(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 November 2003 (06.11.2003)

PCT

(10) International Publication Number
WO 03/091924 A1

(51) International Patent Classification[7]: G06F 17/60

(21) International Application Number: PCT/KR02/01368

(22) International Filing Date: 22 July 2002 (22.07.2002)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:

2002-0022469	24 April 2002 (24.04.2002)	KR
2002-0024735	6 May 2002 (06.05.2002)	KR
2002-0031751	5 June 2002 (05.06.2002)	KR

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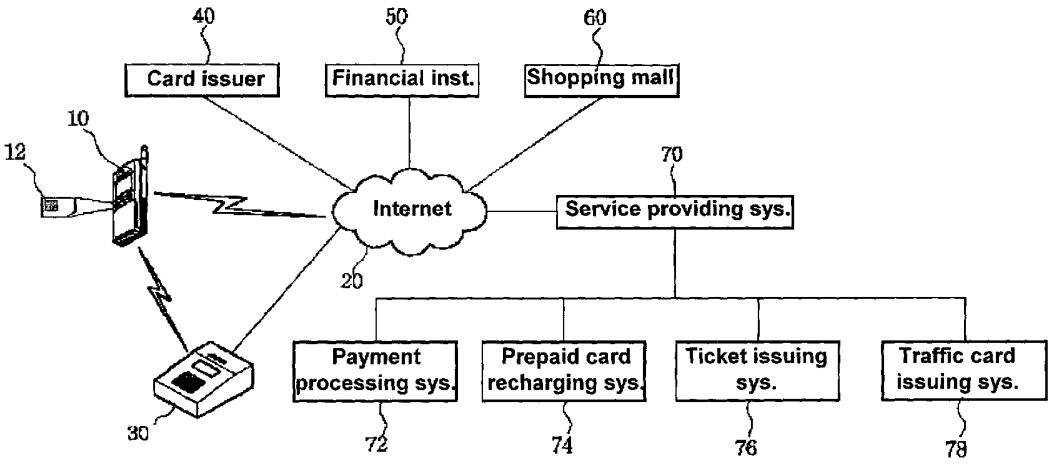
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** MOBILE TERMINAL WITH USER IDENTIFICATION CARD INCLUDING PERSONAL FINANCE-RELATED INFORMATION AND METHOD OF USING A VALUE-ADDED MOBILE SERVICE THROUGH SAID MOBILE TERMINAL



(57) **Abstract:** The present invention enables a user to receive a financial service anywhere through a mobile terminal equipped with a UIM (User Identification Module) electronic card. In the present invention, a user enters his or her password to a mobile terminal with a UIM card including subscriber telephone number, finance, authorization, and personal information, then, if the entered password is correct, authorization is processed with a remote authorizing server based on the authorization information. After authorization, user's requesting service, e.g., payment service, transaction particulars inquiry service, prepaid card recharging service is conducted through a mobile network.

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DESCRIPTION

MOBILE TERMINAL WITH USER IDENTIFICATION CARD INCLUDING PERSONAL FINANCE-RELATED INFORMATION AND METHOD OF USING A VALUE-ADDED MOBILE SERVICE THROUGH SAID MOBILE TERMINAL

1. Technical Field

The present invention relates to a method for payment and recharging using a mobile terminal equipped with a UIM (user identification module) card. Particularly, the present invention is directed to a mobile terminal equipped with a UIM card containing finance information and a method using the same so that the UIM card containing a number of finance and authorization information can be attached to a mobile terminal and both online and offline payment and recharging service can be provided by making use of a local wireless communication module.

2. Background Art

In general, payment by an IC card (credit card, debit card, prepaid card, or traffic card) or recharging thereof can be processed only through a dedicated terminal. In case of online payment through the Internet, too, approval of payment can only be obtained by entering a card number and expiration date after purchasing goods at the corresponding shopping mall. A method utilizing a card, however, suffers from a problem that the card number can be exposed to others by, e.g., hacking because both card number and expiration date are entered at the time of payment for purchasing amount.

A system to resolve the aforementioned problem is disclosed in Korean Laid-Open Patent Application No. 2000-37185. The

disclosed system enables prepaid transactions by embedding an RF chip for a non-contact type prepaid card with an identification number into a mobile communications terminal, with which occasional inquiry into the balance of the prepaid card and recharging thereof are carried out through the Internet. The disclosed system has several advantages such that since a non-contact type RF chip and antenna coil are embedded into a mobile communications terminal, there is no need to carry a card; inquiry into the balance information stored in the RF memory chip can be carried out through a Web server as well as a service terminal; and even recharging can also be fulfilled through a Web server instead of visiting a recharging station for a prepaid card at each and every occasion. However, since said RF chip dose not record monetary information except for the card identification number and actual monetary information according to the card identification number is stored in a Web server, a terminal at a membership store should make a reference to the Web server for the balance information, after which subsequent transactions are conducted; accordingly, the disclosed system is not well suited for the application to a traffic card of a bus or a subway where prompt transactions are demanded. Moreover, the disclosed system is no more than a mobile phone equipped with a pre-existing RF card so that interactions with a mobile phone are not implemented; therefore, a user can only carry out simple functions of making a reference to the Web server for the inquiry into the balance information and recharging by using the card identification number given at the time of subscription or purchase of the mobile phone.

In Korean Laid-Open Patent Application No. 1998-46928, an electronic purse card operating system is disclosed wherein, by embedding a combi-chip comprising a contact type and non-contact type smart card into a mobile device, functions of balance check, subtraction payment, and addition recharging are conducted by the contact type smart card, while balance check and subtraction payment

are conducted by the non-contact type smart card. A recording area for electronic purse information of said two smart cards is synchronized so that identical electronic purse information is utilized, whereby convenience and promptness in usage and stability and security in data processing can be improved. However, the disclosed system also reveals a problem that since available money for payment is confined to the balance stored in the recording area of the combi-chip for electronic purse information, it can only be applied to a prepaid card; therefore, application areas are limited.

3. Disclosure of Invention

The object of the present invention to resolve said problem is to provide a mobile terminal equipped with a user identification module card containing finance information and a method using the same so that payment of finance information and recharging through wireless communication are enabled by storing various finance information into a detachable user identification module card.

A further object of the present invention is to provide a battery pack with an IC card containing subscriber information, thereby providing a mobile communications service according to the present invention without change in the design or structure of the mobile terminal.

In a method for utilizing a mobile terminal capable of insertion, decryption, and recording of the user identification module card containing a mobile identification number, finance, authorization, and personal information; and Internet access through wireless communication and local area wireless communication using a local area communication module, a method for utilizing a mobile terminal equipped with a user identification module card containing finance information to achieve said objective is characterized in that it comprises the steps of: reading mobile identification number, finance, authorization, and

personal information stored in the user identification module card inserted into the user identification module card slot of the mobile terminal and deciding whether or not the entered user password is identical; when the decision is made to be identical, displaying menus of payment service, transaction particulars inquiry service, prepaid card recharging service, ticket issuing and utilization service or traffic card issuing and utilization service, thereby allowing the user to select his or her desired service; and according to said service selected by the user, providing the corresponding service by making an access to a service providing system through the Internet.

A mobile terminal equipped with a user identification module card containing finance information is also characterized in that a mobile terminal capable of wireless data communication through Internet access as well as voice communication comprises a user identification module card containing a mobile identification number, finance, authorization, and personal information; and a user identification module card slot where said user identification module card is inserted and recording and decryption of information stored in the memory of the inserted user identification module card are performed.

In addition, a battery pack of a mobile terminal according to the present invention is characterized in that it comprises a bottom casing which has its bottom outer face engaged with a battery housing compartment of the mobile terminal and a battery cell container having an opening in the top face; a printed circuit board installed on the top face of said cell in said container separated by an insulator; a top casing covering the top face of said container engaged with the upper part of said bottom casing while securing fixed dimensions of space over the top face of said printed circuit board and forming an opening at one face of said space; a palette having an IC chip holder on the top face thereof and capable of entering and exiting said space through said opening; and a

connector connecting said IC chip and said printed circuit board when said palette equipped with said IC chip is inserted into said space.

According to the present invention characterized in said manner, because various card information is stored in a single user identification module card inserted into a mobile terminal, there is no need to carry a number of cards for payment and by making use of the communication function of the mobile terminal, payment can be processed even at a place where a card reader is not readily available. Moreover, when payment is processed by using a local area communication module of the mobile terminal, an effort of inserting a card into a payment terminal can be relieved. In addition, revelation of the card number or password during payment process can be avoided, while at the same time, a roaming service for finance information can be made possible as well as communication roaming service.

In addition, by enabling issuing and cancellation of various cards and IDs to be processed inside a mobile terminal through a wireless communications network, time and manual labor dedicated to card issuing affairs can be saved and cards management work can be simplified.

Finally, since a battery pack according to the present invention enables attachment and detachment of an IC chip without modifying the mechanical or electrical structure of a CDMA mobile terminal which is in wide spread, potential for mass production of a mobile terminal is extremely increased.

4. Brief Description of Drawings

In the drawings:

FIG. 1 is a diagram illustrating a simplified structure of the entire system according to the present invention;

FIG. 2 is a diagram illustrating a simplified structure of a mobile terminal according to the present invention;

FIGS. 3 and 4 are diagrams illustrating an embodiment of a payment system using a local area communication module according to the present invention;

FIG. 5 is a flowchart illustrating a procedure to use various services provided by a mobile terminal according to the present invention;

FIG. 6 is a flowchart illustrating a payment process using a credit card according to a first embodiment of the present invention;

FIG. 7 is a flowchart illustrating a payment process using a debit card according to a second embodiment of the present invention;

FIG. 8 is a flowchart illustrating a payment process using a prepaid card according to a third embodiment of the present invention;

FIG. 9 is a flowchart illustrating a procedure for recharging a prepaid card according to a fourth embodiment of the present invention;

FIG. 10 is a flowchart illustrating a procedure for issuing a ticket according to a fifth embodiment of the present invention;

FIG. 11 is a flowchart illustrating a procedure to use a ticket according to a sixth embodiment of the present invention;

FIGS. 12 and 13 are diagrams illustrating examples displaying transaction particulars inquiries according to the present invention;

FIG. 14 is a flowchart illustrating a procedure for issuing an IC card according to a seventh embodiment of the present invention;

FIG. 15 is a flowchart illustrating a procedure for canceling an IC card according to an eighth embodiment of the present invention;

FIG. 16 is a sectional view of a battery pack for a mobile terminal wherein an IC chip can be mounted according to an embodiment

of the present invention;

FIG. 17 is a diagram illustrating a usage of a battery pack with the structure thereof shown in FIG. 16, where the battery pack is installed in a battery housing compartment of a mobile terminal according to the present invention;

FIG. 18 is a diagram illustrating a battery pack of a mobile terminal wherein an RF receiving antenna is embedded according to an embodiment of the present invention, more specifically, the structure of a battery pack wherein an IC chip having a traffic card function is installed; and

FIG. 19 is a diagram illustrating a battery pack of a mobile terminal wherein an RF receiving antenna is embedded according to another embodiment of the present invention and illustrates a structure when an IC chip having a traffic card function is installed inside the main body of a mobile terminal.

5. Modes for Carrying out the Invention

Hereinafter, preferred embodiments of the present invention will be described in detail with reference to appended drawings.

FIG. 1 is a block diagram illustrating a simplified structure of the entire system according to the present invention comprising a mobile terminal 10, a payment terminal 30, a card issuing company 40, a financial institution 50, a shopping mall 60, and a service providing system 70.

The said mobile terminal 10, equipped with an apparatus (slot) capable of installing and decrypting a user identification module (hereinafter, referred to as UIM) card 12 and a local area communication module capable of local area wireless communications, can make an access to the Internet and by using authorization information and finance information of said UIM card read out through wireless communications, carries out functions such as payment of purchased goods, recharging the balance of said UIM card, ticketing, and transaction particulars inquiry. In the memory of

said UIM card 12 recorded are authorization information such as a mobile identification number, private identification number (hereinafter, referred to as PIN), and a certificate; and personal information such as a user name, address, and contact number; also stored are finance information of various IC cards (credit card, debit card, prepaid card, traffic card). The UIM card 12 is equipped with a microprocessor and memories so that storing and updating finance information are possible. In the FIG. 1, for the purpose of brevity, constituting elements such as a mobile communications base station and a telephone exchange system of a mobile telecommunication company which appear prior to the Internet access have been omitted.

