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(54) **Credit supply system**

Kreditversorgungssystem

Système distributeur à crédit

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(73) Proprietor: **METER PATENT DEVELOPMENT (PROPRIETARY) LIMITED**
Sandton, Transvaal Province (ZA)

(72) Inventor: **Youngleson, Jonathan Sinclair**
Johannesburg, Transvaal Province (ZA)

(74) Representative: **Driver, Virginia Rozanne et al**
Page White & Farrer
54 Doughty Street
London WC1N 2LS (GB)

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EP 0 420 466 B2

Description

[0001] 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.

[0002] FR-A-2575016 describes a system for use in a telephone network wherein an account number is issued by a central authority upon the payment of a sum of funds by a prospective user of a public telephone. The account number has five alphanumeric characters. Telephone apparatus are connected to a central processing unit which monitors a memory and decrements the stored value of funds against that account number according to the telephone usage.

[0003] EP-A-219577 describes a device for controlling the delivery of a utility to a subscriber in which the utility supplier generates a value code which can be used by the subscriber to operate a local device. The value code includes information relating to an amount of the utility and a so-called "period code" which is a further code which is used to enable the local device, and a control number which is used at the local device to check the validity of the value code. The value code includes information related to the period code which is stored at the local device. It is thus necessary for the utility supplier to maintain a record of the period codes of local devices. The period code is a variable control number which must be duplicated at the central office and at the local devices.

[0004] An object of the invention is to provide a credit supply system where the operation of the local device is wholly independent of the utility supplier.

[0005] Moreover, it is an object of the invention to provide a credit supply system where a consumer can determine the amount in value of the goods or services which he wishes to purchase.

[0006] According to one aspect of the invention there is provided a system as claimed in claim 1.

[0007] The code generating means may comprise a dedicated unit or, instead, the code-generating means may comprise existing equipment.

[0008] 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.

[0009] 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.

[0010] A printing means may be connected to the processing means for printing out the code in a visual format for the consumer. 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.

[0011] 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.

[0012] The system in accordance 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.

[0013] In the case of the utilisation of the system with utilities, the device to which 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.

[0014] The processing means at the operating means can be connected to the entering means, 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.

[0015] 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.

[0016] According to the invention, there is also provided a method as claimed in claim 7.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] The keypad 32 is connected to a processing means 38 which indudes 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.

[0027] 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.

[0028] 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.

[0029] 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.

[0030] At his premises, the consumer then enters the code generated by the microprocessor 24 into the operating means 14 via the keypad 32.

[0031] 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.

[0032] 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 meter 30. Should it not do so, the code will be rejected.

[0033] If the microprocessor40 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.

[0034] 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.

[0035] 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 system (10) for supplying a consumer with prepaid goods or services which includes:

   a code-generating means (12) for generating a code which includes data representative of the value of said goods or services and for supplying the consumer with the code as a string of numerals or letters or a combination thereof in a discernible format;
   a device (30) located at the consumer's premises for delivering the goods or services and having an identification number;
   an operating means (14) also located at the consumer's premises which is operable by the consumer and which is connected to the device (30), the operating means (14) including an entering means (32) comprising a keypad having a plurality of keys for enabling the consumer to enter the code into the operating means and a processing means (38) for processing the code and for permitting operating of the device (30) to deliver goods or services, the operating means (14) being operable without communicating with the code-generating means, characterised in that;
   the code generating means (12) includes means (16) for inputting information supplied by the consumer including the identification number of the device and a sum of funds determined and made available by the consumer to indicate said value, and provides a code which includes the data representative of the sum of funds and the identification number; and the processing means (38) includes means for deciphering the code and for comparing the identification number derived from the code with the identification number of the device and is operable to reject the code if they do not correspond and for permitting operating of the device (30) to deliver goods or services to the value of the sum of funds when the identification numbers correspond.

2. The system as claimed in claim 1 in which a storage means is connected to the processing means, prior codes which have been entered being stored in the storage means for comparison with subsequent codes so that should the code entered by the consumer be the same as a prior code, the entered code is rejected.

3. The system as claimed in claim 1 or 2 in which the code-generating means includes a processing means (22) for analysing the information entered by the operator via the input means (16) and for generating the code, the processing means having a memory means (26) 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 (28) is connected to the processing means (22) 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 processing means (38) indudes a memory means (42) in which a crypto-algorithm is stored for deciphering the code entered into the processing means (38) by the consumer via the entering means (32).

