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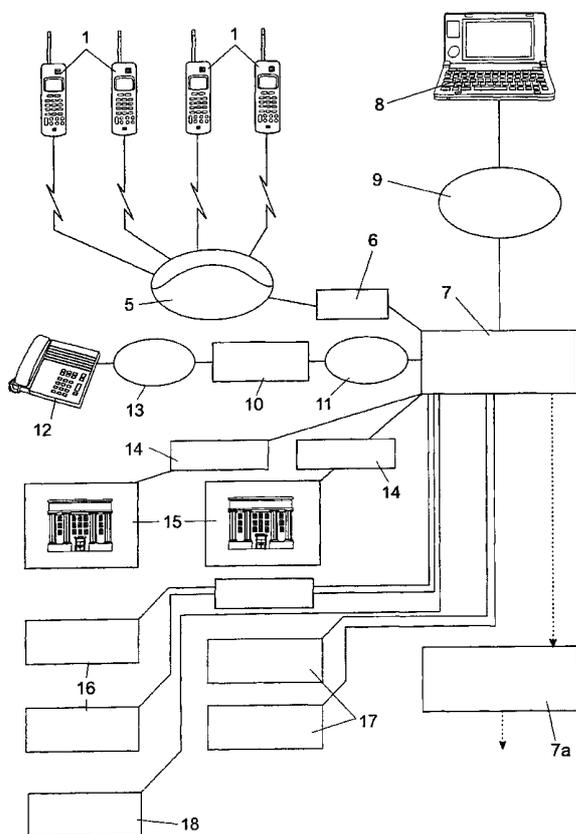
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(54) Title: FLEXIBLE ELECTRONIC SYSTEM FOR CONDUCTING COMMERCIAL TRANSACTIONS



(57) Abstract: A computer based system is provided in which commercial transactions can be conducted by a plurality of participating system members (as herein defined) each having a mobile device adapted to communicate via an associated wireless network with a general computerized server in which a financial data base record is allocated to each of them and a plurality of merchants (each of which by definition has a financial data base record in the computerized server). The computerized server is programmed such that financial transactions can be conducted by remote operation of the mobile device of a participating system member, via the wireless network, to result in the debiting of a financial data base record associated with an instructing participating system member and the crediting of a different financial data base record of another participating system member or a merchant. The system is flexible in that the computerized server is further programmed to receive, in respect of transactions initiated otherwise than by way of the said mobile device, requests for the payment of an amount from a financial data base record of a participating system member; to communicate a message seeking authorization of such payment to the mobile device associated with the relevant participating system member; to receive a secure authorization signal approving of or rejecting the payment wherein such authorization signal is transmitted from the mobile device at the instance of the relevant participating system member; and to thereafter effect further processing of the payment or reservation request upon receipt of such authorization signal.

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FLEXIBLE ELECTRONIC SYSTEM FOR CONDUCTING COMMERCIAL TRANSACTIONS

5 **FIELD OF THE INVENTION**

This invention relates to a flexible electronic system for conducting commercial transactions carried out using a computer based system providing for the transfer of funds or other redeemable value from an account (usually in the form of a data base record) of one entity to that of
10 another without the use of conventional banking transactions, credit or debit cards, smart cards or other forms of electronic money and which may be conducted in a variety of different ways.

15 More particularly, but by no means exclusively, the invention relates to a flexible electronic system for conducting secure commercial transactions initiated in a variety of different ways including over the Internet, as well as various creditor activated payments such as the payment of accounts.

20 **BACKGROUND TO THE INVENTION**

A number of different systems have been proposed to enable commercial transactions to be carried out in a computer based system of the type in which participating system members each have a mobile wireless device,
25 generally, but not necessarily, a mobile, and typically a cellular, telephone, which can communicate, by way of a wireless network, with a general computerized server in which each of the participating system members and each of a number of merchants has an account in the form of a financial data base record. The system enables a participating system member to
30 debit his own financial data base record and credit that of another participating system member or a merchant in order to effect a payment by

the remote operation of the mobile device. The general computerized server could be that of a cellular telephone service provider; a totally independent server; a separate server linked to the server of a bank; or the server of a bank, for example.