The said payment terminal 30 is similar to CAT (Credit Authorization Terminal) installed at a membership store and is equipped with a local area wireless communication module to communicate with said mobile terminal 10. The said payment terminal 30 is connected to a card issuing company 40 or a financial institution 50 through the Internet or VAN (Value Added Network) which is not shown in the drawing.

The said card issuing company 40 and financial institution 50 carry out the functions such as approval of payment for purchased goods and recharging the balance of a UIM card 12 using finance and authorization information stored in the UIM card 12.

The said shopping mall 60 is a merchandise sales system providing online purchase and payment and carries out different processes according to the information about payment means received from the user, i.e., finance information of a UIM card 12: authorization is received by a card issuer 40 in case of a credit card; approval of a transaction is confirmed by the corresponding financial institution 50 in case of a debit card; and in case of a prepaid card, the balance remained in the UIM card 12 is checked and if appropriate, the payment process is completed and purchased goods are shipped by using personal information read out and

received from said UIM card 12.

The said service providing system 70 communicates with said mobile terminal 10 connected to the Internet 20 and provides various services in association with a card issuer 40, a financial institution 50, and a shopping mall 60 by making use of authorization information, personal information, and finance information of an inserted UIM card 12. The said service providing system 70 comprises a payment processing system 72 handling payment for purchased goods or services, a prepaid card recharging system 74 recharging the balance of a prepaid card of the UIM card 12, a ticket issuing system 76 allowing ticket reservation using finance information of the UIM card 12 and transmitting information about reserved tickets to said mobile terminal 10, and a traffic card issuing system 78 providing services intended for a traffic card for expressway, subway, or bus.

FIG. 2 is a diagram illustrating a simplified structure of a mobile terminal according to the present invention. FIGS. 3 and 4 are diagrams illustrating an embodiment of a payment system using a local area communication module according to the present invention.

A mobile terminal 10 according to the present invention, without modifying an ordinary mobile terminal, can detach, attach, and decrypt a UIM card 12 wherein authorization information, finance information, and personal information are stored. The mobile terminal 10 is equipped with a UIM card slot 102 through which data can be recorded into the UIM card and a local area communication module 105 capable of local area wireless communication with a payment terminal 30. The said local area communication module 105 can employ a communication system using RF, IrDA (Infrared Data Association), or Bluetooth. Payment, recharging, and ticket reservation through the Internet utilize existing communications part of the mobile terminal.

As shown in FIGS 3 and 4, payment is accomplished by

communicating with a local area communication module 32 installed in a payment terminal 30. FIG. 3 shows the payment terminal 30 installed at an ordinary store and FIG. 4 shows the payment terminal installed at an entrance gate of a theater or a subway station.

FIG. 5 is a flowchart illustrating a procedure to use various services using a mobile terminal according to the present invention.

First, a UIM card 12 is inserted into the UIM card slot 102 of a mobile terminal S100. After insertion of the UIM card 12, the mobile terminal 10 decides whether or not the UIM card 12 is recognizable and insertion has been correctly made; when it turns out to be incorrect, the mobile terminal generates a fault message notifying the user of a card insertion failure S102; otherwise, finance information, authentication information, and personal information stored in the memory of the UIM card 12 are read out S103. Next, a password is requested to verify whether or not he or she is a valid user and after the entrance of a password S104, a decision is made whether or not it is identical to the password read out from authorization information S105. When the entered password is not correct, a denial message is displayed S106 and re-entry of a password is requested to the user. In case of a correct password, a service menu is displayed and the user's selection for a service is awaited. The user selects a desired service from displayed menus such as payment S108, transaction particulars inquiry S109, prepaid card recharging S110, ticket issuing and using S111, and traffic card issuing and using S112.

Hereinafter, each service will be described in more detail.

FIGS. 6 to 8 are service flowcharts when a user selects the payment service from said service menus. It is assumed that steps prior to payment such as choosing particular goods to purchase and selecting a payment means have been completed.

FIG. 6 is a flowchart illustrating a payment procedure using a credit card according to a first embodiment of the present invention.

When the payment processing system 72 of a service providing system sends a payment start instruction, the user enters purchasing information such as a shopping mall, purchasing list and purchased amount and carries out requisite operations for payment. At this time, purchasing information may be handled so that it can be automatically filled in at the shopping mall. After operations for payment have been accomplished by the user, credit card information and authorization information read out from the UIM card 12 through the S103 procedure described in FIG. 5 are transmitted to the payment processing system 72. The payment processing system 72 requests a credit inquiry to a card issuer 40. If approval for card use is received according to the result of the credit inquiry, the payment processing system 72 makes a payment request and completes the payment process. After payment is completed and a confirmation message for payment is transmitted to the mobile terminal 10, the mobile terminal 10 displays the confirmation message for payment to the user and stores the payment particulars into the memory of the UIM card 12.

FIG. 7 is a flowchart illustrating a payment procedure using a debit card according to a second embodiment of the present invention. Fig. 8 is a flowchart illustrating a payment procedure using a prepaid card according to a third embodiment of the present invention.

As shown in FIG. 6, the user who received the payment start instruction from the payment processing system 72 enters purchasing information and carries out requisite operations for payment. Then, the mobile terminal 10 transmits debit card information and authorization information read out from the UIM card 12 to the payment processing system 72. The payment processing system 72 makes a registration inquiry and requests balance information to the corresponding financial institution 50; the payment processing system 72 compares the balance of the user's account of the corresponding financial institution 50 with the payment amount.

If the account has an insufficient balance, the payment processing system 72 carries out a payment failure processing, whereas, if the balance is more than the payment amount, the payment processing system 72 requests a payment to the financial institution. After completion of the payment, the payment processing system 72 transmits a confirmation message for payment to the mobile terminal 10 so as to display the message to the user. The mobile terminal 10 stores payment particulars into the memory of the UIM card 12 after completion of the payment.

The payment procedure using a prepaid card is similar to said FIG. 7. It is different from that of FIG. 7 in that balance information is not received from the financial institution 50, but balance information of a prepaid card in the UIM card is received directly from the mobile terminal 10; after completion of payment, the balance of the prepaid card in the UIM card 12 subtracted by as much as the payment amount is stored by the mobile terminal 10.

Prior to the aforementioned payment service, if a shopping mall employed a method to obviate the user's manual entrance of personal information such as merchandise delivery address by automating the transmission of personal information in the UIM card 12, payment processing would be more simplified.

FIG. 9 is a flowchart illustrating a recharging procedure for a prepaid card according to a fourth embodiment of the present invention.

A prepaid card recharging system 74 which received a request for recharging a prepaid card from the user issues a recharging start instruction to the mobile terminal 10. The user transmits recharging request information such as a desired recharging amount, a correspondent financial institution, account information, and authorization information to the prepaid card recharging system 74. In this case, too, it would be desirable that information except for the recharging amount is read out from the UIM card 12 and transmitted. By using transmitted information, the prepaid card

recharging system 74 makes an access to the corresponding financial institution 50 and requests a balance inquiry; the financial institution 50 transmits balance information of the corresponding account. The prepaid card recharging system 74 compares the desired recharging amount which the user has entered with the balance of the corresponding account; if the balance turns out to be insufficient, the prepaid card recharging system 74 carries out a recharging failure processing, whereas, if the balance is more than the recharging amount, the prepaid card recharging system 74 requests recharging to the financial institution 50 functioning the same as an account transfer request. In case of acceptance of the recharging request, the prepaid card recharging system 74 transmits a confirmation message for recharging to the mobile terminal 10. The mobile terminal 10 which received the confirmation message for recharging updates balance information of the prepaid card in the UIM card 12 by adding the recharging amount; then, the mobile terminal 10 displays the confirmation message for recharging to the user and stores recharging particulars into the memory of the UIM card 12.

This procedure is identical to that of recharging a traffic card using a traffic card issuing system 78.

FIG. 10 is a flowchart illustrating a procedure for issuing tickets according to a fifth embodiment of the present invention and FIG. 11 is a flowchart illustrating a procedure for using tickets according to a sixth embodiment of the present invention.

The said ticket issuing denotes reservations for various cultural performances or movie tickets.

When the user selects the ticket issuing and using menu shown in FIG. 5 and requests ticket purchasing, the mobile terminal 10 transmits a signal of ticket purchasing request to a ticket issuing system 76. The ticket issuing system 76 which received the request provides the mobile terminal 10 with information about tickets available for purchasing (contents of the performance, available

seats, or price). The user selects a ticket to purchase from among displayed ticket information and further selects a payment means from among credit card, debit card, and prepaid card. After completion of selecting a ticket and a payment means by the user, the mobile terminal transmits the corresponding information (information about the selected ticket and the payment means) to the ticket issuing system 76. The ticket issuing system 76 completes the payment process through said procedure of FIG. 6, FIG. 7, or FIG. 8 according to the transmitted information and issues the purchased ticket to the mobile terminal 10. The mobile terminal 10 displays information about the issued ticket and stores transaction particulars and ticket information into the memory of the UIM card 12.

A procedure for using the tickets issued from such procedure is described below.

If the user carries out ticket presentation operations with the mobile terminal 10 before passing through a gate, the mobile terminal 10 transmits ticket information stored in the memory of the UIM card 12 to the payment terminal 30 installed at the gate. The payment terminal of the gate authenticates transmitted ticket information with a subsequent approval of the ticket and transmits an approval message to the mobile terminal 10, thereby displaying the approval message to the user. After completion of the transmission of the approval message, the payment terminal 30 of the gate transmits information indicating ticket use to the ticket issuing system 76 and displays a ticket use message on the mobile terminal 10. When all the procedure has been done, a gate bar, for example, is opened and the user is allowed to proceed.

FIGS. 12 and 13 are diagrams illustrating examples of display window for transaction particulars inquiries according to the present invention.

When transactions such as said payment, recharging a prepaid card or a traffic card, and ticket reservation are settled,

consequent particulars are all stored in the memory of the UIM card 12 as described previously. The stored information can be displayed assorted according to particular service categories as shown in FIG. 12 or FIG. 13. Or, it can be displayed assorted according to a particular search condition such as date, amount, and transaction particulars.

The amount of money paid during said payment, ticketing, or recharging a traffic card or a prepaid card may be demanded added to the communications expenses (for example, a telephone bill) of the mobile terminal 10 instead of settlement by a financial institution.

In addition, since information such as a mobile identification number (MIN) and PIN is stored in said UIM card 12, even if it is inserted into another mobile terminal 10, the user can use the aforementioned services with his or her own mobile terminal 10 without complicated procedures. Therefore, roaming services both for communications and finance information can be provided.

FIG. 14 is a flowchart illustrating a procedure for issuing an IC card according to a seventh embodiment of the present invention. It is intended that through a wireless communications network or Internet, an IC card such as various identification cards, a license, or a credit card is issued and used online or offline. The present embodiment describes a procedure for issuing a credit card as a specific example of the IC card issuing procedure. In Fig. 14, the reference number 141 is installed in said service providing system 70 of FIG. 1 and the reference number 142 is installed in said card issuing company 40 of FIG. 1.

First, if a message of card issuing request from an applicant is received at said IC card issuing server 141 through the wireless Internet based on WAP or wired Internet based on Web S301, the said issuing server 141 registers the PIN (Personal Identification Number) of the particular applicant based on said received message of card issuing request; thereafter, the said issuing server 141

provides said applicant with the PIN through WAP or Web and closes the connection with the applicant.

Subsequently, said issuing server 141 sends a request to a SMSS (Short Message Service Server) (not shown) of said wireless communications network 20 to notify the corresponding mobile terminal 10 designated by said received message of card issuing request that the applicant is the object of the IC card issuing S303. The said SMSS notifies said mobile terminal 10 of said requested notification about the issuing object through SMSC (Short Message Center) (not shown) in the form of a short message S304.

The said mobile terminal 10 recognizes that it is the issuing object based on said received SMS message. If said PIN information is entered by the user of said mobile terminal 10, the mobile terminal 10 transmits the entered PIN information to said issuing server 141 S306.

The said issuing server decides whether or not the received PIN information from said mobile terminal 10 is identical to said registered PIN information and if the result turned out to be non-identical, closes the transaction S307.

Next, if the PIN information is found to be identical at said S307 stage, a mutual authorization process is carried out according to the agreement predetermined by cryptogram so as to authenticate the mutual validity of the IC chip embedded in said mobile terminal 10 (namely, the UIM card 12) and said issuing server 141.

