(54) Title: METHOD AND SYSTEM FOR VENDING USER TIME, PARTICULARLY FOR COMMUNICATION EQUIPMENT

(57) Abstract: Method for secure vending of prepaid time-of-use in a communication network, such as a cellular telephone system, in which a value certificate is produced, especially a card (cash card) having information about the operating company and in-paid amount and with a secret code which by transfer to the operating company gives disposable time-of-use, especially time-of-use with a cellular telephone. A first information carrier is provided, readable by a machine, especially in the shape of a card (activating card 11) which can be activated for a fixed, predetermined or eligible amount at a place of payment. The activating card is provided with electronic information in the place of payment, regarding requested operating company and time-of-use, or corresponding requests regarding other prepaid services, such as tickets. The information from the activating card thereafter is inserted in a card reader or corresponding unit (cash card vending machine 14) which can be connected to a central server (17) generating and transferring loading codes to the cash card vending machine (14), where a loading code or another relevant code is submitted to the user or the user account of the operating company.
Method and system for vending user time, particularly for communication equipment.

The invention relates to a method and a system as stated in the preamble of the attached claim 1 and 6 respectively, primarily for time-of-use vending for electronic communication equipment, especially cellular telephones.

**Background of the invention**

Some users of cellular telephones prepay for their use, by means of a certain programmed time-of-use in a central computer belonging to the telephone system provider. When the prepaid time is spent, or about to run out, it has to be recharged by buying a so-called "cash-card", where a new code (loading code) can be revealed. The code is used to give a corresponding increase in the account having the corresponding telephone number as at the telephone system provider.

Presently, cash card vending is insecure. As they have considerable value, the cards have to be stored securely at a vending location. Both during transport and in storage such cards are vulnerable to theft.

Moreover, each telephone system provider issues a different cash card, often using different vending distributors. This has resulted in difficulties with regard to obtain cash cards for all providers anywhere in a country. Moreover, some vending locations have limited opening hours, which further limits availability.

**Object of the invention**

The main purpose of the present invention is to provide a method and a system for time-of-use vending, or similarly, time-of-calling vending for individual equipment, which, based on codes installed through a cellular telephone to a network provider, gives the current cellular telephone access to a certain time-of-use. This system should reduce or eliminate the risk of misuse and theft.

**The invention**

The invention is stated in claims 1 and 6, which describe an entirely secure method and system for accomplishing the object stated above. In claim 12 there is stated an alternative embodiment of the system.

Further details of the invention will appear from the other claims 2 to 5, and 7 to 11 and the following description a preferred embodiment.

The most important advantage of the method and the system, is the increased security against misuse and the corresponding reduction of loss. Furthermore, they offer the possibility
for flexible vending, wherein a device can be programmed for cash card vending for an arbitrary number of telephone system providers.

The system can be developed to provide cash card vending where the cards have arbitrarily values. It can also be adapted for use in some other situations, for example to pay for other types of prepaid services, such as tickets, code cards for power supply etc.

Example

The invention is described further in the following, by reference to the preferred example, i.e. cash card vending for cellular telephones, and by referring to the accompanying drawings where:

Fig. 1 shows the main elements of the system schematically;

Fig. 2 shows a block diagram illustrating a cash card vending machine and its co-operation with an external central server;

Fig. 3 shows a flow chart describing the individual steps in the process by use of the equipment in Fig. 1 and 2; while

Fig. 4 shows an illustration of several cash card vending machines, such that they are connected to the central server(s), and further linked to the main centre of the total system.

Fig. 1 shows several variants of activating cards 11, that is, cards provided with a readable unique code adapted to a telephone system provider and values. The readable code can be a bar code, which can be read optically, or a corresponding electronic code, which can be read in an electronic card reader. The activating cards 11 are intended to be activated electronically in an activator 12 placed near a vending terminal 13, for example in a shop. "Activating" means that the activating card has an electronic card "applied" for the paid amount, for time-of-calling with the chosen telephone system provider. It can either be an "on/off"- function containing a message regarding payment of one certain amount, or a code describing the size of the amount, and the possibility of buying of time-of-calling of an arbitrary amount.

