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(54) Title: SCANNING BILL PAY SYSTEM AND METHOD

(57) Abstract

A system of remotely distributed machines (96, 98, 100, 102) is provided for paying bills issued by each of several different remote issuers (90, 92, 94), such as telephone, electricity, gas, and electric utilities or department stores of credit card companies. Each machine has its own computer (80), a scanner (38) for reading information from the bills (86), and for accepting payments, as well as for entering (26, 27), displaying (15) and correcting billing information manually. A bill is inserted by the user into the machine's scanner or a bar–code reader (38), preferably an OCR or other human–readable information scanner, which reads the identity of the issuer, the amount owed, and the due date for payment, etc. The user deposits payment into the machine (10, 24), in cash, or by debit or credit card, and the computer (80) in each machine (10) gives credit for payments made, computes the amount of any late penalites, and computes the balance due. The credits are stored in the machine (10) and the information is conveyed to the proper one of the different issuers. The cash funds are collected regularly from the machines and credited to the accounts of the different issuers (90, 92, 94) in accordance with the issuer identification data and credits stored in the machine (10). Payments made by the debit or credit card are disbursed automatically via the bank clearing systems. Communications between the machines and the issuers is by land lines, or the Internet, with radio or satellite links (88, 91, 93).

SCANNING BILL PAY SYSTEM AND METHOD

This invention relates to automated bill payment and accounting, and particularly to such activities at a location remote from the facilities of the issuer of a bill.

5   In some parts of the world, bills are paid by mailing checks, by credit card payments, electronic fund transfers or similar means.

In other parts of the world, however, such payment means are not normally used. In some countries, payments in cash, either in currency or coins, is the predominant method of payment.

10   For example, one common method of utilities bill payment is the presentment of a bill by a customer to a clerk or teller at a bank or office of the issuer, together with the cash to pay the bill. The bill contains bar-coded information identifying the customer's account number, and giving data about the amounts owed, the due date, etc. Then, the teller or clerk scans the bar-coded information with a bar-code wand

15   which reads the information into a computer, the computer computes the amount due, and the clerk manually inputs the amount paid. The customer's account is up-dated and the payment is credited to the account of the issuer.

Another method of bill payment is one in which a check, money order or cash is sent or presented in person in payment of a bill on which the account information is

20   printed in a special type font which is adapted to be easily read by an optical character recognition ("OCR") device. When the bill is received by the issuer, together with the payment, an OCR device reads the account information from the bill, an operator inputs the amount of payment, and computerized equipment processes the data to perform further functions.

25   Although kiosks have been provided in which customers could make inquiry as to the status of their accounts, they do not permit payment of the bills at the kiosks.

These systems have many disadvantages, one being that they are very labor-intensive and costly for the issuers, and the banks and other institutions collecting payments. Another, equally onerous disadvantage is that customers who wish to or

30   must pay in person often have to wait in long lines to pay their bills, and can pay them only when tellers or clerks are on duty. If the payments must be sent by mail, payments will be delayed. This can impair the customer's credit rating, and can

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create additional cost for late payment penalties and deny the customer use of his or her money for a longer time than otherwise.

A problem with some machines which have been proposed in the past for use in paying bills is that the customer is required to insert the bill into the machine. This presents a difficulty in that the customer may not have the bill to insert, or that the bill has been damaged or for other reasons is not machine-readable.

It is an object of the present invention to provide a bill paying system and method which alleviates or eliminates the foregoing disadvantages.

It is a further object of the invention to provide a system and method which is relatively simple, low in cost, secure, widely available at convenient times, and easy to use.

In accordance with the present invention, the foregoing objectives are met by the provision of a system and method in which bill-paying machines can be widely dispersed over a given area which the system is designed to serve. Although each machine can serve as a bill-paying machine for only one issuer, it is preferable that a plurality of bill issuers join together in utilizing the dispersed bill-paying machines to pay the bills of any or all of the issuers. This provides the most economical use of the hardware, and minimizes the number of trips to different machines that the consumer otherwise would have to make if the machines were not shared.

Each machine has a reader which is used to read the special type font or bar-code on each of the bills, a monetary acceptance means for accepting payment, preferably in the form of cash, and a computer for computing the payments due, crediting payments to the customer's account, advising as to balances due, and controlling the functions of the machine.

In addition, each machine has input means whereby the customer can input sufficient information to the machine to enable the machine to retrieve the appropriate account information and perform the other functions necessary to enable the customer to pay his or her bill without having a machine-readable bill to insert. The input means can be a simple keypad, or keyboard or a touch screen keypad or keyboard.

The machine preferably is programmed to prompt the customer to input the necessary information when he or she indicates that the actual bill is not available, or the machine is unable to read the bill, or the information read needs correction.

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Multiple bills can be paid during one use of the machine by use of a single set of identification data for the customer together with the identities of the bill issuers.

Preferably, each machine is robust, and is lockable to protect the cash and other valuable items which might be stored in the machine.

5   Preferably, one of the different bill issuers is identified by a part of the information printed in machine-readable form on each bill. This information is used in crediting payments to the right account, and in up-dating payment data.

Information is transferred between the bill issuer(s) and each machine by means of a network such as the Internet.

10   The problem of inadequate or unavailable telephone line communications is avoided by using a radio-telephone link, or a satellite link to broadcast and transmit information from the remote units to the bill issuers, banks, etc. This applies also to Internet communications.

