as reservation details and details about programs to be presented, is recorded in the database.

[0032]

First, as shown in FIG. 6, when the power supply on the mobile device 10 side is turned on, authentication between the mobile device 10 and the mobile-communication network 1 is performed in accordance with a prescribed procedure. Next, a menu, which has been formed hierarchically, is displayed on the display part 19 of the mobile device 10; when a theater reservation menu is selected by the manipulation of the key-manipulation part 18, narrowed-down data of the hierarchical menu is sent from the mobile device 10 side to the mobile-communication network 1, and the state transitions to a prompt state for the input of a theater name; when a theater name is input on the mobile device 10 side, that data is sent to the mobile-communication network 1, and the state next transitions to a prompt state that prompts for the input of a performance-city name; then, when the performance-city name is input on the mobile device 10 side, that data is sent to the mobile-communication network 1; then, the state transitions to a prompt state that prompts for the input of a program to be presented; when a program to be presented is input, that data is sent to the mobile-communication network 1. That is, as shown in FIG. 7, when 'Four Seasons Theater' is selected in the menu on the mobile device 10 side, next, the performance-cities selection menu is displayed as 'Tokyo', 'Nagoya', 'Osaka', and 'Fukuoka'; for example, when 'Tokyo' is selected, in accordance with the input of the program to be presented on the programs-to-be-presented menu, the mobile-communication network 1 sends an inquiry request for information about programs to be presented to the reservation server 7.

[0033]

Next, as shown in FIG. 6, the reservation server 7, which received the inquiry request for information about programs to be presented, searches the database 8 for programs to be presented and sends such to the mobile-communication network 1 side. On the mobile-communication network 1 side, the information about programs to be presented is processed into data that is suited to display on the mobile device 10 side and then transferred to the mobile device 10. The mobile device 10 displays the programs to be presented. Furthermore, when a program to be presented is selected in the programs-to-be-presented display menu, the data of that selection result is sent to the mobile-communication network 1 side; then, the state transitions to a prompt state that prompts for the input of the desired reservation date. When a date is input on the mobile device 10 side, that data is sent to the reservation server 7. The reservation server 7, which received the date, sends program-confirmation fee information to the mobile device 10 side. On the mobile device 1 side, when the program fee on the menu that displays the program-confirmation fee is confirmed and a reservation is selected, data concerning that reservation is sent to the reservation server 7. The reservation server 7, which received the reservation, issues electronic-admission-ticket data and sends such, together with the reservation details corresponding to the ticket, to the mobile device 10 side. On the mobile device 10 side, the reservation details and the electronic-admission-ticket data are received; then, a reception confirmation of the electronic-admission ticket is sent to the reservation server 7. That is, as shown in FIG. 7, with regard to programs to be presented, 'Lion King', 'Cats', and 'Rikoran' are displayed as Tokyo performances; here, when 'Lion King' is selected, 'Enter desired performance date:' is displayed as the menu in which the performance date is to be input; therebelow, for example, when 120715, which indicates the date H12/7/15, is input and selected, 'It's ¥10,200:' is displayed as the fee, and therebelow a selection screen that includes 'Purchase: Yes' and

'Purchase: No' is displayed. Here, for example, when 'Purchase: Yes' is selected, 'A ticket has been issued. Venue: Tokyo Theater / Date: H12.7.15 (Performance Start Time:18:00) / Seat: Row J Seat 7 / Thank You' is displayed as the completion of the sale. After the reservation server 7 has received the reception confirmation for the electronic-admission ticket, it registers the reservation details in the database 8 and registers such in the entrance-regulating-apparatus management system.

[0034]

Next, the mobile device 10, which received the reservation details and the electronic-admission-ticket data, temporarily records that data in the memory 20; then, in the same manner as described above, the control part 21 of the mobile-phone part 11 stores the reservation details and the electronic-admission-ticket data, which were stored in the memory 20, from the card-communication part 25 to the memory 34 of the contactless IC card 30. The reservation details are recorded in the reservation-details storage region of the memory 34, and the electronic-admission-ticket data is recorded in the entrance-passage-permission-details storage region of the memory 34. As shown in FIG. 6, by using the contactless IC card 30, which contains the electronic-admission-ticket data, the person can pass through the entrance part of the theater at which the reservation was made.

[0035]

According to the entrance-regulating system 100 of the above-mentioned configuration, the mobile device 10 not only comprises the mobile-phone part 11, which has the function capable of normal voice calls, the function that sends and receives data, and the function that displays data, but also is integrally comprises the entrance-regulating apparatus 40, which constitutes the door through which the person enters the reserved room in the hotel or the admission gate of the theater or movie theater, the contactless IC card 30, which can be used as an electronic key or an electronic-admission ticket for opening and passage, and a card-communication part 25, which can read and write in the same contactless manner; consequently, the mobile device 10 and the contactless IC card 30 can be carried together portably; when the person is to pass through the door of a hotel or the admission gate of a theater or movie theater, the person uses the contactless IC card 30 to control the door or the admission gate, which constitutes the entrance part of the entrance-regulating apparatus 40, and thereby can pass through. In addition, when it is desired to know the reservation details or the like in the contactless IC card 30, by holding up the contactless IC card 30 within the communication area provided by the antenna 28 of the card-communication part 25 of the mobile device 10, communication starts, the data stored in the memory 34 of the contactless IC card 30 is read and temporarily stored in the memory 20 of the mobile-phone part 11, the control part 21 reads that data from the memory 20 and can display it on the display part 19; consequently, it is possible to easily know at any time the reservation details or the hotel settlement details. Accordingly, with regard to the entrance-regulating system 100 of the present embodiment, not only can the mobile device 10 send and receive voice calls and data, but the card-communication part 25, which is integrally provided with the mobile device 10, can read and write from and to the contactless IC card 30, and a person can, using the contactless IC card 30, contactlessly unlock the door of a reserved hotel room, which constitutes the entrance-regulating apparatus 40, and pass through the admission gate of a theater, a movie theater, or the like; thus, the person can enter a reserved room without checking in at the hotel counter, and it is no longer necessary to go pay the fee at the theater or movie theater to get their ticket; thereby, a reservation can be made easily at one's

location. In addition, the reservation details, the settlement amount of the fees when checking out of the hotel, and the like can be easily known at any time by the mobile-phone part 11 reading data from the contactless IC card 30 via the card-communication part 25 and displaying that data on the display part 19.

[0036]

FIG. 8 and FIG. 9 are drawings that explain the entrance-regulating system according to a second embodiment of the present invention, wherein FIG. 8 is a block diagram that explains the configuration of the mobile device and an entrance-regulating apparatus, and FIG. 9 is a drawing that explains the configuration of a network. It is noted that portions corresponding to those in the first embodiment are assigned identical symbols, and detailed explanations thereof are omitted.

[0037]

In these drawings, an entrance-regulating system 200 of the present embodiment comprises a mobile device 50 and an entrance-regulating apparatus 40, which is the same as that in the first embodiment; in addition, the mobile-communication network 1, which comprises the mobile device 50, is connected to the communication network 6, to which likewise the reservation server 7 and the database 8 of the business operator or the like (of the hotel or theater or movie theater) and the clearing house 9 are connected.

