A machine and method for preparing and dispensing documents relating to financial transactions. The machine contains a printer for printing the documents and, optionally, a bar code and/or a MICR reader mounted for movement with the print head of the printer for reading information from each document before/during printing. The machine includes a control unit (which includes a CPU, memories, and input/output devices), an input unit (which may be constituted by a keypad and/or an alphanumeric keyboard), and means for communicating with a remote supervisory location. Operation of the machine may be controlled from the remote supervisory location, which provides periodic authorization to continue to prepare and dispense documents in response to transaction reports, including matching of purchaser and/or beneficiary identification information with one or more lists of restricted customers, which are transmitted from the machine to the remote supervisory location.
SENSE PRINTER DOOR OPEN OR EXEC KEY TO SWITCH BETWEEN EXEC AND OPERATOR MODE

OPERATOR MODE

COLLECT PASSWORD

COLLECT COMMAND

REPORT

SELECT END OF DAY, SALES SUMMARY, OPTIONS

PRINT REPORT

UPDATE LOG

PHONE OUT

CALL HOST

UPLOAD LOG

DOWNLOAD CHANGES

UPDATE LOG

MONEY ORDER

COLLECT AMOUNTS AND FEES

PRINT MONEY ORDERS

UPDATE LOG

VOID

COLLECT NUMBER

UPDATE LOG

EXECUTIVE MODE

COLLECT COMMAND

REPORT

SELECT END OF DAY, SALES SUMMARY, OPTIONS

PRINT REPORT

PHONE OUT

CALL HOST

UPLOAD LOG

DOWNLOAD CHANGES

UPDATE LOG

LOAD BLANK MONEY ORDERS

COLLECT SERIAL NUMBERS

UPDATE LOG

MODIFY OPTIONS

COLLECT OPTIONS

UPDATE FILE

MAINTENANCE

PERFORM HARDWARE DIAGNOSTICS

FIG. 7
FIG. 12
MACHINE AND METHOD FOR PREPARING AND DISPENSING DOCUMENTS

RELATED APPLICATION DATA

[0001] This is a continuation-in-part of application Ser. No. 09/401,857, filed Sep. 22, 1999, now U.S. Pat. No. ______.

FIELD OF INVENTION

[0002] The present invention is directed to machines, methods, and systems for preparing and dispensing documents, including those relating to financial transactions, such as money orders.

BACKGROUND

[0003] A variety of machines for dispensing documents are already in use. These machines, however, possess a number of inherent limitations. Among these limitations are the inability to be efficiently supervised and controlled from a location remote from the machine, the inability of such machines to accept various forms of payment, limitations relating to the nature and form of the data, text, and graphics that can be printed, limitations relating to the security of the documents that are contained within the machines, the inability, or limited ability, of these machines to comply with local, state, and federal regulations in connection with the preparation and dispensing of financial documents, and the limited ability of these machines to monitor their own operation.

[0004] In addition, existing machines are generally capable of preparing only a single type of document and may not be adapted to the preparation of other types of documents. A need, therefore, exists for a stand-alone, self-contained document dispenser which is operative in compliance with regulatory and security guidelines and within a network of a plurality of such dispensers, each of which is in communication with a central administrator at a remote, central location.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIGS. 1 and 2 are perspective views showing an embodiment of a machine according to the present invention in two optional configurations.

[0006] FIG. 3 is a perspective view showing the interior of the machine of FIGS. 1 and 2 with components removed to permit viewing of other components.

[0007] FIG. 4 is a top perspective view showing printer unit components of a printer unit of the machine of FIGS. 1-3.

[0008] FIG. 5 is a block diagram of the components of the machine of FIGS. 1-4.

[0009] FIG. 6 is a pictorial view of a document prepared by a machine according to an embodiment of the invention.

[0010] FIG. 7 is a flow chart illustrating the operation of a machine according to an embodiment of the invention.

[0011] FIGS. 8A and 8B are perspective views showing an embodiment of a machine according to the present invention.

[0012] FIG. 9 is a perspective view showing portions of the interior of the dispenser shown in FIGS. 8A and 8B.

[0013] FIG. 10 shows an arrangement of a print head, a bar code reader, and a MICR scanner/reader according to an embodiment of the present invention.

[0014] FIG. 11 shows an example of a document that may be used in conjunction with an embodiment of the present invention.

[0015] FIG. 12 is a flow chart illustrating the printing process according to one embodiment of the present invention.

[0016] FIGS. 13A and 13B provide flow charts for the processing and dispensing of documents according to an embodiment of the present invention.

[0017] FIG. 14 is a flow chart illustrating the communication process between a machine and a remote central location according to an embodiment of the present invention.