Alternatively, a hand-held data reading and storage device can be used

15   manually to read and transfer the data out of the machine whenever an attendant removes money from it. The hand-held device then is transported to a separate location such as a bank or office, together with the cash, so that the data can be transferred to the proper issuer, and credit can be given to the proper issuers for the money collected. The transfer of data and credit can be accomplished by electronic

20   funds and data transfer; by the transportation of data storage records such as discs or tapes, by hand, or by mail; or by modem, cellular telephone, or satellite.

The payment acceptor means can alternatively include or comprise a debit card or credit card acceptor.

If the machine accepts cash, it is preferred that it give change in cash to enable

25   the user to pay the exact amount of his or her bill. Alternatively, the machine can be programmed to accept overpayments as a credit towards the payment of future bills. Preferably, a limit is placed on the amount of change that can be given by the machine to any one customer, so as to avoid misuse of the machine and rapid depletion of the change supply in the machine.

30   Preferably, a printed receipt is prepared by the machine and issued to the user. The printer also can issue a statement of the account owed, even though the customer does not pay anything on that account.

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The foregoing and other objects and advantages of the invention will be apparent from or specified in the following description and drawings.

In The Drawings:

Fig. 1 is a perspective view of a bill-paying machine constructed in accordance with the present invention;

Fig. 2 is a cross-sectional view of a portion of the bill-paying machine of Fig. 1, taken along lines 2-2;

Fig. 3 is a plan view of a typical bill which is to be paid by use of the machine;

Fig. 4 shows a typical bar-code used on some bills to be paid by use of the bill-paying machine of Fig. 1; and

Fig. 5 is a schematic block diagram of the bill-paying system of the present invention.

GENERAL DESCRIPTION

Fig. 1 shows a bill-paying machine 10 constructed in accordance with the present invention. The machine 10 includes a secure metal housing 12 with a video display screen 14 and individually lockable hinged access doors 16, 18, 20, and 22. Each of the doors has a threaded key-operated lock 17, 19, 21, and 23, respectively. The locks are of the type which provide the holding strength of a threaded fastener, together with a key-operated lock.

Mounted on the upper left hand panel 18 is a display 24. The display has two lines, forty-characters each, and is of the fluorescent indicator panel type commonly known as a "FIP" display. It is used to deliver messages to the user.

A row 26 of programmable keys also is provided.

Alternatively, the video display screen 14 can be used to display messages, as indicated at 15.

In addition, the screen 14 preferably is a touch-screen in which the user can touch a designated area to key-in a specified function. Thus, a full alpha-numeric keyboard 27 is formed on the touch screen so that the user can use it to key-in all of the data necessary for inquiring into the status of his or her account, and paying all or a part of any amount due, all without the necessity of reading any information from a bill, and even without the necessity of having a bill on hand. The keyboard also can be used to make any necessary corrections to the information read from the bill.

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As an alternative, the keyboard or keypad provided can be a conventional manually-operable device instead of one formed on a video screen.

An array of touch screen programmable switches 25 also is provided.

Thus, the user can access the account information and pay the bill simply by
5   inputting certain information, such as the identity of the bill issuer, which can be selected from a display on the screen of the names of the companies whose bills can be paid by use of the machine, the name of the customer and his or her "PIN" number. Of course, if the machine 10 is dedicated to use by only one company, then it is not necessary to select among different bill issuers.

10   The customer then can pay all or any part of the bill, in cash or by way of a credit or debit card, and receive an up-dated statement of the account, showing the amount paid and balance due.

An array of touch screen programmable switches 25 also is provided.

Two pushbuttons 28 and 30 are provided. The pushbutton 28 is marked "OK" and is provided for signalling that the input or computation is correct, when prompted
15   by the display 24. Pushbutton 30 is to provided for canceling a transaction.

A slot 32 is provided through which a printed receipt is issued. A printer (not shown) located behind the slot issues the receipt or statement of account upon the completion of a transaction.

Panel 20, in the lower left hand corner of the upper portion of the machine 10
20   has a recess or cavity 34 (also see Fig. 2).

The bottom wall 36 of the recess 34 serves as a platform for a bill 40 bearing bar-coded bar-code information 42 (also see Figs. 3 and 4) or the same information in machine-readable form. A scanner 38 is mounted so as to extend into the recess 34 to the extent necessary so that its scanning beam or beams 39 (Fig. 2) scan across the
25   bar-code 42 or other machine-readable information.

As it is shown in Fig. 2, a photoelectric detector 54 of the reflective type detects when a bill 40 is in place and sends a signal to turn on the scanner 38. This prevents the scanner 38 from staying on all the time and unnecessarily using power and/or burning out. The scanner 38 is connected by a cable 52 to the other electronic
30   components of the system.

A lamp 56 is provided within the recess 34, the housing has a transparent window 35 allowing the light from the lamp 56 to be seen by the user. The lamp 56

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turns on when the scanner 38 is turned on, thus giving light for the user to see where the bill is located, and indicating positively that the scanner has been turned on.

Also mounted on the panel 20 is a coin acceptor 44, with an indicator light 45 which indicates when there is no more change in the machine to give, and/or other

5   messages.

Mounted on the panel 16 is a paper money acceptor 46, as well as a credit and debit card acceptor slot 49 with a mechanism (not shown) to draw the debit or credit card into the machine, read it and return it. Alternatively, a card "swiper" can be provided. Also, an indicator lamp 47 is provided with the bill acceptor 46.

10   Mounted on the panel 22 is a change receptacle 48 for dispensing change to the user of the machine.

Inside of the housing is a lockable box 50 for collecting coins. The box is easily removable, with a key, to collect the coins from the machine 10.

Similarly, a collector bin (not shown) is provided for the paper money. That

15   bin also is lockable and can be removed to collect the paper money deposited in the machine.