[0038]

The mobile device 50 comprises: a mobile-phone part 51, which is provided with the same functions as those in the first embodiment and is integrally provided with an antenna 52; and a gate-control card 53, which is incorporated freely mountable on and connected to the mobile-phone part 51 via a connector or the like.

[0039]

In addition to having the same portions as those of the first embodiment, the mobile-phone part 51 is integrally provided with an antenna 52 for sending and receiving data via wireless coupling between the mobile-phone part 51 and the entrance-regulating apparatus 40. The gate-control card 53 is, for example, a small card provided with an integrated circuit having dimensions of approximately 20 x 25 mm and having sufficient resistance to external improper access or the like; the gate-control card 53 comprises an interface circuit 54, a card-control part 55, a communication-control part 56, memory 57, etc.; when the gate-control card 53 is incorporated in the mobile-phone part 51, the interface circuit 54 is connected to the control part 21 of the mobile-phone part 51 via a connector 58, and the communication-control part 56 is connected by a connector 59 and via the antenna 52, which is provided on the mobile-phone part 51. The communication-control part 56 is a portion that, in response to a wireless, contactless sending (call) from the entrance-regulating apparatus 40 via wireless coupling between the antenna 52 and the antenna 41 of the entrance-regulating apparatus 40, starts a process to control the sending and receiving of data. The antenna 52 is a coil that is suited to the wireless coupling between the antenna 52 and the antenna 41 of the entrance-regulating apparatus 40, the same as in the contactless IC card 30 of the first embodiment. The memory 57 stores routines for performing processes on calls from the entrance-regulating apparatus 40 and has a commuter-ticket-details storage region, a boarding/deboarding-history storage region, and a prepaid-balance storage region, similar to the first embodiment. The interface circuit 58 is a circuit for sending and receiving, between the control part 21 of the mobile-phone part 51 and the card-control part 55, data to be written and data that has been read. It is noted that the communication network 6, to which the gate-processing apparatus 40, the mobile-

communication network 1, the reservation server 7, and the database 8 are connected, is the same as that in the first embodiment.

[0040]

According to the entrance-regulating system 200 of the above-mentioned configuration, not only does the mobile device 50 comprise the mobile-phone part 51, which has the function that is capable of normal voice calls, the function that sends and receives data, and the function that displays data, but also entrance-passage permission details, which are composed of reservation details and an electronic key or an electronic-admission ticket, are stored in the entrance-regulating apparatus 40, and the gate-control card 53, which is constituted from a small card that can be used contactlessly, is incorporated freely mountable on and connected to the mobile-phone part 51 via the connectors 58, 59; consequently, a person can use the mobile device 50 to control the entrance part of the entrance-regulating apparatus 40 and thereby can pass through. In addition, when it is desired to know the reservation details or the like in the gate-control card 53, communication with the gate-control card 53 is started by the manipulation of the key-manipulation part 18 of the mobile-phone part 51, data read by the card-control part 55 from the memory 57 is taken into the control part 21 via the interface circuit 54 and temporarily stored in the memory 20, and the control part 21 reads that data from the memory 20 and can display it on the display part 19; consequently, the reservation details can be easily known at any time. In the second embodiment, unlike the first embodiment, the antenna 52 portion among the functions that correspond to the contactless IC card 30 is integrally provided on the mobile-phone part 51 of the mobile device 50; with regard to other functions thereof, a small card, which serves as the gate-control card 53, is incorporated freely mountable on and connected to the mobile-phone part 51 via the connectors 58, 59; consequently, aspects the same as those of the first embodiment become possible by owning the mobile device 50 alone. The gate-control card 53, which is constituted from such a small card, is provided by the business operator.

[0041]

FIG. 10 and FIG. 11 are drawings that explain the entrance-regulating system according to a third embodiment of the present invention, wherein FIG. 10 is a block diagram that explains the configuration of the mobile device and the entrance-regulating apparatus, and FIG. 11 is an oblique view that explains the state in which the entrance-regulating apparatus is used by the mobile device. It is noted that portions corresponding to those in the first embodiment are assigned identical symbols and detailed explanations thereof are omitted. In addition, the communication network is the same as those in the first and second embodiments and therefore is not shown in the drawings.

[0042]

In these drawings, an entrance-regulating system 300 of the present embodiment comprises a mobile device 60 and the entrance-regulating apparatus 40, which is constituted from a hotel door or the like the same as in the first embodiment; in addition, the mobile-communication network 1, which comprises the mobile device 60, likewise is connected to the communication network 6, to which the reservation server 7 and the database 8 of the hotel operator or the like and the clearing house are connected.

[0043]

The mobile device 60 comprises a mobile-phone part 61, the same as in the first embodiment, and an entrance-control part 62, which is integrally incorporated as an integrated circuit in the mobile-phone part 61.

[0044]

The entrance-control part 62 comprises an antenna 67 in addition to an interface circuit 63, a control part 64, a communication-control part 65, and memory 66, which have the same functions as those in the second embodiment. In the second embodiment, the antenna 52 is provided on the mobile-phone part 51 of the mobile device 50, and the gate-control card 53 serves as a small card and is freely mountable; however, with regard to the mobile device 60 of the present embodiment, the entire configuration of the entrance-control part 62, which comprises the antenna 67, is incorporated as an integrated circuit. Accordingly, the functions of every part are the same as those in the second embodiment. That is, the communication-control part 65 is a portion that, in response to a wireless, contactless sending (call) from the entrance-regulating apparatus 40 via wireless coupling between the antenna 67 and the antenna 41 of the entrance-regulating apparatus 40, starts a process to control the sending and receiving of data. The antenna 67 is a coil that is suited to the wireless coupling between the entrance-regulating apparatus 40 and the antenna 41, the same as in the second embodiment. The memory 66 stores routines the same as those in the second embodiment and has the reservation-details storage region and the entrance-passage-permission-details storage region. The interface circuit 63 is a circuit for sending and receiving, between the control part 21 of the mobile-phone part 61 and the control part 64, data to be written and data that has been read. It is noted that the communication network 6, to which the gate-processing apparatus 40, the mobile-communication network 1, the reservation server 7, and the database 8 are connected, is the same as that in the first embodiment.

[0045]

As shown in FIG. 10, with regard to the entrance-regulating apparatus 40: a door main body 71 is mounted, freely openable and closable, in the entrance of the room; a card-presenting part 73, which is for the person to hold up in the communication area the mobile device 60 provided with the antenna 41, is provided at a lower portion of the door main body 71, at which the key mechanism of a handle 72, which constitutes the entrance part 46, is provided; and a control apparatus 74, which comprises the card reader/writer 42, the interface circuit 43, the control part 43, the memory 45, etc., is provided in the interior of the door main body 71.

