

SYSTEM AND TERMINAL FOR AUTOMATIC EXCHANGE INVOLVING CARD

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates generally to an automatic money exchange system and method involving a card and, more particularly, to a card available in a plurality of countries, and an automatic money exchange system and method involving the
10 card.

2. Description of the Related Art

Cash has been chiefly used as payment means for goods or services. With the advent of the credit society, the use of
15 credit cards is sharply increasing.

Credit cards are plastic cards that are issued by banks and large stores. Credit cards may be used as cards for making postpaid payments for goods and services and cards for withdrawing cash from an Automated Teller Machine (ATM). The
20 Identification (ID) Information and password of a card owner are stored on the magnetic strip of a card. A credit card member store accesses the main computer of a credit card company via a Credit Authorization Terminal (CAT) online, checks the limit of a credit card and the account, balance and
25 validity thereof, and authorizes a deferred payment based on

the checking. The ATM of a bank reads information about a credit card, checks the details of the account of a credit card owner based on the read information, and provides money. A prepaid card may be used to pay for goods and services using a specific amount of money that it has been charged with. A
5 prepaid card refers to a card that can be used in prepaid card member stores to make a payment using a specific amount of money the card has been charged with.

In general, in the case of prepaid cards, discount
10 benefits are commonly provided to customers in return for prepayment. Prepaid cards are chiefly used in the fields of business in which small amounts of cash are chiefly used to make payment. Prepaid cards are characterized by prepayment, the variability of their utility values, non-registration,
15 portability, short-term use, and reliable economic efficiency. In Korea, representative prepaid cards include public telephone cards and cards for commuting on the subway. There is a need for a variety of payment-related services that enable the efficient use of a variety of payment means and provide more
20 convenience services, as described above.

Furthermore, people frequently stay in foreign countries for the purpose of vacations or business trips. Accordingly, prepaid cards that are used locally need to be used in foreign countries.

25 However, the interoperability and compatibility of prepaid

cards (traffic cards) are highly influenced because standards for prepaid cards and exchange rates differ depending on the country. Accordingly, there is a disadvantage in that a separate card should be purchased and charged while a user stays in a foreign country because a traffic card used in one country cannot be used in other countries. Furthermore, there is another disadvantage in that a user cannot use the remaining money left on a card from a foreign country until the user visits the foreign country again.

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SUMMARY OF THE INVENTION

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and embodiments of the present invention seek to provide a method of using a single card in a plurality of countries.

Other embodiments of the present invention seek to provide a method of unifying the traffic card standards of different countries so that a single card can be used in the different countries.

Yet another embodiment of the present invention seeks to provide a method of enabling a user to simply exchange a specific amount of money stored on a card.

According to an embodiment of the present invention, there is provided an automatic money exchange system,

including a transmission center for generating an information modification file indicative of a change in information stored on a card and sending the generated information modification file; a money exchange terminal for storing the information
5 modification file received from the transmission center and exchanging a specific amount of money, stored on the card, for currency indicated in the information modification file when the card comes within a detectable range; and the card for providing the specific amount of money to the money exchange
10 terminal, and receiving and storing the currency.

According to another embodiment of the present invention, there is provided a money exchange terminal, including a communication unit for receiving an information modification file indicative a change in information stored on a card; a
15 storage unit for storing the information modification file received from the communication unit and details of processing based on the information modification file; and a control unit for exchanging a specific amount of money, stored on the card, for currency indicated in the information modification file
20 when the card comes within a detectable range.

According to an aspect of the present invention, there is provided an automatic money exchange system, comprising: a transmission center for generating, for each card, an information modification file indicative of a change in
25 information stored on a card in which an amount of money to be paid is charged in advance and sending the generated

information modification file to at least two money exchange terminals; a money exchange terminal for storing the information modification file received from the transmission center and, if there is an information modification file
5 including a card serial number identical with an unique card information received from a card that comes within a detectable range, reading the amount of money stored on the card and a currency code indicating currency, and exchanging the read amount of money for currency indicated in the information
10 modification file; and the card for providing the stored amount of money to the money exchange terminal in accordance with a request of the money exchange terminal, and storing the exchanged amount of money from the money exchange terminal and the currency, wherein the money exchange terminal sends the
15 details of the processing of the exchange to the transmission center, the information modification file includes information on an exchange rate for the exchange, and a fare is collected from the amount of money charged in the card.

