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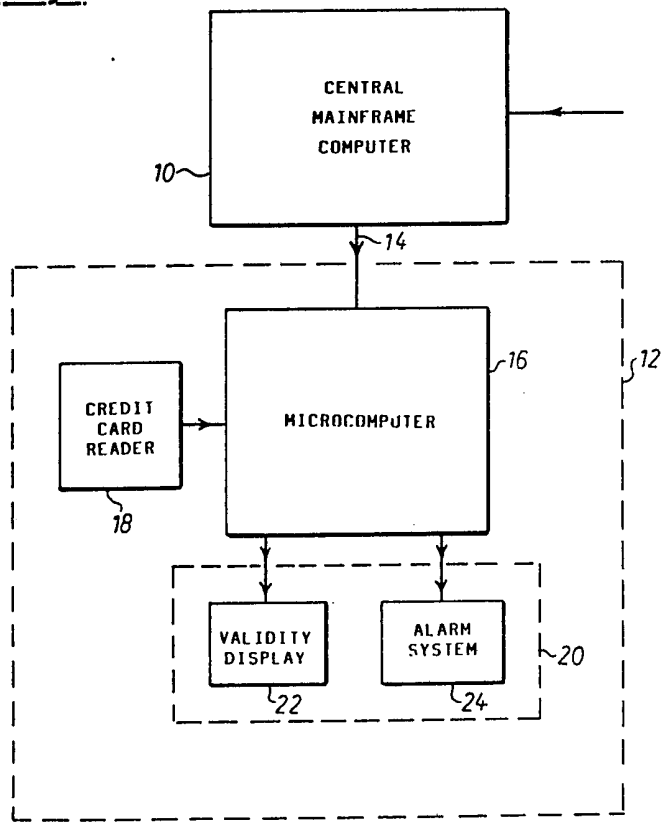
(54) Credit card validation system

(57) A credit card validation system wherein information is supplied to a central computer (10) concerning the identity of invalid credit cards and the central computer then updates the memories of a plurality of remote computers (16) for example, by way of telephone lines, so that each remote computer (16) contains a list of all currently invalid cards; each remote computer (16) has a card reader (18) or keyboard which enables the card number to be inserted of any card whose validity status is to be checked at the remote location; that remote computer (16) then compares the inserted number with the list of invalid numbers in its memory and indicates the result to the operator (20).

Fig 1



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The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.
The print reflects an assignment of the application under the provisions of Section 30 of the Patents Act 1977.

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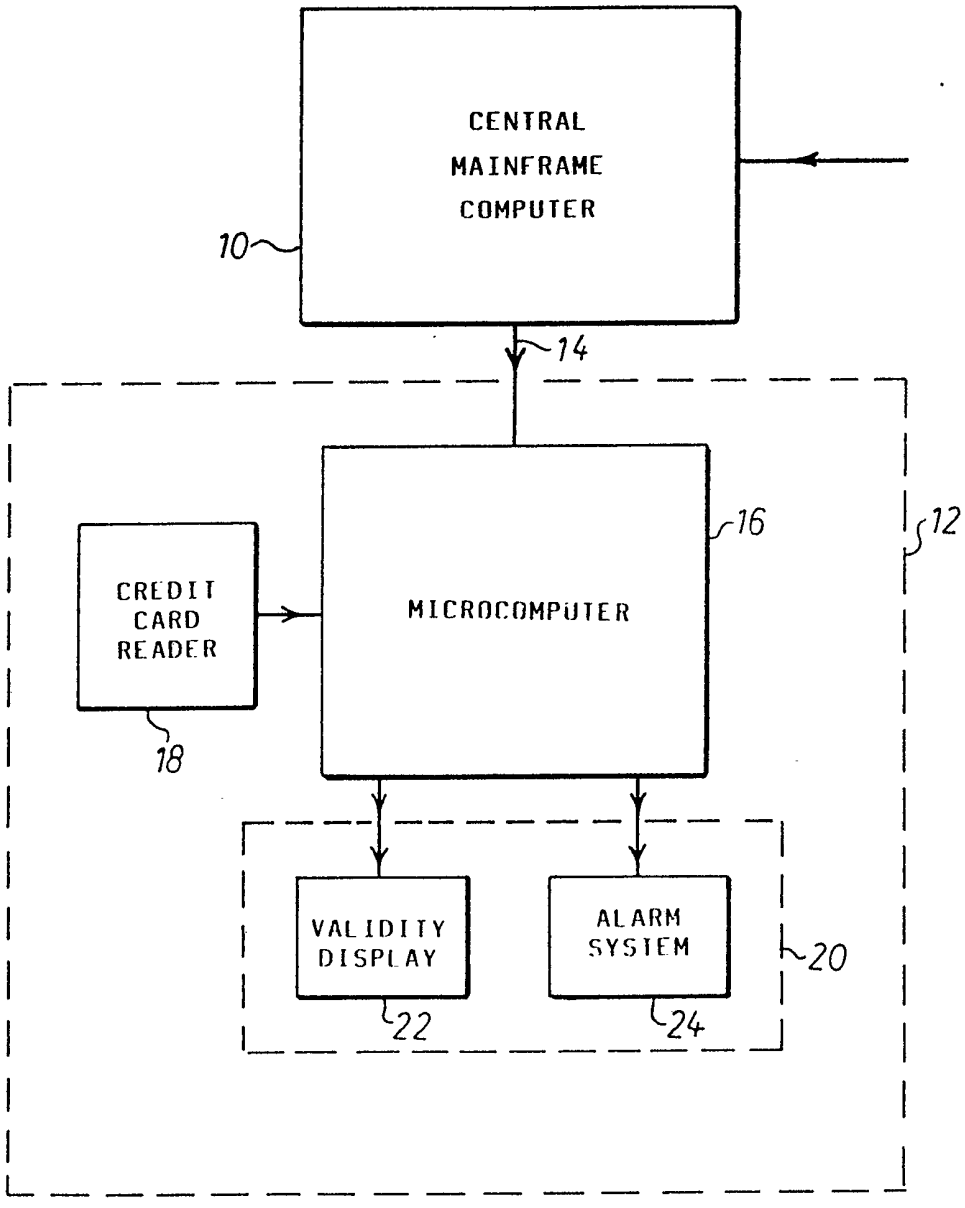
Fig 1