The activator 12 is designed to make such an activation of an inserted card. To ensure that security of the activator is maintained, it is arranged in the present case such that it has to be supplied daily or at a certain period of time, with a code structure that a local system responsible person generates with a master card, that is, an electronic identity card, belonging to the person concerned. Additionally, every salesman must have a correspondingly individual salesman card to be legitimate and to open the activator 12.
Fig. 1 also schematically shows a cash card vending machine 14, with a card reader 15, connected to an external central server 17 that generates a cash card 19. These elements will be described further in the following.

Fig. 2 illustrates a system according to the invention in the shape of a block diagram. There is shown a cash card vending machine 14 provided with a card reader 15, able to read inserted activating cards 11, with a communication unit 16 (modem) connecting the card machine to the external central server 17, and a printer 18 receiving a control signal and code information for the cash card from the communication unit / central processor 16 of the machine.

The central server 17 assigns each card machine 14 if necessary with a series of loading codes for cash cards or codes for other possible prepaid services from one or more telephone system providers, telephone companies respectively.

The cash cards 19 are printed from the cash card vending machine printer 18 immediately after the customer has inserted an activating card. In this way there will not be any need for transport and storage of cash cards in the way they are today. Consequently, the risk of theft and other loss is reduced. A user can chose to get more cash cards at once, for example before a holiday or travel. The unused cash cards can be kept in the same way and with the same security as money.

The cash cards 19 printed out therefore have the code which is to be transferred to the telephone system provider to credit the time-of-calling. At the same time, it will be used as a receipt and/or accountancy enclosure if that is wanted.

The cash card vending machine 14 can be provided with a sensor giving signals to the central server 17 at a door opening and with an alarm. Security is further increased if the cash card vending machine registers and stores information for all transactions and transfers them to the central server 17. Information with regard to status, number of cards vended, card values, telephone system providers, salesmen, and other relevant information is registered in the data central 17 for further processing and distribution. Information of vending for every individual cash card vending machine 14 and for every telephone system provider will therefore always be easily accessible.

The individual elements in this system can be designed on the basis of prior art. Elements not shown in the schematic illustrations belong to prior art, such as mechanisms for handling the cards, alarm installation, power supply and the like.

In Fig. 3 a flow chart is shown explaining an example of the individual steps of operation and function of the system.

Fig. 4 shows a system having several cash card vending machines. Two cash card vending machines 22 and 23 are operating under a central server 24 and another cash card vending
machine 25 is operating under a central server 26. Accordingly, each central server can operate a number of cash card vending machines. All central servers 24 and 26 will be connected to a main central 27. This again will be connected to one or more operating companies (not shown).

The cash card vending machines 14 can be located at places where cash card vending is of interest, for example in shops, kiosks, cafes, transport terminals (such as railway stations and airports), petrol stations, banks and post offices etc. The individual telephone service providers wanting to sell their cards in this way then will make an agreement with the individual vending location or chain-stores on provision and remaining vending conditions and moreover, an agreement related to the management company for the current network of cash card vending machines.

The vending location only needs to store worthless and risk free activating cards as a basis for producing cash cards. In the cash card vending machines 14 there exists no cash cards of value, only a roll of blank paper for the printing of cash cards.

**Modifications**

A modification of the invention described in the example is that the activating cards for a telephone system provider do not have predetermined values. The customer asks for a cash card of x NOK. This amount is registered by the salesman at the same time as the card is activated in the activator. The cash card vending machine registers this, and prints a cash card. Information of sold time-of-calling is sent by the card machine via the central server to the telephone system provider, in connection with the loading code printed on the cash card. In this case the loading code can be brought out and at the same time registration of the amount online at the operating company, or a message can be sent back to the operating company about the size of the value paid for the given loading code already downloaded in the central server. The election of the alternatives will be decided with regard to security and programming.

There is a further simplified embodiment where the information on the activating card is transferred directly to a cash card vending machine immediately near a vending terminal. In this case, the activating card can be omitted as a physical element for the user to hand over, instead it is an electronic element not being physical outside the equipment near the cash card vending machine. The activator and the cash card vending machine can here be integrated to a cash card terminal.