After the mutual authorization between said IC chip 12 and said issuing server 141 has been completed in said S308 stage, the said issuing server 141 selects an application program to enable the use of said requested IC card and downloads it to said mobile terminal 10 S310. The said mobile terminal 10 stores the said downloaded application program into the memory of said IC chip 12 and responds by notifying the said issuing server 141 of the completion of the storing process S311.

Finally, upon receiving the response from said S311 stage,

by providing the server of the corresponding card company 412 with the information indicating the completion of said IC card issuing S312, thereby accomplishing the registration for the use of said issued IC card in real-time, the said issuing server 141 allows the said IC card to be used between said mobile terminal 10 and said payment terminal 30 belonging to said server of the card company 142 by wireless communication such as IrFM communication system S313.

In case of a transaction using the aforementioned IC card in said S313 stage, the server of said card company 142 communicates with said payment terminal 30 as the corresponding distribution terminal in association with the server 142 based on the information about said registered IC card for use. The said mobile terminal 10 communicates wirelessly in the form of an IrFM message with said payment terminal 30 based on said application program, thereby enabling said IC card to be used according to its purpose.

FIG. 15 is a flowchart illustrating a procedure for canceling an IC card according to an eighth embodiment of the present invention, more specifically, the procedure of canceling the IC card issued through the procedure described in FIG. 14.

The said mobile terminal 10, when the predetermined canceling key is entered S401, generates a request for the entrance of the PIN so as to identify the user by displaying a message such as "Enter the PIN input" on a window S402. After the PIN has been entered S403, the said mobile terminal 10 decides whether or not the entered PIN information is identical to the preset PIN information S404 and if the result turned out to be non-identical, requests a re-entrance, whereas, when they are found to be identical, the said mobile terminal 10 transmits a notification message of cancellation request to said issuing server 141 S405.

The said issuing server 141 transmits a message of a delete command of the corresponding application program to cancel the IC card to said mobile terminal 10 with the encrypted cancel key of

the issuer S406.

The said mobile terminal 10 carries out authentication of said received cancel key transmitted according to the predetermined cryptogram S407 and makes a decision on the authentication result S408. When the authentication is completed normally, the said mobile terminal 10 deletes the application program as said IC card downloaded and in use from said S409 stage of FIG. 14 S409 and transmits a response message notifying the said issuing server 141 of the completion of the deletion S409.

The said issuing server 141 delivers information about the cancellation of the card based on said received response message of the delete completion to the server of the card company 142 as an issuer S410. The said server of the card company 142 decides whether or not payment balance exists in the IC card to be cancelled S411. If it turns out that no payment balance remains, the cancellation process is completed S413, whereas, if the payment balance exists, the cancellation is retained S414.

FIG. 16 is a sectional view of a battery pack for a mobile terminal wherein an IC chip can be installed according to an embodiment of the present invention. An IC (Integrated Circuit) chip (namely, the UIM card shown in FIG. 1) having various functions can be attached to and detached from the battery pack of the mobile terminal so that when the mobile terminal equipped with the battery pack having an embedded IC chip is used, various functions offered by the corresponding IC chip can be utilized.

As shown in the same figure, the battery pack 600 according to the present invention comprises a bottom casing 610, a battery cell 620, a printed circuit board 630, a connector 640, a top casing 650, a palette 660, an IC chip 670, a foreign material protector 680, and insulators 691-693 insulating necessary parts between constituting elements.

The said bottom casing 610 is composed of a planar bottom face 611 and side faces 612 forming the side part extended from the

boundary of the bottom face 611, thereby the said bottom face 611 and said side faces 612 forming a container 613 as an inside space.

The said battery cell 620 is composed of ordinary Li-ion (Lithium ion) cells and installed in the bottom part of said container 613 with its exterior faces insulated by insulators 691-692.

The said printed circuit board 630 sits on the top face of said battery cell 620 and installed parallel to the top face of said battery cell 620 at the entrance side inside said container 613 with its boundary firmly fixed to said side faces 612.

The said connector 640 electrically connects said printed circuit board 630 and said IC chip installed in said palette 660. The said connector 640 is installed so that electrical signals of said IC chip 670 through said printed circuit board 630 are connected to the outside.

The said top casing 650 is composed of a planar top face 651 and a side part 652 forming side faces extended downwardly from the boundary of the top face 651. The said side part is so formed that three faces out of the four side faces thereof match the three faces of said side part 612 of said bottom casing and abutting faces are assembled such that they are firmly bonded each other by a bonding part 694. The remaining face out of the four faces of said side part 652 is open and the opened face forms an opening 653 with the dimension measured up to the downward length of said side part 652.

The said palette 660 has a holder 661 on the top face thereof wherein said IC chip 670 can be installed and can enter and exit through said opening 653 formed on one face of said top casing 650. In case said palette 660 is inserted and installed through said opening 653 after said IC chip 670 is installed, the palette 660 is connected to said connector 640, while it is located at the top face of said printed circuit board 630, thereby making said IC chip 670 and said printed circuit board 630 electrically connected

through said connector 640.

The said foreign material protector 680 is so formed that a small groove is carved at the upper end of one of side faces of said bottom casing, thereby forming the entrance of said opening 653. The said insulators 691-693 are formed at the top face and bottom face of said battery cell 620 and positioned between said printed circuit board 630 and said palette 660, thereby insulating them.

FIG. 17 is a diagram illustrating the use of said battery pack 600 assembled according to the diagram of FIG. 16, where said battery pack 600 is installed in the battery housing compartment of a mobile terminal 10.

In the following, the functions of a mobile terminal 10 according to the present invention equipped with said battery pack assembled as shown in FIG. 16 will be described.

First, after said palette 660 is extracted through said opening 653 and said IC chip 670 is installed in said holder 661 of the palette 660, if the palette 660 with the IC chip 670 installed is inserted in the reverse of said extraction direction through said opening 653, the said IC chip 670 and said printed circuit board 630 is electrically connected through said connector 640.

As shown in FIG. 17, if the battery pack 600 in said description is installed in the battery pack housing compartment of said mobile terminal 10, the said printed circuit board 630 and the internal circuit of said mobile terminal 10 are connected through said connector 640; thus, various functions can be realized according to the circuit design of said IC chip 670.

FIG. 18 is a diagram illustrating a battery pack for a mobile terminal with an embedded RF receiving antenna according to an embodiment of the present invention and describes a structure where an IC chip functioning as a traffic card is installed within the battery pack. More specifically, it describes a battery pack for a mobile terminal with an embedded RF receiving antenna, where the

structure of a traditional battery pack has been modified so as to provide traffic and financial services by installing an RF receiving antenna for RF communication of said local area communication module 105 shown in FIG. 2 into the battery pack for the mobile terminal.

As shown in FIG. 18, the battery pack with an embedded RF receiving antenna comprises a battery pack 810 equipped with an IC chip (not shown in FIG. 18) and a printed circuit board 820 equipped with a function of an RF receiving antenna installed on one face of said battery pack 810.

The said printed circuit board 820 is composed of an IC chip connector 821 with multiple pins 1-8 used for signal connection with said IC chip; an impedance matching circuit block 822 connected to antenna pins 4, 8 of said connector 821 used for impedance matching between the antenna and feeder; a loop antenna 823 formed by the connection to said antenna pins 4, 8; and an ordinary circuit block 824 comprising a battery protection circuit block for the safety of said battery and a microcontroller (u-COM) circuit block controlling said IC chip. The said printed circuit board 820 is installed on one of faces of said battery pack 810 in order for said connector 821 of said printed circuit board 820 to be connected to said IC chip.

The said loop antenna 823 is made of wires 823b wound along a loop-shaped groove formed along the periphery of said printed circuit board 820. The loop-shaped groove is connected to the antenna pins 4, 8 of said antenna.

The said ordinary circuit block 824 basically comprises a battery protection circuit block responsible for the safety of the battery and a microcontroller circuit for the access and control of the IC chip.

The said connector 821 is a spare terminal to be used for the case when the connector pins 1, 2, 3, 5, 6, 7 electrically connecting said microcontroller circuit and said IC chip for the control

thereof are not sufficient or another function in addition to the original function of IC chip connection is required. The said connector 821 is composed of the antenna pins 4, 8 electrically connecting said RF loop antenna 823 and said IC chip in the present embodiment.

The said impedance matching circuit block 822 is the most important part of the RF antenna technology. A proper impedance matching is crucial in order for radio waves to be emitted into the air through an antenna. For this purpose, the said impedance matching circuit block 822 is made of the combination of inductors and capacitors.

To illustrate the function of the battery pack integrated as shown in FIG. 18 according to an embodiment of the present invention, various functions implemented in the IC chip are carried out by communication between the IC chip embedded in said battery pack 810 (refer to the structure illustrated in FIG. 16) and the microcontroller in said ordinary circuit block 824 through said pins 1-3, 5-7 of said connector; when the IC chip functions as a traffic card, the said IC chip and said RF loop antenna 823 are connected through said antenna pins 4, 8 and the said impedance matching circuit block 822 conducts impedance matching between the two, thereby emitting radio waves optimized for RFID, whereby the IC chip communicates with a traffic terminal for payment of traffic charges (for example, a traffic terminal as a non-contact type fare terminal installed at the entrance and exit of a bus or a subway station). Accordingly, by installing the battery pack structured as shown in FIG. 18 into a mobile terminal, not only a necessary operating power can be provided but the function of an IC card (i.e., a UIM card) such as a traffic card or a credit card can be obtained as well.

FIG. 19 is a diagram illustrating a battery pack for a mobile terminal equipped with an RF receiving antenna according to another embodiment of the present invention and describes a structure where

an IC chip functioning as a traffic card is installed in the main body of the mobile terminal. More specifically, it describes the battery pack for a mobile terminal with an embedded RF receiving antenna, where the structure of a traditional battery pack has been modified so as to provide traffic and financial services by installing an RF receiving antenna for RF communication of said local area communication module 105 shown in FIG. 2 into the battery pack for the mobile terminal.

As shown in FIG. 19, on one side of the battery pack 920 supplying power input to said mobile terminal installed are: a micro strip line 911 functioning as an RF antenna; an antenna connection terminal 912 connecting the micro strip line 911 and an IC chip (not shown) with the function of a traffic card embedded in the main body (not shown) of the mobile terminal; and a printed circuit board 910 wherein an impedance matching circuit block 913 is formed by the combination of inductors and capacitors for impedance matching between said micro strip line 911 and feeder (not shown) and which is connected to said antenna connection terminal 912.

To illustrate the function of the battery pack integrated in said manner, when the battery pack in FIG. 19 is installed into the main body of a mobile terminal, the said IC chip installed within the main body of said mobile terminal 10 as shown in FIG. 2 and said micro strip line are electrically connected through said connection terminal 912. The said impedance matching circuit block 913 carries out impedance matching between the two and emits radio waves optimized for RFID, whereby the IC card communicates with a traffic terminal for payment of traffic charges (for example, a traffic terminal as a non-contact type fare terminal installed at the entrance and exit of a bus or a subway station) and thus performs the function of a UIM card as a traffic card or a credit card.

CLAIMS

1. A method for using a mobile terminal capable of insertion, decryption, and recording of a UIM card containing a mobile identification number, finance, authorization, and personal information and capable of Internet access through wireless communication and local area wireless communication through a local area communication module, comprising:

reading a mobile identification number, finance, authorization, and personal information stored in the UIM card inserted into the UIM card slot of the mobile terminal and deciding the identicalness with the entered user password;

in case when the decision is made to be identical, displaying menus of payment service, transaction particulars inquiry service, prepaid card recharging service, ticketing and utilization service or traffic card issuing and utilization service and enabling the user to select his or her desired service; and

providing the corresponding service by connecting to a service providing system through the Internet according to the service selected by the user.

2. The method according to claim 1, wherein said payment service comprises:

a payment processing system of the service providing system receiving purchasing information such as a shopping mall, purchasing goods, purchasing amount and payment means;

accessing to a card issuer or financial institution using said received information and carrying out authorization and thus completing the payment of the corresponding purchasing amount; and

transmitting a message of payment confirmation to the mobile terminal after completion of the payment and the mobile terminal displaying the message of payment confirmation to the user and storing the payment particulars into the memory of the UIM card.

3. The method according to claim 2, wherein, when the payment means is a prepaid card, the said payment is completed by receiving balance information of the UIM card and thus processing payment.