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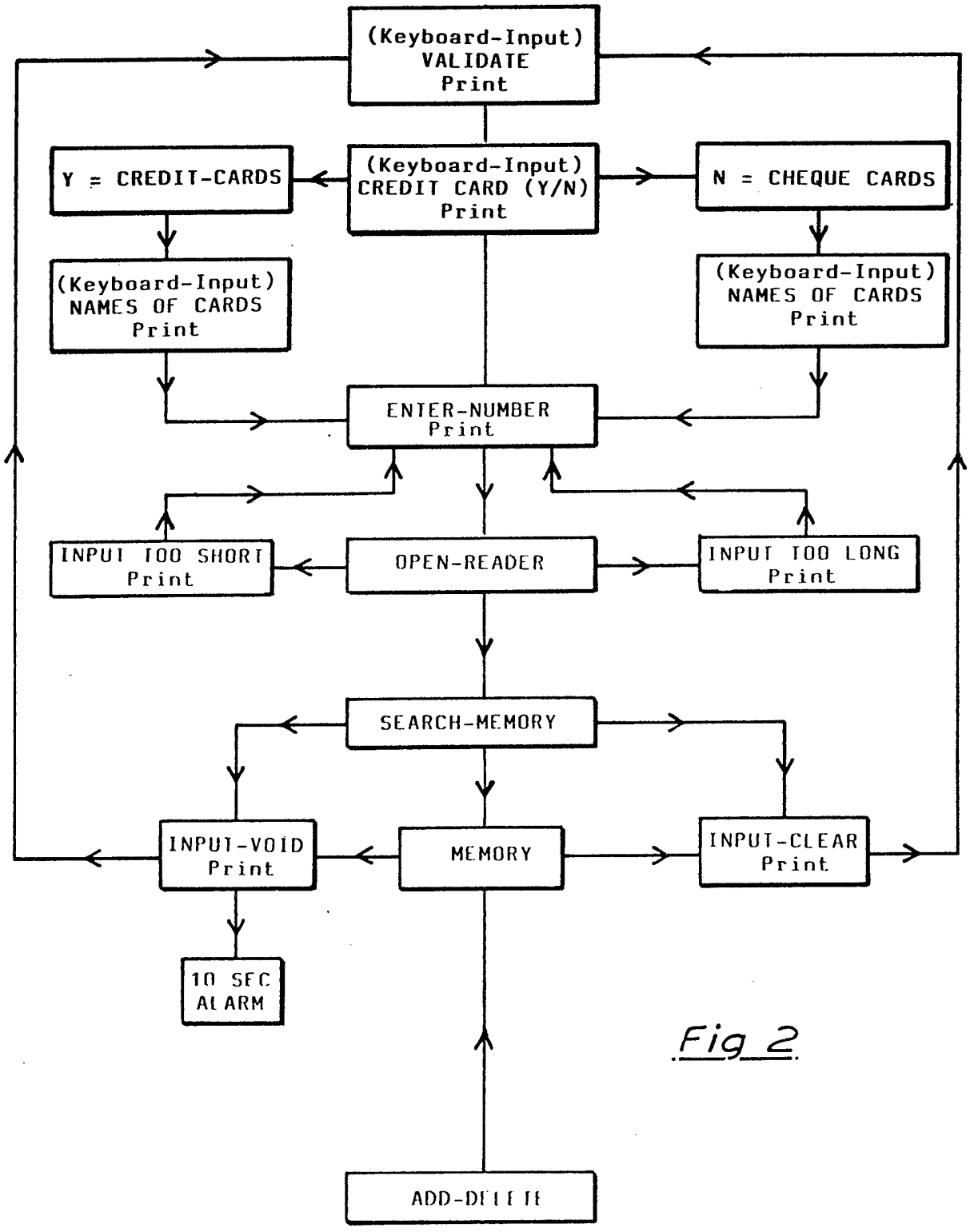