The machine as described above can be configured in several ways. It only need have one input device to take payment, i.e. the paper currency acceptor or debit card reader. Likewise, the machine need not have a display (14) or touch screen as all

20   instructions can be displayed on the FIP (24), or vice-versa.

TYPICAL BILL TO BE PAID

Fig. 3 is a top plan view of a typical bill 40 to be paid utilizing the present invention.

The example shown in Fig. 3 is a somewhat schematic electric bill issued by

25   an electric utility company to a hypothetical customer named Munoz in Monterrey, Mexico. Various printed information appears in the fields 43 and 49, and the bar-code 42 is printed along the lower longitudinal edge of the bill.

Such a bill is issued by each of several different utilities in some countries. The bar-code is located in the same location for each of the bills, but contains

30   different information, depending upon the utility involved, and other variables.

Fig. 4 is an enlarged and more detailed drawing of a typical bar-code as used on such a utility bill as that shown in Fig. 3.

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Now referring to Fig. 4, as an example of a typical bar code structure, the first

field 60 consists of digits 1-4, which identify the issuer of the bill, such as a particular

electric company, water company, etc. Of course, it should be understood that the

company indicated could be any governmental agency, or a retail establishment,

5   where the retail establishment uses the bill-paying machine system for payment by its

customers, or any other issuer of bills.

A second field, including digits 5-8, contains the year and the month the

contract for supply of electricity was signed.

Field 64, including digits 9-12, is the number of the contract with the

10   customer.

Field 66, consists of a single digit, number 13, which is a checksum.

Field 68, digits 14-17, identify the month and the year of billing.

Field 70, consisting of a single digit 18, indicates the type of user; e.g.,

residential, industrial, federal, state or city government, rural, water pumping, etc.

15   This information can be used to establish the appropriate charge rate.

Field 72, consisting of a single digit 19, is another checksum.

Field 74, consisting of a single digit 20, is a digit separating the preceding

fields from the subsequent fields.

Field 76 consisting of four digits, 21-25, is the month and the day when the

20   bill becomes overdue.

Field 78, consisting of eleven digits, gives the amount to be paid.

Fig. 3 also represents a machine-readable bill which does not use bar-coding.

Instead, the same information as that contained in the bar code is printed, either in the

same location as the bar code, or elsewhere on the bill. It is printed in another

25   machine-readable form, such as in any one of a number of well-known OCR device-

readable type fonts. Alternatively, the OCR can be adapted to read ordinary type

faces. A further option is to use magnetic ink and type faces and a reader to read

same, as in printed machine-readable information on checks.

BILL-PAY SYSTEM

30   Fig. 5 is a schematic block diagram of the bill paying system. The system

includes a plurality of bill-pay machines 10, 96, 98, 100 and 102. The electrical

components of the machine 10 is shown in detail. Each of the other bill-paying

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machines 96, 98, 100 and 102 is the same as the machine 10, and therefore is shown only as a block.

Multiple computers or other data receiving and storage devices 90, 92 and 94, which are located at the remote offices of issuers of the bills, are shown connected to
5   receive data from one or more of the bill-paying machines through a data reading device 86, a line or other data transmission link 88, through a bank or office 89, and a line or other transmission link 91.

Additional data links 93 for communicating data directly to the bill issuing offices from the bill-paying machines also are shown.
10   As noted above, the data transmission links can include radio links, satellite links, and the Internet. The data transmitted preferably is encrypted, by the use of standard encryption-decryption software or other such software, for security purposes.

The dashed lines at the bottoms of blocks numbers 94 and 102 indicate that additional issuers and bill-paying machines can be added to the system, as desired.
15   Normally, the number of bill-paying machines will be larger than the five shown in Fig. 5.

Each bill-paying machine 10 includes a microprocessor 80 with a stored program 82. Connected to the microprocessor are the FIP display 24; the scanner 38; the bill detector 54; the bill acceptor 46; the coin acceptor 44; the programmable keys
20   26; the change making device 48; a printer 84 for printing and issuing the receipt to the customer; the video display screen and touch screen 14; and the data reading device 86, which either can be a dial-up modem, or one of several other devices to be described below.

SCANNER

25   Preferably, the scanner 38 used in the bill-paying machine is of the fixed-mount variety. The preferred bar-code scanner is a laser scanner, such as the Model LPN9626RR1S032 sold by Opticon Laser.

Alternatively, a CCD scanner can be used. Both scanners are capable of scanning the stationary bar-code 42 on the bill 40, without the motion of any physical
30   parts.

The laser scanner is preferred because it is believed to be the most accurate, even though it is somewhat more expensive that the CCD scanner.

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Both laser and CCD or OCR scanners can be used too. In fact, it is preferred that a single type of scanner be used together with software which adapts the scanner to read either bar-code (linear or two-dimensional) or ordinary human-readable information, preferably, but not only, in special OCR type fonts. The video display

5   screen 14 can be used to display the information read by the scanner 38 to enable the user to verify the accuracy of the scanner and to make any corrections, via the touch screen keyboard 27.

An alternative scanner which can be used under certain circumstances to read bar-codes is a bar-code scanning wand which must be moved relative to the bar-code

10   to scan it. If a stationary wand is used, the bill would be inserted into the machine and moved lengthwise of the bar-code past the wand. Alternatively, the wand could be moved mechanically across the bar-code on a stationary bill.

The scanner 38 preferable is supplied with software to make it selectively convertible in operation; that is, the bill-pay machine can be a universal device

15   operable, with the aid of appropriate prompts, with any of a variety of different types of bar coding schemes.