According to another aspect of the present invention,
20 there is provided a money exchange terminal, comprising: a communication unit for receiving an information modification file indicative a change in information stored on a card in which an amount of money to be paid is charged in advance; a storage unit for storing the information modification file
25 received from the communication unit and details of processing

based on the information modification file; and if there is an information modification file including a card serial number identical with an unique card information received from a card that comes within a detectable range, a control unit for
5 reading the amount of money stored on the card and a currency code indicating currency and exchanging the read amount of money for currency indicated in the information modification file, wherein the control unit sends the details of the processing of the exchange to a transmission center, the
10 information modification file includes information on an exchange rate for the exchange, and a fare is collected from the amount of money charged in the card.

BRIEF DESCRIPTION OF THE DRAWINGS

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The above and other objects, features and advantages of the present invention will be more clearly understood from the

following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 shows the format of an information modification file according to an embodiment of the present invention;

5 FIG. 2 shows a money exchange system for exchanging a specific amount of money stored on a card using the information modification file according to an embodiment of the present invention;

10 FIG. 3 shows a country code and a currency code that are stored on a card according to an embodiment of the present invention;

FIG. 4 shows a detailed operation that is performed between a card and a money exchange terminal according to an embodiment of the present invention; and

15 FIG. 5 shows the configuration of the money exchange terminal according to an embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 Embodiments of the present invention will be described in detail with reference to the accompanying drawings.

FIG. 1 shows the format of an information modification file according to an embodiment of the present invention. The format of the information modification file according to this
25 embodiment of the present invention will be described in detail

below with reference to FIG. 1.

Referring to FIG. 1, the information modification file includes unique card information, a serial number, an information modification type, information parameters, and a
5 check field. The information modification file may include some other type of information in addition to this information. Furthermore, some information may be omitted, if necessary.

The unique card information corresponds to unique information related to a card, including a card number. The
10 unique card information is made up of four bytes. The serial number refers to the sequential position of a corresponding information modification file if a plurality of information modification files are generated for a specific card. That is, if three information modification files are generated for a
15 specific card, the three information modification files have serial numbers 1 to 3, and each of the three information modification files is made up of 1 byte.

The information modification type refers to the type of information that is requested for a card, and is made up of 1
20 byte. For example, it may be assumed that the information modification type is set to "1" when the exchange of money is requested, "2" when it is requested that a card be included in a positive list, and "3" when it is request that a card be included in a blacklist.

25 The information parameters include the type of currency

and the time of a corresponding country and information about an exchange rate. The exchange rate recorded on the information parameters may be the exchange rate at any one of various points of time. For example, the exchange rate may be
5 the exchange rate at a point of time at which a user registered information, or the exchange rate at a point of time at which an information modification file was generated. The check field checks whether there is an error in a corresponding information modification file at a receiving end, that is,
10 whether the data is valid. The check field is made up of four bytes.

The size of each of the pieces of information that form the information modification file may vary depending on the size of the information modification file or the type of
15 information included in the information modification file.

FIG. 2 shows a money exchange system using the information modification file according to an embodiment of the present invention. The money exchange system using the information modification file according to the embodiment of the present
20 invention will be described in detail below with reference to FIG. 2.

Referring to FIG. 2, the money exchange system includes a transmission center 200, a money exchange terminal 202, and a prepaid card 204. The money exchange system may include other
25 elements in addition to the above elements.

A user accesses the web using a PC or a smart phone, and inputs exchange information. If the user possesses a plurality of cards, the user may select a specific card and then input exchange information. The exchange information includes a
5 country which the user desires to enter and the date on which the user desires to enter the country.

The transmission center 200 generates an information modification file for each card based on the received exchange information. Since it is agreed that the information
10 modification type of the generated information modification file is set to "1" when the exchange of money is requested as described above, the transmission center 200 sets the information modification type of the generated information modification file of a card that requests the exchange of money
15 to "1," and stores a corresponding country and time in the information parameters.

The transmission center 200 sends a list of generated information modification files to the money exchange terminal 202 at specific intervals. The transmission center 200 may
20 send the list of information modification files to the money exchange terminal 202 installed in each country. Alternatively, the transmission center 200 may classify a list of the information modification files depending on the countries for which the exchange of money is requested and then
25 send a list of information modification files classified

depending on the countries for which the exchange of money is actually requested. This can prevent the money exchange terminal 202 from receiving and processing an unnecessary list of information modification files.