Fig 2

SPECIFICATION

Credit card validation system

The present invention resides in a credit card validation system.

Credit cards are used extensively to enable a wide variety of transactions, such as payment of bills, to take place without the use of cash. Some credit cards even allow the credit card user to obtain cash at authorized cash dispensers. It is no wonder, then, that credit cards have proved very useful to the individual who, by use of the credit card, can beneficially control his own cash flow.

Unfortunately many credit cards are lost or stolen and, if not reported immediately, this can result in another person using that credit card for his own gain at the expense of the authorized credit card user. This in turn means that the credit card organisation incurs some financial loss as the credit card holders are usually assured of losing only a certain amount if they inform the credit card organisation within a specified period. Despite millions of pounds being lost this way every year, there has been no satisfactory answer to this problem as yet.

Credit card validation systems are known in which a regularly updated printed list of invalid credit card numbers is sent by the credit card organisation to each shop or bank which accepts their credit card. Whenever a credit card is used in such a shop or bank, the cashier checks the number of that card with the invalid numbers on the list. In this way it is determined whether the credit card is valid or not. Unfortunately, it is often the case that the cashier does not carry out a full check of the invalid numbers because of the time this would take. Also, there is a considerable delay between the time a lost card is reported to the credit card organisation and the time an updated list of invalid cards is received by all relevant shops and banks. Consequently this system is very susceptable to error, resulting in a reduced chance of identifying lost or stolen credit cards when they are presented.

It is an object of the present invention to provide a credit card validation system which can greatly reduce the fraudulent use of credit cards.

In accordance with the present invention there is provided a credit card validation system comprising a central computer by which data concerning invalid credit cards can be sent to one or more remote computers, each of which is arranged to compare the data received from said central computer with data received locally concerning individual credit cards in order to test the prevailing validity of such credit cards, and having an input device for inputting to the remote computer the data concerning individual credit cards and an output device from the remote computer for revealing the validity status of the individual credit cards.

Thus, in a system in accordance with the invention, information is supplied to the central computer concerning the identity of invalid credit cards and the central computer then updates the memories of all remote computers, for example by way of telephone lines, so that each contains a list of all currently invalid cards; each remote computer has associated with it a card reader or input keyboard which enables the card number to be inserted of any card whose validity status is to be checked at the remote location; that remote computer then compares the number which has been inserted with the list of invalid numbers in its memory and indicates the result of the comparison to the operator by way of the output device; the operator is thus able to determine quickly whether or not the card can be accepted for a given transaction.

The invention will now be described further hereinafter, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram of one embodiment of a credit card validation system of the present invention, end

Fig. 2 is a flow diagram of one possible programme for operating the invention.

The illustrated system is capable of checking the validity of credit cards and enables the list of invalid numbers to be updated at anytime, thus reducing considerably the fraudulent use of credit cards.

The system comprises a central main frame computer 10 to which each of a plurality of user systems, only one of which is indicated by the dotted line 12 in the drawing, is connected via a respective telephone line 14. Each user system 12, which is situated in, say, each branch of a bank or shop, comprises a dedicated credit card micro-computer 16, a credit card reader 18, and means for indicating the validity of a credit card, shown by dotted line 20. In the embodiment shown in the drawing, the validity indicator 20 comprises a display 22 for confirming whether the credit card is valid or not and an alarm system 24 which is triggered upon detection of an invalid credit card.

