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Invalidation Search Report
On
“A prepayment utility metering system”
GB2364420

February 17, 2015

Contents

1. Search objective

Objective of this assignment was to conduct a validity search on the subject matter disclosed in the patent entitled “A prepayment utility metering system”.

2. Understanding of the subject matter

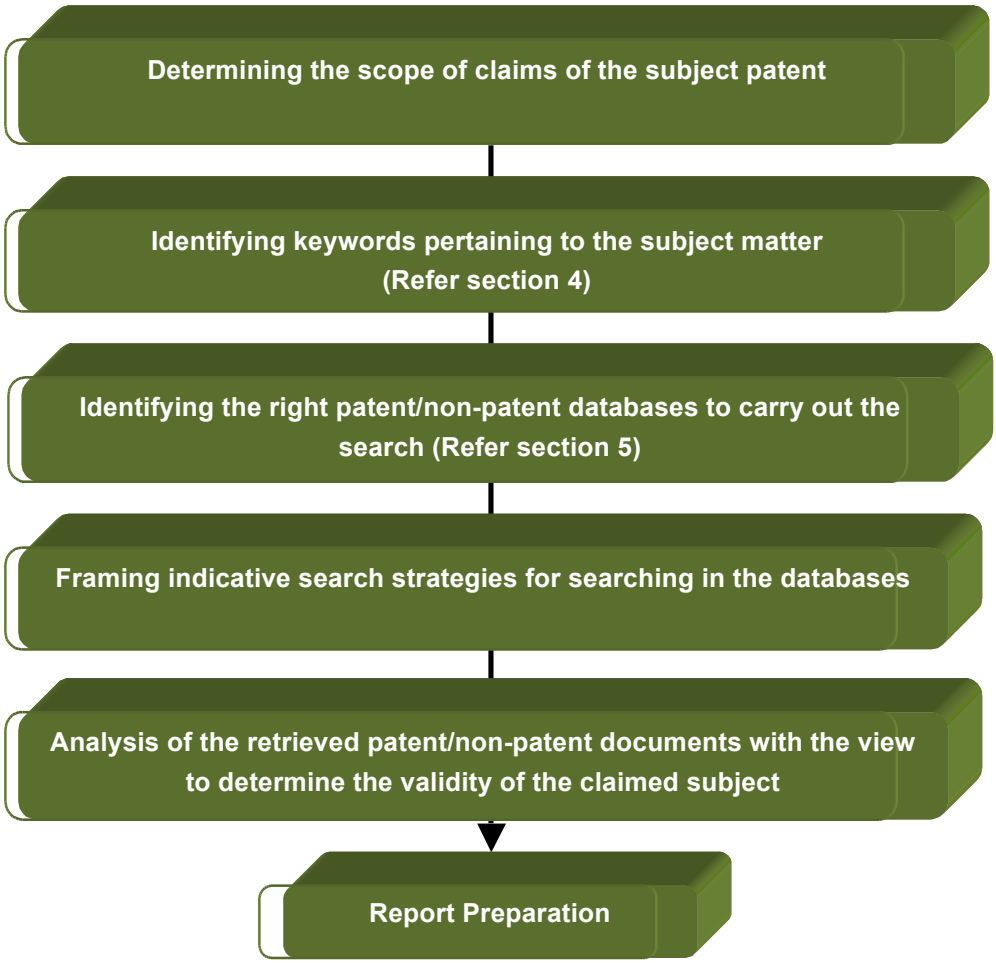
The present invention relates to a prepaid power metering system comprising of a prepaid power meter, cellular transceiver/communication means/modem provided at the location of energy usage, and a remote communication unit, wherein the prepaid power meter is configured to communicate with the remote communication unit though the cellular transceiver. The prepaid power meter has an associated location identifier and a memory unit for storing credit information, and the remote communication unit has a database to store plurality of unique identifier and the corresponding transceiver number and its credit details. The remote communication unit is configured to determine transceiver number from unique identifier to communicate with the utility meter via the transceiver and update/add pre-payment credit to the memory of utility meter.