5

Generally speaking, these systems are aimed at obviating the ills of crime (including fraud), inconvenience to clients, and costs of existing banking and payment systems including many proposed systems utilizing smart cards or other electronic wallets.

10

As a totally separate issue, electronically conducted commercial transactions are becoming more and more commonplace, particularly commercial transactions conducted over the Internet. The most important factor which has an effect of limiting the number of debtor or creditor driven electronically
15 conducted transactions carried out, for example, by way of the Internet, is the security of effecting on-line payment electronically.

One typical way of effecting payment is for a purchaser, for example, to provide a merchant or vendor with the purchaser's credit card details and the
20 merchant or vendor then draws the required funds from the credit card provider's account. A serious disadvantage of this is that unscrupulous persons who become possessed of the credit card details can use them fraudulently for their own dishonest gain. This has led to an enormous amount of activity in the field of encryption of data such as credit card data
25 and data identifying its owner. Numerous different encryption techniques are therefore available and some are more effective than others.

Another development is one in which a person provides credit card details to service system which stores the details in a secure server and passes the
30 details along from the server to a merchant or a merchant's bank when a user makes a purchase on the Internet. There is, nevertheless, the danger

that the details stored on the server could be retrieved by a hacker, for example.

5 Be that as it may, there are still a large number of persons who do not trust payment in this manner irrespective of the security measures which are applied to data such as credit card information. Accordingly, development of the potential of business conducted by way of the Internet is being seriously prejudiced.

10 There are many other instances in which a debtor or creditor driven electronic payment could potentially be made from a data base record but in which active authorization of the transfer of funds would be required. An example of this is the simple settlement of an account with a supplier of goods or services.

15 In the case of bank accounts, this difficulty is often overcome where regular payments are made to the same creditor by authorizing a debit order entitling the creditor to draw funds owed from the debtor's account. This is not always satisfactory because the debtor may be unaware of the quantum of the amount drawn, and consequently, in the event that the amount is unusually high, may be unaware of an unsatisfactory balance remaining in the relevant account at any particular time. Also, this arrangement does not provide any assistance in the case of unplanned or impromptu transactions.

25 **OBJECT OF THE INVENTION**

It is an object of the invention to provide a computer based system for conducting commercial transactions which has enhanced flexibility when compared to the systems referred to above.

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DEFINITIONS

In this specification it is to be understood that the following terms are to be accorded the meanings stated hereunder.

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"Cleared", "clearance" or any other form of the word as applied to a transaction means that the relevant credit has become available for use by the recipient without restriction by the computerized server in which the relevant financial data base record is held.

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"Financial data base record" is intended to mean any data base record including data as to an amount of money reflected in currency units or a record of a number of any other type of redeemable or consumable units having value.

15

"Irreversible" as applied to a transaction means that, absent criminal activity (including fraud) or processing error (whether hardware or software related) the transaction cannot be reversed other than at the instance of the recipient.

20

"Merchant" is intended to include all suppliers of goods and services of all types which may be participating system members as herein defined but irrespective of such membership have been allocated a financial data base record in a computerized server of the invention as defined below.

25

"Mobile device" means any device communicating by way of a wireless network operated by a service provider and including mobile telephones but which need not necessarily assume the form of a telephone.

30

"Participating system member" is intended to mean any subscriber of a wireless network forming a part of a system according to this invention as hereinafter defined and includes mobile telephone subscribers as well as

users of prepaid cellular or mobile services who form part of such a system.

"Vendor" is intended to include all suppliers of goods and services of all types which do not have a financial data base record as herein defined.