5 As described above, the transmission center 200 may send a list of information modification files to all money exchange terminals 202 once a day, or may send information modification files at specific time intervals.

10 The money exchange terminal 202 stores the list of information modification files.

15 The money exchange terminal 202 checks whether a specific prepaid card 204 comes within a detectable range in real time. If a specific card comes within a detectable range, the money exchange terminal 202 reads the requisite information from the specific prepaid card 204. In the present invention, the money exchange terminal 202 reads unique card information from the prepaid card 204.

20 The money exchange terminal 202 checks whether there is an information modification file including information identical with the read unique card information. If, as a result of the checking, there is an information modification file including information identical with the read unique card information, the money exchange terminal 202 requests so that the prepaid card 204 exchanges a specific amount of money, stored on the prepaid card 204, at the exchange rate. That is, the exchange

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rate terminal 202 reads a currency code and a country code from the user information field of the prepaid card 204 and exchanges the specific amount of money based on stored information about the exchange rate.

5 The information about the exchange rate that is used for the exchange of money in the money exchange terminal 202 may be provided in various ways. For example, if the money exchange terminal 202 is connected to an exchange rate server online, the money exchange terminal 202 receives the exchange rate in
10 real time and exchanges the specific amount of money. If the money exchange terminal 202 is not connected to an exchange rate server, the money exchange terminal 202 may receive information about the exchange rate at a specific point of time and exchange the specific amount of money. That is, the money
15 exchange terminal 202 may use information about the exchange rate at a point of time at which a user requests the exchange of money from the transmission center 200, or information about the exchange rate at a point of time at which the transmission center 200 provides a list of information modification files to
20 the money exchange terminal 202. The money exchange terminal 202 may receive information about the exchange rate at various points of time in addition to the above points of time.

 The money exchange terminal 202 stores the details of the processing of the information modification file, and sends the
25 details of the processing to the transmission center 200 at

specific intervals. The transmission center 200 stores the received details of the processing, and may delete the processed information modification file, if necessary. That is, the transmission center 200 may resend a non-processed
5 information modification file when a subsequent list of information modification files is sent, but may not send a processed information modification file when a subsequent list of information modification files is sent.

The prepaid card 204 also stores information indicating
10 that the exchange of money has been completed.

FIG. 3 shows a country code and a currency code that are stored on a card according to an embodiment of the present invention.

Referring to FIG. 3, in the card, Korea is selected from
15 among various country codes, such as Korea, USA and China, and set as the currency code, and Won is selected from among various currency codes, such as Won, dollar and Euro, and set as the currency code.

A money exchange terminal that can be used to make a
20 payment in dollars does not allow a payment to be made using a card whose payment means is set to Won. Accordingly, the money exchange terminal reads a specific amount of money stored on the card in Won and exchanges the specific amount of money for dollars. As described above, the money exchange terminal 202
25 exchanges the specific amount of money using information about

the exchange rate received in real time or previously stored. The money exchange terminal 202 stores the resulting money in the prepaid card 204. Accordingly, a user may use a single card in a plurality of countries having different currency
5 units.

FIG. 4 shows a detailed operation that is performed between the prepaid card 204, the money exchange terminal 202 and the transmission center 200 according to an embodiment of the present invention. The operation that is performed between
10 the prepaid card 204, the money exchange terminal 202, and the transmission center 200 according to the embodiment of the present invention will be described in detail below with reference to FIG. 4.

At step S400, the prepaid card 204 comes within a
15 detectable range from the money exchange terminal.

At step S402, the money exchange terminal 202 reads information stored on the prepaid card 204. In particular, in regard to the present invention, the money exchange terminal 202 reads information recorded on a specific field. The
20 specific field is a field on which unique card information is recorded.

At step S404, the money exchange terminal 202 checks whether there is an information modification file including unique card information identical with the read information.
25 If, as a result of the checking, there is an information

modification file including unique card information identical with the read information, the money exchange terminal 202 processes the exchange, that is, the item requested by the information modification file.

5 At step S406, The money exchange terminal 202 and the prepaid card 204 store the details of the processing of the exchange.