4. The method according to claim 1, wherein said prepaid card recharging service comprises:

a step, conducted by the prepaid card recharging system of the service providing system, of receiving recharging request information such as desired recharging amount, a correspondent financial institution, account information, and authorization information;

accessing to the corresponding financial institution using said received recharging request information and requesting balance check and receiving balance information of the corresponding account;

comparing said received balance of the corresponding account with the desired recharging amount and in case of insufficient balance, conducting a recharging failure processing, otherwise, making a request of recharging to the financial institution; and

in case of acceptance of the recharging request, transmitting a message of recharging confirmation to the mobile terminal; and the mobile terminal received the message of recharging confirmation updating balance information of the prepaid card of the UIM card by adding the recharging amount; and displaying the message of recharging confirmation to the user and storing recharging particulars into the memory of the UIM card.

5. The method according to claim 1, wherein said ticketing and utilization service comprises:

a step, conducted by the ticket issuing system of the service providing system, of receiving a ticket purchasing request;

providing the mobile terminal with information about available tickets and receiving information about tickets selected by the user and payment means for ticket purchasing amount;

completing the payment according to the received information

and issuing paid tickets to the mobile terminal and the mobile terminal displaying information about issued tickets to the user and storing transaction particulars and information about issued tickets into the memory of the UIM card; and

using tickets stored in the memory of said UIM card.

6. A mobile terminal, equipped with a UIM card containing finance information, capable of wireless data communication through the Internet as well as voice communication, comprising:

a UIM card containing a mobile identification number, finance, authorization, and personal information; and

a UIM card slot where said UIM card is inserted and which decrypts the information stored in the memory of the inserted UIM card and records information thereto.

7. The mobile terminal according to claim 6, further comprising a local area communication module for local area communication with a payment terminal.

8. A method for issuing and managing IC cards using a mobile terminal equipped with a UIM card containing finance information through data communication between a server for issuing an IC card and the mobile phone capable of attachment and detachment of an IC chip authorized by the server, comprising:

a first step, conducted by the server in case of reception of a request message for issuing an IC card transmitted through wired Internet, wireless Internet or offline to said server, of giving the corresponding user a particular personal identification information and notifying the corresponding mobile phone designated by the issuing request message of the fact that the mobile terminal is the current object of issuing;

a second step, conducted by the designated mobile phone in case of reception of said notification message, of transmitting encrypted personal identification information to said server;

a third step, conducted by the server, of deciding whether or not said given personal identification information is identical

to said received personal identification information;

carrying out a mutual authorization process according to the agreement predetermined between the IC chip installed in said designated mobile phone and said server, when the decision is made to be identical at the third step;

downloading an application program validating said requested IC card from said server to said mobile phone after mutual authorization at the previous stage;

downloaded application program into the memory of said installed IC chip and thus enabling the use of said IC card and transmitting the result of said downloading to said server; and

a seventh step, conducted by the said server in case of reception of said downloading completion message, of completing the registration process for real-time use by providing the corresponding server of the corresponding issuer with information indicating the completion of issuing said IC card.

9. The method according to claim 8, further comprising:

an eighth step, conducted by the said mobile phone, of notifying said server of the request for canceling in the case of entrance of information about a cancel key and a secret key agreed for the identification of the user;

a ninth step, conducted by the server based on said notified request, of transmitting a delete command containing information about the agreed cancel key to said mobile phone to delete said stored application program;

a tenth step, conducted by the said mobile phone, of authenticating said delete command based on said cancel key information and deleting said stored application program according to the result of authentication and upon completion of said deletion, transmitting the completion information to said server; and

a eleventh step, conducted by the said server, of providing the corresponding server of the corresponding issuer with card cancellation information according to said received deletion

completion information, thereby making the cancellation completed in real-time.

10. The method according to claim 8, wherein said notification about the issuing object is accomplished by a short message.

11. The method according to claim 8, wherein the said server of said issuer communicates with the corresponding distribution terminal in association with the server based on said registration information for real-time use.

12. The method according to claim 11, wherein using of said IC card is carried out by said mobile phone communicating wirelessly with said distribution terminal according to said downloaded application program.

13. The method according to claim 12, wherein said wireless communication is of infrared transmission system.

14. A battery pack for a mobile terminal capable of installing an IC chip containing finance information, comprising:

a bottom casing which has its bottom outer face engaged with a battery housing compartment of said mobile terminal and a battery cell container having an opening in the top face;

a printed circuit board installed on the top face of said cell in said container separated by an insulator;

a top casing covering the top face of said container engaged with the upper part of said bottom casing while securing fixed dimensions of space over the top face of said printed circuit board and engaged with said bottom casing so as to form an opening at one face of said space;

a palette having an IC chip holder on the top face thereof and capable of entering and exiting said space through said opening; and

a connector connecting said IC chip and said printed circuit board electrically when said palette equipped with said IC chip is inserted into said space.

15. The battery pack according to claim 14, wherein the

in-between space of said printed circuit board and said palette are insulated except for said connector.

16. The battery pack according to claim 14, wherein said printed circuit board connects between said IC chip and said mobile terminal electrically.

17. A battery pack for a mobile terminal equipped with an RF receiving antenna, comprising:

a connection block for signal connection with said IC chip;

a loop antenna formed by being connected to the antenna pins of said connector;

a battery protection circuit block for the safety of said battery; and

a printed circuit board containing a microcontroller circuit block for the control of said IC chip and installed on one face of the battery pack in order for said connection block to be electrically connected to said IC chip.

18. The battery pack according to claim 17, wherein said loop antenna is made of wires wound along the loop-shaped groove formed along the periphery of said printed circuit board and the said loop antenna is connected to said antenna pins.

19. The battery pack according to claim 17, further comprising an impedance matching circuit block on said printed circuit board for impedance matching between the antenna and feeder wherein the impedance matching circuit block is connected to said antenna pins.

20. A battery pack for a mobile terminal equipped with an RF receiving antenna, characterized in that a micro strip line and antenna connection terminals connecting the micro strip line and said IC chip are formed on a printed circuit board which is installed on one face of the battery pack which can be attached to or detached from said mobile terminal while providing operating power thereto.

21. The battery pack according to claim 20, further comprising an impedance matching circuit block on said printed circuit board for impedance matching between said micro strip line and feeder

wherein the impedance matching circuit block is connected to the antenna connection terminals.

FIG. 1

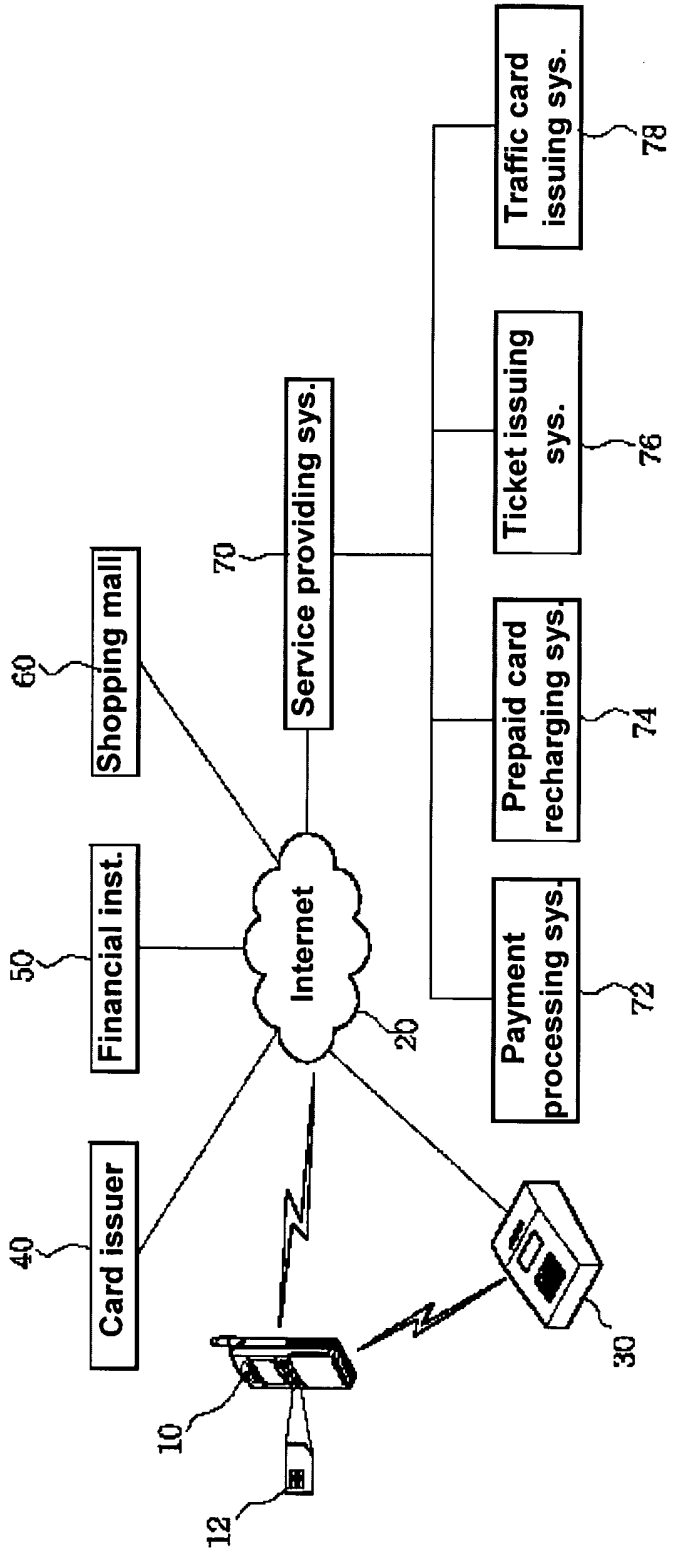

Traffic card issuing sys.
78
Ticket issuing sys.
76
Prepaid card recharging sys.
74
Payment processing sys.
72
Service providing sys.
70
Shopping mall
60
Financial inst.
50
Card issuer
40
Internet
20
10
12
30

FIG. 2

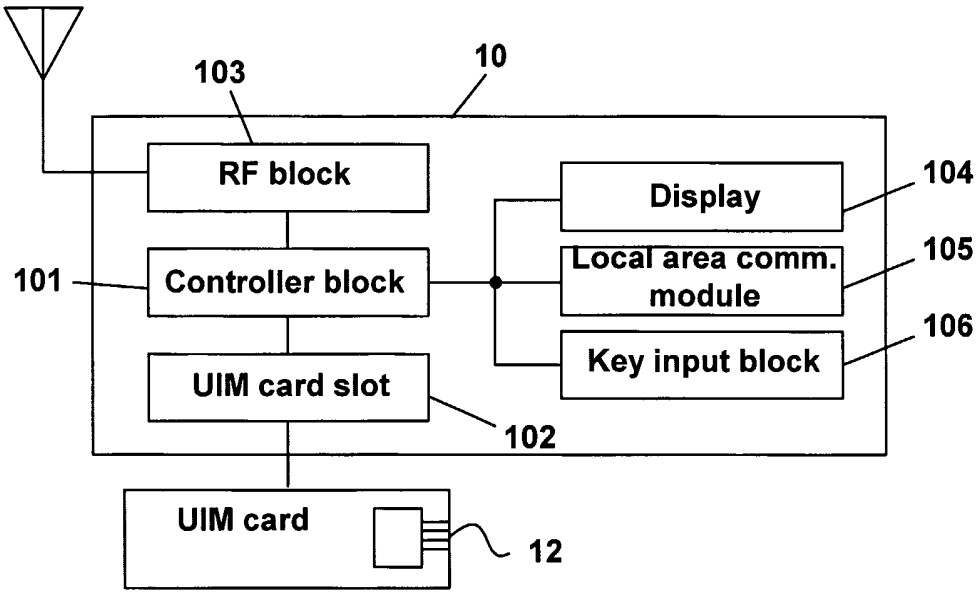

103
10
RF block
Display
104
101
Controller block
Local area comm. module
105
106
Key input block
UIM card slot
102
UIM card
12