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SUMMARY OF THE INVENTION

In accordance with this invention there is provided a computer based system for conducting commercial transactions and which includes a plurality of participating system members (as herein defined) each having a mobile device adapted to communicate via an associated wireless network with a general computerized server in which a financial data base record is allocated to each participating system member and a plurality of merchants (each of which by definition has a financial data base record in the computerized server) and wherein the computerized server is programmed such that financial transactions can be conducted by remote operation of the mobile device of a participating system member, via the wireless network, to result in the debiting of a financial data base record associated with an instructing participating system member and the crediting of a different financial data base record associated with any one of self, another participating system member or a merchant, the system being characterized in that the computerized server is further programmed to receive, in respect of transactions initiated otherwise than by way of the said mobile device, a request for a payment to be debited to a financial data base record of a participating system member or for the reservation of funds for future payment of such an amount; to communicate a message seeking authorization of such payment or reservation to the mobile device associated with the relevant participating system member; to receive a secure authorization signal approving of or rejecting the payment or reservation of funds wherein such authorization signal is transmitted from the mobile device at the instance of the relevant participating system member; and to thereafter

effect further processing of the payment or reservation request upon receipt of such authorization signal.

Further features of the invention provide for the secure authorization signal to be selected from that associated with a security code such as a PIN number, or a simple authorization in combination with secure identification of the participating member, the secure identification including biometric identification such as thumb or finger print recognition, retina recognition, voice recognition, or palm print recognition; for the commercial transaction or funds reservation requiring authorization to be either a debtor or a creditor activated transaction; for the commercial transaction to be one originating on a web site of the Internet, a point of sale (POS) transaction for example at the till or cash register of a merchant in which a merchant POS device initiates a payment request to the computerized server, or for the transaction to be the settlement of an account in which funds are requested by a creditor to settle such account; and for the mobile device to be a mobile telephone, in particular a cellular telephone, preferably utilizing symmetric key encryption or other secure encryption in its electronic circuitry, and, in instances in which a SIM card is used, on the SIM card.

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The invention therefore provides an integrated authorization system which is versatile and can be used in a number of different situations. Significantly, the authorization system can be used for any transaction initiated in an on-line situation on the Internet by either the creditor or the debtor and the transaction can be referred to the computerized server which in turn will communicate a message to the relevant participating member by way of the appropriate mobile device requesting authorization. The participating member can authorize the relevant transaction simply by carrying out the appropriate secure authorization activity, for example, by entering the necessary security code or PIN number in response to the inquiry either immediately in interactive manner or at a later time by way of a message sent in response to the authorization request. The creditor could be any of a

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merchant or a vendor. In the case of a cellular telephone the request could be displayed on the screen but it may, such as in the case of telephones not having a suitable display screen, be carried out utilizing interactive voice response (IVR) techniques.

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Authorization is also made possible in a POS (point of sale) situation and in such a case a cashier or the participating member, for example, at a point of sale, could enter the identification number of the participating member into the POS device as well as the relevant amount if it is not automatically there, so that this information can be transmitted to the computerized server. The latter will then communicate a message to the mobile device of the participating member and request confirmation which can be achieved by the member carrying out the appropriate secure authorization, for example, by entering the necessary security code or PIN number in optionally interactive response to the inquiry.

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For use in such a POS situation, each participating system member may be provided with either a data retaining card such as a swipe card or another device such as one capable of communicating by radio frequency, infrared or other electromagnetic radiation, in either case for facilitating the secure and accurate transfer of the participating system member's account number and optionally also other data to a recipient communications device which could be another participating system member's mobile device or a POS device or other device of a merchant.

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The invention also renders the settling of accounts utilizing electronic transfers possible in instances such as those in which a creditor, for example a merchant, requests settlement of a monthly account from the computerized server which then communicates with the participating member requesting authorization of payment after the receipt of which the computerized server will clear that transaction for completion.

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It will be understood that use of the system envisaged by this invention will have a highly desirable effect on a relevant debtor as each payment must be approved actively and thus the debtor remains in complete control of the financial data base record and is always aware of amounts that are debited
5 to the relevant account. It is believed that the type of account payment suggested above may well be preferred by debtors over stop orders and debit orders as it will undoubtedly promote a more effective management of finances. Also, the security afforded by the use of a vehicle, namely the mobile device and its associated network, which is independent of the device
10 being used to initiate a payment or funds reservation request, is considerable. Most of all, the invention provides an answer to the problems presently being perceived, if not actually existing, in current Internet payment systems.