From our analysis of the disclosure, following key novel elements/steps emerge from the claimed subject matter:

1. A pre-payment energy supply system comprising a remote communication unit, a pre-payment utility meter, and a digital cellular transceiver (provided at a location of energy usage) configured to enable communication between utility meter and remote communication unit.
2. The utility meter having an associated location identifier unique to the location and a memory for storing pre payment credits.
3. The remote communication unit configured to determine transceiver number from unique identifier to communicate with the utility meter via the transceiver and update/add pre-payment credit to the memory of utility meter.
4. The remote communication unit having a database to store plurality of unique identifier and the corresponding transceiver number and its credit details.

3. Research Methodology

The following search methodology was adopted for finding the relevant prior art documents.



4. Keywords

One or more of the key words listed below have been used in different combinations while conducting the prior art search.

Keywords
Prepayment / Recharge / Amount / Credit/ Prepaid
Cellular transceiver / Transmitter –Receiver / Wireless / RF link, Radio Communication/ Modem / GPRS / communication unit
Meter / Power Meter / Energy Meter / Electricity Meter/ Utility meter
Command / Signal / Operative / Instruction
Remote Communication Unit / Server / Host/ Center server / Central Office / Central Station / supplier/ utility provider
Wireless / Wireless Network / Network
Memory / Storage Unit
Transfer / Send /communication

5. Databases used

Patent databases

- ❑ QUESTAL ORBIT
- ❑ THOMSON INNOVATION
- ❑ USPTO
- ❑ ESPACENET
- ❑ WIPO
- ❑ JPO
- ❑ GOOGLE PATENTS
- ❑ PATENT LENS
- ❑ SUMOBRAIN
- ❑ FREE PATENT ONLINE

Non Patent database

- ❑ SCIENCE DIRECT
- ❑ GOOGLE SCHOLAR

6. Search results

RESULT- 1

Publication Number	Assignee	Priority Date	Publication Date
WO1999058987	Seung Ho Tak.	May 12, 1998	Nov 18, 1999
Title of the Publication	Method for transmitting and storing value and value store electric power meter using the same		

Abstract:

A value store electric power meter is provided. The server of an electric power supplier, an electric power seller, or an electric power reseller transfers value through an electric power line through a built-in electric power modem, stores value received through the electric power modem inside the value store electric power meter in a value store module, reduces a value according to the amount of electric power consumption, omits processes of visually reading a meter, calculating the amount of use, printing and mailing a bill, settling up, and paying an uncollected amount and arrears. Accordingly, it is possible to save electric power supplying costs, to reduce the electric power rate by a user, and maximizing the profit of the electric power supplier. The electric power meter is used for IC card payment type gas and water meters in which the IC card having credit value is transferred and stored in an off-line state. Accordingly, the electric power value and the added value measurement is easily and rapidly performed. Therefore, it is convenient for the user and remarkably reduces all the costs.

Cited Portion:

(Page 25 Line 8-24) A value store electric power meter is provided. The server of an electric power supplier, an electric power seller, or an electric power reseller transfers value through an electric power line through a built-in electric power modem, stores value received through the electric power modem inside the value store electric power meter in a value store module, reduces a value according to the amount of electric power consumption, omits processes of visually reading a meter, calculating the amount of use, printing and mailing a bill, settling up, and paying an uncollected amount and arrears. Accordingly, it is possible

to save electric power supplying costs, to reduce the electric power rate by a user, and maximizing the profit of the electric power supplier. The electric power meter is used for IC card payment type gas and water meters in which the IC card having credit value is transferred and stored in an off-line state. **The value store electric power meter has a value store power meter serial number (SVPMSN) of 3 bytes. The electric power modem 13 communicates with the LS by a modem identification number (M-ID) address of 1/256. When the server of the electric power seller or the electric power re-seller sees a request to transfer the value, it starts a short-distance communication with the value store electric power meter of the subscriber according to an addressing process for selecting the M-ID of the subscriber**. The subscriber requests the transfer of credit value by contacting the ARS of the electric power seller or the electric power re-seller by telephone or a digital interphone 20 and a keypad 21 , selecting the settlement by credit card or bank account, and selecting the payment of the transferred electric power credit value. Then, a credit value managing server is requested to transfer the credit value by the AN given by the server of a credit card company. **The credit value managing server of the electric power seller calls the M-ID through the AS and the LS, transfers the credit value to the SVPM and stores the transferred credit value by performing the above-mentioned value storing processes**.