The system can also have a variant, where the central server (17) is arranged for transfer of a loading code directly to a service provider for crediting the customer account.
Claims:
1. Method for secure vending of prepaid time-of-use in a communication network, such as a cellular telephone system, in which a value certificate is produced, especially a card (cash card) having information about the operating company and prepaid amount and with a secret code which by transfer to the operating company gives disposable time-of-use, especially time-of-use of a cellular telephone, characterized in
- that a first information carrier, readable by a machine, especially in the shape of a card (activating card 11) which can be activated for a fixed, predetermined or eligible amount at a place of payment, (activator 12),
- that the information carrier (activating card 11), readable by a machine, is provided with electronic information by the activator (12) regarding required operating company and time-of-use, or corresponding requests regarding other prepaid services, such as tickets,
- that the information from the activating card thereafter is inserted in a card reader or corresponding unit (cash card vending machine 14) which can be connected to a central server (17) generating and transferring loading codes to the cash card vending machine (14), where a loading code or another relevant code is submitted to the user or the user account of the operating company.

2. Method according to claim 1, characterized in that the cash card vending machine (14) is provided with series of loading codes from the operating company or the operating companies via the central server (17).

3. Method according to claim 1, characterized in that the cash card vending machine (14) is provided with an online loading code after a payment is made.

4. Method according to claim 2, characterized in that a feedback is made, regarding the value of the amount in connection with a downloaded loading code, after a given amount is paid.

5. Method according to any one of claims 1 to 4, characterized in that the loading codes are generated on a printer which is provided in or in connection with the cash card vending machine (14).

6. System for accomplishing the method according to claim 1, characterized in that it comprises
- a central server (17) arranged for transfer of loading codes from providers of prepaid services to the cash card vending machine for use as a payment equivalent,
- a number of first, preferably card-shaped information carriers (activating cards 11) which can be electronically coded,
- a network of activators (12) which can code the first information carriers (11) and which are placed in different trade places,
- a cash card vending machine (14) having a communication connection to a central server (17) in a computer network, whereas the cash card vending machine (14) has
  - a card reader (15) or corresponding unit, to read the first information carrier (11),
  - a central data processor/communication unit (16) to exchange information with an external central server (17), and to transfer a user code to a printer (18) and to communicate this to the user as a loading code, and
  - a unit (18) which can receive a loading code from the server (17) and transfer it to the user.

7. System according to claim 6, characterized in that it is arranged to get vending data from the vending machines for further transfer to the providers, such as time-of-use for mobile telephony from a telephone company.

8. System according to either one of claims 6 to 7, characterized in that the unit comprises a printer (18) for printing of a cash card, to receive a loading code from the server and transfer it to the user.

9. System according to either one of claims 7 or 8, characterized in that the activator (12) is connected to a first electronic means blocking which is activated (opened) by an electronic key (master card), which identifies a local system operator.

10. System according to claim 9, characterized in that the activator (12) is connected to a second electronic blocking means which is activated (opened) by another electronic key (operating card), which identifies a salesman.

11. System according to any one of claims 7 to 10, characterized in that the activator and the cash card vending machine are integrated into one unit.

12. System according to claim 6, characterized in that the central server (17) is arranged for transfer of a loading code directly to a service provider for crediting the customer account.
Figur 2
Security person activates system with MASTER CARD

Sales person register identity with OPERATOR CARD

Activator opens and updates the computer system

Purchaser selects an "empty" activating card

Purchaser pays the stated or chosen amount

Activator provides electronic information

Purchaser places activating card in card vending machine for control in the computer

External server sends and receive information to/from the vending machine computer, the main computer and the computer systems of the service providers

The computer generates a refill code for the cash card

Vending machine printer prints cash card with code

Purchaser enters refill code in cellular phone etc.

Figur 3
INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO 01/00338

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G07F 7/00, H04M 17/00
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)

IPC7: G07F, H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

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

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents
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Date of the actual completion of the international search: 27 November 2001
Date of mailing of the international search report: 03-12-2001

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