DETAILED DESCRIPTION

[0018] An object of the present invention is to open the possibility of preparing and dispensing documents, and in particular documents having monetary value, from any desired point-of-sale location, with a high degree of security and in compliance with local, national, and/or international regulations.

[0019] Another object of the invention is to provide flexibility in the types of documents that can be dispensed from a single machine.

[0020] A further object of the invention is to improve communications between a machine through which financial transactions are processed and a central location remote from the machine, and in particular to allow transmission, from the machine to the central location, of information relating to the financial transactions, and from the central location to the machine of authorization instructions to continue, and/or termination instructions to terminate, preparation and dispensing of financial documents.

[0021] Still another object of the invention is to allow collection and/or input of information into the machine through the use of a keyboard with full sets of alpha and numeric characters.

[0022] Still another object of the invention is to allow such a machine to be configured to produce various types of documents.

[0023] Still another object of the invention is to allow the purchase of such documents to be electronically debited to, for example, credit or debit accounts by the use of credit, debit, or “smart” cards.

[0024] The above and other objects are achieved, according to the present invention, by the provision of a machine for preparing and dispensing documents relating to financial transactions, the machine comprising:

[0025] a stand-alone, self-contained document dispenser having a housing;

[0026] a manually operable input unit for input of data and operating commands, said input unit being external to and coupled through said dispenser housing;
a document printer unit for printing readable information, including a monetary value, on documents based on data input at said input unit, wherein said document printer unit is contained entirely within said dispenser housing and comprises:

a printer having a print head configured to move back and forth along a guiding rod in a scanning path that is transverse to the direction of advancement of the documents; and

an optical reader for reading barcode information on said documents, said optical reader being mounted so as to be aligned with the print head and move along said rod with the print head, wherein the print head prints a barcode on each said document as it moves in one direction and, as it returns along said rod in the opposite direction, the optical reader reads the barcode just printed by the print head, thereby verifying proper function of the printer unit without advancing the document;

an internal control unit contained entirely within said dispenser housing and directly electrically coupled to said input unit and said printer unit for controlling operation of said printer unit in response to data and commands input at said input unit, wherein the control unit comprises a memory means for receiving and storing data received from said input unit and representing at least the monetary value of each document; and

a communication interface for conducting communications with an off-site central location remote from said dispenser and operative to transmit the data stored in said memory means to said central location, wherein the control unit is operative to receive authorization instructions from the central location via said interface.

Objects of the invention are further achieved by a machine for preparing and dispensing documents relating to financial transactions, the machine comprising:

a stand-alone, self-contained document dispenser having a housing;

a manually operable input unit for input of data and operating commands, said input unit being external to and coupled through said dispenser housing;

document printer unit for printing readable information, including a monetary value, on documents based on data input at said input unit, wherein said document printer unit is contained entirely within said dispenser housing and comprises:

a printer having a print head configured to move back and forth along a guiding rod in a scanning path that is transverse to the direction of advancement of the documents; and

a Magnetic Ink Character Recognition (MICR) reader for reading information on said documents, said MICR reader being mounted so as to move along said guiding rod;

an internal control unit contained entirely within said dispenser housing and directly electrically coupled to said input unit and said printer unit for controlling operation of said printer unit in response to data and commands input at said input unit, wherein the control unit comprises a memory means for receiving and storing data received from said input unit and representing at least the monetary value of each document; and

a communication interface for conducting communications with an off-site central location remote from said dispenser and operative to transmit the data stored in said memory means to said central location, wherein the control unit is operative to receive authorization instructions from the central location via said interface.

Additional objects of the invention are achieved by a method for preparing and dispensing documents relating to financial transactions, the method comprising:

providing a machine comprising a stand-alone, self-contained document dispenser, said dispenser including a printer and an internal control unit having a memory means for receiving and storing data relating to each said transaction;

obtaining identification information relating to at least one of a purchaser and a beneficiary of each document to be dispensed;

accessing at least one of a list of restricted purchasers and restricted beneficiaries to determine whether there is a first type of match between the purchaser’s identification information and the list of restricted purchasers or a second type of match between the beneficiary’s identification information and the list of restricted beneficiaries;

when at least one of said matches is found, recording in said memory means information about the at least one match that has been found; and

determining whether to dispense said document based on a predetermined set of parameters.

It is noted that, in the instant application, the term “monetary order” is used illustratively, and not by way of limitation, as an example of a “financial document”. Also, the terms “purchaser” and “buyer” may be used to refer to an entity (including one or more individuals) on whose behalf the financial document is prepared, while the terms “payee” and “beneficiary” may be used to refer to an entity (including one or more individuals) for whose benefit the financial document is prepared, and the term “customer” may be used to refer generally to a purchaser and/or a beneficiary.