[0046]

According to the entrance-regulating system 300 of the above-mentioned configuration, not only does the mobile device 60 comprise the mobile-phone part 61, which has the function capable of normal voice calls, the function that sends and receives data, and the function that displays data, but also the entrance-control part 62, which can be contactlessly used as an electronic key that controls the entrance part 46 of the entrance-regulating apparatus 40, is integrally incorporated as an integrated circuit; consequently, a person can unlock the entrance-regulating apparatus 40, open the door main body 71, and enter the room using the mobile device 60 alone, the same as in the second embodiment. That is, as shown in FIG. 11, by holding up the mobile device 60 in the communication area of a card-presenting part 77, which is provided at a lower portion of the handle 72 of the door main body 71 of the entrance-regulating apparatus 40 and is provided with the antenna 41, communication is started and, by satisfying the conditions of the electronic key, the lock is unlocked and the door main body 71 can be opened. In addition, when it is desired to know the commuter-ticket details or the prepaid balance of the entrance-control part 62, communication with the gate-control part 63 is started by the manipulation of the key-manipulation part 18 of the mobile-phone part 61, data that was read from the memory 66 by the control part 64 is taken into the control part 21 via the

interface circuit 63 and temporarily stored in the memory 20, and the control part 21 reads that data from the memory 20 and can display such on the display part 19; consequently, the reservation details and the like can be easily known at any time. In the third embodiment, unlike the gate-control card 53, which is constituted from the small card of the second embodiment, the entrance-control part 62 is integrally incorporated as an integrated circuit.

[0047]

It is noted that, in each of the above-mentioned embodiments, an example of a reservation for a hotel or a reservation for a theater or a movie theater was explained; however, the embodiments are applicable to one in which a person makes a reservation and passes through an entrance part; for example, the embodiments are also applicable to a reservation or the like for a concert hall, an amusement park, a theme park, an event venue, and the like. In addition, examples were explained in which the contactless IC card 30, the gate-control card 53, or the gate-control part 62 could be used as an electronic key or an electronic-admission ticket; however, if data that can be used as a credit card is used in combination and stored in advance, then purchases can be made by bank withdrawal and the like without holding cash; furthermore, it may be made such that it can be used to pay the meal charge of a hotel restaurant or the like or can be used in a vending machine for soft drinks, cigarettes, and the like provided at a theater or a movie theater.

[0048]

EFFECTS OF THE INVENTION

According to the present invention as explained above, the mobile device comprises: the mobile-phone part; the card-communication part, which performs data communication with the contactless IC card used in the entrance-control apparatus for entrance control; or an entrance-control card and an entrance-control part, which are used directly with the entrance-regulating apparatus; not only can the mobile device send and receive voice calls and data, but also a reservation for a hotel, a theater, a movie theater, or the like can be made easily at one's location; data corresponding to a key that opens a hotel room or that corresponds to a ticket for entering a theater, a movie theater, or the like can be received in advance; the door can be opened easily and thereby the room can be used; and thus the theater, the movie theater, or the like can be entered and the performance or movie can be enjoyed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram that explains the configuration of a mobile device, a contactless card, and an entrance-regulating apparatus according to a first embodiment of the present invention.

FIG. 2 is a drawing that explains the configuration of a network according to the first embodiment of the present invention.

FIG. 3 is a drawing that explains memory regions of a contactless IC card according to the first embodiment of the present invention.

FIG. 4 is a drawing that explains a data send/receive example of a hotel reservation according to the first embodiment of the present invention.

FIG. 5 is a drawing that explains a display example for a hotel reservation on a mobile device according to the first embodiment of the present invention.

FIG. 6 is a drawing that explains a data send/receive example of a theater or movie-theater reservation according to the first embodiment of the present invention.

FIG. 7 is a drawing that explains a display example of a theater or movie-theater reservation on a mobile device according to the first embodiment of the present invention.

FIG. 8 is a block diagram that explains the configuration of the mobile device and the entrance-regulating apparatus according to a second embodiment of the present invention.

FIG. 9 is a drawing that explains the configuration of the network according to the second embodiment of the present invention.

FIG. 10 is a block diagram that explains the configuration of the mobile device and the entrance-regulating apparatus according to a third embodiment of the present invention.

FIG. 11 is a drawing that explains the state in which the entrance-regulating apparatus is used by the mobile device according to the third embodiment of the present invention.

EXPLANATION OF THE REFERENCE NUMBERS

1	Mobile-communication network
2	Base station
3	Exchange
4	Information-transfer system
5	Gateway
6	Communication network
7	Server
8	Database
9	Clearing house
10	Mobile device
11	Mobile-phone part
12	Antenna
13	Wireless send/receive part
14	Voice-conversion circuit
15	Speaker
16	Microphone
17	Message-communication part
18	Key-manipulation part
19	Display part
20	Memory
21	Control part
24	Card-communication control part
25	Card-communication part
26	Interface circuit
27	Card-communication control part
28	Antenna
30	Contactless IC card
31	Antenna
32	Communication-control part
33	Card-control part
34	Memory
40	Entrance-regulating apparatus
41	Antenna
42	Card reader/writer
43	Interface circuit
44	Control part
45	Memory
46	Entrance part
50	Mobile device
51	Mobile-phone part
52	Antenna
53	Entrance-control card
54	Interface circuit
55	Card-control part

56 Communication-control part
57 Memory
58 Interface circuit
59 Connector
60 Mobile device
61 Mobile-phone part
62 Entrance-control part
63 Interface circuit
64 Control part

65 Communication-control part
66 Memory
67 Antenna
71 Door main body
72 Handle
73 Card-presenting part
74 Control apparatus
100, 200, 300 Entrance-regulating systems