15 The basic system of the invention is preferably one in which transactions, once completed and authenticated become irreversible in respect of at least certain categories of transactions which generally include at least transactions in respect of which the recipient is one of a predetermined list of participating system members or merchants but, more typically, said
20 categories include all transactions in respect of which the recipient is a participating system member or merchant. The recipient in respect of the transaction may, in the alternative, be a vendor. The program of the computerized server is preferably adapted to disallow any requested transaction (including fund reservation requests) in the event that the
25 balance of units in an instructing participating member's financial data base record, including any credit facility, is inadequate to fund the requested transaction.

In order that the above and other features of the invention may be more fully
30 understood one embodiment as well as a variety of optional features thereof will now be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:-

5 Figure 1 is a schematic diagram of a system according to the invention; and,

 Figure 2 is a block diagram of a cellular telephone forming part of the system illustrated in Figure 1.

10

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWING

Simply by way of example the instant embodiment of the invention is described as being applied to a computerized server to be accessed using, in amongst other devices, mobile devices in the form of cellular telephones in which a microprocessor and memory are embodied, such as in a SIM card removably held in each of the relevant cellular telephones. It will be quite apparent to those skilled in the art that the invention can just as easily be applied to any other type of cellular or mobile telephone or other suitable wireless device and associated network and that the term cellular telephone can be replaced by such other suitable device in what follows. Also a single system may involve the use of a plurality of different wireless and other communications devices as will be apparent from a reading of this specification although for simplicity of description cellular telephones will be used as the example.

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In this embodiment of the invention a system for conducting commercial transactions includes a number of participating system members (as herein defined) each of which has, in this case, a cellular telephone (1) embodying a SIM card (2) or having alternative memory specially selected to be adequate for the purposes of implementing the system described below. The

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cellular telephones are each pre-programmed with conventional applications and data as indicated by numeral (3) (see Figure 2) as well as with additional applications and additional data necessary for the implementation of the system. Each menu item has associated with it a preset standard message
5 which is a substantially complete instruction which only requires a small amount of data in order to complete it, for example, the identity of the recipient the amount to be transferred and a security signal which is described further below. The identity of the recipient may in appropriate cases even be selected from a sub-menu in which there is a custom list of
10 potential recipients.

It is to be noted that in this particular embodiment of the invention the participating system members need not all belong to the same wireless network and that a plurality of networks can be involved without in any way
15 adversely affecting the operation of the system.

The extent to which the additional menu items and data are carried by the cellular telephone itself will depend largely on the capacity of the memory (in the instant case the SIM card) in the mobile device and the associated
20 microprocessor. Thus, in its most comprehensive form, as far as the cellular telephone is concerned, all of the applications and data occasioned by the additional menu structures will be resident in the memory of the cellular telephone. In other cases a lesser portion of those applications and data may be present but in any event whatever is necessary to achieve the objectives
25 set out below. The smallest amount will inevitably be cases in which the cellular telephone has a browser for accessing the necessary applications and data which may then be maintained on the server, for example.

Irrespective of this, all of the applications and data associated with the
30 additional menu items will be resident on the computerized server described in more detail below.

The cellular telephone memory, in this case the SIM cards, used in the system, are programmed to communicate interactively by way of suitable interpretive software (6) with a general computerized server (7) with the communication being by way of the associated cellular (wireless) network (5), the applicable one of which in this particular instance is of the type generally known as GSM in which SMS (short message system) format of transmission is used.

The computerized server (7) is programmed to accept instructions also from a computer, for example a laptop computer (8); via the Internet as indicated by numeral (9) as well as from call centres indicated by numeral (10); or even by way of intra-net as indicated by numeral (11). Participating system members, and also creditors, can thus, communicate with the computerized server (7).

The computerized server (7) may also be connected through suitable communications software (14) with participating banking institutions (15); with vendors (16) as well as merchants (17) not having cellular telephones and information services (18). Finally, the computerized server may also be linked to similar computerized servers (7a) which may be located in different geographic areas or in different countries and each of which has its own set of participating system members, merchants, vendors etc..

The computerized server in this example provides a data base record for each participating system member and merchant wherein each data base record may be identified at least in part by a cellular telephone number where applicable. Each data base record also includes data embodying the additional PIN number, and any additional security number or data which may be desirable.