For example, when the machine detects the placing of a bill in the receiver opening 34, the scanner 38 detects whether or not the bill bears bar-coded information.

20   If bar-coded information is detected, the stored program 82 for the applicable type of bar-code is accessed, and operation proceeds as described above.

If no bar-code is detected, the stored OCR scanning program is accessed and OCR scanning progresses.

If no bill is placed in the receiver, the user, again prompted by a message on

25   the screen 14, touches one of the programmable areas 25 on the screen to start the manual input mode of operation.

MICROPROCESSOR

The microprocessor 80 can be any one of a number of commercially available integrated circuit microprocessors, such as the Motorola HC11, or the Intel 486 or

30   Pentium processor. Preferably, it has battery-backed random access memory ("RAM") and read-only memory ("ROM").

10
FUNDS AND DATA TRANSFER

The cash which is collected in the locked boxes is removed from the bill-paying machine periodically by authorized representatives. The funds are carried to the office 89 (Fig. 5) or other safe collection point, where the funds are credited to the

5   accounts of the respective issuers. The data regarding the funds in the individual accounts of the bill payers are then transmitted to the issuers, either directly from the bill-paying machines through links 93, or through links 88 and the office 89. It should be understood that the dashed lines 88 and 93 indicating the paths of transfer of data can indicate data transmission over telephone lines or dedicated lines, but

10 preferably indicate transmission by cellular telephone, or through satellite data transmission channels or the Internet, as described above.

If cellular or satellite data links are used, then the unit 86 in each bill-paying machine includes appropriate transmitters, and each issuer location would have corresponding receiving and transmission equipment.

15 If cellular telephones are used to transfer the data, preferably, the data is transferred at night when usage rates are low. Preferably, the frequencies between voice frequencies are used for data transmission.

If desired, wireless remote transmission and monitoring of the bill-paying machines can be accomplished by use of a wireless service such as that made

20 available by RAM Mobile Data Company of Woodbridge, New Jersey.

Alternatively, a hand-held data recording and reproducing device can be used to gather the data from each machine by the representative who collects cash from the machine, and the data recorder can be carried to the office 89 to be stored and transmitted to the issuers, while the cash is credited to the accounts of the appropriate

25 issuers, in accordance with
the payment data.

Examples of hand-held data terminals which can be used for this purpose include the so-called "PDA" machine 97; the "Newton" laptop computer sold by Apple Computer, etc. Such machines can be simply plugged into a connector 95 for a

30 serial port on the microprocessor 80 to read the data out, and the data can be read out of the portable device at the office 89 in a similar fashion.

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Each such portable device preferably has a display, a key pad or pen type data entry means, a non-volatile memory of relatively large capacity, and a serial port or infra-red or R-F (radio frequency) link data transfer means.

This method of data gathering is advantageous in that, since the cash should be
5   removed by an authorized representative from the bill-pay machines frequently, the incremental time required for that person to read out the data could be relatively small. Also, only one hand-held portable data terminal is needed for each representative, as compared to one read-out and communications device per machine if the data is transmitted electronically.

10   Data can be transferred to and from the portable device 97 by infra-red or R-F data link, instead of by use of the serial port, if desired.

Alternatively, data can be stored in non-volatile memory packs mounted on easily-removable circuit cards, such as "PCMCIA" cards used in laptop computers for such a purpose. The card simply can be removed by the representative when he or
15   she removes funds from the machines. The representative then replaces each data-containing card with an empty card. The data-containing card then is carried to the office 89 where its data is read out and transmitted as described above.

Alternatively, a portable hand-held computer adapted to use PCMCIA cards is used to gather data from the bill-pay machines. The card containing data is removed
20   from the bill-pay machine, plugged into the hand-held computer to empty its data into the hand-held device, and then replaced in the bill-pay machine.

This combination has the advantage, over the use of replaceable cards, in that far fewer cards are needed, and a possibly cumbersome load of cards need not be carried to and from the office 89 by the service representative.

25   **OPERATION**

Each bill-paying machine is programmed to operate as follows. The specific programming steps used to achieve these results are not described in detail herein because they are well within the skill of the art to perform.

1.   When the machine is in stand-by, waiting for a customer, it displays a
30   message on the display 24 or screen 14, such as "PLACE BILL IN RECEIVER OR, IF YOU HAVE NO BILL, TOUCH "MANUAL" AREA ON SCREEN", in the language appropriate to the location of the machine. Preferably, in the stand-by mode, the scanner 38 is turned off.

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2.   If the user has a bill, the user inserts the bill into the receiver 34 and

places it on the support platform 36 with the bar-code 42 or other coded information

in a location where it can be read.

3.   The detector 54 detects the presence of a bill and sends a signal which

5   turns on the scanner 38. The scanner 38 scans and reads the coded data, using the

stored program for the specific type of code found on the bill. If the code is

unreadable for any reason, such as: the reader cannot read that type of code, or the

coded area is smeared, crumpled or otherwise damaged, or the code is not located in

the appropriate place, the user is prompted to use the "manual" mode of operation.

10   Once the coded data or manually input information has been read, the machine

is programmed to perform the following steps.

4.   Stored in the computer 80 is a set of program instructions instructing it

to detect whether the payment date has passed. If so, it computes and applies a late

penalty, in accordance with stored instructions.

15   In some cases, where the payment is very late, the utility will have

been disconnected; that is, the telephone, water, gas, etc. will have been turned off,

and a fee for reconnection must be added to the bill. Reconnection fees are computed

or retrieved from memory and added to one bill. Next, the total amount due,

including any late penalties and reconnection fees, is displayed.