In addition, the term “transaction” is defined as the combined, sequential purchase of financial documents, e.g., money orders, added up to the total face value thereof, plus any applicable fees. In other words, where a plurality of money orders are printed for the same customer, at the same time (i.e., sequentially), the plurality of money orders together constitute a single transaction, and the sum of the
face value of each of the plurality of money orders, added to applicable fees, if any, constitutes the “transaction amount”. It follows that, when a single money order is involved, the single money order constitutes the “transaction” and the “transaction amount” is the face value of the money order, plus any applicable fees.

[0048] Similarly, “multiple transactions” are transactions performed on the same day by/for the same customer (as determined by a customer name match) at all locations within a network of document dispensers that are in communication with a single off-site, central location, or central administrator (e.g., the “headquarters”). Moreover, “structured transactions” may be defined as transactions performed by/for the same customer at all locations from which headquarters gathers data over a certain period of time, as determined by a customer name match.

[0049] With the above in mind, FIGS. 1 and 2 present perspective views showing two configurations of an embodiment of a machine according to the present invention. The machine is comprised essentially of a document dispenser and any external devices that may be connected thereto. In the embodiment shown in FIGS. 1 and 2, the machine comprises three modules: (1) a manually operable input unit, or data entry module, 2; (2) a printer unit, or module; and (3) a terminal control unit, or module, wherein the printer and terminal control modules are both housed in a case, or housing, 4 of the dispenser.

[0050] Case 4 may be made of metal and is composed of a bottom plate, or base 6, two side panels 8 that are fixed to base 6, a rear panel (not visible in FIGS. 1 and 2, but shown as element 34 in FIG. 3), a rear door 10 hinged to the upper edge of the rear panel and a front door 12 having a lower edge that is hinged to the front edge of base 6. Door 12 is provided with a dispensing slot 14 for delivery of prepared documents. In an alternative embodiment shown in FIGS. 8 and 9, the dispenser may comprise a single door 300 (see FIG. 8A) that is hinged at the back of the dispenser to the upper edge 335 of the rear panel 334 and that, when closed, covers the entirety of the dispenser, including the front, leaving exposed a dispensing slot 314 for delivery of prepared documents.

[0051] Input unit 2 may be mounted on the upper surface of lid 12, as shown in FIG. 1, or may be placed on a table or counter, alongside case 4, as shown in FIGS. 2, 8A, and 8B. The base of input unit 2 is formed to allow unit 2 to rest on a counter or table top, as shown in FIG. 2, and is also configured, in cooperation with the upper surface of door 12, to be mounted securely, but removeably, as with screws or bolts, on that upper surface.

[0052] For each mounting arrangement, input unit 2 is connected to the control unit by a suitable cable 18 connected at one end to a connector mounted on the rear surface of unit 2 and at the other end to a connector (e.g., a port, interface etc.) on the back of case 4.

[0053] Door 10 can be opened to gain access to a document storage receptacle forming part of the printer unit and door 12 can be opened to gain access to a printer forming part of the printer unit, including access to the print head, as well as to permit clearing of any paper jams that may occur between the printer and slot 14. Preferably, case 4 is provided with a key operated lock 20 which locks at least door 10 in its closed position. The lock may also, optionally, be configured to lock door 12 in the closed position.

[0054] In the alternative embodiment shown in FIGS. 8 and 9, access to the document storage receptacle, the printer, and the print head may be gained through the single door 300. In addition, a door (or cover) key operated lock 320 may be utilized to secure the door 300 in the closed position. In addition, turning the lock 320 to an open position places the dispenser in a “privileged” mode in which the user (or operator) is able to load new documents, configure machine functions, close out the day, etc.

[0055] Input unit 2 may be, essentially, a keypad having an array of manually operable keys 24, a LCD display 26, preferably with LED backlighting, and, in embodiments of the invention, a data reader 30 capable of reading data stored in smart cards or on magnetic strips of debit or credit cards. Preferably, display 26 contains a high contrast, high viewing angle LCD display with a format of two lines of 20 alphanumeric characters each, including the capability of displaying three special currency characters.

[0056] Keys 24 may be constituted, for example, of a 5x5 matrix of full travel alphanumeric keys of the type provided on a push button telephone handset, in addition to a double width double zero key and operating command keys. The operating command keys may include, for example, keys that perform the following functions:

[0057] Clear—clears the previous input that appears on the display; Escape—stops the present procedure and returns to the previous step; Credit Card—indicates that the transaction is being conducted with a credit card; Report—prints a report; Debit Card—indicates that the transaction is being conducted with a debit card; Void—voids a money order or other transaction; Bill Pay—indicates that a bill payment is being made; No Fee—indicates that no fee is being charged for the current transaction; Next—scrolls to the next option within the current activity; Print—prints the current document; Alpha—switches the numeric keys to alphabetic keys; Enter—enters the operator input, if any, and scrolls to the next action; 00—inputs a double zero.