6. The system as claimed in claim 5 in which the processing means (38) is operable to decipher the code to obtain therefrom the amount of utilities purchased by the consumer.

7. A method of supplying a consumer with prepaid goods or services, which includes:

   generating a code by means of a code generating means (12), said code including data representative of the value of said goods or services;
   issuing the code to a consumer as a string of numerals or letters or a combination thereof in a discernible format; and
   by means of a keypad, entering the code manually into an operating means (14) operable by the consumer and to which a device (30) to be operated is connected, said device having an identification number, and processing the code to permit the supply of goods or services to the consumer, the operating means being operable, without communicating with the code generating means (12), to provide the consumer with goods or services, characterised in that;
   the consumer determines and makes available a sum of funds relating to said value and sup-

plies the identification number of the device (30), this information being encoded such that the code includes the data representative of the sum of funds and the identification number; and there is carried out at the operating means (14) the steps of deciphering the code, comparing the identification number derived from the code with the identification number of the device (30), rejecting the code if they do not correspond and delivering goods or services to the value of the sum of funds if they do correspond.

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 storing each code entered into the operating means and comparing a code which has been entered with the prior stored codes 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.

Patentansprüche

1. System (10) zum Beliefern eines Verbrauchers mit vorbezahlten Waren oder Dienstleistungen, welches beinhaltet:

- eine Codeerzeugungseinrichtung (12) zum Erzeugen eines Codes, der Daten enthält, die den Wert der Waren oder Dienstleistungen repräsentieren, und zum Beliefern des Verbrauchers mit dem Code in einem erkennbaren Format als Zeichenfolge von Ziffern oder Buchstaben oder einer Kombination davon;
- eine Vorrichtung (30) zum Liefern der Waren oder Dienstleistungen, die sich in den Räumlichkeiten des Verbrauchers befinden und eine Identifikationsnummer aufweisen;
- eine ebenfalls in den Räumlichkeiten des Verbrauchers befindliche Betätigungseinrichtung (14), die durch den Verbraucher betätigbar und mit der Vorrichtung (30) verbunden ist, wobei die Betätigungseinrichtung (14) eine Tastatur, die eine Vielzahl Tasten aufweist, umfassende Eingabeeinrichtung (32), die es dem Verbraucher ermöglicht, den Code in die Betätigungseinrichtung einzugeben, und eine Verarbeitungseinrichtung (38) zum Verarbeiten des Codes und zum Ermöglichen des Betriebs der Vorrichtung (30), Waren oder Dienstleistungen zu liefern, umfaßt, wobei die Betätigungseinrichtung (14) betätigbar ist ohne mit der Codeerzeugungseinrichtung (12) zu kommunizieren, dadurch gekennzeichnet, daß
- die Codeerzeugungseinrichtung (12) eine Einrichtung (16) umfaßt zum Eingeben von durch den Verbraucher gelieferter Information einschließlich der Identifikationsnummer der Vorrichtung und einer Geldsumme, die durch den Verbraucher festgelegt und verfügbar gemacht ist, um den Wert anzugeben, und einen Code liefert, der die für die Geldsumme und die Identifikationsnummer repräsentative Daten beinhaltet; und
- die Verarbeitungseinrichtung (38) Mittel umfaßt zum Entschlüsseln des Codes und zum Vergleichen der von dem Code abgeleiteten Identifikationsnummer mit der Identifikationsnummer der Vorrichtung und den Code zurückweist, wenn diese einander nicht entsprechen, und zum Zulassen einer Betätigung der Vorrichtung (30) zum Liefern von Waren oder Dienstleistungen zu dem Wert der Geldsumme, wenn die Identifikationsnummer sich entsprechen.

2. System nach Anspruch 1, bei dem eine Speichereinrichtung mit der Verarbeitungseinrichtung verbunden ist, wobei früher eingegebene Codes in der Speichereinrichtung gespeichert sind zum Vergleich mit nachfolgenden Codes, so daß, sollte der von dem Verbraucher eingegebene Code derselbe sein wie ein früherer Code, der eingegebene Code zurückgewiesen wird.

3. System nach Anspruch 1 oder 2, bei dem die Codeerzeugungseinrichtung eine Verarbeitungseinrichtung (22) zur Analyse der durch die Bedienperson über die Eingabeeinrichtung (16) eingegebenen Information und zum Erzeugen des Codes ist, wobei die Verarbeitungseinrichtung einen Speicher (26) aufweist, in dem ein Verschlüsselungsalgorithmus gespeichert ist, der die Information verschlüsselt, um den Code bereitzustellen.

