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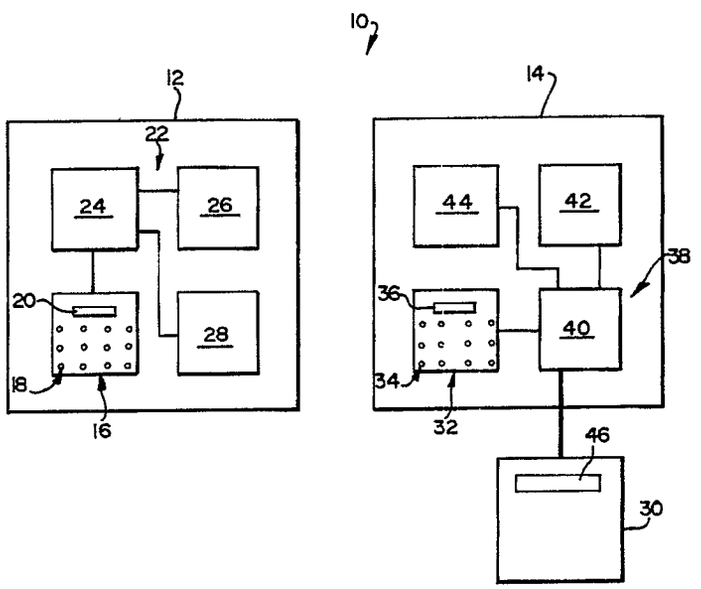
## (54) Credit supply system.

(57) A credit supply system 10 includes a code-generating means 12 for generating a code in response to the provision of predetermined information by a consumer and for supplying the consumer with the code in a discernible format, the code including data representative of a predetermined sum of funds. An operating means 14 is operable by the consumer and is connected to a device 30 to be operated, the operating means 14 including an entering means 32 for enabling the consumer manually to enter the code into the operating means 14, the operating means 14 controlling the device 30 to provide the consumer with goods or services to the value of the sum of funds encoded in the code.

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# CREDIT SUPPLY SYSTEM

THIS INVENTION relates to a credit supply system. More particularly, the invention relates to an electronic credit supply system used for the pre-payment of goods or services and to a method of supplying credit.

According to one aspect of the invention, there is provided a credit supply system which includes

a code-generating means for generating a code in response to the provision of predetermined information by a consumer and for supplying the consumer with the code in a discernible format, the code including data representative of a predetermined sum of funds; and

an operating means which is operable by the consumer and which is connected to a device to be operated, the operating means including an entering means for enabling the consumer manually to enter the code into the operating means, the operating means controlling the device to provide the consumer with goods or services to the value of the sum of funds encoded in the code.

The code generating means may comprise a dedicated unit or, instead, the code-generating means may comprise existing equipment.

In the case of a dedicated unit, the code-generating means may include an input device by means of which an operator enters the said predetermined information. The said predetermined information may comprise information relating to the value of funds required by the consumer, the date, and an identification number of the device connected to the operating means for which the consumer requires the funds. It will be appreciated that the code-generating means may be operable either by the consumer personally or by a person manning the code-generating means. In the latter case, the said person will be supplied with the infomation by the consumer, the person then entering the information via the input device.

The code-generating means may also include a processing means, which may be in the form of a microprocessor, for analysing the information entered by the operator via the input device and for generating the code, the processing means having a memory means in which a crypto-algorithm is stored which encrypts the information to provide the code.

A printing means may be connected to the processing means for printing out the code in a visual format for the consumer. Thus, for example, the code may comprise a predetermined string of numerals, letters, or a combination thereof. Instead of a printing means, the consumer may be able to be placed in communication with the code-generating means via a telephone line. Then, the consumer may be provided with the code aurally by the person manning the code-generating means.

The processing means may be operable to verify that the amount entered by the consumer via the input device is the same as that paid in by the consumer.

The system in accordanoe with the invention is intended particularly for use in the provision of funds for utilities used by a consumer. However, those skilled in the art will appreciate that other applications of the system will be readily apparent. Thus, for example, the system, in accordance with the invention, could be used for purchasing goods or services such as, for example, bus or train tickets, or the like, transfer of funds in banks, etc.