[0058] Unit 2 may be provided with an optional on/off key switch whose position will be sensed by the control unit to cause operation to enter an executive mode, which will be described in greater detail below. Unit 2 also contains its own controller printed circuit board provided with a CPU and a memory connected to operate the devices of unit 2 under control of a main CPU in terminal control unit 40 (FIG. 3).

[0059] In an alternative embodiment, the manually-operable input unit may be constituted by an alpha-numeric keyboard 325, such as, e.g., a personal computer keyboard. As shown in FIG. 8B, the keyboard 325 is connected to the control unit via a separate cable 329, and may have its own display 327. The keyboard 325 may be used either in conjunction with, or in place of, the keypad mentioned above. Thus, even though FIG. 8B shows the dispenser connected to both a keypad and a keyboard, in embodiments of the invention, the input unit 2 for inputting of data, purchaser/paye information, etc. may be constituted exclusively by the keyboard 325. As will be explained in further detail below, in alternative embodiments, such information may also be entered through a Point of Sale (POS) or other device that may be connected to the dispenser.
FIG. 3 is an exploded perspective view showing the machine of FIGS. 1 and 2 in a partially disassembled state. Specifically, one side panel 8 has been moved away from its assembled position and doors 10 and 12 are opened. Therefore, in this view, rear wall 34 of case 4 is visible.

Installed in the lower part of case 4 is the control unit 40 which is constructed in the manner currently used for personal computers to include a motherboard 42, a central processing unit (CPU) containing a microprocessor, a power supply 44, volatile and non-volatile memories 46, preferably including a non-volatile flash memory whose contents can be altered from a remote supervisory location via a telephone link, Ethernet (network) interface, or other means of communication, and a plurality of cards 48 selected to perform various functions, including communications with the other modules of the machine and with a remotely located central location, e.g., with the computer system of a central administrator that is located at a central location and administers and communicates with one or more machines located at one or more separate locations remote from the central location.

According to one embodiment of the invention, the central processing unit should be at least at the 486 level with a 33 MHz clock, running a version of DOS 6.22. Motherboard 42 carries at least a main memory having a minimum of 4 Mb of Fast Page RAM, with a minimum expansion capability for an additional 32 Mb of memory. The system clock is a real-time clock which is processor controlled and provided with a battery back-up. Motherboard 42 further carries a non-volatile secondary memory having a minimum capacity of 8 Mb. A terminal program, report information and translation logs reside in this memory. The system is capable of being expanded to have at least 80 Mb of memory of this type.

Motherboard 42 further carries, on one or more of cards 48, or directly on board 42, a group of interfaces including two serial ports on one card, at least one parallel port and at least one standard PS/2 style connector and interface. One of the two serial ports is used to communicate with unit 2, while the other is used to control printer unit 50, to be described below.

The parallel port is provided to communicate with an optional external lister printer. The PS/2 connector and interface are provided particularly for optional connection to a standard personal computer keyboard.

In one embodiment, cable 18 is hardwired to control unit 40 at a connection point that is preferably located at the bottom of case 4 in a recessed area. This location helps to reduce the risk of tampering or accidentally disconnecting various cables. A first connector panel (not visible) at the rear of case 4 includes at least the following components: an AC input connector; an RJ 11 phone line jack; and an RJ 11 phone jack (pass through). A further connector panel 43 carries the PC keyboard plug (PS/2 type) and possibly other connectors.

FIG. 9 shows a rear connector panel 334 of the dispenser according to one embodiment of the invention. In this embodiment, the panel may include one or more of the following:

(1) A port 391 for connecting to a keypad or keyboard including a display;

(2) A port 392 for keyboard connection;

(3) Two USB ports 393, which may connect to a number of external devices, such as, for example, an external Magnetic Ink Character Recognition (MICR) scanner for hand-feeding and scanning of cashed checks, an external printer (e.g., dot matrix, laser, inkjet, thermal, etc.), an external communications device, a keyboard/display combination (such as, e.g., the embodiment of FIG. 8B, where the keyboard 325 has an integrated display 327, such that this port can be used to print to the keyboard display), or an external optical scanner (e.g., to scan a check, a customer’s identification document, etc.)—this port may also be used to connect to a cash register, or any other device that requires interaction with the machine;

(4) A modern port 394 for a phone line communication connection to, e.g., the central administrator/location;

(5) An Ethernet network port 395, which enables connection to a computer network, as well as to a POS system for, e.g., dispensing money orders—through this port, the machine is able to report sales, etc. through the computer network (instead of dialing out, for example) and, by the same token, can be controlled through the network;

(6) A serial port 396 which allows, generally, the same types of connectivity as discussed above with respect to the USB ports 393—in addition, an external device may remotely control the machine through this port, such as, e.g., a POS system through which a user (or operator) may enter the transaction details, followed by the POS system instructing the machine to print the documents, etc.;

(7) A parallel port 397, which enables printing to a multitude of printing devices, including, e.g., a dot matrix printer, a laser printer, an inkjet printer, and a thermal printer; and

(8) A power plug 398 to connect, e.g., through a standard computer power cable.