20   5.   f the user is not then prepared to pay the bill, he can simply press one

of the pre-programmed buttons 25 or 26 to print out a statement which is printed by

the printer in the machine (not shown), dispensed through the slot 32 and cut off. The

printer preferably is a simple dot-matrix printer with a conventional paper cut-off

mechanism, but can also be a thermal or inkjet printer with cut-off mechanism. Also

25   the printer can be of a type that is combined with the bar code or OCR reader and thus

permits the printing of the receipt on the actual bill presented for payment.

6.   The computer next causes an appropriate message to be displayed on

the display 24, such as "DEPOSIT MONEY", or the equivalent. The user then inserts

paper money into the bill acceptor 46 and/or coins into the coin acceptor 44 or inserts

30   a debit or credit card into slot 49. As each bill or coin is deposited and accepted or

when the debit or credit card has been verified and the payment amount input, a

corresponding credit is developed and the accumulated credit total is displayed on the

display 14 or 24.

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When the total credits equal or exceed the amount due, the display 24 indicates that the bill has been paid.

7. If the amount deposited exceeds the amount due by no more than a pre-determined amount, and if the machine has sufficient funds to issue change, change will be dispensed into the change receptacle 48.

8. Alternatively, if the user wishes to apply the excess payment as a credit against future bills, he operates one of the programmable keys 25 or 26 to indicate this fact, and the machine indicates this credit balance, stores it, and prints this information out on a receipt issued by the printer through the slot 32.

9. If the machine is out of change; that is, if it does not have enough change to pay out the maximum amount of change for any given transaction, this fact will be indicated by the lamp 45 which may display a message such as "EXACT CHANGE ONLY".

10. If the money deposited by the user does not equal or exceed the amount of the bill due, the user can cancel the transaction by pressing the cancel button 30 and receive a full refund. In the event that insufficient credit is deposited into the machine, after a pre-determined time period the machine will automatically complete the transaction by issuing a receipt showing a part payment and may also indicate on the receipt when any remaining balance is due.

11. In an alternative arrangement, the machine will not accept a bill or coin which drives the total paid over the amount due by more than the change limit.

12. The "OK" button 28 is pressed pursuant to prompts displayed on the display 14 or 24 at various points during each transaction to indicate the user's acceptance of the operations indicated.

13. When the transactions relating to one bill issuer have been completed, the machine will ask the user if the bills of any other issuer serviced by the machine are to be paid. If so, the machine repeats the foregoing steps for each other issuer, until the user ends the process and the machine returns to stand-by status.

As it can be seen from the foregoing, the invention admirably meets the objectives set forth above.

Each of the bill-pay machines 10 is a physically secure unit which can accept cash or another payment means to pay bills due to the various issuers who use the machines. The machines can be located in bank lobbies; integrated with automatic

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teller machines ("ATMS"); in offices of the issuers, and in diverse other locations, such as grocery stores, travel offices, bus, air line and train terminals, and other locations, such as convenience stores and the like where personnel are at hand to keep an eye on the machines.

5   Also, with remote surveillance by video cameras, the machines can be located at sites which are unguarded by people who are physically present.

The user has the option of using a credit or debit card or cash to transfer funds, and need not pay cash to a teller or clerk. This greatly speeds the payment of the bills and reduces labor costs. Bill payments need not be mailed, and late payment penalties

10   can be avoided, all without the user having to buy or rent any expensive computer or other equipment.

The bar codes or OCR codes can be printed on ordinary paper, so that the bills need not be printed on heavy, expensive card stock. The printing of the coded information on the bills is relatively inexpensive, and the code scanners used also can

15   be relatively inexpensive.

Each of a plurality of bill issuers is identified simply and easily by storing its identification as part of the coded information. This information is used, conveniently, to deposit the funds collected from the machine to the accounts of the proper issuers, and to transmit the account information to those issuers so that the next

20   bill they issue to the customer will take account of the payments made at the machines.

Change is given for cash transactions, and yet the maximum amount of change given is limited so as to minimize misuse of the bill-paying machines simply to give change and to preserve the change supply in the machine.

25   Data transfer is accomplished, in certain forms of the invention, without the need for reliable telephone lines. Thus, the unit 86 in Fig. 5 can be either a modem for transmission over telephone lines, or a wireless transmitter, or a hand-held data terminal or other hand method of data transfer can be used.

The above description of the invention is intended to be illustrative and not

30   limiting. Various changes or modifications in the embodiments described may occur to those skilled in the art. These can be made without departing from the spirit or scope of the invention.

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CLAIMS:

1.   A bill-paying system comprising, in combination, a plurality of bill-paying machines at geographically spaced-apart locations, a plurality of data reception stations, remote from said machines, each for a different one of a plurality of bill issuers, each of said machines having a computer, a code reading device for reading human-readable characters, a funds acceptor device, said computer being programmed to receive and store data read by said reading device from a bill presented to said machine identifying the issuer of said bill, to compute and store data representing the amount to be paid by the presenter of said bill, and the amount actually paid by said presenter, and a data transfer device for transferring the stored data to the one of said data reception stations corresponding to the identified issuer.

2.   A system as in Claim 1 in which said data transfer device is selected from the group consisting of: a radio-telephone link; a satellite link; modems and telephone line or other world-wide web; and hand-held data transfer and storage devices.

3.   A system as in Claim 1 in which said code-reading device is selected from the group consisting of an optical character recognition device, a multi-function scanner for selectively reading either bar-coded or human-readable information, and a magnetic ink character scanner.

4.   A system as in Claim 1 in which each of said bill-paying machines includes an input device for manually inputting billing information as an alternative to reading billing information from a bill.