FIG. 1

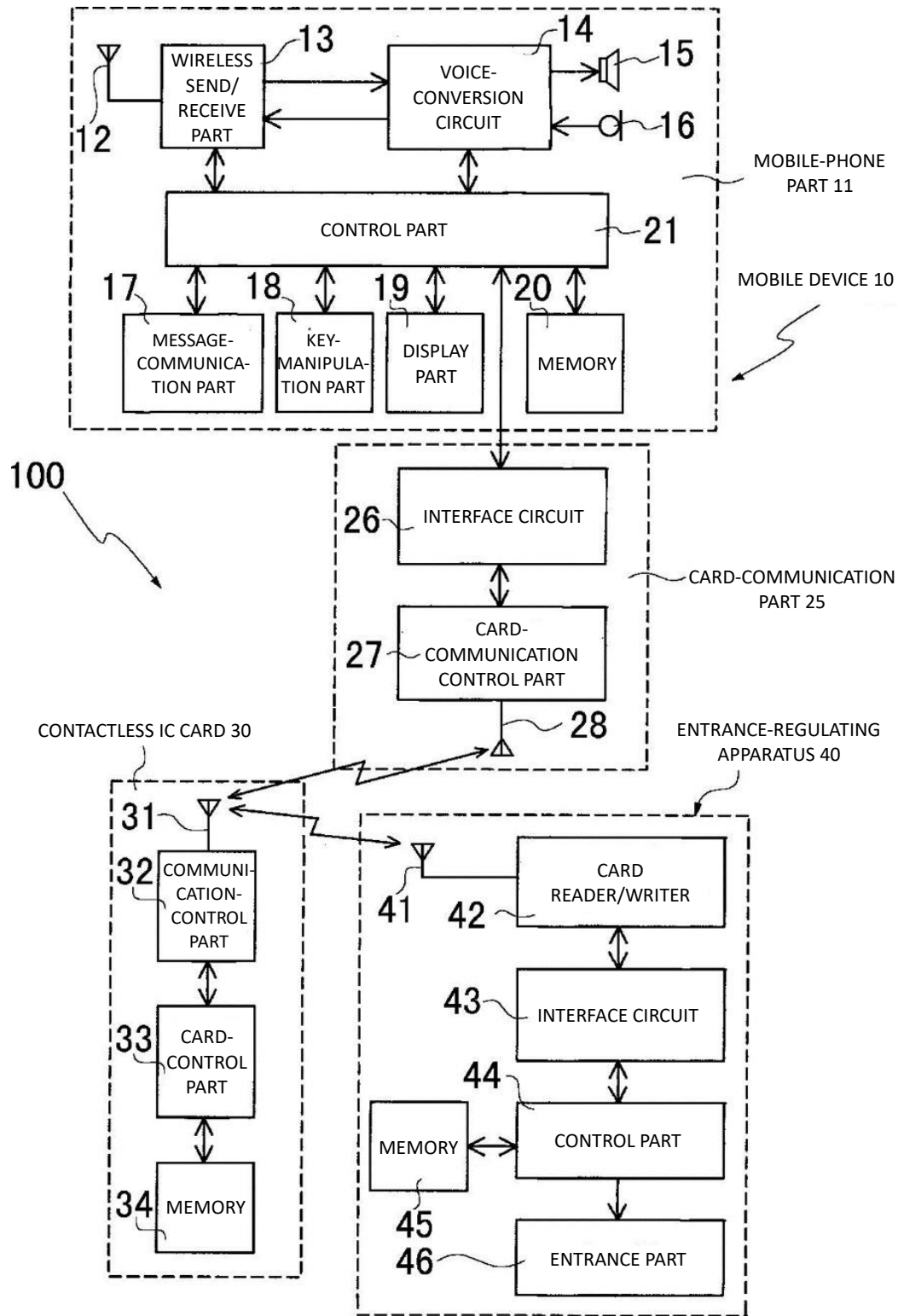


FIG. 2

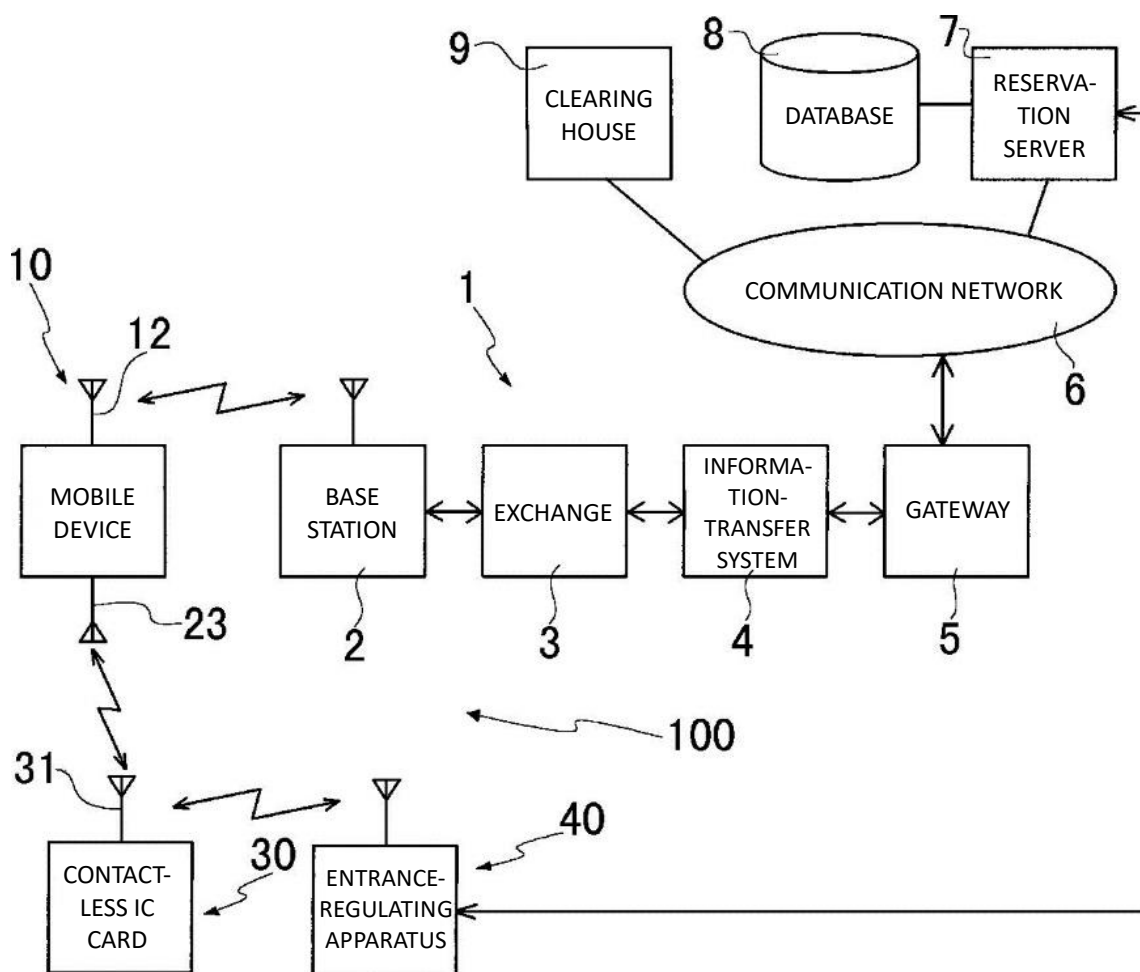


FIG. 3

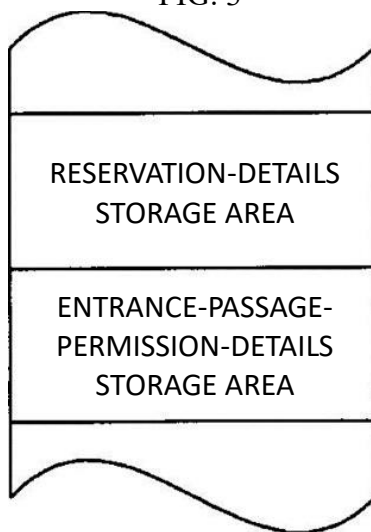


FIG. 9

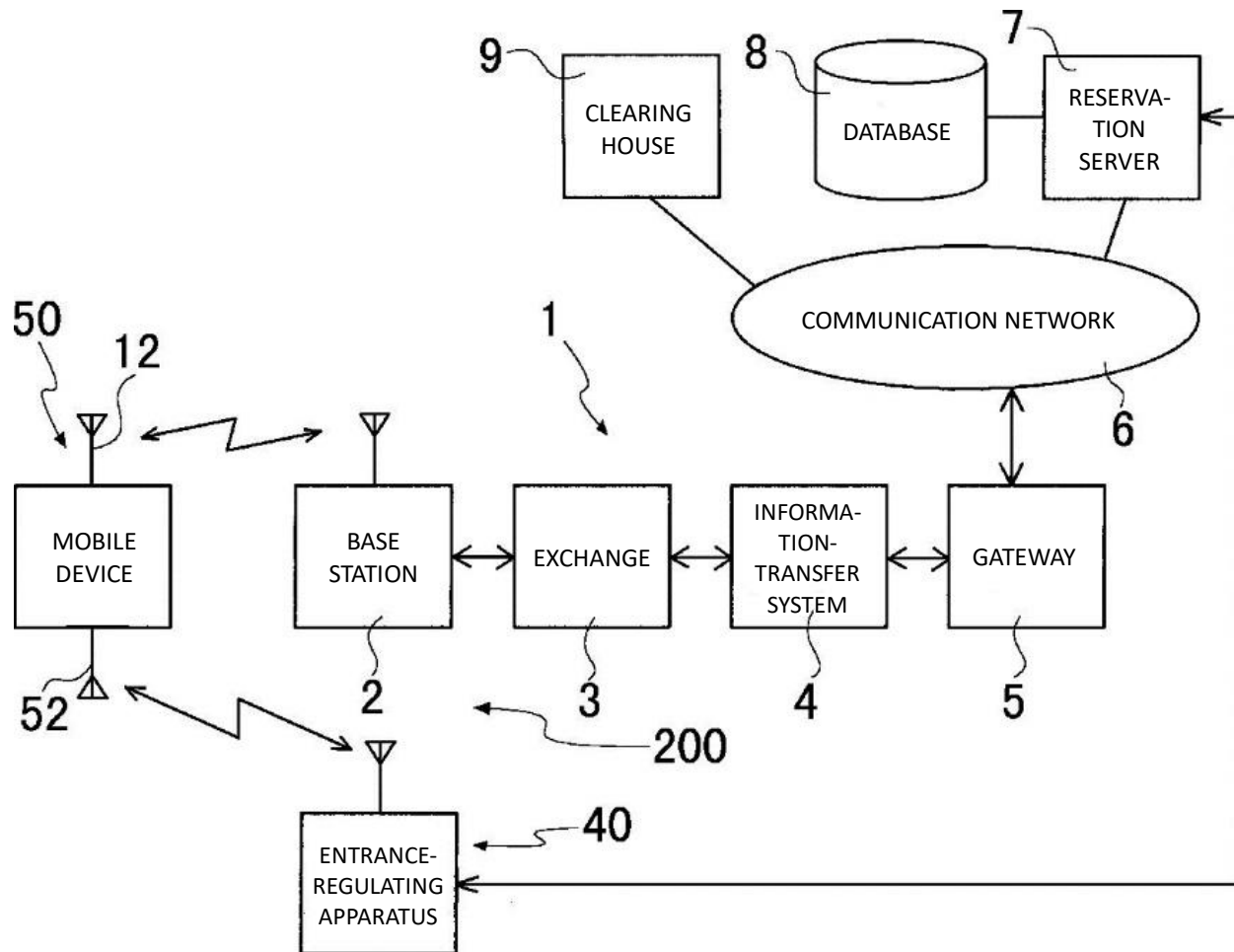


FIG. 4

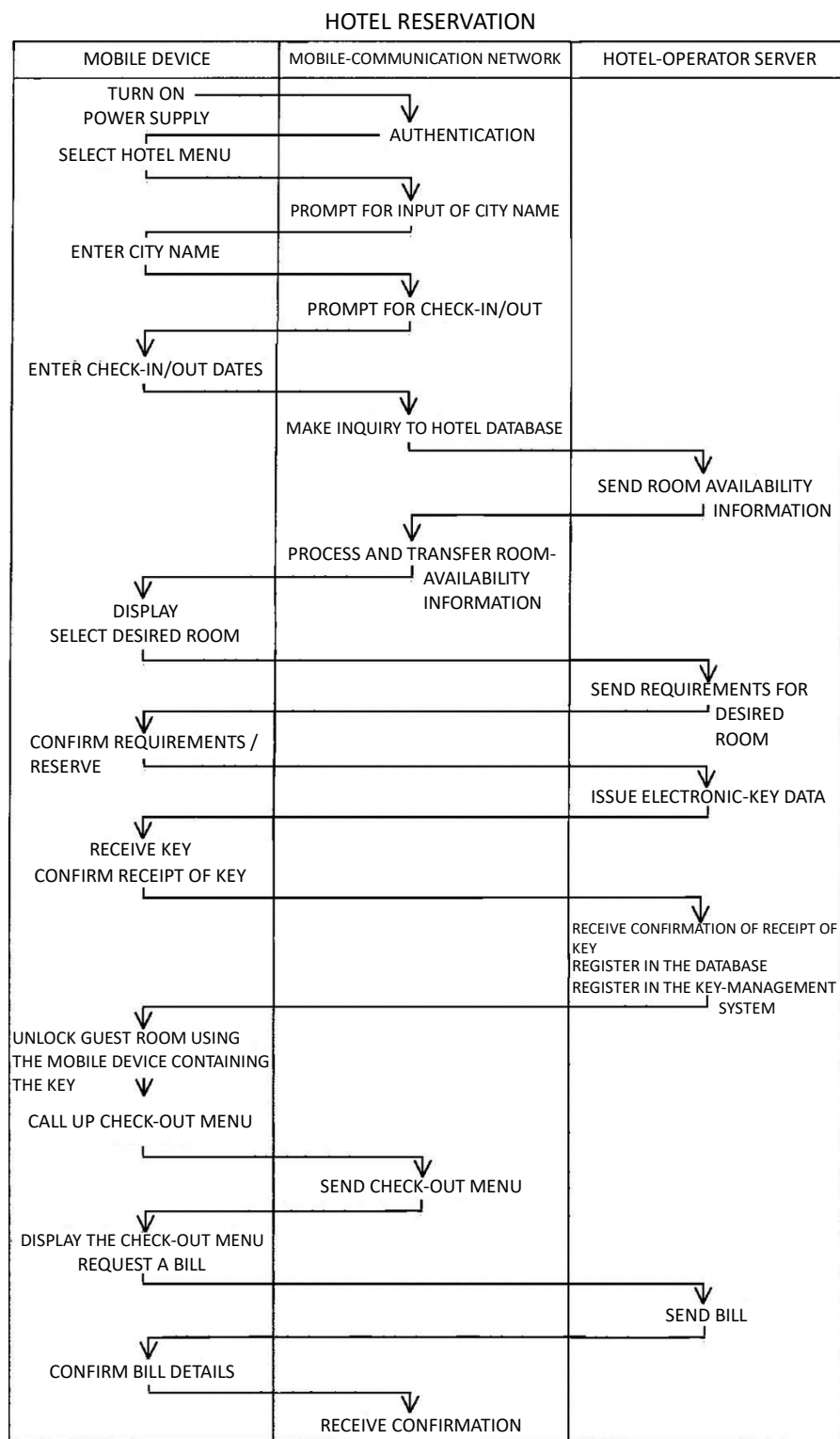


FIG. 6

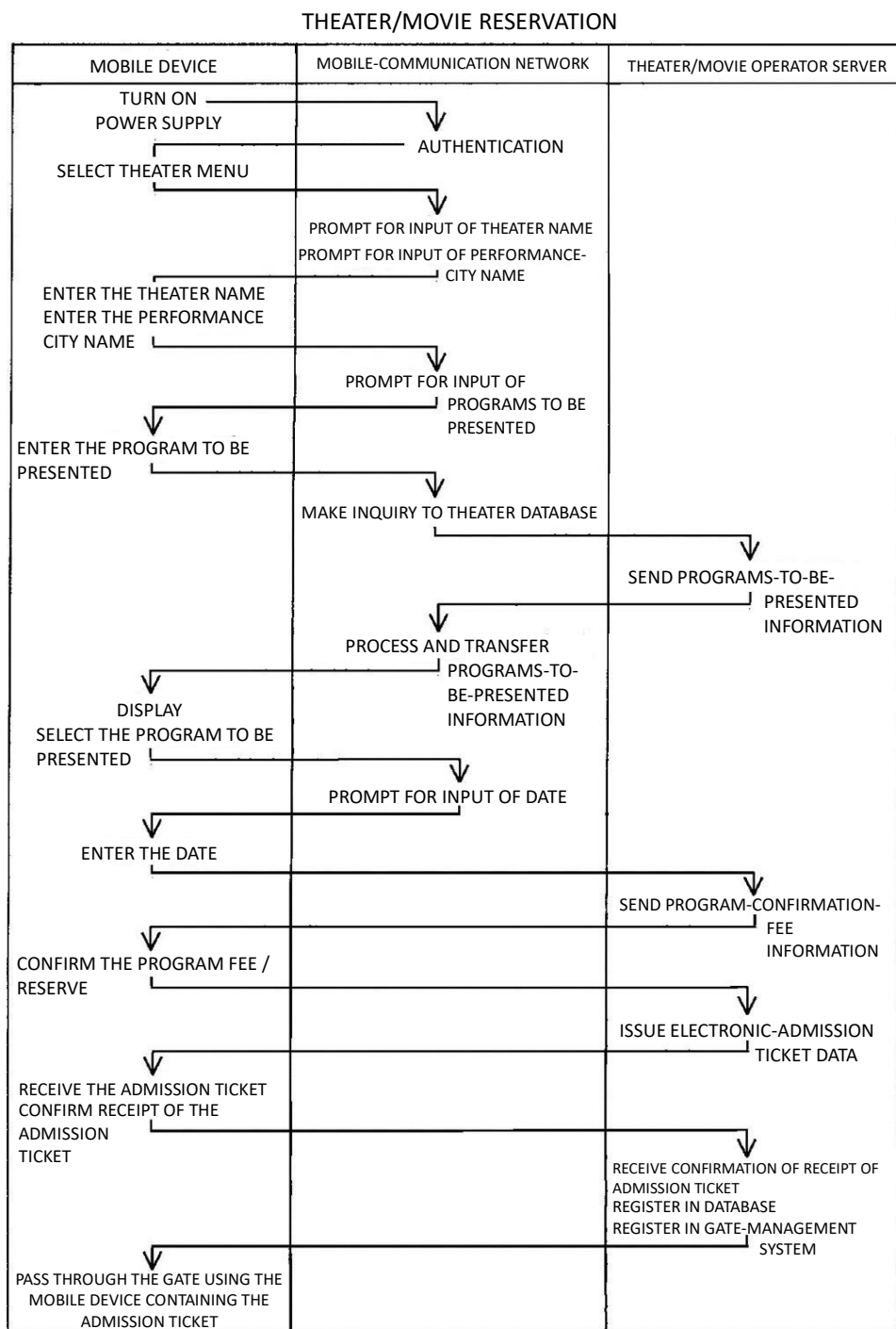


FIG. 11

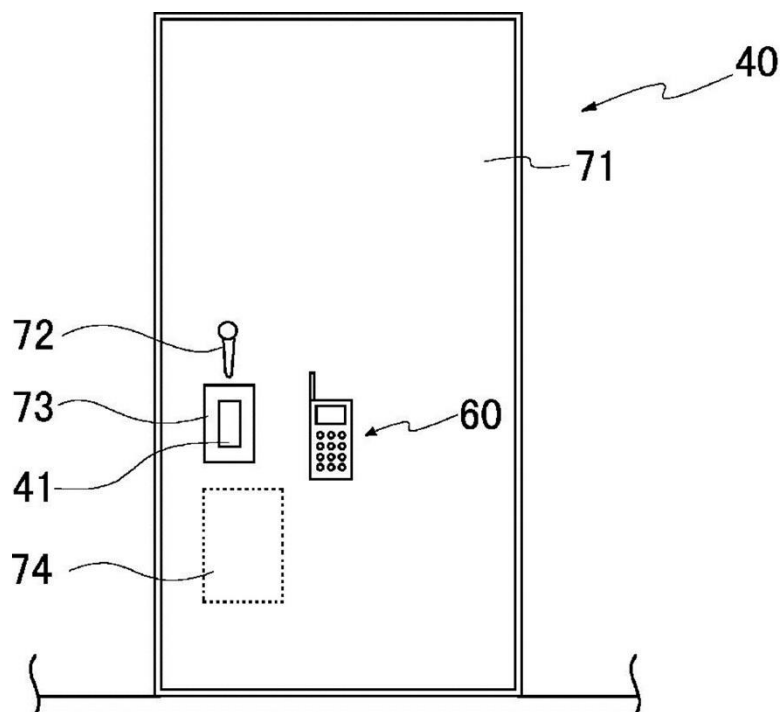


FIG. 5

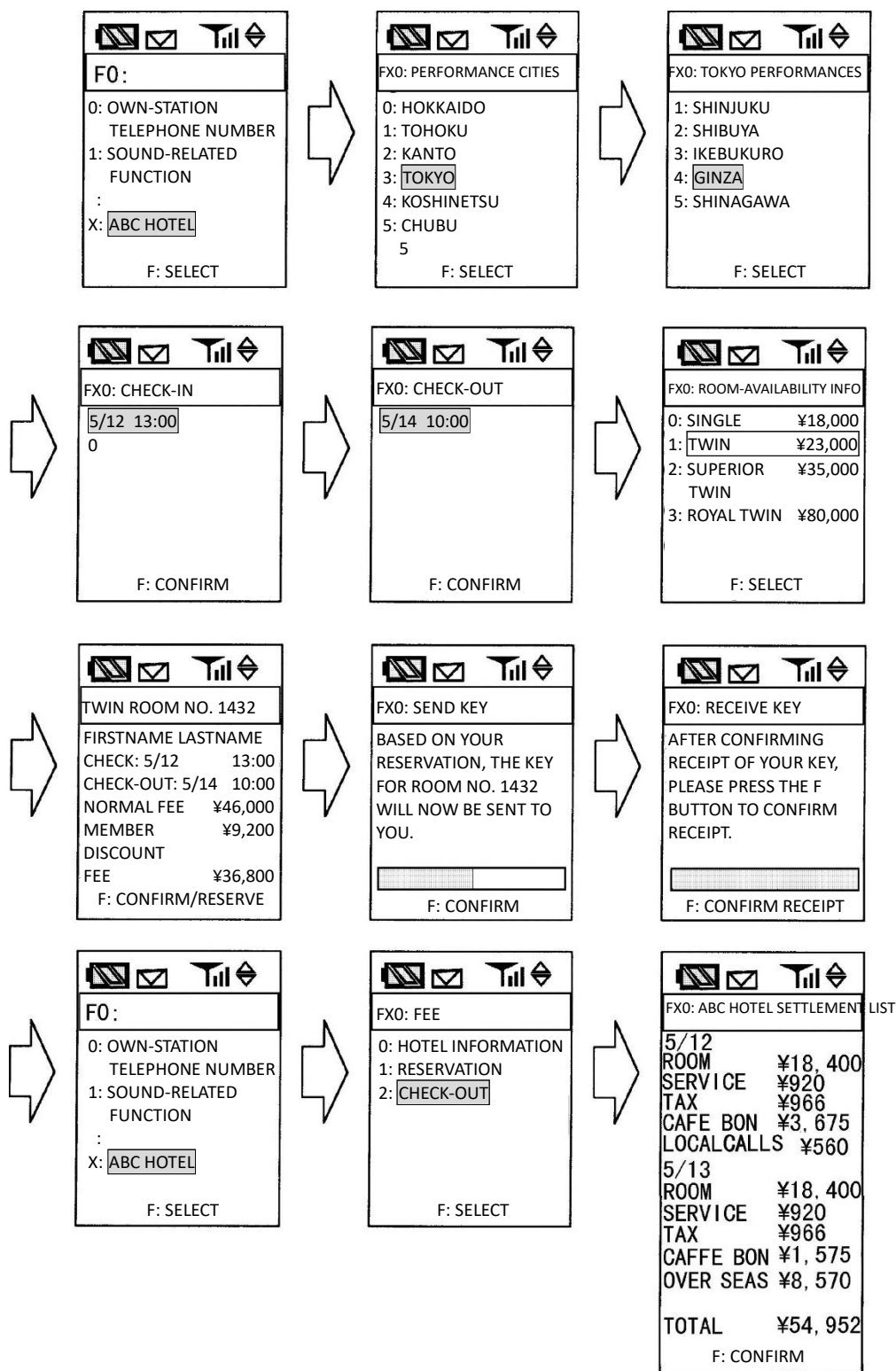


FIG. 7