Referring back to FIG. 3, control unit 40 also includes an expansion area that can accommodate a number of additional cards, a manual power cut off switch, and an internal modem. The switch is provided to allow manual shut off of the entire machine and is normally left on unless control unit 40 is being serviced. The internal modem may be of the auto answer/auto-dial type with a data transfer speed of at least 14,400 bits per second over voice grade phone lines. Other types of connectivity, including, but not limited to, digital, cable, and/or wireless communications may also be established.

FIG. 4 is a perspective view of the machine according to an embodiment of the invention. In this view, the machine is viewed from the top with doors 10 and 12 open to allow the components of printer unit 50 to be viewed. The basic components are a document form storage receptacle, or paper tray, 52, an inkjet printer which includes an essentially flat printer platen 54, and a document form guide system including a guide plate 56 for guiding each one of a plurality of document forms in succession from recep-
tacle 52 to platen 54; receptacle 52 is provided with tail-lifting tabs which raise the back end of the stack of document forms to facilitate manual removal of those forms if necessary.

[0077] FIG. 4 further illustrates that, in this embodiment, the machine is equipped with door open sensors 58. These sensors 58 can be microswitches that are coupled to control unit 40 to halt operation of the machine if door 10 should be opened.

[0078] In printer unit 50, paper is transported along a single paper path by a unidirectional friction drive preferably composed of a single set of rollers, including an idle roller 57 (FIG. 3) and a drive roller 59 (FIG. 4), both of which are located above the document forms as they are fed to the print head. In the preferred form of drive, paper does not travel over the wheels or rollers and there is a minimal risk of paper jams.

[0079] Provision is made for a transport inhibit function which opposes false advance of document forms through the printer. The transport will feed the document forms at a rate of at least 4 inches per second and is constructed to handle documents having a width of up to 6 inches, although other configurations are also possible.

[0080] Preferably, the document forms are fed in cooperation with printer operation to perform printing with a line pitch of 6 lines per inch over a print zone having a width of the order of 4.5 inches. A paper advance button 53 is also provided inside case 4. Both a form feed and a line feed mode can be available.

[0081] Printer platen 54 forms part of the printer of printer unit 50. The printer includes, as is visible in FIG. 3, a print head 62 carried by a carriage 64. Carriage 64 is movable along a support (or guiding) rod 66 in a direction perpendicular to the direction of movement of document forms through the printer.

[0082] Carriage 64 is driven by a conventional mechanism and print head 62 is constructed according to principles well-known in the art. Indeed, the printer can be constituted by a commercially available ink jet printer which is constructed, or can be adapted to be mounted in printer unit 50, although, as will be discussed below, modifications may be made to the printer unit to achieve the objectives of the present invention.

[0083] In one embodiment of the invention, prior to being loaded into tray 52, each document form is preprinted with a bar code 82, as shown in FIG. 6, that contains a sequence number uniquely identifying that document form, e.g., money order. In a stack introduced into receptacle 52, successive forms will have successive sequence numbers. Each form 70 will further be provided with a conventional “top of form” mark which is formed of optical black ink having a specific reflectivity and position. This mark is located on the back of each document 70, 70’, etc. and is therefore not visible in FIG. 6.

[0084] According to a particular feature of an embodiment of the invention, print head 62 may carry a bar code reader (e.g., an optical reader) 63, which may also be of a conventional type, for reading a bar code which was preprinted on each document form or which is printed in printer unit 50. Thus, bar code reader 63 can serve as a verifier of a bar code which has been pre-printed, or is being printed on the document form while the latter is being processed within the dispenser.

[0085] One advantage of an ink jet printer is that it includes a carriage that must of necessity traverse a printing region transverse to the document form feed direction and that can thus displace a bar code reader along a path suitable for reading a bar code. In this regard, in the embodiment shown in FIG. 3, printing is effected while carriage 64 is displaced in one direction along rod 66, and a reading function is performed with bar code reader 63 during the return movement of carriage 64.