The programming of the computerized server enables the functions of receiving and sending of data in the form of; a facility for encrypting and

decrypting data at least with regard to financial; and the ability to link up with participating banks vendors; broadcast services; other third party services and other similar computerized servers.

5 Most importantly the program enables financial transactions to be carried out between a participating system member as the instructing participating system member and any one of another instructing participating system member or merchant by the debiting and crediting a value balance in each data base record or sub-record affected by a particular transaction.

10

The arrangement is such that a participating system member is able, by remote operation of the cellular telephone, to conduct a commercial transaction by debiting the data base record associated with himself and crediting a data base record of another participating system member or merchant. The information required to do this, and which has to be transmitted to the computerized server is the identity of the recipient, conveniently conveyed by way of a identification number of some sort, the amount to be transferred, and the security signal such as the PIN number or the like.

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Use of a menu structure of the type described above with pre-set standard messages, enables data pertaining to a transaction to be captured rapidly and a composite message, including the additional PIN (almost invariably encrypted) if it be required by the server, to be formulated prior to connection with the server where the size of memory is adequate to permit this. This results from the fact that a substantial part, if not an entire duplicate, of the necessary parts of the program or application as well as the menu data are resident in the memory of the cellular telephone itself so that certain activities can be carried out independently of the server. This facility will be limited if inadequate memory is available in the cellular telephone.

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On the other hand, if the recipient is a merchant which has its own application and computer, a transaction may be selected interactively with the recipient's application with the communication being by way of the computerized server in order to select a required transaction. Of course, the
5 computerized server can also be used as a conduit to any vendor and to their computer systems.

As a general rule the computerized server is programmed to enable the debiting from a relevant data base record which has an adequate positive
10 balance (or specially arranged credit facilities) to another data base record in the general manner which will be quite apparent from the above.

Preferably, once the transaction becomes completed, at least as between an instructing participating system member and a recipient who has a data base
15 record in the computer server, the transaction becomes irreversible. The transaction is therefore as good as having taken place in cash of any type as the only person who can reverse the transaction (other than in instances addressed in the definition of "irreversible" above), either in whole, or partly by way of a refund, is the recipient. Dispute resolution is therefore up to the
20 payer and recipient.

Once the transaction has been completed the server may be programmed to send a confirmatory message to both parties advising them of the completion of the transaction.
25

In instances in which there are other similarly configured and programmed servers inter-linked with the server described above, the recipient could be a participating system member of a different server from that of which the payer is a participating system member. In order to ensure that transactions
30 may be irreversible and can be carried out with clearance taking place in real time the computerized servers must all be connected, or be capable of immediate connection, at all times via fixed connections. Each server will, of

course, have its own unique identification number.

It is also preferred that the programming of both the server and the SIM cards is such that the additional menu data can be changed remotely by way
5 of the server as and when required and the additional PIN, if resident on the SIM, can also be change as required.

The system as described above is, in terms of this invention, significantly enhanced in its flexibility in that the computerized server is further
10 programmed to receive requests for the payment of amounts from a financial data base record of a participating system member or for the reservation of funds for future payment of such amounts from a variety of different devices other than the mobile device of a participating system member.

15 In particular, the participating system member may request payment or reservation of funds in respect of a transaction initiated on the Internet, the request being made by way of the Internet rather than by means of the cellular telephone (or other mobile device). In such an instance the payment or reservation of funds request is conveyed to the computerized server which
20 then sends the authorization request to the participating system members mobile device, the cellular telephone in this case, requesting authorization. The security signal is returned in consequence of the participating system member either interactively, or subsequently transmitting a message, authorizing the payment or reservation of funds. As a result of the fact that a
25 completely different device is used for the authorization process a high degree of security is present in the arrangement. Of course the security signal can be encrypted to whatever degree is required to ensure security.

By the same token the payment or reservation of funds request could be
30 initiated by a third party, for example, the supplier which offers their goods and services on a web site over the Internet. The same principles apply.

The same principles apply in the case of a POS (point of sale) transaction in which a merchant POS device initiates a payment request to the computerized server which then sends a message to the participating system member for authorization as set out above.

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Still further, other creditors could similarly request payment or the reservation of funds which could be authorized in the same way with the same degree of security.