5.   A bill paying machine for the payment of bills bearing information regarding the bill and the person or entity owing it, said machine comprising, in combination, a support structure, a human-readable information scanner secured to said structure, a payment accepting device secured to said structure for accepting payment against amounts due on said bill, and a computer for applying payments against said amounts due and computing the payment status of said bills.

6.   A machine as in Claim 5 in which said scanner is selected from the group consisting of an OCR device, a device convertible between an OCR device and a bar-code reader, and a magnetic ink character reader.

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7.   A machine as in Claim 5 including a manual input device for use as an adjunct to said scanner, said manual input device including a plurality of keys operable in response to the touch of the user.

8.   A bill paying machine for paying bills bearing information identifying one of a plurality of different issuers, the amount owed and the due date, said machine comprising, in combination, a lockable housing, a recess in said housing, a surface in said recess for supporting a bill for scanning, a human-readable information scanning device mounted in said housing adjacent said recess and adapted to scan and read information on one of said bills, a computer for storing data regarding the identification of said issuer, said amount owed, and said due date, and for computing late penalties due and total amount due, a payment acceptance device for accepting cash payments and converting said payments into credits against said bills, and a communication device for electronic communication with said issuer to communicate said credits to the proper ones of a plurality of said issuers.

9.   A method of remote payment of bills bearing information in human-readable form, said method comprising the steps of:

        (a)   providing machines at a plurality of locations remote from the issuer of said bill, each of said machines having a scanner for reading said human-readable information, a payment acceptance device, and a computer for converting payments made into the machine into credits against said bill;

        (b)   presenting a bill to one of said scanners in one of said machines causing said information on said bill to be converted into data identifying the issuer of said bill, the amount owed, and the due date;

        (c)   alternatively, inputting billing information into said machine by manual keying,

        (d)   inputting credits into said machine, said machine computing corresponding credits to said bill, and

        (e)   conveying information to said issuer, including said credits.

10.   A method as in Claim 9 in which each of said machines has a secure, lockable housing and is capable of stand-alone use, said depositing step including depositing cash into a collection box, and periodically gathering cash from said box, taking said cash to a collection station, and manually gathering data from said

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machines and carrying said data to said collection station with said cash, and

including providing debit or credit card acceptance means.

11.   A method as in Claim 10 including the step of providing a video screen

and displaying billing information read from bills or manually input, whereby

5   alphanumeric characters read by said scanner and manual input can be displayed,
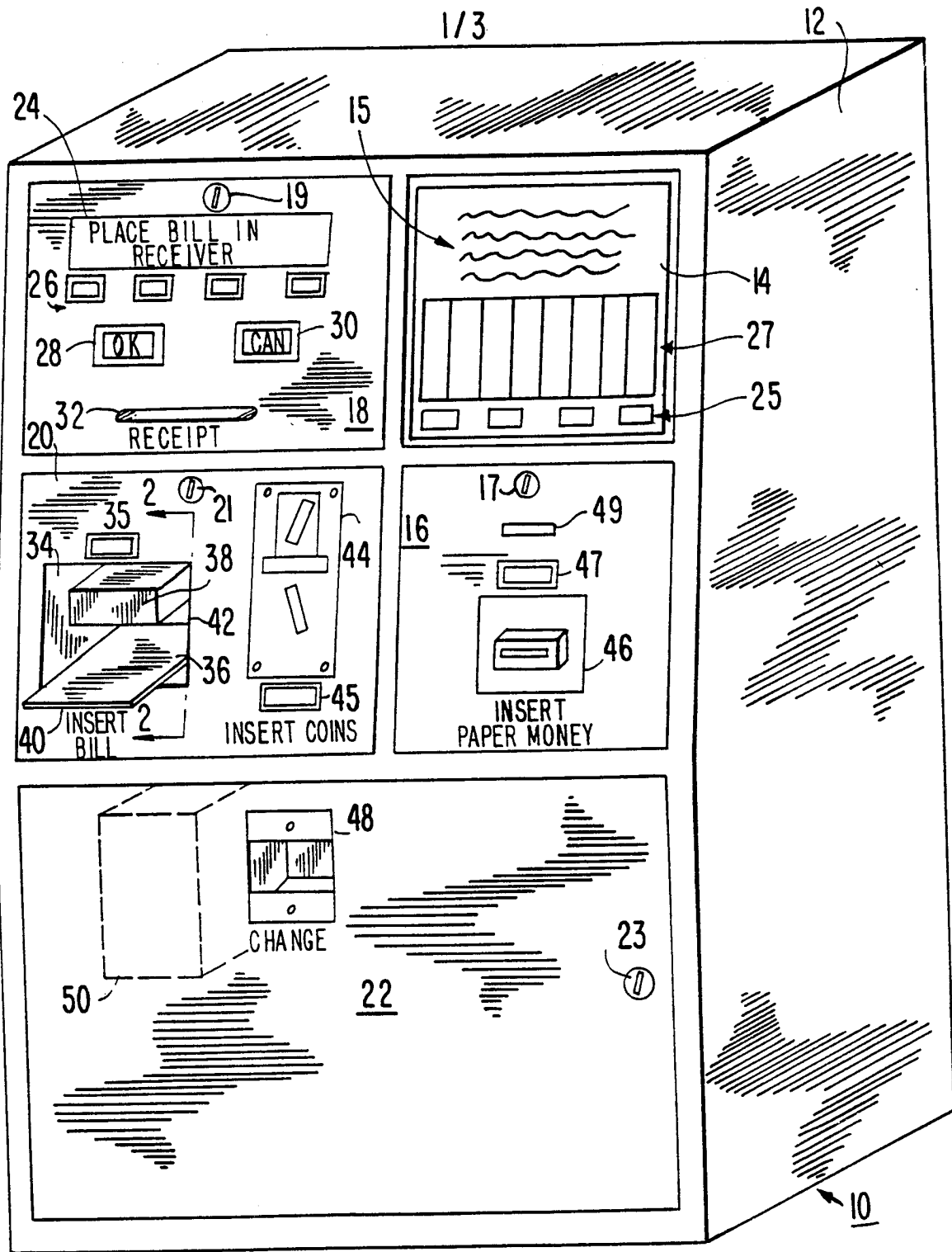
compared and corrected.