[0086] As will be discussed further below, this configuration allows for verification of the printer’s functionality where the reader 63 is mounted so as to be aligned with, rather than laterally offset from, the print head 62 and move along rod 66 with the print head. In this way, the print head prints a barcode on the document as it moves in one direction and, as it returns along rod 66 in the opposite direction, the reader 63 reads the barcode just printed by the print head, thereby verifying proper functioning of the printer unit without advancing the document.

[0087] In an alternative embodiment, shown in FIG. 10, an inkwell 361 and print head 362 move along a guiding rod 366, as described in connection with the above embodiment. Here, however, the print head 362 may include either a bar code reader 363, a MICR reader 365, or both. In addition, as shown in FIG. 10, either reader, or both, may be mounted so as to be aligned with the print head 362. Where included, the MICR reader is used to read information or indicia from the financial document to ensure sequential processing of documents, e.g., to ensure that the serial number of successive money orders is in sequence. In addition, either or both of the bar code reader 363 and MICR reader 365 may be included in the machine, with the capability to turn each one off.

[0088] In a mode of operation according to an embodiment of the invention, each sweep of carriage 64 along rod 66 occurs in approximately 350 milliseconds to produce one line of standard print, or one-quarter of a custom print line.

[0089] The printer can be further associated with a tear bar that will separate two contiguous document forms along a clean sharp edge.

[0090] Printer unit 50 further includes a variety of sensors which can be constructed and arranged in a manner known in the art. These include a top-of-form sensor, an out-of-paper sensor, the rear door sensors 58 that were already described above, and a similar front door sensor (not shown, except for sensors 88).

[0091] The top-of-form sensor is an optical sensor that will be focused on a reserved area of each document form which is provided with a top-of-form mark. This sensor will be connected to control unit 40 to assist in achieving form alignment and determination of the presence of an imprinted document form.

[0092] The out-of-paper sensor is located in receptacle 52 and provides an indication of an “out-of-paper” status when there are no more document forms in receptacle 52. In addition, sensors 58 provide an indication when door 10 is
opened and the print head access sensor provides a corresponding indication when door 12 is open.

[0093] Print head 62 may be constituted by virtually any commercially available ink jet print head. By way of example, it is presently contemplated to employ a HP® thermal ink jet head, such as a head sold under the model designation 626A. The optical bar code reader may also be of a commercially available type and is mounted on carriage 64 close to head 62.

[0094] Printer unit 50 further includes a printer controller of a conventional type having stand-alone intelligence and including a CPU that controls real-time printer functions, including sensing the positions of doors 10 and 12. The printer controller may communicate with the main CPU of control unit 40 using a RS-232 C interface, hardware hand-shaking, and a suitable protocol. The program for directing operation of the printer controller will be loaded on an associated flash memory card.

[0095] The printer controller may support two or more font sets. Preferably, a first font set includes a complete ASCII character set with at least three international currency symbols. The printer controller must be capable of printing this font set either right side up or upside down. A second desired font set is a custom font having, at the least, numerals, special currency symbols, a custom trademark symbol, and a special bar code verify symbol. The characters of the second font set preferably have a height which is four times that of the first font. The characters of the first font set can be printed during one pass of print head 62, while printing of characters of the second set requires 4 passes. Characters of the second font set need be printed only upside down.

[0096] Printer unit 50 further includes a rocker switch via which an agent who is responsible for the machine can control power to the machine. This switch controls a sleep mode only and its operation is superseded by an internal power cut-off switch in control unit 40.

[0097] Printer unit 50 will normally print with ordinary ink, preferably thermal ink. However, it would also be possible to utilize magnetic ink, which is available for use in ink jet print heads. This would open the possibility of producing financial documents that require characters printed in magnetic ink, starting from totally blank document forms. It would then be possible, by providing suitable software, that can be downloaded to a flash memory in control unit 40 via a telephone link (or other means of communication mentioned above), to generate and dispense different types of documents from the same blank document supply. This will also allow a complete image of the resulting document to be stored electronically. In addition, an ink jet printer will produce a consistent printed product and this will facilitate distinguishing authentic documents from counterfeit documents.

[0098] Printer unit 50 further has a separate power supply connection via which power is normally supplied from a power outlet. However, it is conceivable that printer unit 50 could be connected to some other control device, in which case use would be made of an external power adapter.

[0099] As noted above, input unit 2 includes a separate case, or housing, the bottom of which is equipped for mounting unit 2 either on a counter top or on the top surface of door 12. In addition, the input unit 2 may include an optional on/off key-operated switch. The on/off state of the switch is detected by an appropriate sensor which is connected to control unit 40 to determine whether operation is to be performed in the executive mode. Reader 30 mounted in the case of unit 2 may be any suitable, commercially available, card reader capable of reading credit, debit, or “smart” cards. One type of reader that may be used is manufactured by American Magnetics under model designation 171/121.