FIG. 3

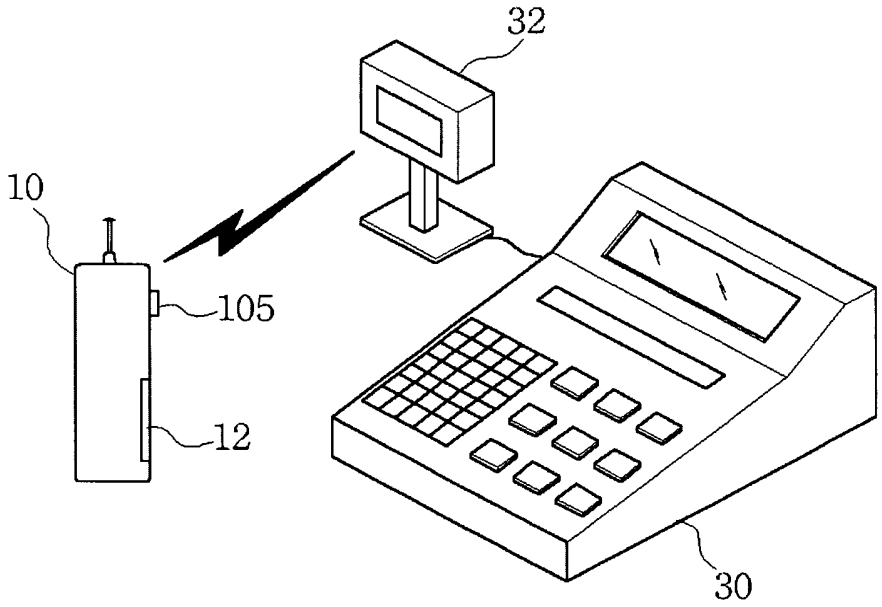

32
10
105
12
30

FIG. 4

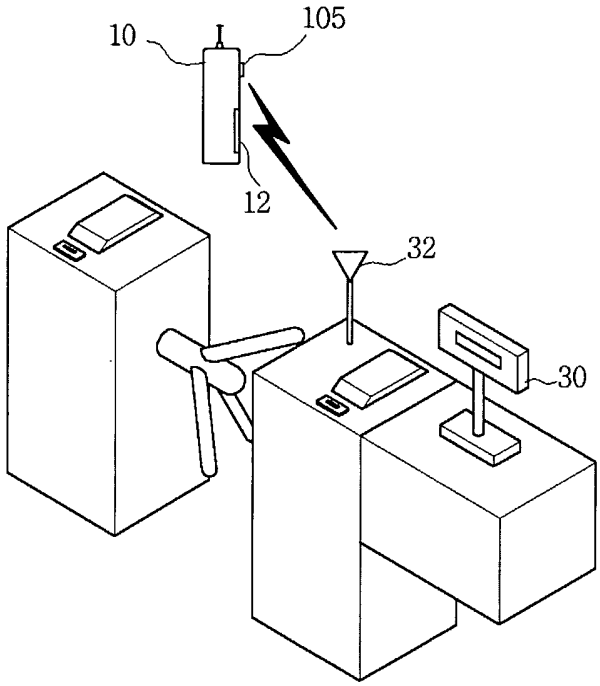


FIG. 5

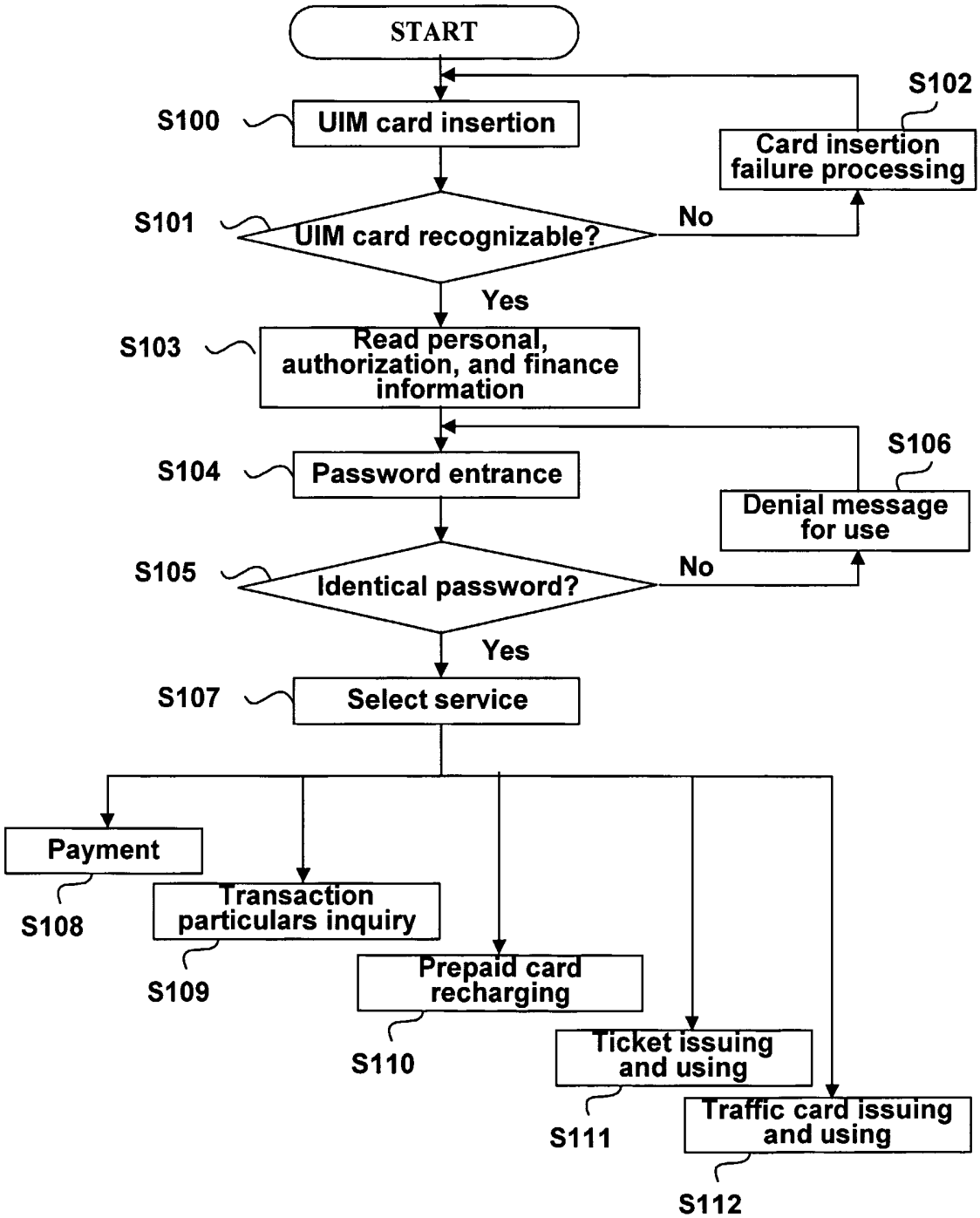

START
S100
UIM card insertion
S101
UIM card recognizable?
No
S102
Card insertion failure processing
Yes
S103
Read personal, authorization, and finance information
S104
Password entrance
S105
Identical password?
No
S106
Denial message for use
Yes
S107
Select service
Payment
S108
Transaction particulars inquiry
S109
Prepaid card recharging
S110
Ticket issuing and using
S111
Traffic card issuing and using
S112

FIG. 6

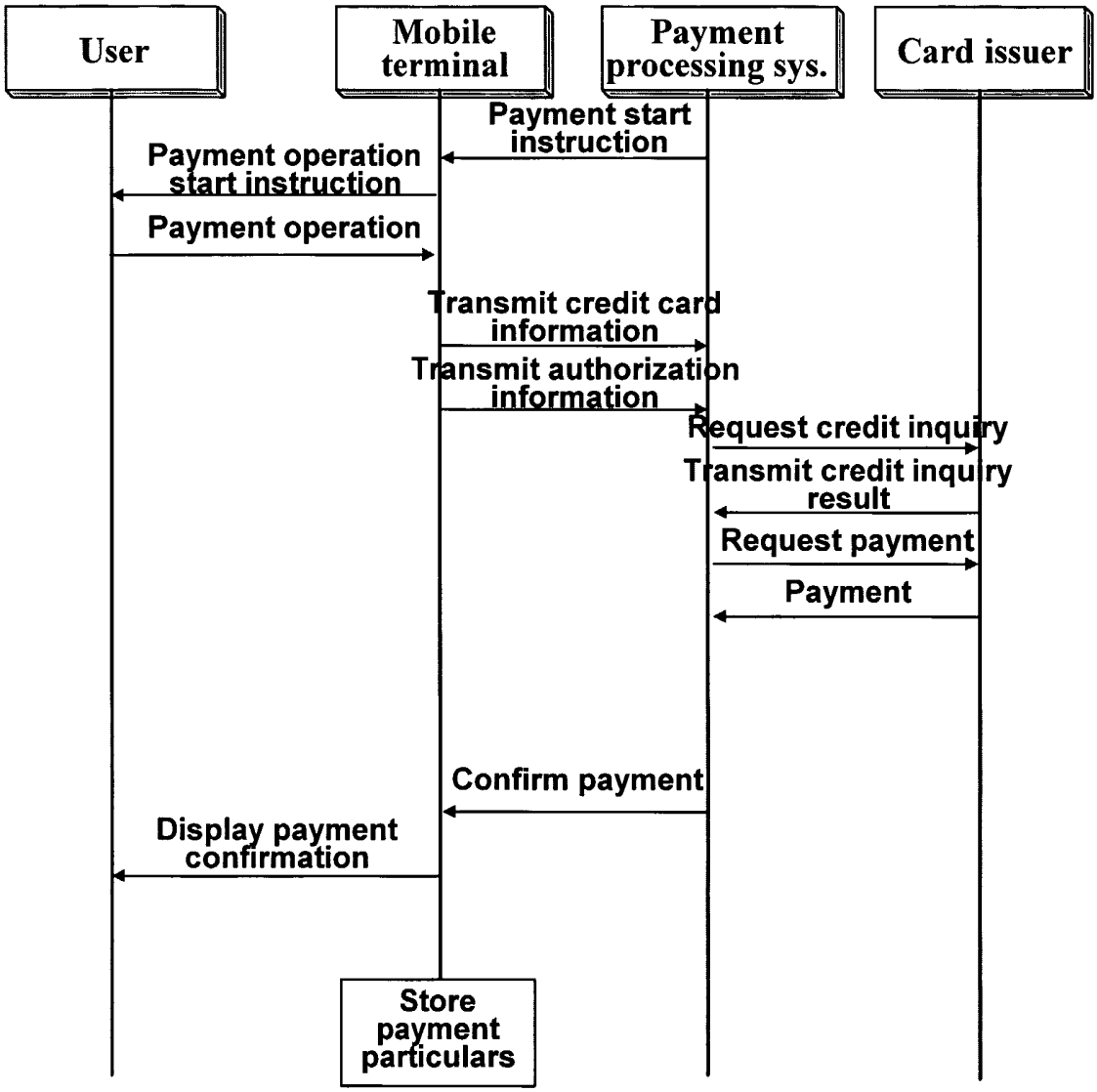

User
Mobile terminal
Payment processing sys.
Card issuer
Payment start instruction
Payment operation start instruction
Payment operation
Transmit credit card information
Transmit authorization information
Request credit inquiry
Transmit credit inquiry result
Request payment
Payment
Confirm payment
Display payment confirmation
Store payment particulars