Whenever a credit card is lost or stolen, the credit card holder telephones the computer centre containing the main frame computer 10, and gives the number of the missing card. It is not necessary for the user to give his personal identification number, PIN, down the telephone line. This can be found out at the computer centre via the credit card number. The PIN number is then inputted into the main frame computer 10 which then immediately outputs the number to every user system 12 connected to it where it is stored in the memory of the microcomputer 16. This ensures that each user system 12 is always

updated with new information concerning invalid credit card numbers.

On the back of every credit card there is a magnetic strip which contains coded information concerning the PIN number and the credit card organisation identification number. This information is read into the micro-computer 16 via a magnetic tape head in the credit card reader 18 whenever a credit card is used in the shop or bank containing the user system 12. The microcomputer is programmed to compare the PIN number with the invalid numbers in its memory and to trigger the validity indicator 20 which reveals to the cashier whether the card is valid or not. In the embodiment shown in the drawing, a display 22 is used to indicate validity in conjunction with an alarm system 24 which is triggered by the microcomputer 16 whenever an invalid card is detected.

If a user system 12 does have an alarm system 24 it might comprise a video camera to record an image of the person presenting the invalid card or an audio alarm or both or indeed any kind of security system the circumstances demand. In other instances it may only be necessary to have a visual display of validity thus omitting the alarm system. The validity indicator 20 is not restricted to a display ot an alarm system but may comprise any means of indication, such as a printer.

The microcomputer includes first memory (e.g. a RAM) to hold the information received from the central computer via the telephone line and second memory (e.g. a ROM or EPROM) to hold the necessary programme for controlling the microcomputer operations.

It is normal practice for shops to issue receipts when a credit card transaction takes place. This is usually achieved by placing a receipt slip over the credit card and passing a sliding plate over it to ensure that the credit card number, revealed in raised lettering on the card, is printed onto the receipt slip by the usual carbon copy technique. The card reader 18 of the present invention reads the PIN number and the credit card organisation identification number from the magnetic strip on the back of the credit card and, as such, has a distinctly different function from the above-mentioned receipt-issuing reader. In the receipt-issuing reader the card remains stationary while the sliding plate is passed over it whereas in the credit card reader 18, the card is moved over the magnetic tape head in a sliding holder. It is possible to perform these two functions simultaneously. This can be done, for example, by ensuring that the magnetic tape head moves under the credit card as the sliding plate passes over it.

In order that the PIN number and credit card organisation identification number are fully read into the microcomputer 16 via the card reader 18, the micro-computer is programmed so that it only accepts a certain number of bits. For each credit card, the same number of bits is used to store the numbers in the magnetic strip. If the number of bits is, say, 8 then if a different number of bits is read into the microcomputer 16 the information will not be accepted. The validity display 20 is then triggered to indicate this.

The credit card validator of the present invention, as well as being able to keep an up to date list of invalid numbers which can be readily checked against each credit card used can be equipped to prevent unauthorised access to its memory contents.

Unauthorised memory access can be achieved by connecting another computer into telephone line 14 between the mainframe computer 10 and the user system 12. However, this is prevented in the present system by means of a code number sent with every number from the main-frame computer 10. The code number is sent first, then the associated PIN number of a credit card, the credit card organisation identification number and finally information to determine whether the number being sent is to be added to the list of invalid numbers or deleted from it. The microcomputer 16 is programmed so that if the code number is not received then it instantly deletes the whole of the memory contents. This prevents the memory contents from being altered by an unauthorised user. At the same time the validity indicator 20 gives an indication of what has happened. The user system 12 can then be shut down until such time as the unauthorised user is disconnected from the system. The main frame computer 10 can then re-load all invalid numbers into the microcomputer 16 and the system used again.

An important advantage of this system is that the information sent from the mainframe computer 10 to the microcomputer 16 is just a series of numbers and no actual money transfers take place. Thus there is less incentive for people to try to alter the memory contents of the microcomputer 16. Most credit card frauds are done by individuals or small groups of people for whom it would be too much trouble in any case.

Although, as described above, it is preferred for the information in the cards to be inserted by way of a magnetic reader, in other embodiments it is equally possible for the card number to be inserted manually by way of a keyboard at the location where the validation is to be effected.