 At step S408, the money exchange terminal 202 sends the details of the processing of the exchange to the transmission
10 center 200.

 At step S410, the transmission center 200 stores the received details of the processing, and may delete the processed information modification file, if necessary.

 FIG. 5 shows the configuration of the money exchange
15 terminal 202 according to an embodiment of the present invention. The structure of the money exchange terminal 202 according to this embodiment of the present invention will be described in detail below with reference to FIG. 5.

 The money exchange terminal 202 according to this
20 embodiment of the present invention includes a card reader unit 500, a fare collection unit 502, a control unit 504, a transaction details storage unit 506, an information modification file list storage unit 508, an exchange rate storage unit 510, and a communication unit 512.

25 The information modification file list storage unit 508

stores a list of information modification files received from the transmission center 200. The information included in the information modification file includes a request for the exchange of a specific amount of money stored on a card, a
5 blacklist, a positive list, a change of denomination, and charging, as described above.

The transaction details storage unit 506 stores the details of transactions that have been performed between the card and the money exchange terminal. In regard to the present
10 invention, the transaction details storage unit 506 stores the details of information that has been changed in response to the request of an information modification file on a card included in a list of information modification files at the request of the money exchange terminal. That is, the transaction details
15 storage unit 506 stores a variety of pieces of information about the details of the modification of a card, such as the details of the exchange of money using a card which requested the exchange of money, the details of a change of denomination using a card which requested a change of denomination, and the
20 details of a change into a blacklist using a card which requested a change into a blacklist.

The exchange rate storage unit 510 stores the exchange rates of countries in which traffic cards are compatible. As described above, a reference point of time at which the
25 exchange rate is stored in the exchange rate storage unit 510

may be one of various points of time, such as the point of time at which a user requests the exchange of money from the transmission center 200, and the point of time at which the transmission center 200 sends a list of information
5 modification files to the money exchange terminal 202.

The card reader unit 500 reads information about the prepaid card 204 and information about the balance of the prepaid card 204. If the balance read by the card reader unit 500 is greater than a traffic fare, the fare collection unit
10 502 collects the traffic fare. The fare collection unit 502 collects a variety of small amounts of money for the purchase of articles in addition to the traffic fare.

The control unit 504 constitutes part of the money exchange terminal, and controls all the elements. That is, the
15 control unit 504 controls the card reader unit 500, the fare collection unit 502, the communication unit 512, and the storage units 506, 508 and 510. In particular, in regard to the present invention, the control unit 504 checks whether there is an information modification file including information
20 identical with unique card information read by the card reader unit 500. If, as a result of the checking, there is an information modification file including information identical with the read unique card information, the control unit 504 exchanges a specific amount of money stored on the prepaid card
25 204 at the exchange rate, and performs control so that the

resulting money is provided to the card. That is, the control unit 504 reads a currency code and a country code from the user information field of the prepaid card 204, and exchanges a specific amount of money based on information about the
5 exchange rate.

The communication unit 512 communicates with the transmission center 200. The communication unit 512 receives a list of information modification files from the transmission center 200, and sends the details of a transaction stored in
10 the money exchange terminal and information about the card that has been modified based on the information modification file to the transmission center 200.

In addition, when a card having a country code identical with a country code that can be processed comes within a
15 detectable range, the money exchange terminal 202 of the present invention exchanges a specific amount of money stored on the card for the currency of a target country, even though there is no information modification file. That is, if a user located in a first country enters a second country, a specific
20 amount of money stored on the card of the user is exchanged for the currency of the second country based on the information modification file. However, when the user located in the second country enters the first country, the money exchange terminal 202 automatically exchanges a specific amount of
25 money, stored on the card, for the currency of the first

country if a country code stored on the card is identical with a country code that may be processed by the money exchange terminal 202, even though there is no information modification file. The money exchange terminal 202 stores the details of the processing, and may provide the details of the processing to the transmission center 200, if necessary.

As described above, the money exchange system using the information modification file according to the present invention enables a single card to be used in a plurality of countries. That is, a user may use a single card in a plurality of countries because the money exchange terminal that receives the information modification file automatically exchanges a specific amount of money, stored on a card, for the currency of a target country.