FIG. 7

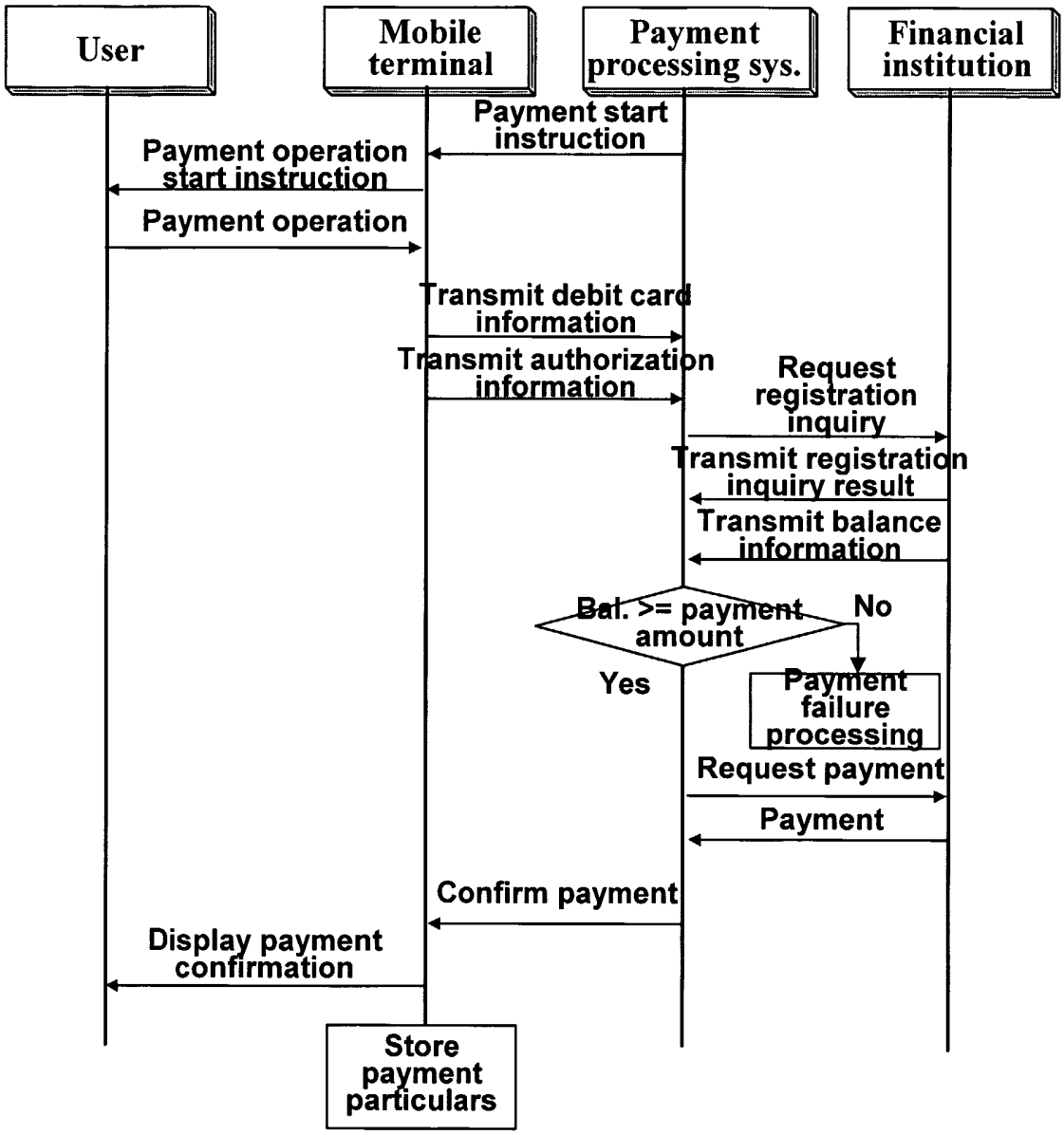

User
Mobile terminal
Payment processing sys.
Financial institution
Payment start instruction
Payment operation start instruction
Payment operation
Transmit debit card information
Transmit authorization information
Request registration inquiry
Transmit registration inquiry result
Transmit balance information
Bal. >= payment amount
No
Yes
Payment failure processing
Request payment
Payment
Confirm payment
Display payment confirmation
Store payment particulars

FIG. 8

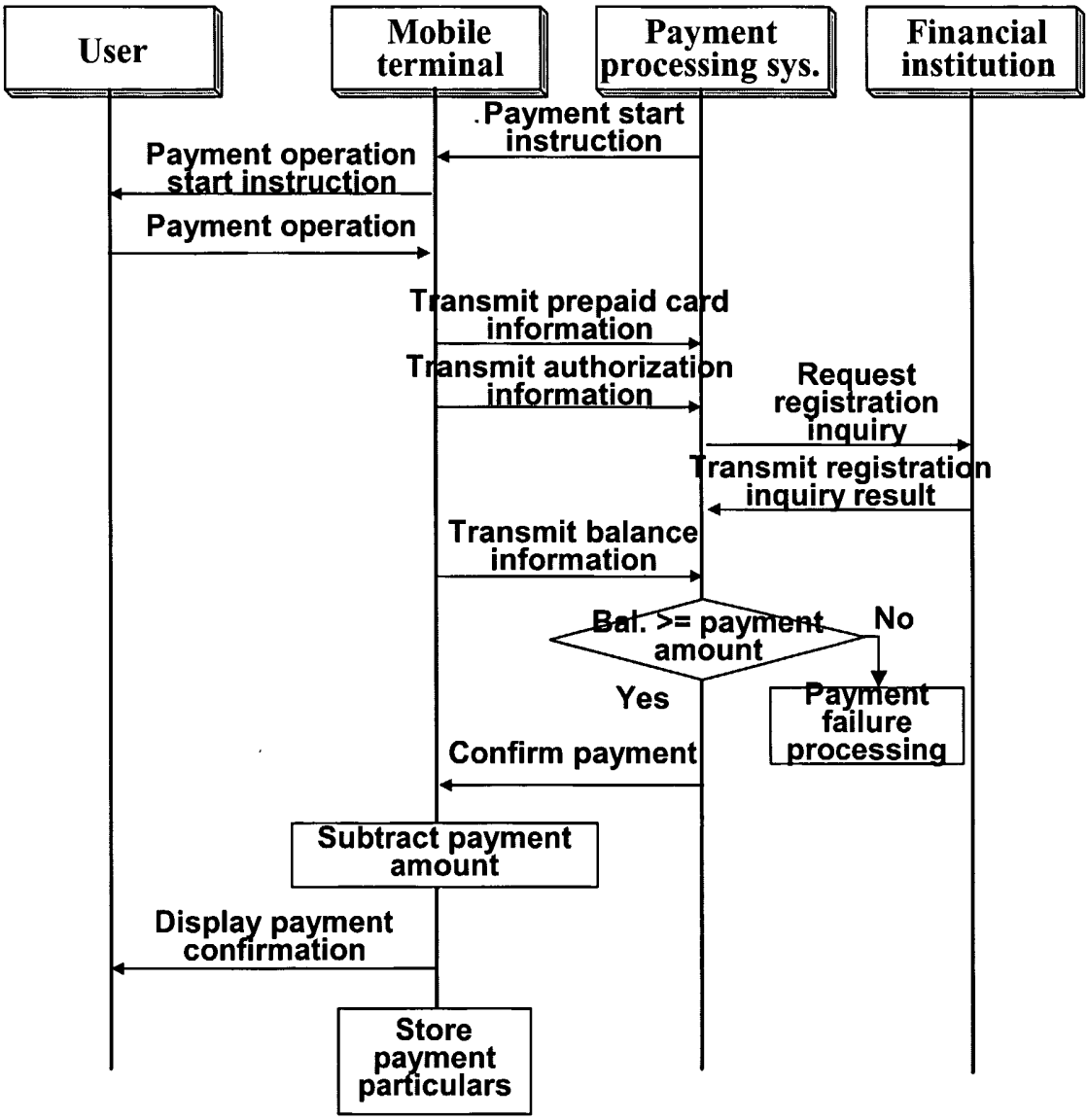

User
Mobile terminal
Payment processing sys.
Financial institution
Payment start instruction
Payment operation start instruction
Payment operation
Transmit prepaid card information
Transmit authorization information
Request registration inquiry
Transmit registration inquiry result
Transmit balance information
Bal. >= payment amount
No
Yes
Payment failure processing
Confirm payment
Subtract payment amount
Display payment confirmation
Store payment particulars

FIG. 9

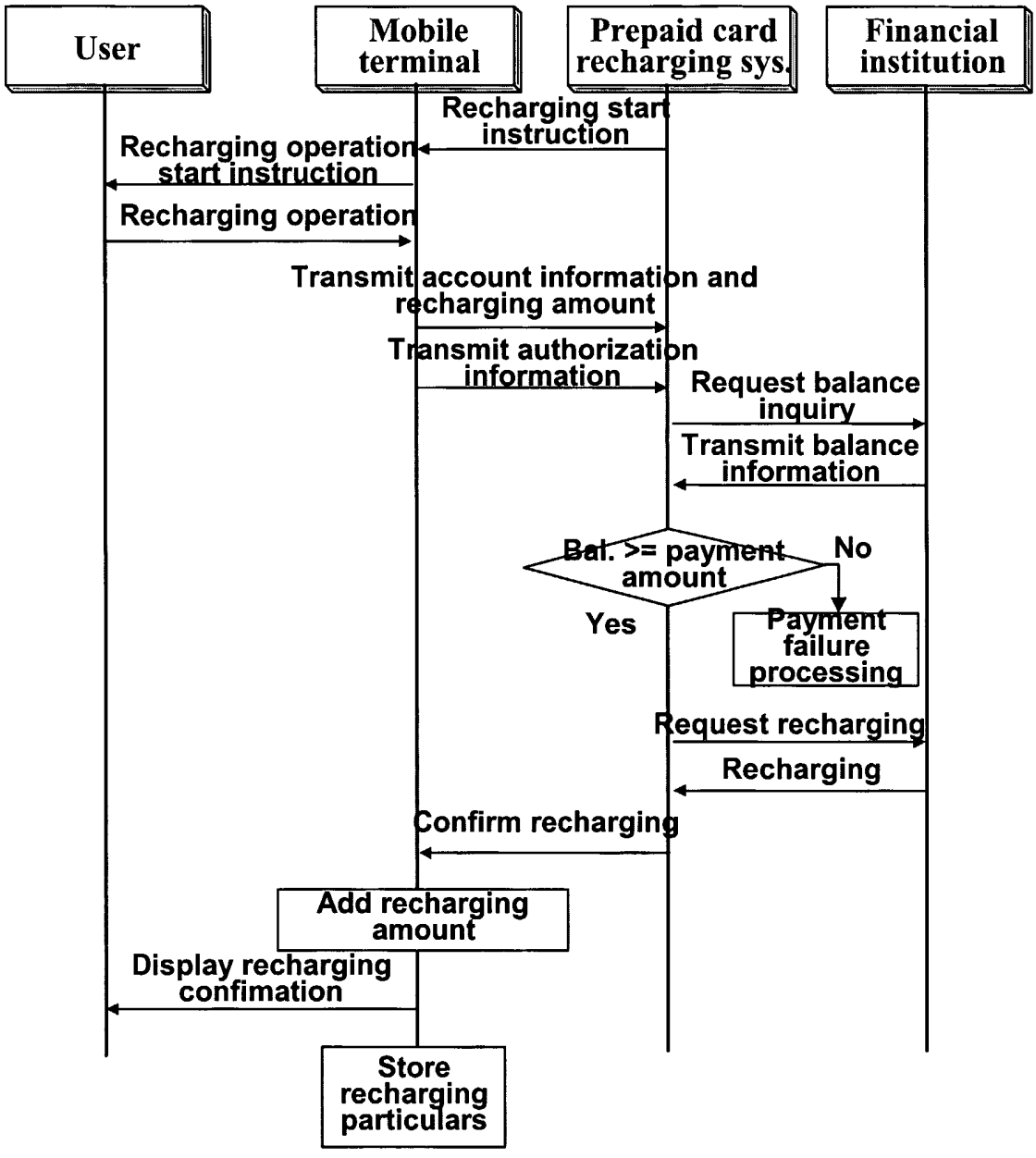

User
Mobile terminal
Prepaid card recharging sys.
Financial institution
Recharging start instruction
Recharging operation start instruction
Recharging operation
Transmit account information and recharging amount
Transmit authorization information
Request balance inquiry
Transmit balance information
Bal. >= payment amount
No
Yes
Payment failure processing
Request recharging
Recharging
Confirm recharging
Add recharging amount
Display recharging confimation
Store recharging particulars