In the case of the utilisation of the system with utilities, the device to which the the operating means is connected may be a utilities meter in a premises of the consumer, for example, an electricity meter or a water meter.

The operating means may include a processing means to which the entering means is connected, the processing means including a memory means in which a crypto-algorithm is stored for deciphering the code entered into the processing means by the consumer via the entering means. The processing means may then be operable to determine the value of funds purchased by the consumer and to credit the consumer's utilities meter with the said value of funds.

To improve the security of the system, a storage means may be connected to the processing means, prior codes which have been entered being stored in the storage means. Thus, in use, when the consumer enters a new code into the operating means, this code is compared with the prior codes stored in the storage means by the processing means. If the code is the same as a previous code entered by the consumer, the processing means will cause the new code entered by the consumer to be rejected.

According to a second aspect of the invention, there is provided a method of supplying credit which includes

generating a code in response to the provision by a consumer of predetermined information, the code including data representative of a predetermined sum of funds;

issuing the consumer with the code in a discernible format; and

entering the code manually into an operating means, operable by the consumer and to which a device to be operated is connected, to provide the consumer with goods or services to the value of the sum of funds encoded in the code.

The method may include analysing the information and encrypting the information by means of a crypto-algorithm to provide the code.

The method may then include, after the code has been entered into the operating means, deciphering the code to determine the value of the sum of funds to provide a store of credit for the device to enable the device to be operated.

The method may also include comparing the code entered into the operating means with prior codes stored in the operating means and, if the code is the same as any one of the prior codes, rejecting the code so entered and, if the code differs from the prior codes, accepting the code thereby to provide a store of credit for the device.

Although the system has been described with reference to the code-generating means being a dedicated unit, it will be appreciated that an existing unit, for example, an automatic teller machine of a bank could be used. Then, when the consumer enters the said information into the machine, the consumer's bank account would be debited and a credit supplier's bank account would be correspondingly credited by the machine.

The invention is now described by way of example with reference to the accompanying diagrammatic drawing which shows, in block diagram form, a credit supply system in accordance with the invention.

Referring to the drawing, a credit supply system, in accordance with the invention, is illustrated and is designated generally by the reference numeral 10. The system 10 comprises a code generating means 12 for generating a unique code representative of predetermined information. The system 10 further includes an operating means 14 operable by a consumer, the operating means 14 being connected to a device to be controlled as will be described below.

The code generating means 12 includes an input device 16 comprising a keypad 18 and a display 20. The input device 16 is connected to a processing means 22 having a microprocessor 24 and a memory means 26. A printer 28 is connected to the microprocessor 24.

The system 10 in accordance with the invention is intended particularly for use by a consumer wishing to utilize predetermined utilities such as, for example, electricity, water, gas, or the like, or a telephone service. The example illustrated makes reference to the use of the system 10 with reference to the consumption of electricity by the consumer. Those skilled in the art will, however, appreciate that the system 10 can be used in other applications, such as, for example, the purchase of bus or train tickets, aeroplane tickets, or the like, the transfer of funds in banks, or the purchases of other goods or services.

Thus, the operating means 14, is connected to the device which, in the example illustrated, is an electricity meter 30 of the consumer's premises.

The operating means 14 comprises an entering means in the form of a keypad 32 having a plurality of keys 34 and a display 36.

The keypad 32 is connected to a processing means 38 which includes a microprocessor 40. The processing means 38 has a memory means 42 in which a crypto-algorithm is stored and a storage means 44 in which previous codes entered by the consumer are stored.

The various components of the system 10 will be readily realizable to a person skilled in the art and, as such, the components are not described any further herein.

In use, the consumer provides the predetermined information which the consumer can either enter into the code-generating means 12 via the keypad 18 of the input device 16 personally or the information can be entered by an operator manning the code-generating means 12. Thus, for example, the consumer or operator would enter into the code-generating means via the keypad 18 information relating to the date, the value of electricity which the consumer wishes to purchase and an identification number of the consumer's electricity meter. If the consumer enters the information personally, the microprocessor 24 then verifies via an appropriate verification means (not shown) that the amount paid in by the consumer is the same as the amount entered via the keypad 18.

A crypto-algorithm is stored in the memory means 26 and the microprocessor 24 encrypts the information entered via the keypad 18 to generate the unique code. The consumer is provided with the code via the printer 28.