10 Indeed it is envisaged that stop orders and debit orders could be replaced by payment requests according to the invention and this would have the benefit of keeping the participating system member in full knowledge of transactions being debited against his data base record.

15 As indicated above, the secure authorization signal may be selected from that associated with a security code such as a PIN number, or a simple authorization in combination with secure identification of the participating member, the secure identification including biometric identification such as thumb or finger print recognition, retina recognition, voice recognition, or
20 palm print recognition.

Simply by way of example the type of message received by the participating system member could be any of those along the following lines.

25 "Please enter security PIN to authorize payment of R380.00 (US\$49.12) to Amazon".

"Please enter security PIN to authorize payment for purchases made from Friendly Grocer during January".

30

"Please enter security PIN to authorize payment for purchases made from Friendly Grocer during from 01/01/2001 through 28/02/2001".

"Please enter security PIN to authorize payment to Hilton International for your stay from 01/01/2001 through 15/01/2001".

5 It will be quite apparent that in response to any such authorization request the participating system member responds by entering the security PIN or, in other cases, performing the necessary activity to generate the appropriate security signal. As no one else is in position to generate a return message (assuming the participating system member to be responsible and not to have shared information concerning his security situation with others) the
10 transaction is entirely secure and not subject to any of the disadvantages outlined above where third parties, or the merchant or vendor are supplied with credit card details which can be abused.

The invention therefore provides an integrated authorization system which is
15 versatile and can be used in a number of different situations as will be clear from the foregoing

It will be understood that numerous alternative and additional rules and requirements can be imposed on a system as described without departing
20 from the scope hereof. Also, the basic system can be changed widely, the basic feature being only that the data base records be maintained separately from an associated cellular telephone in a general remote computerized server.

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CLAIMS:

1. A computer based system for conducting commercial transactions and which includes a plurality of participating system members (as herein defined) each having a mobile device adapted to communicate via an associated wireless network with a general computerized server in which a financial data base record is allocated to each participating system member and a plurality of merchants (each of which by definition has a financial data base record in the computerized server) and wherein the computerized server is programmed such that financial transactions can be conducted by remote operation of the mobile device of a participating system member, via the wireless network, to result in the debiting of a financial data base record associated with an instructing participating system member and the crediting of a different financial data base record associated with any one of self, another participating system member and a merchant, the system being characterized in that the computerized server is further programmed to receive, in respect of transactions initiated otherwise than by way of the said mobile device, a request for a payment to be debited to a financial data base record of a participating system member or for the reservation of funds for future payment of such an amount; to communicate a message seeking authorization of such payment or reservation to the mobile device associated with the relevant participating system member; to receive a secure authorization signal approving of or rejecting the payment or reservation of funds wherein such authorization signal is transmitted from the mobile device at the instance of the relevant participating system member; and to thereafter effect further processing of the payment or reservation request upon receipt of such authorization signal.

2. A computer based system as claimed in claim 1 in which the secure authorization signal is selected from that associated with a security code and a simple authorization in combination with secure identification of the participating member.
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3. A computer based system as claimed in claim 2 in which the security code is a PIN number.
4. A computer based system as claimed in claim 2 in which the secure
10 identification includes biometric identification selected from thumb or finger print recognition, retina recognition, voice recognition, and palm print recognition.
5. A computer based system as claimed in any one of the preceding
15 claims in which the commercial transaction is selected from the group consisting of one originating on a web site of the Internet, a POS transaction in which a merchant POS device initiates a payment request to the computerized server, and the settlement of an account in which funds are requested by a creditor to settle such account.
20
6. A computer based system as claimed in any one of the preceding claims in which the mobile device to be a mobile telephone.
7. A computer based system as claimed in claim 6 in which the mobile
25 device is a cellular telephone.