The value store electric power meter of claim 4, comprising 35 a non-volatile memory storing a characteristic 3 byte ID number and recording an electric power use state during a certain period of hours, days, or months for remotely monitoring the surreptitious or abnormal use of electric power and performing an electronic sealing function.

(Page 15 line 8-12)The credit value is transmitted and stored in the electric power meter, the gas meter, the water meter, and the calorimeter via the power line modem. The electric power credit value is stored in the SVM and the remaining values are stored in the respective regions of the IC card electronic purse.

Disclosure of the Invention 5 It is a first object of the present invention to provide value transmitting and storing methods in which the server of an electric power

supplier or an electric power re-seller communicates with value store electric power meters of the respective subscribers, **stores value in a store value module (SVM) inside the value store electric power meter o according to the present invention, and transmits added credit value information to and stores added credit value information in an IC card.** Accordingly, suppliers or re-sellers create a high added value for 3 consumers by increasing the effectiveness of management and considerably reducing the price of electric power.

(Page 16 Line 25-32) A credit value/added value storage IC card 5 registers the card serial number (CSN) of a subscriber IC card on a management database by the master key of the electric power re-seller managing the credit value store electric power meter according to the present invention and checks the presence of a registered legal CSN when the server is requested to transmit credit value, thus preventing the 16 illegal use of electric power

(Page 3 line 03-09) it is a second object of the present invention to provide a value storing method for storing value on the IC card by which it is possible to use credit value information transmitted through a power line modem with all the meters in homes and factories, such as a gas meter, a water meter, and a calorimeter for measuring heat energy, which are installed and operated on an off-line basisNamely, the terminal encrypts the Info by Encrypt (Info, Ks) and sends the encrypted value M to the host. Here, Info=Log+ModeTB+Balance+ID. The host authenticates the terminal once again by decoding the encrypted value M by Info'=Decrypt (M, Ks) and comparing ID'with ID. When the terminal is authenticated, the use during days, weeks, or months and timer information is backed up on the record file and checked.

RESULT- 2

Publication Number	Assignee	Priority Date	Publication Date
WO2000058922	Hermanus Albertus Bos, Merlin Gerin S A Proprietary L	Mar 26, 1999	Oct 5, 2000
Title of the Publication	Utility purchases by prepayment		

Abstract:

A system for the prepayment of utility services comprises: a communication link, in particular a GSM link (5), between a consumer and a vendor of the utility services, the consumer having a prepayment meter (2) for dispensing the utility services; identification means for enabling the vendor to establish an identity of the prepayment meter along the communication link; a facility (7) for generating a prepayment token; and a transmitter (4) for transmitting the generated prepayment token to the consumer along the communication link, in particular by means of the SMS of the GMS link. The prepayment token is generated as a function of the prepayment meter identity and a selected quantity of utility services purchased by the consumer.

Cited Portion:

(Claim 1) A method for the prepayment of utility services, comprising the steps of: establishing a communication link between a consumer and a vendor of the utility services, the consumer having a prepayment meter for dispensing the utility services; providing to the vendor along the communication link, data relating to the identity of the consumer's prepayment meter**; purchasing a selected quantity of utility services; generating a prepayment token as a function of the prepayment meter identity and the purchased quantity of utility services; and transmitting the generated prepayment token to the consumer along the communication link.**

(Claim 10) A system as claimed in claim 9 in which the **identification means establishes the identity of the prepayment meter as a function of a unique telephone number on the SIM.**

(Claim 6) A system for the prepayment of utility services, comprising: a communication link between a consumer and a vendor of the utility services, the consumer having a prepayment meter for dispensing the utility services; identification means for enabling the vendor to establish an identity of the prepayment meter along the communication link; a generation facility for generating a prepayment token as a function of the prepayment meter identity and a selected quantity of utility services purchased by the consumer; and a transmitter for transmitting the generated prepayment token to the consumer along the communication link.

(Claim 7) A system as claimed in claim 6 in which the communication link is a Global System for Mobile telephony (GSM) telecommunication link.

(Claim 8) A system as claimed in claim 7 in which the GSM telecommunication link is accessible by means of an access terminal.

(Claim 9) A system as claimed in claim 8 in which the access terminals a GSM handset having a Subscriber Interface Module (SIM).