Furthermore, an additional card does not need to be purchased in a foreign country because a single card can be used in a plurality of countries. Accordingly, the inconvenience of having money left over on a card after being used in a foreign country can be obviated. Furthermore, user benefits can be maximized because the money exchange terminal automatically exchanges a specific amount of money, left over after being used in a foreign country, for the currency of the user's country when the user enters their own country.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those

skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

WHAT IS CLAIMED IS:

1. An automatic money exchange system, comprising:
 - a transmission center for generating, for each card, an information modification file indicative of a change in information stored on a card in which an amount of money to be paid is charged in advance and sending the generated information modification file to at least two money exchange terminals;
 - a money exchange terminal for storing the information modification file received from the transmission center and, if there is an information modification file including a card serial number identical with an unique card information received from a card that comes within a detectable range, reading the amount of money stored on the card and a currency code indicating currency, and exchanging the read amount of money for currency indicated in the information modification file; and
 - the card for providing the stored amount of money to the money exchange terminal in accordance with a request of the money exchange terminal, and storing the exchanged amount of money from the money exchange terminal and the currency,
- wherein the money exchange terminal sends the details of the processing of the exchange to the transmission center, the information modification file includes information on an exchange rate for the exchange, and a fare is collected from the amount of money charged in the card.

2. The money exchange system of claim 1, wherein the information modification file comprises unique card information, a serial number, an information modification type, and a check field.

3. The money exchange system of claim 2, wherein the money exchange terminal reads a country code and a currency code stored on the card.

4. The money exchange system of claim 3, wherein the money exchange terminal exchanges the specific amount of money, stored on the card, for currency indicated in the information modification file using the currency code and an exchange rate.

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5. The money exchange system of claim 4, wherein the exchange rate used to exchange the specific amount of money at the money exchange terminal is at least one of an exchange rate at a point of time at which the transmission center generates
10 the information modification file, an exchange rate at a point of time at which the transmission center sends the information modification file to the money exchange terminal, an exchange rate at a point of time at which the transmission center is instructed to generate the information modification file , and
15 an exchange rate at a point of time at which the money exchange terminal exchanges the specific amount of money.

6. The money exchange system of claim 3, wherein if the read currency code corresponds to currency that can be
20 processed by the money exchange terminal, the money exchange terminal exchanges the specific amount of money, stored on the card, for currency that can be processed at the money exchange terminal.

25 7. A money exchange terminal, comprising:

a communication unit for receiving an information modification file indicative a change in information stored on a card in which an amount of money to be paid is charged in advance;

a storage unit for storing the information modification file received from the communication unit and details of processing based on the information modification file; and

if there is an information modification file including a card serial number identical with an unique card information received from a card that comes within a detectable range, a control unit for reading the amount of money stored on the card and a currency code indicating currency and exchanging the read amount of money for currency indicated in the information modification file,

wherein the control unit sends the details of the processing of the exchange to a transmission center, the information modification file includes information on an exchange rate for the exchange, and a fare is collected from the amount of money charged in the card.

8. The money exchange terminal of claim 7, wherein the exchange rate used to exchange the specific amount of money at the money exchange terminal is at least one of an exchange rate at a point of time at which a transmission center generates the information modification file, an exchange rate at a point of time at which the transmission center sends the information

modification file to the money exchange terminal, an exchange rate at a point of time at which the transmission center is instructed to generate the information modification file , and an exchange rate at a point of time at which the money exchange terminal exchanges the specific amount of money.

9. The money exchange terminal of claim 8, wherein the communication unit sends the details of the processing based on

the information modification file to external.

10. The money exchange terminal of claim 7, wherein if the read currency code corresponds to currency that can be
5 processed by the money exchange terminal, the control unit exchanges the specific amount of money, stored on the card, for currency that can be processed by the control unit.

SYSTEM AND TERMINAL FOR AUTOMATIC EXCHANGE INVOLVING CARD

ABSTRACT

5 Disclosed herein is an automatic money exchange system
and method involving a card. The automatic money exchange
system includes a transmission center, a money exchange
terminal, and a card. The transmission center generates an
information modification file indicative of a change in
10 information stored on the card, and sends the generated
information modification file. The money exchange terminal
stores the information modification file received from the
transmission center, and exchanges a specific amount of money,
stored on the card, for currency indicated in the information
15 modification file when the card comes within a detectable
range. The card provides the specific amount of money to the
money exchange terminal, and receives and stores the currency.

Fig. 2