In those embodiments which do employ a magnetic reader, the apparatus in which the reader head is incorporated can comprise the conventional mechanism currently used for mechanically printing out the payment and receipt slip from the card itself. As mentioned above, this employs a sliding plate carried by a bridge mechanism which is manually displaced over the card with the payment and

receipt slip located therebetween. The magnetic reader can be mounted on the underside of this bridge mechanism so that when the card is placed in an inverted position in the apparatus and the bridge mechanism is manually displaced over the card, the reader passes over the magnetic strip on the card to extract the necessary information from it. Upon the card being positively validated it can then simply be inverted, the necessary slip inserted over it and the bridge mechanism operated once more to perform the usual formation of the receipt slips.

It should be understood that the term "credit card" as used herein includes similar card devices, such as cheque cards.

Reference is directed to the accompanying Fig. 2 which is a flow diagram of an example of one possible programme for controlling the user system 12 of Fig. 1.

CLAIMS

1. A credit card validation system comprising one or more remote computers and a central computer by which data concerning invalid credit cards can be sent to said one or more remote computers, the or each remote computer being arranged to compare the data received from said central computer with data received locally concerning individual credit cards in order to test the prevailing validity of such credit cards, and the or each computer having an input device for inputting to that remote computer the data concerning individual credit cards and an output device for revealing the validity status of the individual credit cards.

2. A credit card validation system as claimed in claim 1 wherein the input device of the or each remote computer comprises a magnetic reader, means being provided for achieving relative displacement of the card to be validated and the magnetic reader whereby coded information contained on the card is read into the remote computer, the latter computer being programmed to compare the information read magnetically from the card with the invalid numbers in its memory and to trigger the output device appropriately to reveal whether the card is valid or not.

3. A credit card validation system as claimed in claim 2 wherein the magnetic reader is incorporated in a receipt-forming device wherein a receipt slip is placed over the card and a sliding plate is passed over the receipt slip so that the credit card number, revealed in raised lettering on the card, is printed onto the receipt slip by a carbon copy technique, the magnetic head being coupled to the sliding plate whereby to be displaced relative to the card during movement of the sliding plate.

4. A credit card validation system as claimed in claim 1, wherein the input device of the or each remote computer comprises a keyboard by which information concerning the card number can be entered into that remote computer, the latter computer being programmed to compare the information introduced by the keyboard with the invalid numbers in its memory and to trigger the output device appropriately to reveal whether the card is valid or not.

5. A credit card validation system as claimed in claim 2, 3 or 4 wherein detection of an invalid card presented to a remote computer is arranged to trigger an alarm.

6. A credit card validation system as claimed in claim 5 wherein the alarm includes a video camera positioned to record an image of the person presenting the invalid card.

7. A credit card validation system as claimed in any of claims 1 to 6 wherein the or each remote computer is programmed to accept only a predetermined number of bits sufficient to identify fully any particular card.

8. A credit card validation system as claimed in any of claims 1 to 7, wherein unauthorised access to the or each remote computer is prevented by arranging for the central computer, when sending invalid numbers to the or each remote computer, to preface the information concerning invalid numbers with a special code number, the remote computer(s) being programmed such that if it receives instructions to alter the invalid numbers in its memory without receiving the appropriate code number, it immediately deletes the whole of its memory content or invalid numbers until such time as the system is reset by way of the central computer.

9. A credit card validation system comprising a central computer which is arranged to accept information concerning the identify of invalid credit cards and to then update the memories of a plurality of remote computers so that each contains a list of all currently invalid cards, each remote computer having associated with it a card reader or input keyboard which enables the card number to be inserted of any card whose validity status is to be checked at the remote locations, that remote computer being arranged to then compare the number which has been inserted with the list of invalid numbers in its memory and to indicate the result of the comparison to the operator by way of an output device whereby the operator is thus able to determine whether or not the card can be accepted for a given transaction.

10. A credit card validation system as claimed in claim 9, wherein the central computer updates the remote computers by way of respective telephone lines.

11. A credit card validation system comprising a central computer by which data concerning invalid credit cards can be sent to one or more remote computers, each of which is arranged to compare the date received from

said central computer with data received locally concerning individual credit cards in order to test the prevailing validity of such credit cards, and having an input device for inputting to the remote computer the data concerning individual credit cards and an output device from the remote computer for revealing the validity status of the individual credit cards.

12. A credit card validation system substantially as hereinbefore described with reference to Fig.1 of the accompanying drawings.

13. A credit card validation system as claimed in any of the foregoing claims, when programmed in accordance with the programme of Fig.2.

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