FIG. 10

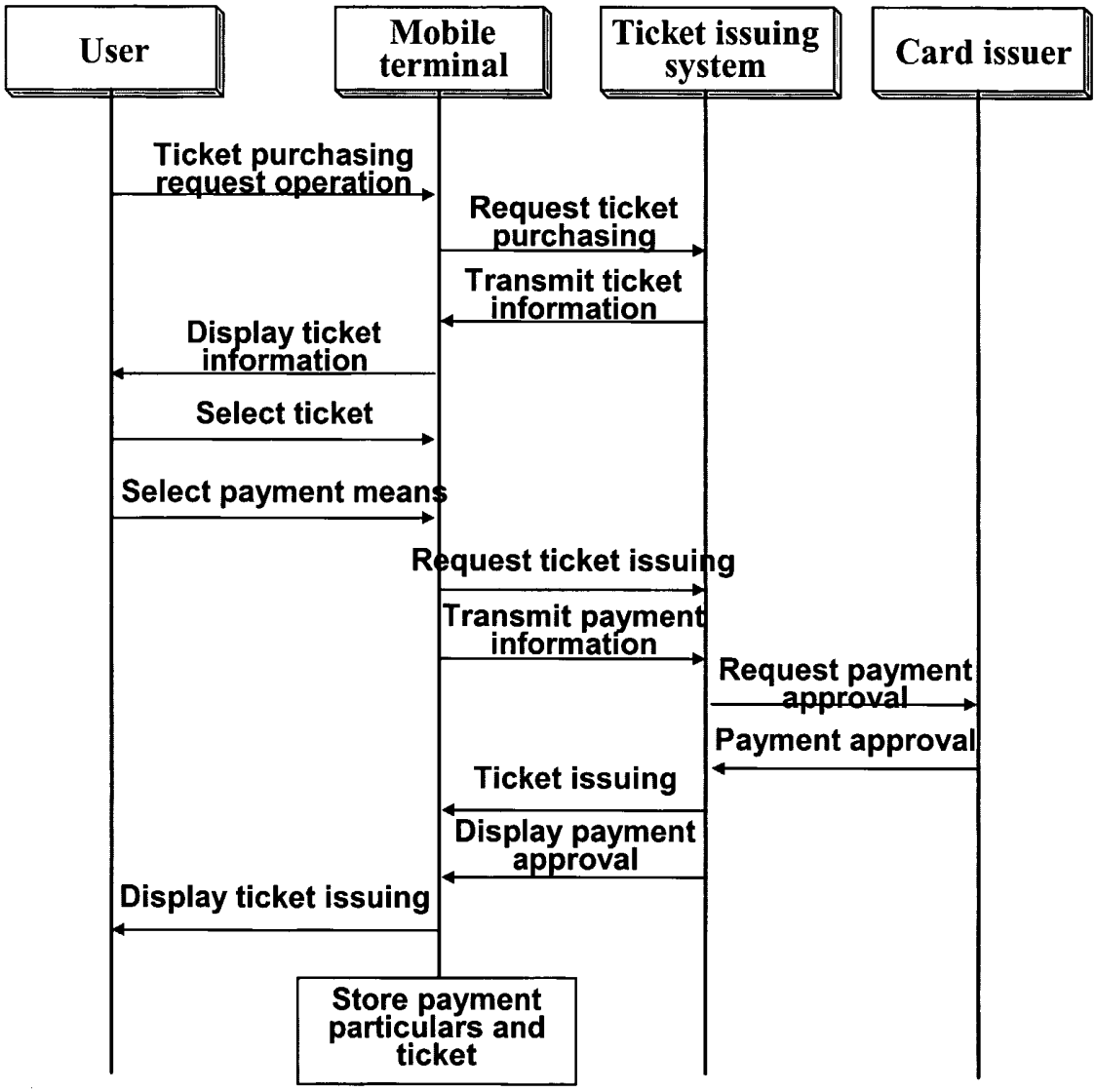

User
Mobile terminal
Ticket issuing system
Card issuer
Ticket purchasing request operation
Request ticket purchasing
Transmit ticket information
Display ticket information
Select ticket
Select payment means
Request ticket issuing
Transmit payment information
Request payment approval
Payment approval
Ticket issuing
Display payment approval
Display ticket issuing
Store payment particulars and ticket

FIG. 11

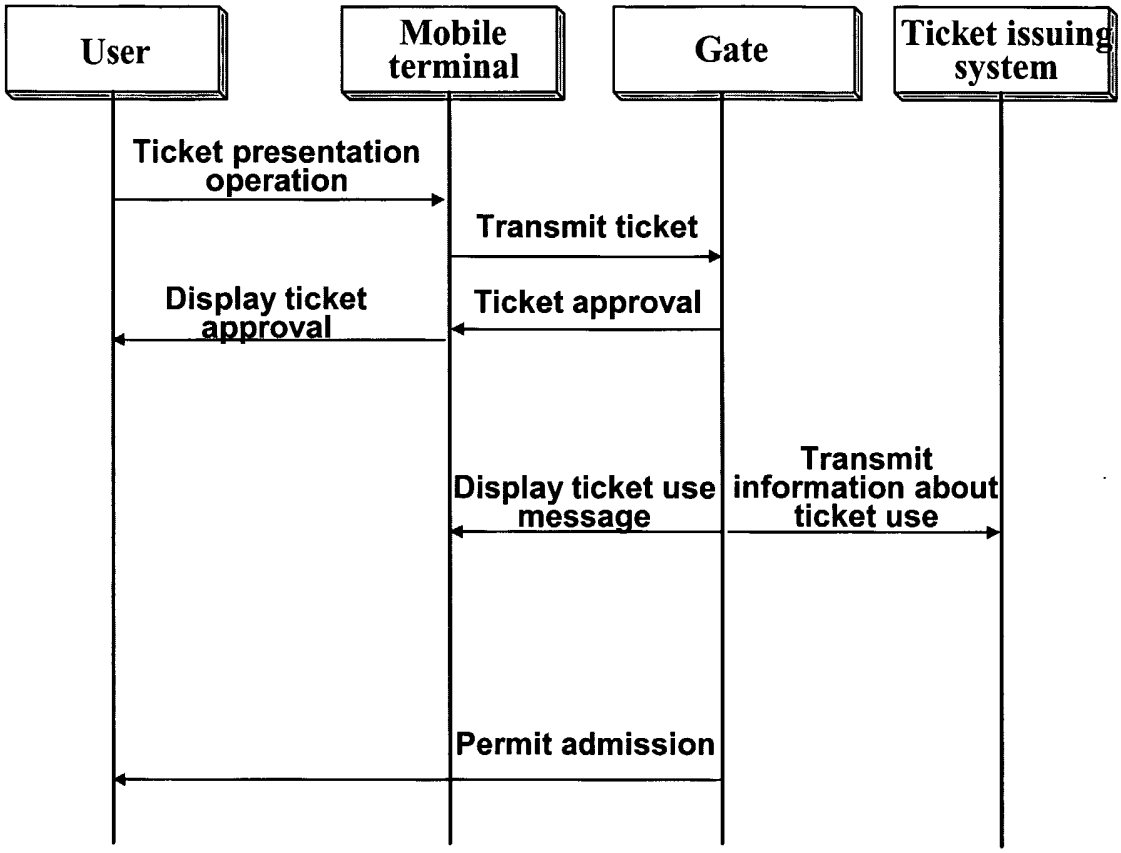
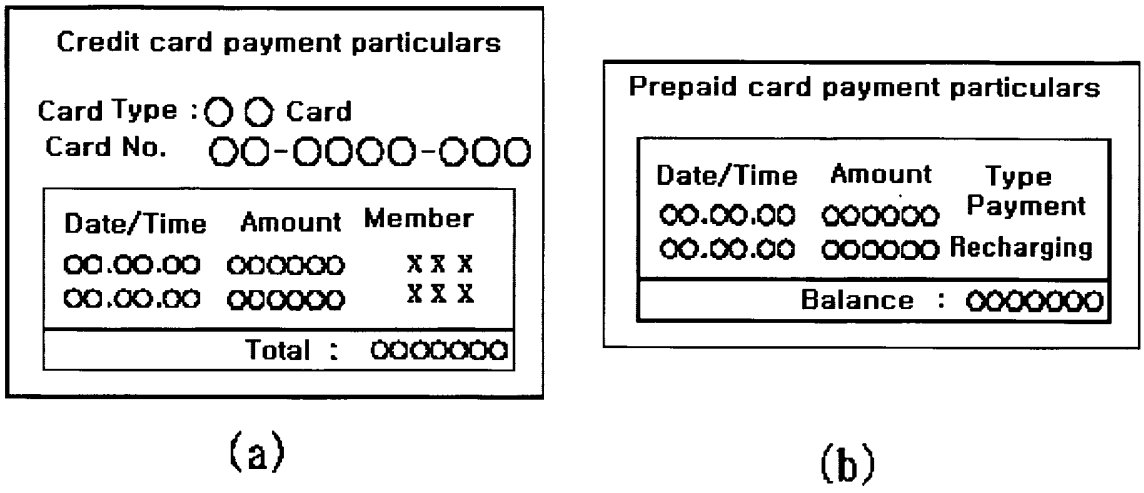
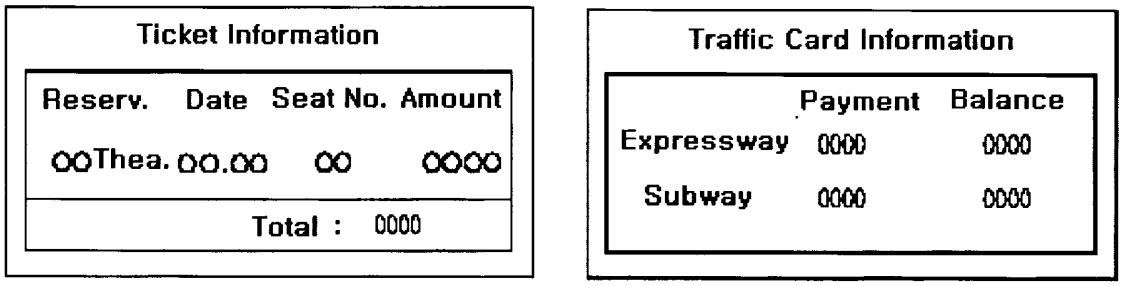

User
Mobile terminal
Gate
Ticket issuing system
Ticket presentation operation
Transmit ticket
Display ticket approval
Ticket approval
Display ticket use message
Transmit information about ticket use
Permit admission

FIG. 12



(a) (b)

FIG. 13



(a) (b)

FIG. 14

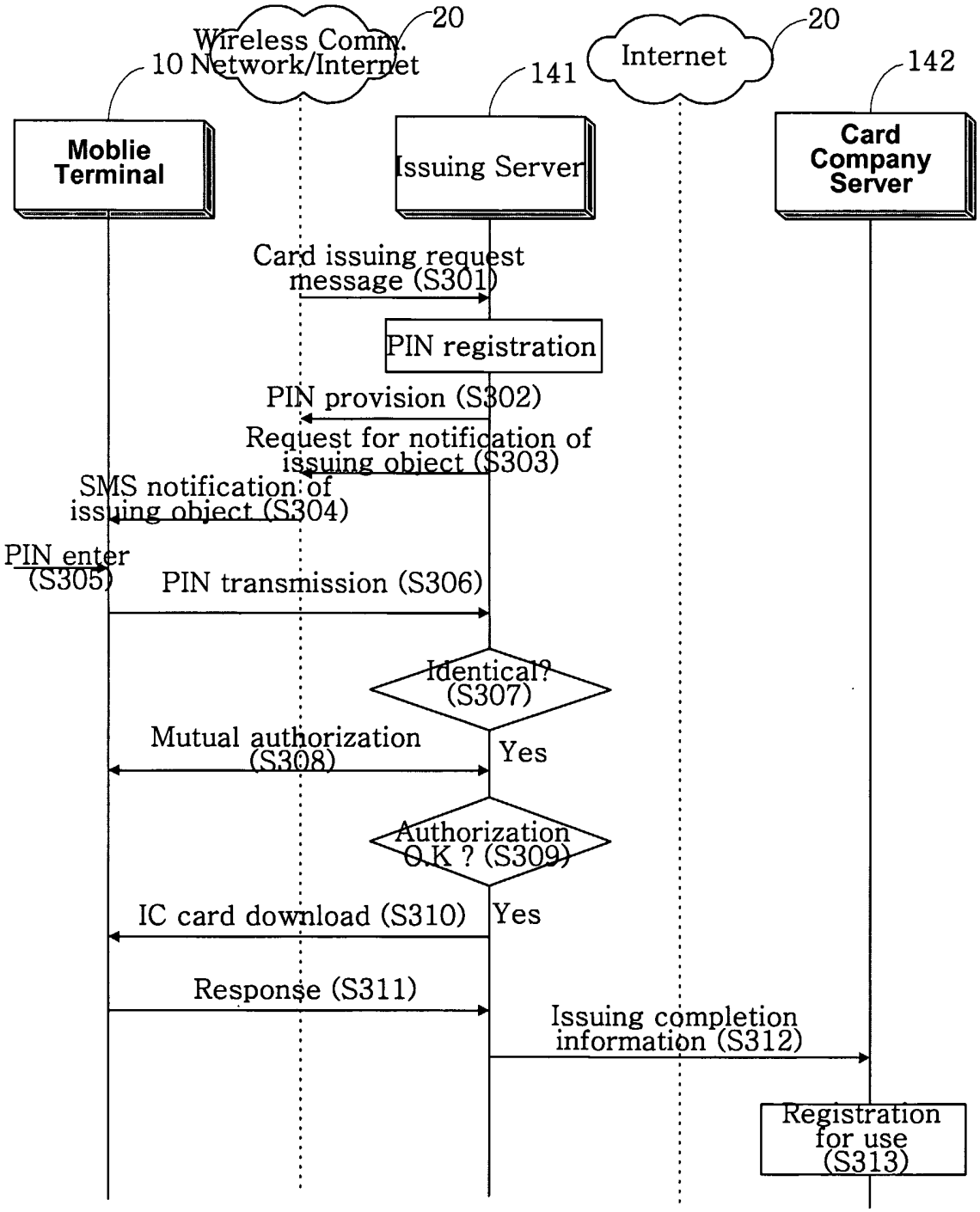

Wireless Comm. Network/Internet
20
10
Internet
20
141
142
Moblie Terminal
Issuing Server
Card Company Server
Card issuing request message (S301)
PIN registration
PIN provision (S302)
Request for notification of issuing object (S303)
SMS notification of issuing object (S304)
PIN enter (S305)
PIN transmission (S306)
Identical? (S307)
Mutual authorization (S308)
Yes
Authorization O.K ? (S309)
IC card download (S310)
Yes
Response (S311)
Issuing completion information (S312)
Registration for use (S313)