4. System nach Anspruch 3, bei dem eine Druckeinrichtung (28) mit der Verarbeitungseinrichtung (22) zum Ausdrucken des Codes in einem für den Verbraucher sichtbaren Format verbunden ist.

5. System nach einem der vorstehenden Ansprüche, bei dem die Verarbeitungseinrichtung (38) eine Speichereinrichtung (42) umfaßt, in dem ein

Schlüsselalgorithmus gespeichert ist zum Entschlüsseln des von dem Verbraucher über die Eingabeeinrichtung (32) in die Verarbeitungseinrichtung (38) eingegebenen Codes.

6. System nach Anspruch 5, bei dem die Verarbeitungseinrichtung (38) den Code entschlüsselt, um hieraus die Menge der von dem Verbraucher erworbenen Güter zu erhalten.

7. Verfahren zum Versorgen eines Verbrauchers mit vorbezahlten Waren oder Dienstleistungen, welches umfaßt:

- Erzeugen eines Codes mittels einer Codeerzeugungseinrichtung (12), wobei der Code Daten enthält, die den Wert der Waren oder Dienstleistungen repräsentieren;
- Ausgeben des Codes an einen Verbraucher in einem erkennbaren Format als Zeichenfolge von Ziffern oder Buchstaben oder einer Kombination davon;
- manuelles Eingeben des Codes unter Verwendung einer Tastatur in eine Betätigungseinrichtung (14), die durch den Verbraucher betätigbar ist und mit der eine zu bedienende Vorrichtung (30) verbunden ist, wobei die Vorrichtung (30) eine Identifikationsnummer aufweist, und Verarbeiten des Codes, um die Lieferung der Waren oder Dienstleistungen an den Verbraucher zu ermöglichen, wobei die Betätigungseinrichtung (14) betätigbar ist, ohne mit der Codeerzeugungseinrichtung (12) zu kommunizieren, um den Verbraucher mit den Waren oder Dienstleistungen zu versorgen; dadurch gekennzeichnet, daß
- der Verbraucher eine Geldsumme hinsichtlich des Werts bestimmt und verfügbar macht und die Identifikationsnummer der Vorrichtung (30) liefert, wobei diese Information codiert wird, so daß der Code die die Geldsumme und die Identifikationsnummer repräsentierenden Daten enthält; und
- an der Betätigungseinrichtung (14) Schritte ausgeführt werden, nach denen der Code entschlüsselt wird, die von dem Code abgeleitete Identifikationsnummer mit der Identifikationsnummer der Vorrichtung (30) verglichen wird, der Code zurückgewiesen wird, wenn diese sich nicht entsprechen, und die Waren oder Dienstleistungen bis zu dem Wert der Geldsumme ausgeliefert werden, wenn sie sich entsprechen.

8. Verfahren nach Anspruch 7, welches ein Analysieren der Information und ein Verschlüsseln der Information mittels eines Verschlüsselungsalgorithmus zum Bereitstellen des Codes beinhaltet.

9. Verfahren nach Anspruch 7 oder 8, welches, nachdem der Code in die Betätigungseinrichtung eingegeben wurde, ein Entschlüsseln des Codes zur Bestimmung des Wertes der Geldsumme beinhaltet, um einen Guthabenspeicher für die Vorrichtung zu schaffen, damit die Vorrichtung betätigt werden kann.

10. Verfahren nach einem der Ansprüche 7 bis 9 einschließlich, welches ein Speichern jedes in die Betätigungseinrichtung eingegebenen Codes und ein Vergleichen eines Codes, der eingegeben wurde, mit den zuvor gespeicherten Codes beinhaltet sowie ein Zurückweisen des eingegebenen Codes, wenn der Code derselbe wie irgendeiner der vorherigen Codes ist, und ein Akzeptieren des Codes, wenn der Codes von den vorherigen Codes abweicht, um dadurch einen Guthabenspeicher für die Vorrichtung zu schaffen.