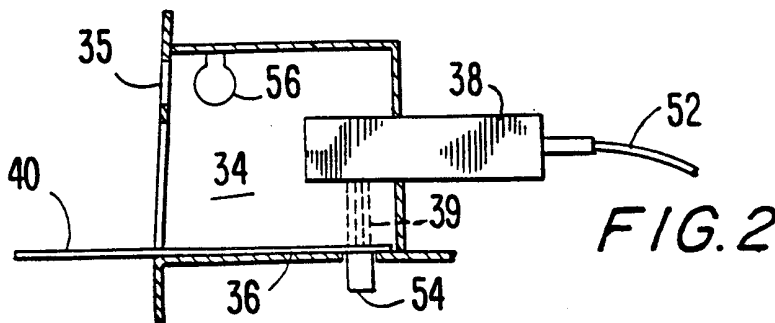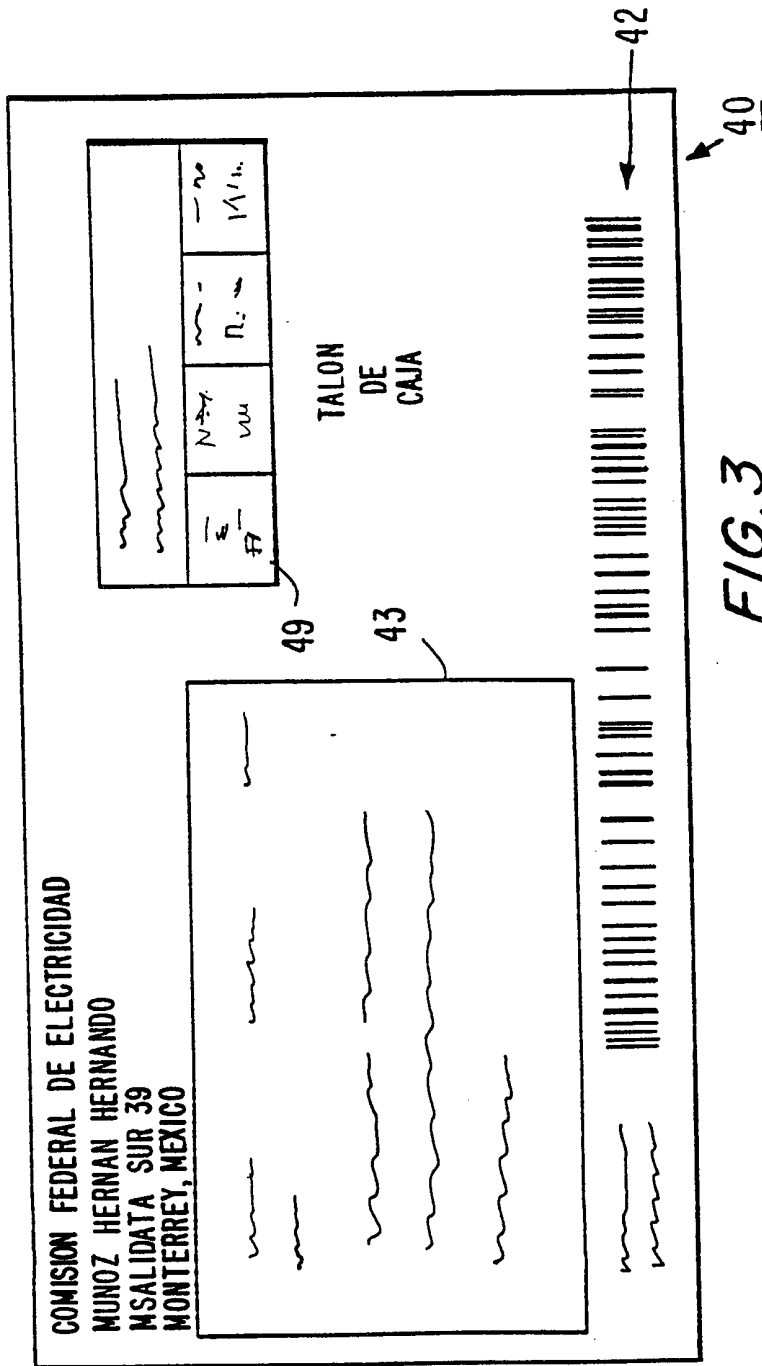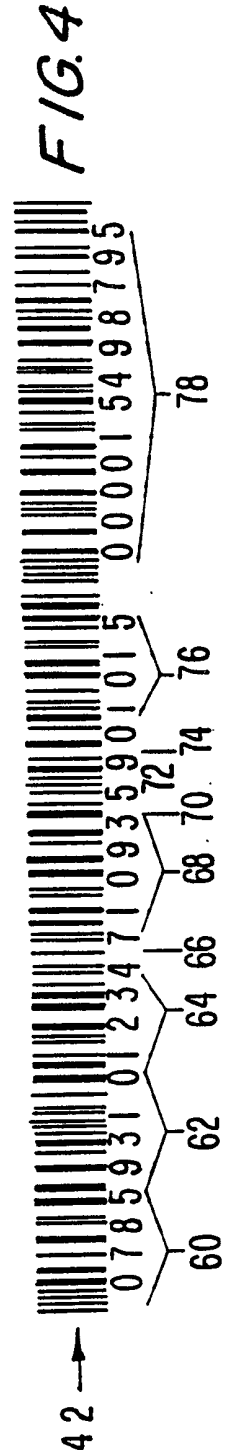1/3