At his premises, the consumer then enters the code generated by the microprocessor 24 into the operating means 14 via the keypad 32.

The microprocessor 40 verifies, by comparing the code entered via the keypad 32 with previous codes stored in the storage means 44 that the code entered by the consumer is a new code. Should the code entered by the consumer be the same as a code entered previously and stored in the storage means 44, the microprocessor 40 rejects the code entered by the consumer.

If the code entered by the consumer is found to be unique, the crypto-algorithm stored in the memory means 42 is employed by the microprocessor 40 to decipher the code to obtain therefrom the amount of utilities purchased by the consumer. The microprocessor 40, utilising the crypto-algorithm in the memory means 42 also verifies that that portion of the code relating to the identification number of the electricity meter 30 in fact corresponds with the identification number of the me-

ter 30. Should it not do so, the code will be rejected.

If the microprocessor 40 determines that the code is correct in all respects, the amount of utilities purchased is entered into the electricity meter 30 and this amount is displayed on a display 46 of the electricity meter 30.

It will be appreciated that, instead of the consumer being supplied with the code in a printed format, the consumer may either directly or via a third party, such as a hawker, contact the operator telephonically to be provided with the code in an aural format. The consumer would then enter the code so provided in the operating means 14 in the same manner as that described above. In this situation, the consumer's account which he has with the supplier of the utilities would be debited by the operator via the processing means 22. It will be appreciated that in such a case and to obviate the need to collect payment from the consumer the consumer's account would have to be in credit. If, however, the consumer deals through the third party, payment would be made by the consumer to the third party who would confirm that he has received payment, prior to the code being provided to the consumer.

Hence, by means of the invention, a novel system is provided for supplying credit by a supplier of goods or services to a consumer thereof. The provision of the code in a printed format or an aural format obviates the need for sophisticated electronic equipment to encode and read devices such as magnetic or "smart" cards.

## Claims

1. A credit supply system which includes
a code-generating means for generating a code in response to the provision of predetermined information by a consumer and for supplying the consumer with the code in a discernible format, the code including data representative of a predetermined sum of funds; and
an operating means which is operable by the consumer and which is connected to a device to be operated, the operating means including an entering means for enabling the consumer manually to enter the code into the operating means, the operating means controlling the device to provide the consumer with goods or services to the value of the sum of funds encoded in the code.

2. The system as claimed in Claim 1 in which the code-generating means includes an input device by means of which an operator enters the said predetermined information.

3. The system as claimed in Claim 2 in which the code-generating means includes a processing means for analysing the information entered by the operator via the input device and for generating the code, the processing means having a memory means in which a crypto-algorithm is stored which encrypts the information to provide the code.

4. The system as claimed in Claim 3 in which a printing means is connected to the processing means for printing out the code in a visual format for the consumer.

5. The system as claimed in any one of the preceding claims in which the operating means includes a processing means to which the entering means is connected, the processing means including a memory means in which a crypto-algorithm is stored for deciphering the code entered into the processing means by the consumer via the entering means.