Revendications

1. Système (10) de fourniture à un consommateur de marchandises ou de services prépayés qui comprend :

un dispositif de génération de code (12) pour générer un code qui comporte des données représentatives de la valeur desdites marchandises ou services et pour fournir au consommateur le code sous la forme d'une chaîne de chiffres ou de lettres ou d'une combinaison de ceux-ci dans un format perceptible ;
un dispositif (30) situé dans les locaux des consommateurs pour la fourniture des marchandises ou des services et ayant un numéro d'identification ;
un dispositif d'exploitation (14) situé aussi dans les locaux du consommateur qui est utilisable par le consommateur et qui est relié au dispositif (30), ledit dispositif d'exploitation (14) comprenant un dispositif d'introduction (32) qui comprend un clavier ayant plusieurs touches pour permettre au consommateur d'introduire le code dans le dispositif d'exploitation et un dispositif de traitement (38) pour traiter le code et pour permettre l'exploitation du dispositif (30) pour fournir des marchandises ou des services, le dispositif d'exploitation (14) étant utilisable sans communication avec le dispositif de génération de code, caractérisé en ce que ;
le dispositif de génération de code (12) comprend un dispositif (16) pour introduire des informations fournies par le consommateur comprenant le numéro d'identification du dispositif et une somme de fonds déterminée et rendue disponible par le consommateur pour indiquer

ladite valeur et fournit un code qui comprend les données représentatives de la somme de fonds et le numéro d'identification ; et
le dispositif de traitement (38) comprend un dispositif pour crypter le code et pour comparer le numéro d'identification dérivé du code avec le numéro d'identification du dispositif et est utilisable pour rejeter le code s'ils ne correspondent pas et pour permettre l'exploitation du dispositif (30) pour fournir des marchandises ou des services pour la valeur de la somme de fonds lorsque les numéros d'identification correspondent.

2. Système selon la revendication 1, dans lequel un dispositif de stockage est relié au dispositif de traitement, des codes préalables qui ont été introduits étant stockés dans le dispositif de stockage pour une comparaison avec des codes ultérieurs de sorte que si le code introduit par le consommateur est le même qu'un code préalable, le code introduit est rejeté.

3. Système selon la revendication 1 ou 2 dans lequel le dispositif de génération de code comprend dispositif de traitement (22) pour analyser l'information introduite par l'opérateur via le dispositif d'introduction (16) et pour générer le code, le dispositif de traitement ayant un dispositif de mémoire (26) dans lequel un algorithme de cryptage est stocké qui crypte l'information pour fournir le code.

4. Système selon la revendication dans lequel un dispositif d'impression (28) est relié au dispositif de traitement (22) pour imprimer le code dans un format visuel pour le consommateur.

5. Système selon l'une quelconque des revendications précédentes dans lequel le dispositif de traitement (38) comprend un dispositif de mémoire (42) dans lequel un algorithme de cryptage est stocké pour déchiffrer le code introduit dans le dispositif de traitement (38) par le consommateur via le dispositif d'introduction (32).

6. Système selon la revendication 5 dans lequel le dispositif de traitement (38) est utilisable pour déchiffrer le code pour obtenir à partir de celui-ci le montant des services acquis par le consommateur.