FIG.1

FIG.2

FIG. 3

FIG. 4
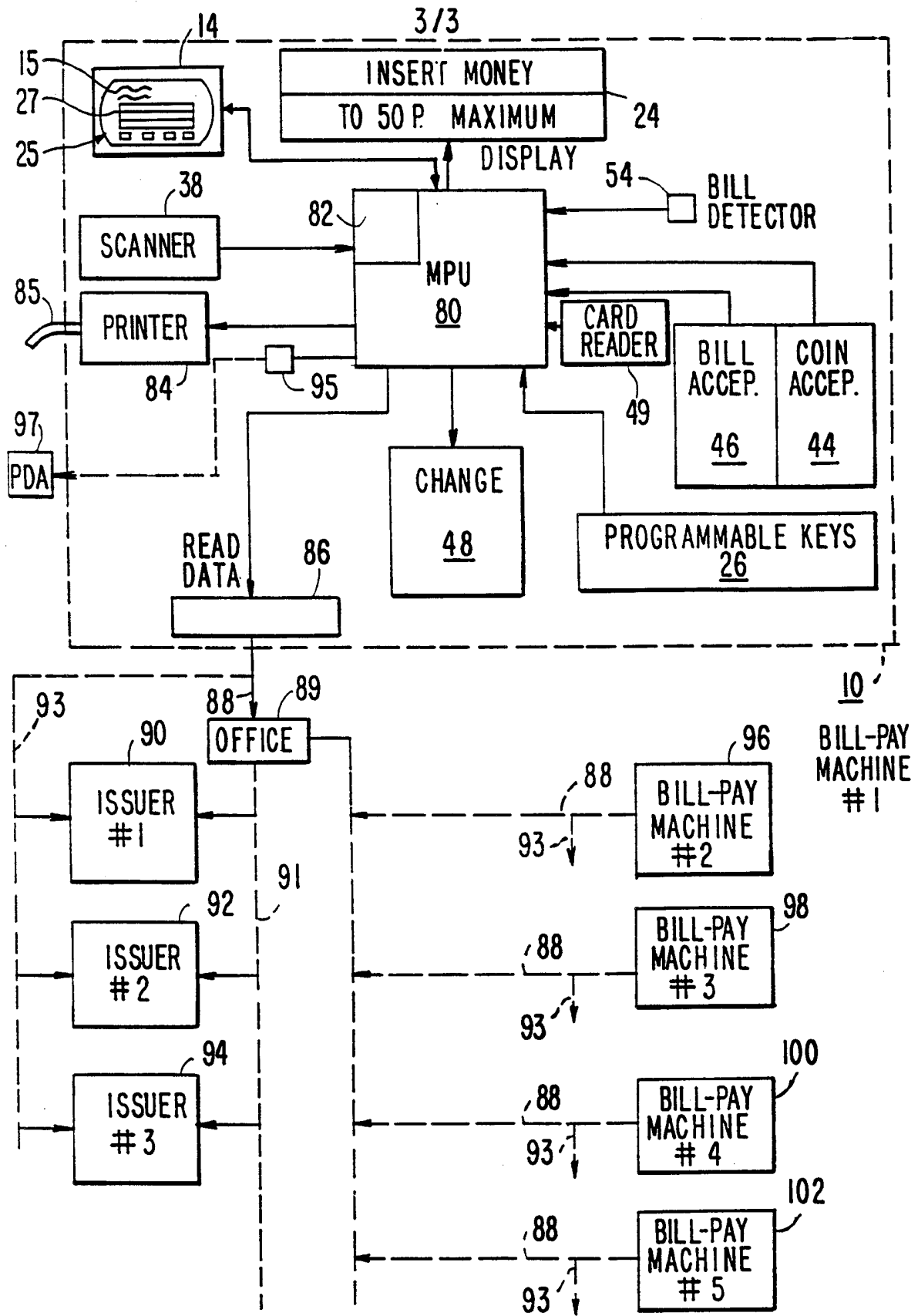
3/3

FIG. 5

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6)   : G06F 17/60

US CL   :Please See Extra Sheet.

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)

U.S. :   235/380, 379, 381, 472; 902/1-9, 13, 15, 18, 20, 22, 25, 27, 30, 31

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

NONE

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

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,616,902 A (COOLEY ET AL) 01 April 1997 (01/04/97), see entire document	1-11
Y	US 4,970,655 A (WINN ET AL) 13 November 1990 (13/11/90), see entire document	5-11
Y	US 5,183,142 A (LATCHINIAN ET AL) 02 Febuary 1993 (2/2/93), see entire document.	5-11
Y	US 4,359,631 A (LOCKWOOD ET AL) 16 November 1982 (13/11/92) , see entire document	1-11

| | Further documents are listed in the continuation of Box C. | | See patent family annex. |

	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 OCTOBER 1999	03 NOV 1999

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Form PCT/ISA/210 (second sheet)(July 1992)*

A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

235/380, 379, 381, 472; 902/1-9, 13, 15, 18, 20, 22, 25, 27, 30, 31