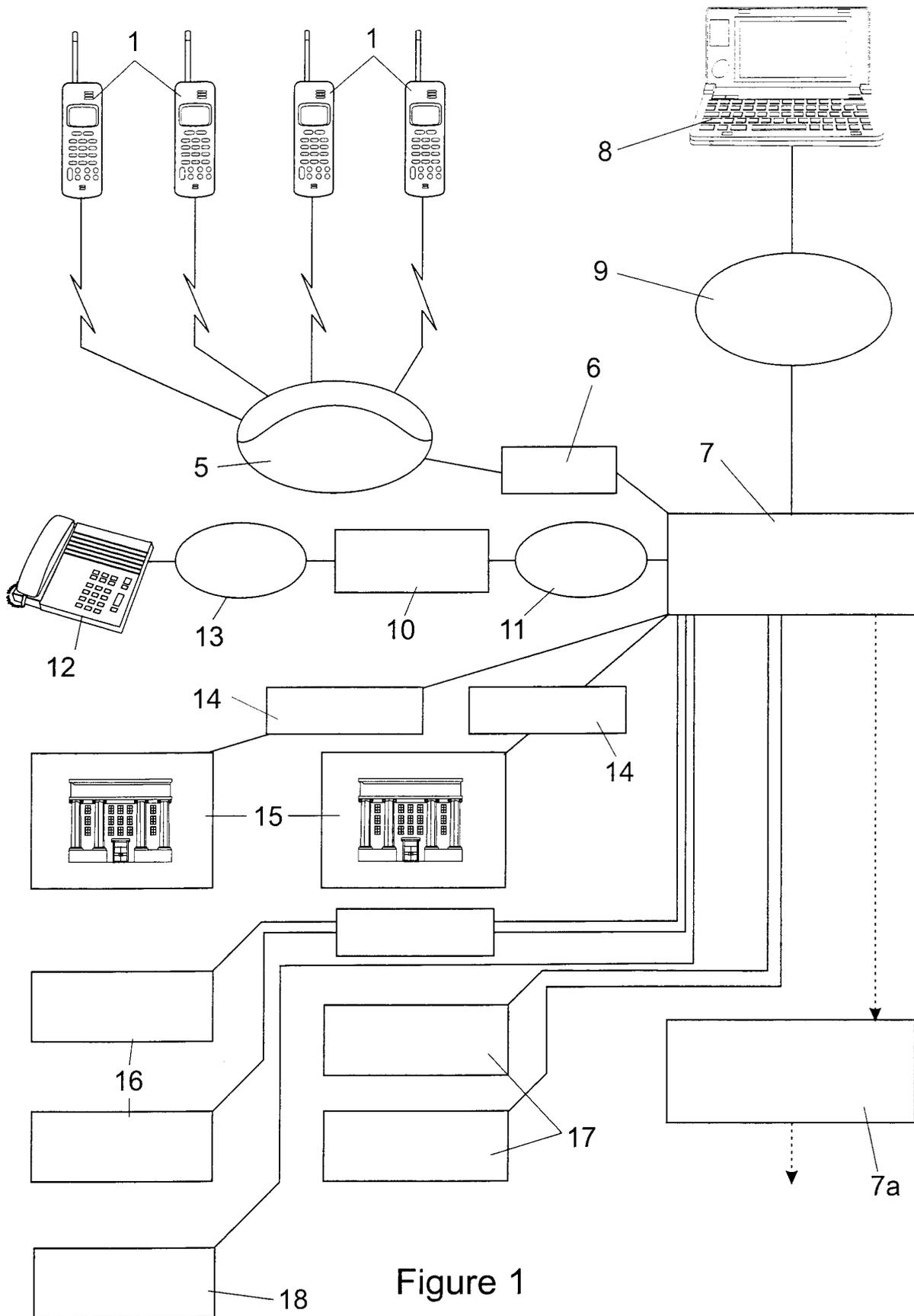


Figure 1

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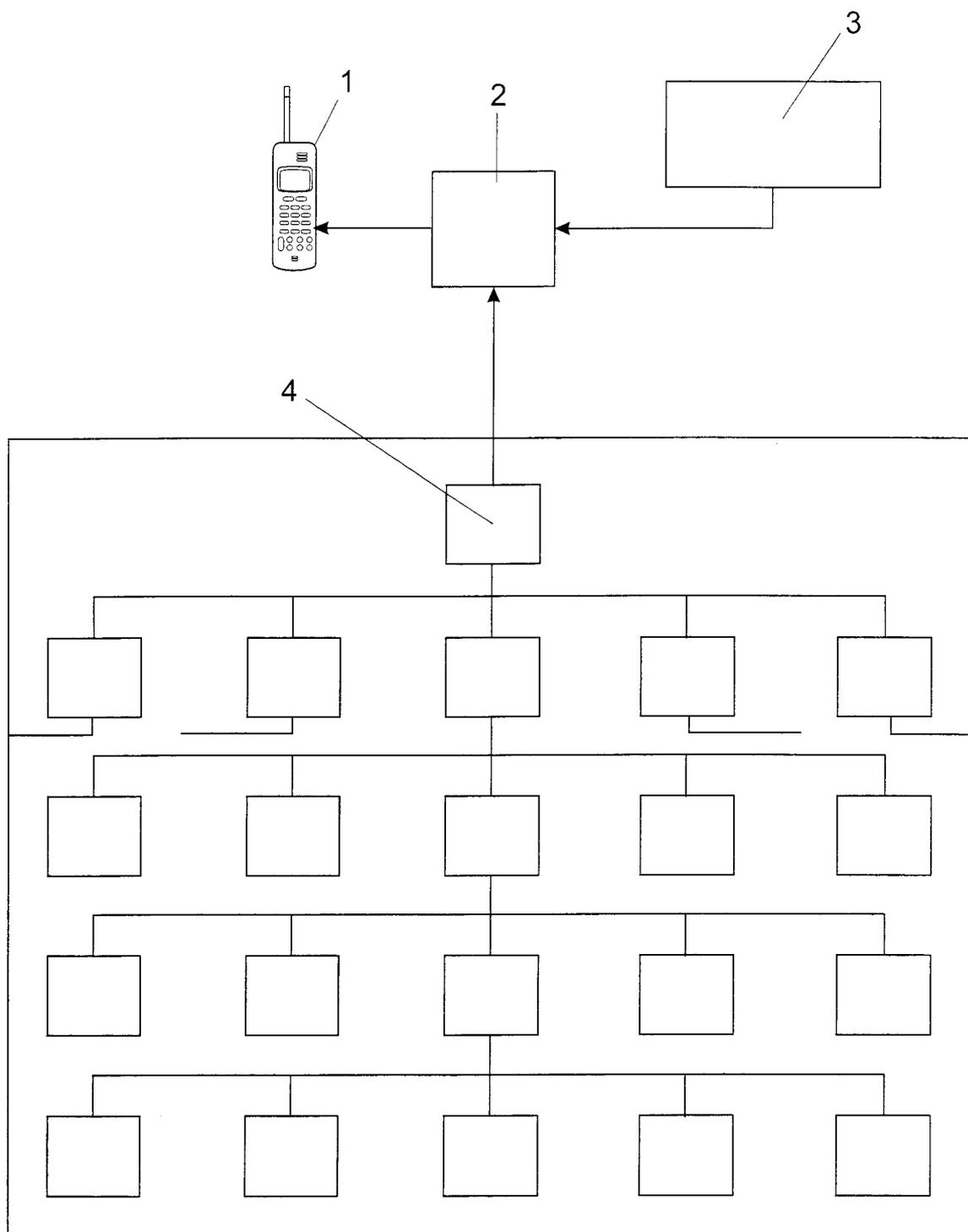


Figure 2

INTERNATIONAL SEARCH REPORT

Intern. Application No

PCT/IB 01/00099

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G07F7/10 //G07F19/00

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)

IPC 7 G07F

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

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

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 198 46 452 A (SIEMENS AG) 16 December 1999 (1999-12-16) column 3, line 7 - line 29 column 4, line 25 - line 67 column 6, line 3 - line 18 claims 1,2,6,7,12,16,18-22,28,30 ---	1-7
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 05, 31 May 1999 (1999-05-31) & JP 11 045366 A (ATENSHIYON SYST KK), 16 February 1999 (1999-02-16) abstract ---	1-3,5-7
A	WO 99 14711 A (ANDRASEV AKOS) 25 March 1999 (1999-03-25) page 6, line 15 -page 7, line 29 page 10, line 24 -page 12, line 25 --- -/--	1,2,5-7

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Patent family members are listed in annex.

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