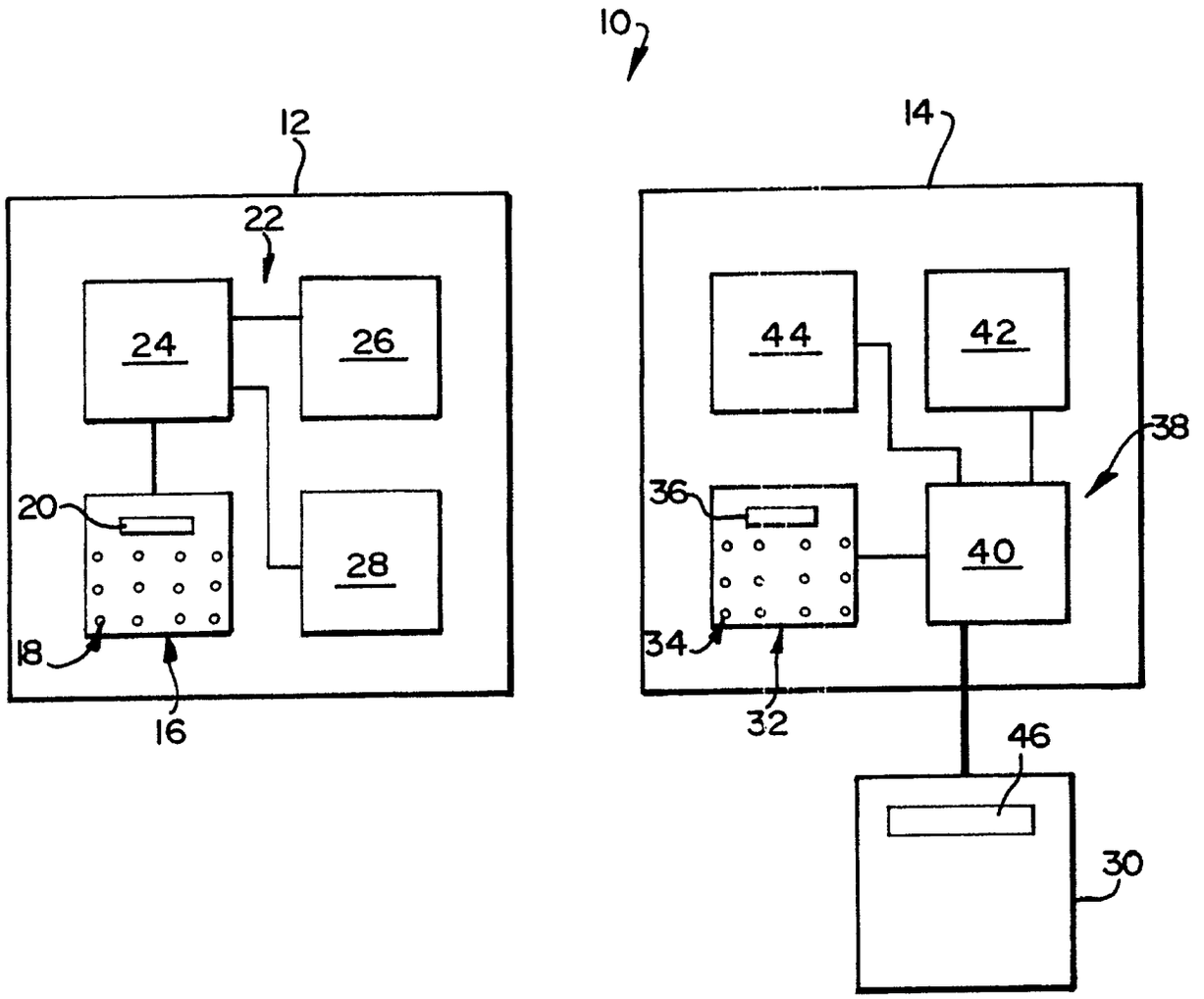
6. The system as claimed in Claim 5 in which a storage means is connected to the processing means, prior codes which have been entered being stored in the storage means.

7. A method of supplying credit which includes
generating a code in response to the provision by a consumer of predetermined information, the code including data representative of a predetermined sum of funds;
issuing the consumer with the code in a discernible format; and
entering the code manually into an operating means, operable by the consumer and to which a device to be operated is connected, to provide the consumer with goods or services to the value of the sum of funds encoded in the code.

8. The method as claimed in Claim 7 which includes analysing the information and encrypting the information by means of a crypto-algorithm to provide the code.

9. The method as claimed in Claim 7 or Claim 8 which includes, after the code has been entered into the operating means, deciphering the code to determine the value of the sum of funds to provide a store of credit for the device to enable the device to be operated.

10. The method as claimed in any one of Claims 7 to 9 inclusive which includes comparing the code entered into the operating means with prior codes stored in the operating means and, if the code is the same as any one of the prior codes, rejecting the code so entered and, if the code differs from the prior codes, accepting the code thereby to provide a store of credit for the device.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# EUROPEAN SEARCH REPORT

Application Number

EP 90310141.8

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
|---|---|---|---|
| X | FR - A - 2 575 016 (GRANDMOUGIN) * Totality * | 1-10 | G 07 F 7/08 |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

G 07 F 7/00
H 04 M 17/00

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| VIENNA | 28-12-1990 | BEHMER |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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