[0100] FIG. 5 is a pictorial diagram illustrating various essential components of units 2, 40, and 50. All of the elements shown in FIG. 5 have already been described above or are identifiable by suitable legends.

[0101] FIG. 6 is a pictorial view of one type of document which can be generated according to the present invention. The document in question is a money order 70 that will be generated starting from a money order form. Initially, a strip of such forms will be introduced into receptacle 52 with successive forms being attached together at tear-off lines 72. The paper will be pre-cut to permit each completed document to be separated, after passing through printer unit 50, from the remaining document forms.

[0102] In one embodiment, each document form consists of two parts: a receipt 74 and a portion 76 that will constitute the actual money order. Alternatively, as illustrated in FIG. 6, part 76 may consist of the money order and a stub connected to the money order along a line 78, which is partially pre-cut to permit the money order to be separated from the stub. In addition, the money order is separated from receipt 74 along a further line 80 that is also pre-cut. When each document form consists of only two parts 74, 76, the various lines will be pre-cut to allow the paper to be torn more easily along line 72 than along line 80. If each form is also pre-cut along line 78, this will be done in such a manner as to allow the paper to be torn along line 78 more easily than along line 80 but less easily than along line 72.

[0103] Bar code 82 may be, for example, based on the Code 39 bar code system and consists of at least four sections. The bar code will contain a money order sequence number and one or more check digits for permitting error detection and possibly correction, during bar code reading. Bar code 82 will be associated with a human readable money order sequence number.

[0104] When a document form is fed through printer unit 50, the alignment mark is first detected and bar code 82 is read with the aid of bar code reader 63 mounted on carriage 64. The information read by bar code reader 63 is transmitted to control unit 40, where the money order sequence number will be compared with that of the money order that was previously prepared and dispensed to ensure that there is no break in the money order sequence numbering.

[0105] As document form 70 is conveyed through printer unit 50, in the transport direction illustrated in FIG. 6, a receipt text 84, which is one line high, is printed on receipt portion 74. Then, on the money order document 76, there are printed, in succession, a money text and a money amount 86, each of which is one line high, and the money amount 88, including a suitable currency symbol. Money amount 88 is preferably printed in the special custom font having a height of several lines, for example four lines.
There may then also be printed, either on the money order document or on the stub, if this is provided, a further bar code 90 that contains the associated document sequence number and, optionally, the money order amount.

[0106] Bar code 90 will be read by bar code reader 63 as the resulting document exits from the machine. As described previously, this reading operation will permit verification that the machine software has correctly determined the money order sequence number of the particular form 70 and that printer unit 50 has performed a printing operation (e.g., that there is sufficient ink in the inkwell); otherwise, bar code 90 would not appear or would be insufficiently dark to be read by bar code reader 63. The money order sequence number contained in bar code 90 may then be compared with the bar code number 82 of the next form 70 to verify that there has been no break in the money order sequence numbers. After bar code 90, it is also possible to print a message text 92 and a stub text 94, each of which has a height of one line.

[0107] Preferably, bar code 82 is located relative to adjacent tear-off line 72 so that when a completed document has been dispensed by being torn off along an associated line 72, the bar code 82 of the following document form will be in line with the reading field of bar code reader 63.

[0108] In another embodiment shown in FIG. 11, the document form 370 includes a receipt portion 374 and a document portion 376, wherein the latter may include a pre-printed barcode 382. In embodiments where the printer unit includes a bar code reader, the machine operates as described above in using the reader to gather sequence number and other related information from the bar code 382 and to communicate such information to the control unit to ensure correct sequencing. However, in embodiments where a MICR reader 365 is used (either alone, or in conjunction with a bar code reader), information relating to the document is gathered by the MICR reader by reading the money order routing transit number 383a, the money order number 383b, the check digit number 383c, and the special code 383d, and then processing the information in association with the control unit.

[0109] The operation of a machine according to the invention may be controlled, or at least supervised, from a remote location which receives reports from the machine, e.g., via a telephone connection, or other means of communication mentioned above, on a periodic basis, and issues authorization instructions to allow the machine to continue dispensing documents. Such communications may be established at regular intervals, e.g., approximately once every 24 hours, and/or at the same time every day, etc., and may be manually initiated or scheduled to start automatically.

[0110] Typically, the remote location will be established to monitor and supervise a number of these machines which are installed at different point-of-sale (or retail) locations. A remote location which can cooperate with a machine according to the present invention can be constituted by a personal computer which is suitably programmed to establish communication with one or more machines, receive and display data from each of those machines, and transmit authorization and control instructions, including security and reconfiguration instructions, back to each machine.