FIG. 15

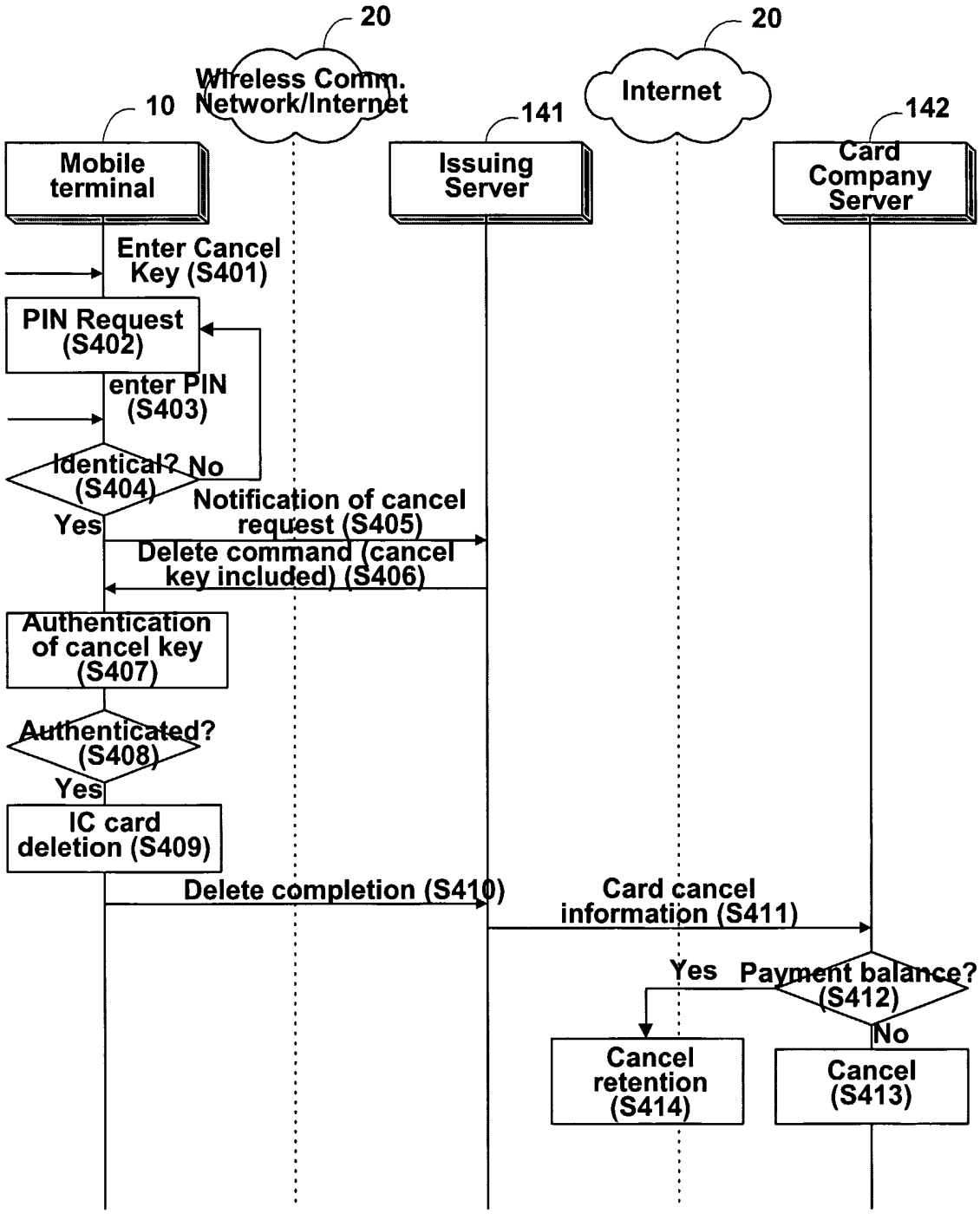

20
Wireless Comm. Network/Internet
20
Internet
10
Mobile terminal
141
Issuing Server
142
Card Company Server
Enter Cancel Key (S401)
PIN Request (S402)
enter PIN (S403)
Identical? (S404)
No
Yes
Notification of cancel request (S405)
Delete command (cancel key included) (S406)
Authentication of cancel key (S407)
Authenticated? (S408)
Yes
IC card deletion (S409)
Delete completion (S410)
Card cancel information (S411)
Yes
Payment balance? (S412)
No
Cancel retention (S414)
Cancel (S413)

FIG. 16

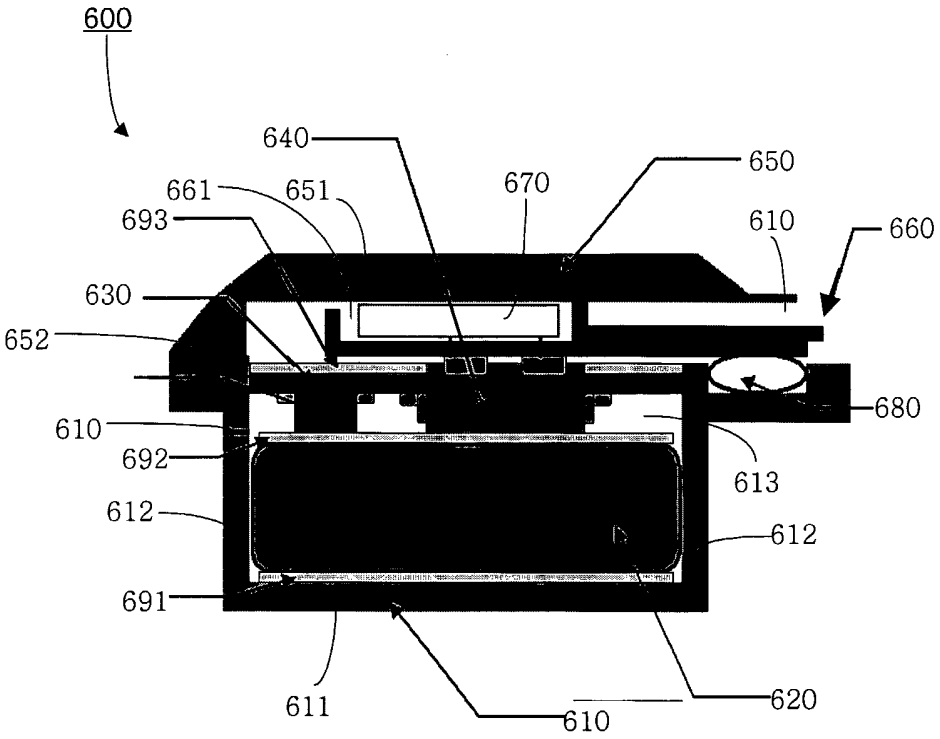

600
640
650
661
651
670
693
610
660
630
652
680
610
692
613
612
612
691
611
610
620

FIG. 17

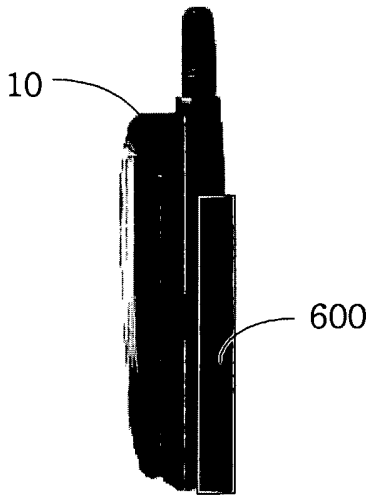

10
600

FIG. 19

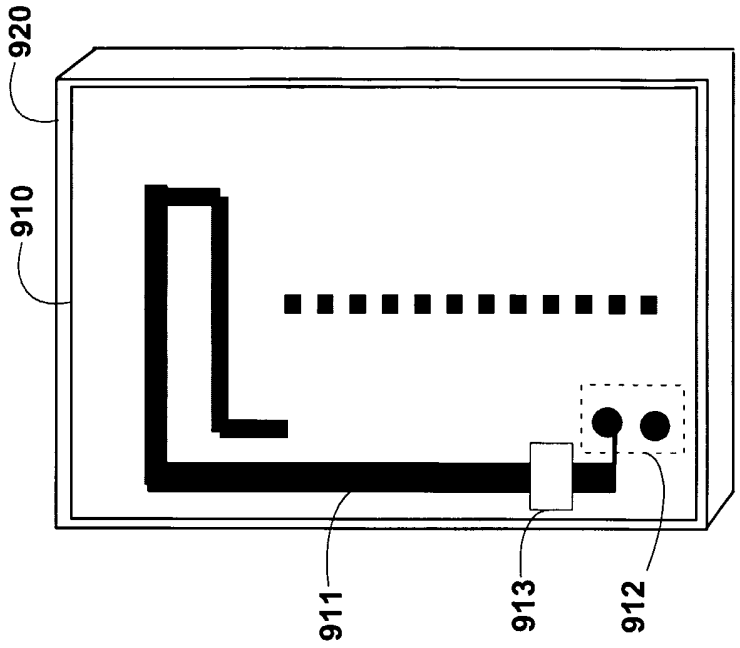
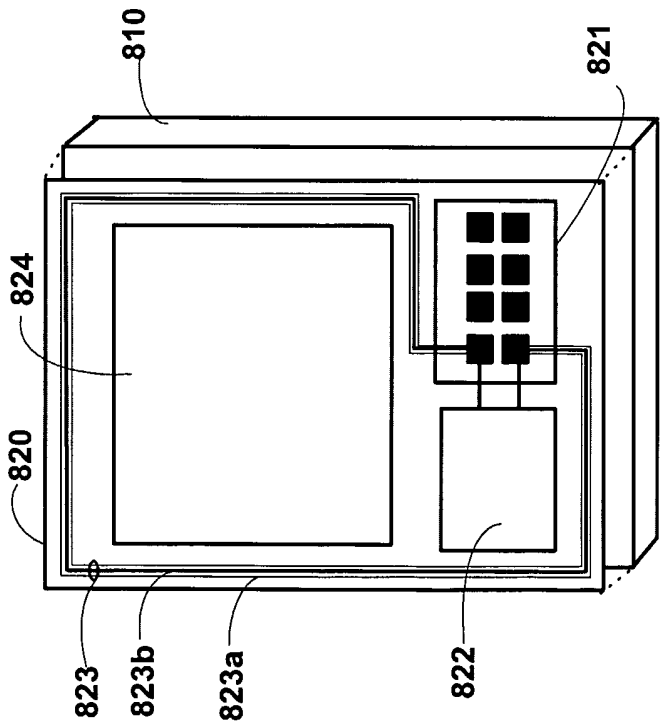


FIG. 18



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/01368

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G06F 17/60

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC G06F 17/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and applications for inventions since 1975

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 2001-63383 A (HYUNDAI CURITEL, CO. LTD) 9 JULY 2001 See the whole document	1-13
Y	KR 2001-25503 A (EYES VISION, CO. LTD) 6 APRIL 2001 See the whole document	1-13
A	KR 2001-18417 A (SK TELECOM, CO. LTD) 5 MARCH 2001 See the whole document	1-13
A	KR 2001-96375 A (LG TELECOM, CO. LTD) 7 NOVEMBER 2001 See the whole document	1-13

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

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Date of the actual completion of the international search	Date of mailing of the international search report
08 JANUARY 2003 (08.01.2003)	08 JANUARY 2003 (08.01.2003)
Name and mailing address of the ISA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer YOO, Byung Chul Telephone No. 82-42-481-5994

Form PCT/ISA/210 (second sheet) (July 1998)