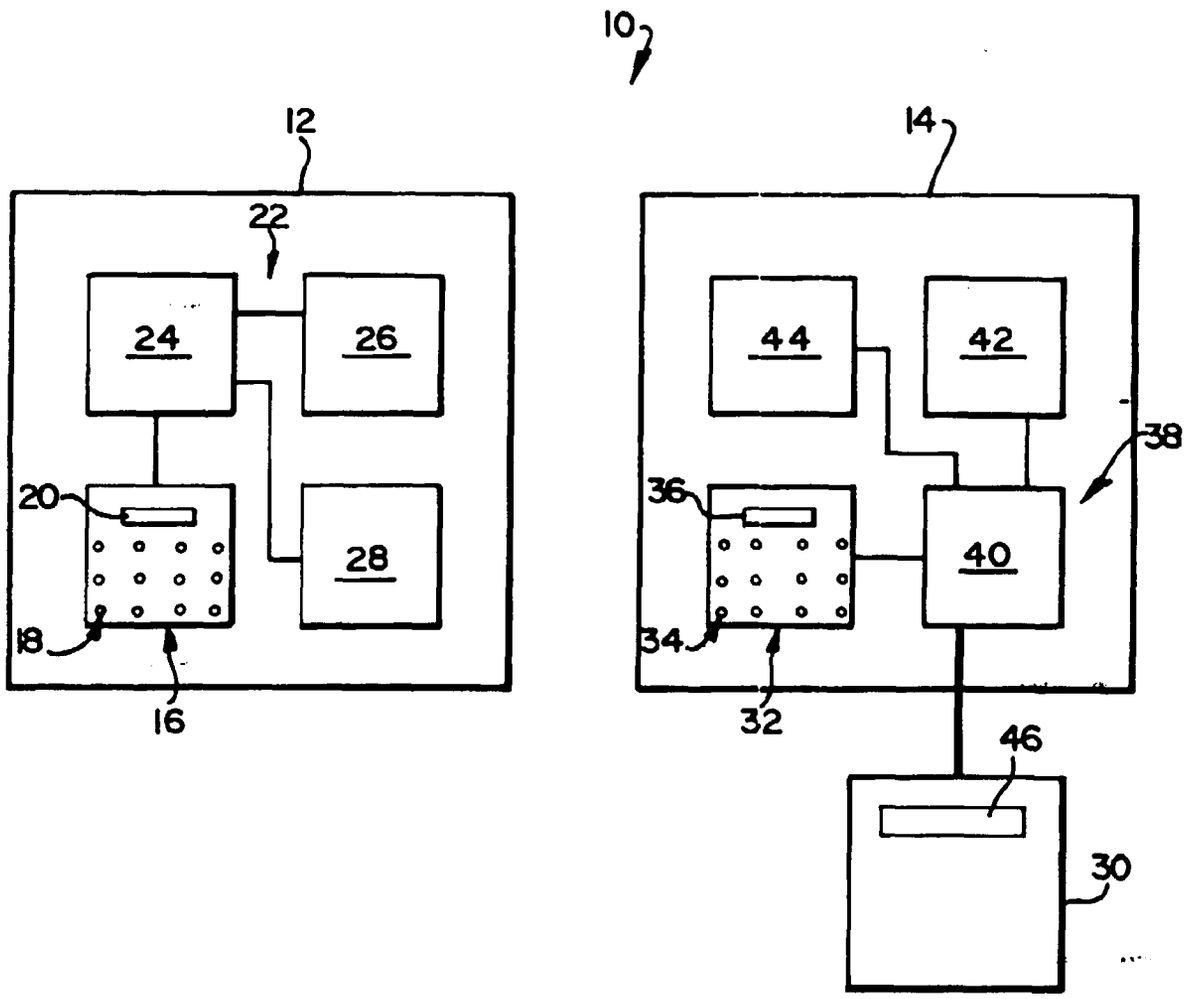
7. Procédé de fourniture à un consommateur de marchandises ou de services prépayés qui comprend :

générer un code au moyen d'un dispositif de génération de code (12), ledit code comportant des données représentatives de la valeur desdites marchandises ou services ;
émettre le code à un consommateur sous la forme d'une chaîne de chiffres ou de lettres ou d'une combinaison de ceux-ci dans un format perceptible ; et
introduire manuellement au moyen d'un clavier le code dans le dispositif d'exploitation (14) utilisable par le consommateur et auquel un dispositif (30) à utiliser est relié, ledit dispositif ayant un numéro d'identification, et traiter le code pour permettre la fourniture de marchandises ou de services au consommateur, le dispositif d'exploitation étant utilisable sans communication avec le dispositif de génération de code (12), pour fournir des marchandises ou des services au consommateur caractérisé en ce que
le consommateur détermine et rend disponible une somme de fonds relative à ladite valeur et fournit le numéro d'identification du dispositif (30), ces informations étant codées de sorte que le code comprend les données représentatives de la somme de fonds et le numéro d'identification ; et
il est réalisé dans le dispositif d'exploitation (14) les étapes de cryptage du code, de comparaison du numéro d'identification dérivé du code avec le numéro d'identification du dispositif (30), de rejet du code s'ils ne correspondent pas et de fourniture de marchandises ou de services pour la valeur de la somme des fonds s'ils correspondent.

8. Procédé selon la revendication 7 qui comprend une analyse des informations et un cryptage des informations au moyen d'un algorithme de cryptage pour fournir le code.

9. Procédé selon la revendication 7 ou la revendication 8 qui comprend, après que le code ait été introduit dans le dispositif d'exploitation, un déchiffrage du code pour déterminer la valeur de la somme de fonds pour fournir une provision de crédit au dispositif pour permettre au dispositif d'être utilisé.

10. Procédé selon l'une quelconque des revendications 7 à 9 inclus qui comprend un stockage de chaque code introduit dans le dispositif d'exploitation et une comparaison du code qui a été introduit avec des codes préalables stockés et, si le code est le même que celui des codes préalables, rejette le code ainsi introduit et, si le code diffère du code préalable, accepte le code pour fournir ainsi une provision de crédit au dispositif.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