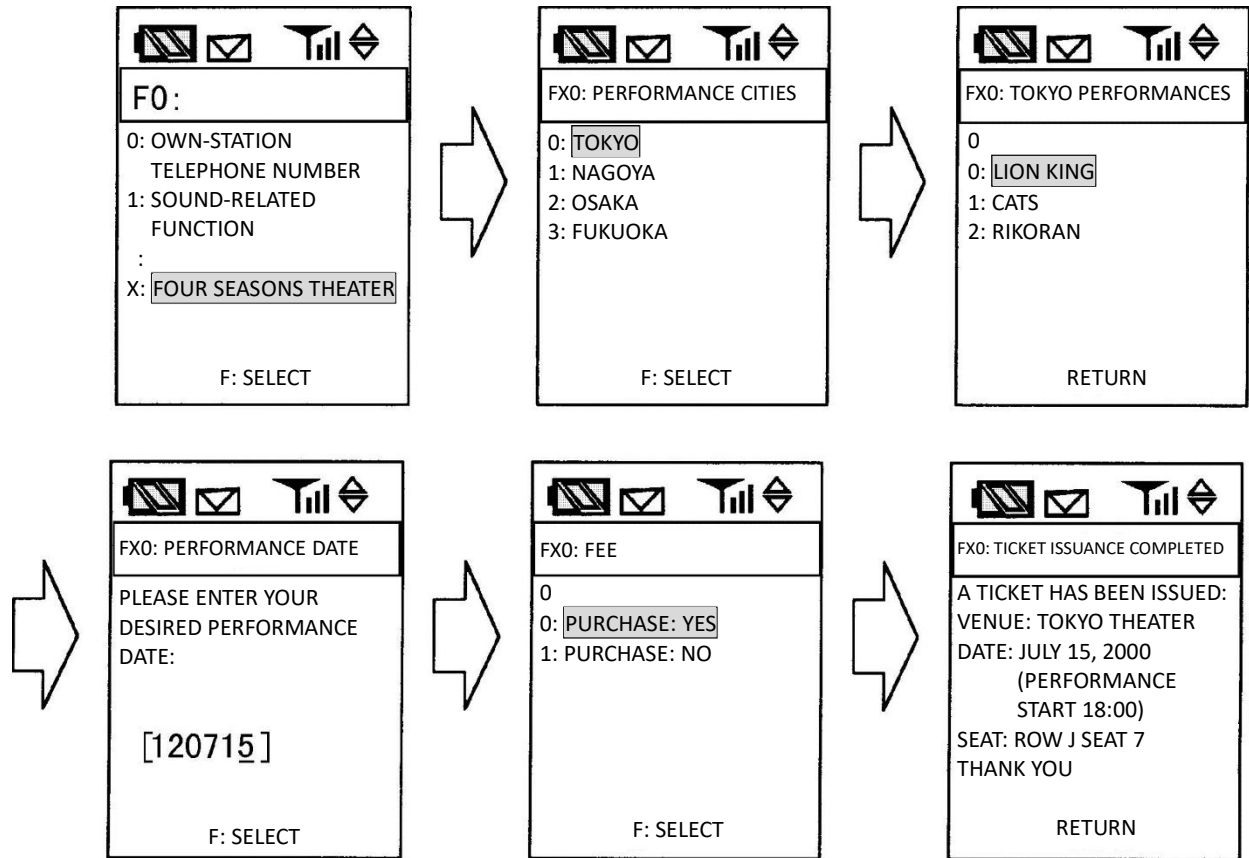


FIG. 8

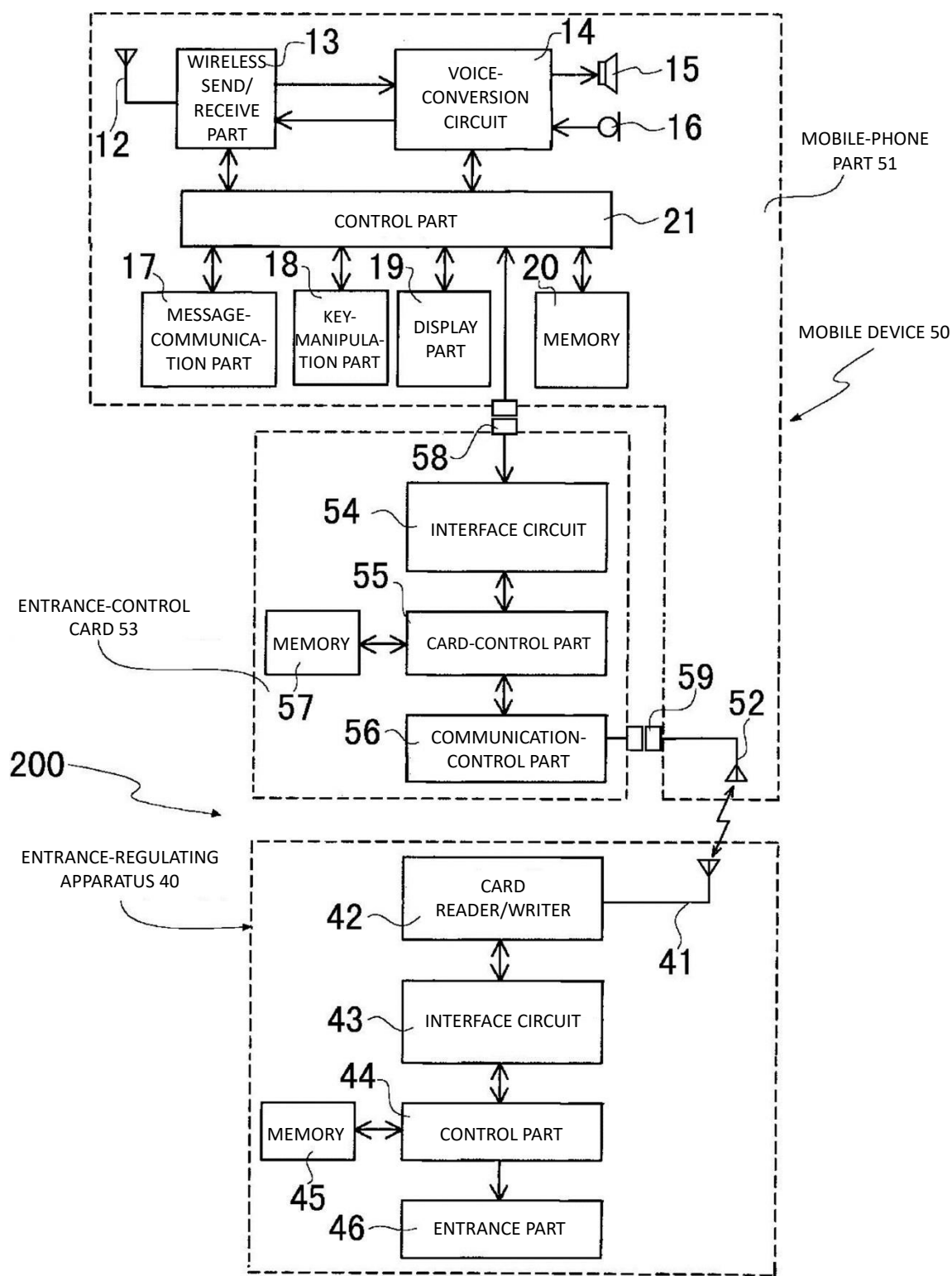
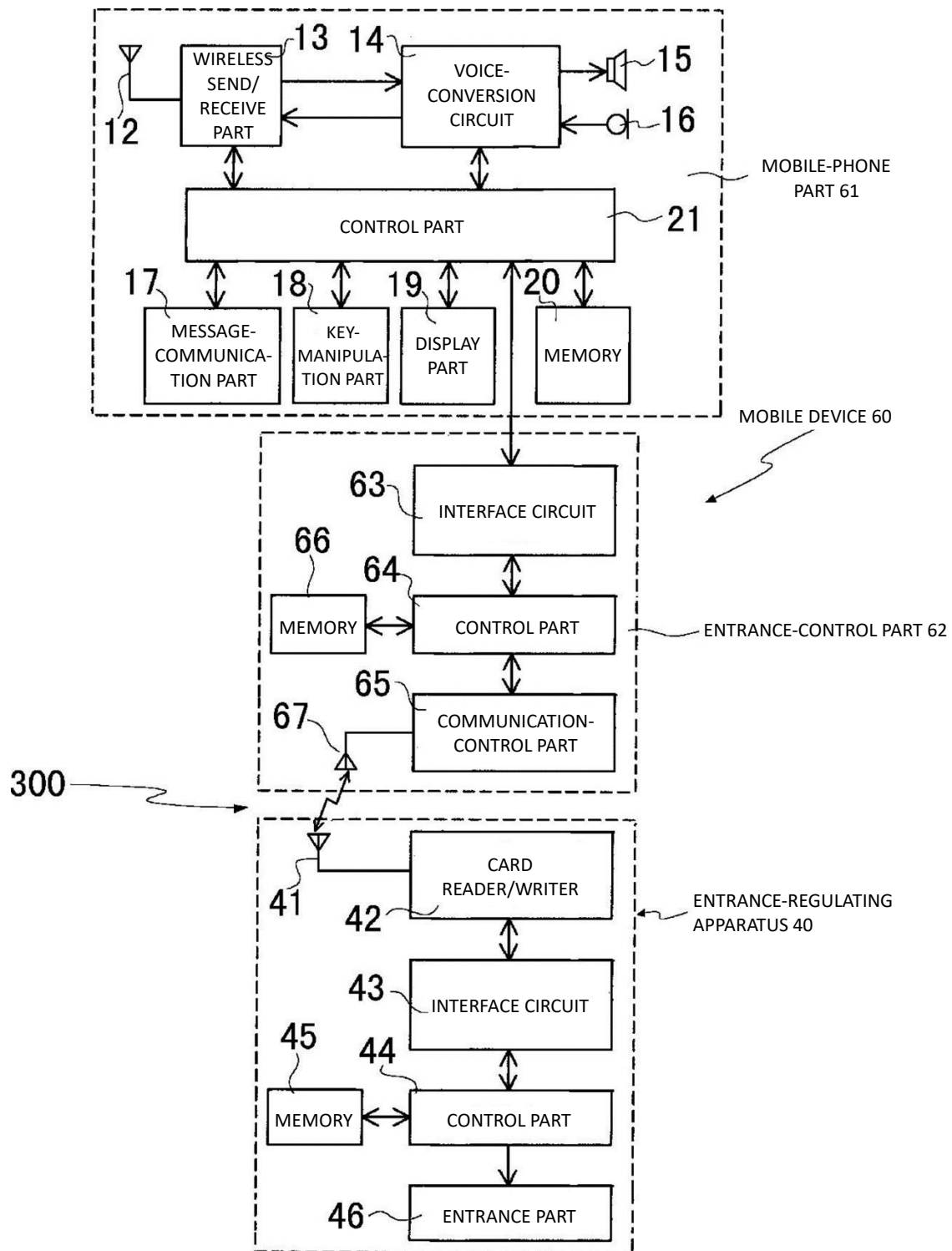


FIG. 10



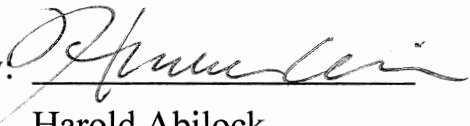
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H04B 5/02		G06K 19/00	Q	
7/26		H04B 7/26	M	
H04Q 7/38			109 T	
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	c/o East Japan Railway Company	(Reference)	FF28 FF36 GG01 GG11	
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	c/o J-Phone East Co., Ltd.		CC16 DD01 DD04 EE01 EE23	
	JR Shinanomachi Building		EE28 FF04 FF08 GG03 GG06	
	34, Shinanomachi, Shinjuku-ku,		GG07	
	Tokyo		5B058 CA17 KA02 KA04 KA06 YA11	
			YA13	
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	JR Shinanomachi Building		EE12 EE16 EE35 FF02 FF23	
	34, Shinanomachi, Shinjuku-ku,		HH23	
	Tokyo			

I, Harold Abilock, declare as follows:

1. I am over 21 years of age and am competent to make this declaration.
2. I am a native speaker of English.
3. I am fluent in Japanese.
4. I have 35 years of experience translating Japanese to English.
5. I translated the attached patent document "JP2002083087A" from Japanese to English.
6. I certify that the translation of the document "JP2002083087A" is, to the best of my knowledge, a true and accurate translation from Japanese to English.
7. In signing this declaration, I understand that the translation and this declaration may be filed as evidence in a contested case. I acknowledge that I may be subject to cross-examination within the United States.
8. I declare under penalty of perjury that all statements made herein are true and accurate to the best of my knowledge and belief, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed: March 15, 2023

By: 
Harold Abilock