RESULT- 3

Publication Number	Assignee	Priority Date	Publication Date
WO1998052167	LG (UK) Limited	May 12, 1997	Nov 19, 1998
Title of the Publication	Credit transfer in metering systems		

Abstract:

A credit transfer system is provided for transferring credit**, representing credited consumption of a metered service G issued to a consumer, to a consumer metering apparatus (1, 2)** which is selectively operable to cut-off the supply of the service to the consumer. The **system comprises payment means (**2) for controlling supply of the metered service G by the consumer metering apparatus in dependence on received credit. **The payment means (2) has a memory for storing received credit data indicative of the total of all credit ever received by the payment means.** The system includes a portable data storage device (3), associated with the payment means (2), for storing issued credit data indicative of the total of all credit ever issued for the payment means (2). **The system also includes means for verifying the association of the data storage device (3) and payment means (2).** The payment means (2) is operative to read the issued credit data from the associated data storage device (3) and, **if the association is verified, to determine from the issued credit data and said received credit data the amount of any newly issued credit, and to update said received credit data in accordance with the newly issued credit so determined.**

(Page 3, Line 3-8)The present invention relates generally to credit transfer in metering systems for metering the supply of a service, such as gas, electricity, water, pay television etc., to a consumer. In the following, particular reference will be made to gas metering systems though it is to be understood that the invention can be applied in metering systems for other services.

(Page 9, Lines 3-14) Another aspect of the invention provides payment means for use in a credit transfer system according to the first aspect of the invention. Further, it

is to be appreciated that, where features are described herein with reference to apparatus embodying the invention, corresponding features may be provided in a method of the invention, and vice versa. In particular, another aspect of the present invention provides a method of transferring credit, representing credited consumption of a metered service issued to a consumer, to consumer metering apparatus which is selectively operable to cut-off the supply of the service to the consumer **and comprises payment means for receiving credit and having a memory for storing received credit data indicative of the total of all credit ever received by the payment means, a**nd a service meter for metering consumption of the service by the consumer, the method comprising:

(Page 7, Lines 6-15)Numerous types of association data and verification systems will be apparent to those skilled in the art. For example, a simple id (such as the meter serial number or the card serial number) could be stored on the card and in the payment means to uniquely identify the card as associated with a particular payment means. The payment means could then check the card id (or indeed the card could check the payment means id where such a processing facility is provided on the card. **The payment means may be integrated with the meter in the consumer metering apparatus. but in preferred embodiments the payment means is provided in a separate payment unit which is arranged for remote communication with the meter, via hard-wired or wireless links.** The payment unit can then be located at any convenient point in the consumer's premises for controlling supply of the metered service in dependence on the received credit.

(Page 10, Lines 11-31)Figure 1 illustrates schematically the main elements of a metering system embodying the invention. The system includes a consumer metering apparatus which comprises a meter 1 and a payment unit 2 which is hereinafter referred to as the customer display terminal or CDT. The consumer is provided with a memory card 3. such as the smart card or magnetic stripe card, for use with the payment means 2. Also shown is a point of sale terminal (POS) 4 which is typically located at a public location to which the consumer takes the card 3 in order to purchase credit.

The meter 1 comprises a basic mechanical meter unit (MMU) 5 which meters the gas supply G and incorporates a cut-off valve 6 which is selectively controllable to cut off

the supply of gas to the consumer. The meter 1 also includes a meter controller 7 which receives the meter data (ie. consumption data) from the MMU 5 and controls operation of the cut-off valve 6. The meter controller 7 can communicate with the CDT 2 which is located at a convenient access position in the consumer's premises. **The CDT 2 comprises a card interface unit 8 of generally known type for transfer of data with the card 3 when the card is inserted in a slot (not shown) of the unit. The** CDT includes a display 9 for displaying messages. instructions etc. to the consumer. The card interface 8 and display 9 are controlled by **a payment controller 10 which can also communicate with the meter controller 7 of the meter 1. The communication link between the payment controller 10 and meter controller 7 may be a hardwired or a wireless link as desired for a particular application.**

7. Other References:

1. US4731575
2. WO0075902
3. GB2297663
4. US6010069
5. WO1999031953 (Already Shared by you)
6. WO1998010394
7. US5994892
8. WO2000000935
9. 6018726
10. WO1998010394 (In context of Interface Management Unit 22 and Utility Meter 28)
11. NPL-1 (Page 12, Figure 3)