[0111] The computer at the remote location may generally be staffed by a human operator to review the data received from each machine. Alternatively, the review process, or portions thereof, may be automated, such that little or no human involvement may be necessary. In either case, if, upon review, that data does not reveal any adverse conditions, security issues, or inappropriate operation of the machine, the latter will receive an authorization command—either when the operator inputs an authorization command via the computer keyboard and then transmits that command to the individual machine, or (automatically) from the remote location computer. In this system, other commands can be transmitted from the remote location to a machine to modify the operation of the machine in a desired manner.

[0112] The operation of a machine according to one embodiment of the invention will now be described with reference to the operation, or programming, flowchart of FIG. 7 and with respect to a machine which is configured to issue money orders. However, the machine according to embodiments of the invention can easily be programmed to issue other types of financial documents.

[0113] Unless otherwise specified, all of the operations described below are performed under control of software provided in control unit 40.

[0114] When the machine is first placed in operation, a number of operations are performed and conditions are detected in startup step 102 of FIG. 7. These include monitoring the states of the door sensor switches and of a key switch to determine whether operation is to be performed in an operator mode or in a executive mode. All hardware, including the printer controller, is initialized and a stored options file and log file are read from flash memory in control unit 40. Essentially, the operator mode is employed to generate and dispense money orders, while the executive mode is employed to perform supervisory and maintenance functions on the machine. Operation in either mode is performed by an individual (operator) who is stationed at the machine and who communicates with the machine via input unit 2.

[0115] In some embodiments, the machine may operate in a "slave" mode, where the functionality of the machine is not controlled through the input unit 2 (e.g., a keypad or keyboard), but through an I/O port connected to a remote device. When the machine operates in this mode, all of the input/output occurs through one or more of the communications ports described hereinabove, and data, including error messages, etc. are relayed to the operator through the communications port rather than through the keypad/keyboard displays.

[0116] Returning to FIG. 7, if the operator mode is selected, at step 104, the operator is prompted to input a password, which is checked at step 106. If the correct password has not been input, the system determines whether any actions indicated in the options file, such as generating a report, are to be performed, and performs those actions. The operator can then input a function command, which is detected at step 108. In the example illustrated, these commands can include generating a report in procedure 110, establishing a telephone communication link in procedure 112, generating a money order in procedure 114, or voiding a transaction in procedure 116.

[0117] Generation of a money order in procedure 114 will include the following operations. Firstly, in step 120, the
operator will collect payment for the money order which includes the face value of the money order and any service charges or fees and will input the amount of the money order and of the transaction fee. If a credit, debit, or smart card is being employed to pay for the money order, the operator will input the amount to be charged to the card account, the card will be inserted into the card reader, and a telephone connection can be established in order to obtain authorization to charge the amount involved in the transaction to the account represented by the card.

[0118] At this point, a number of conditions can be checked, including whether the requested money order amount exceeds a preset limit, whether the machine is currently authorized to issue further money orders, whether the previous transaction has been correctly closed, and whether there is a document form available in the machine. If the system is operating properly, a document form will be available in the printer unit in a position such that bar codes 82, 382 can be read by bar code readers 63, 363—alternatively, or in combination, a MICR reader may now read the MICR information. At this time, in step 122, bar codes 82, 382 (and/or the MICR information) are read and the document sequence number represented by that bar code (and/or MICR information) is compared with the sequence number of the previous money order that was issued in order to confirm that the correct document is in position to be printed.

[0119] At this time, the system can also check further conditions, such as whether the bar code that has been read is associated with the first document form of a pack of forms, whether a door has been opened and closed, or power has been turned on or off since the issuance of the previous document and whether there is any paper jam in the printer. If all conditions have been satisfied, printing of the money order can proceed. Upon completion of printing the money order, any problems encountered within the machine during the transaction are also logged.

[0120] In procedure 112, the operator will contact the remote location in step 150. After a telephone (or other) connection has been established, the transaction log maintained in control unit 40 will be uploaded to the remote location in step 152 and any changes to be made to the machine will then be downloaded from the remote location in step 154. In addition, the log maintained by control unit 40 is then updated to indicate that the log was uploaded.

[0121] When report procedure 110 is selected, the operator inputs the type of report, such as agent shift report, daily summary report, sales summary, options, etc., in step 130. In response, in step 132, the machine prints the report and in step 134 the transaction log is updated to record occurrence of the report printing operation.

[0122] The agent shift report can include the following items of information: Agent ID; agent number; machine number; date and time of report; total due; total value of commission; total value of documents dispensed; total value of fees; total amount collected; total number of documents dispensed; value of non-fee documents dispensed; number of non-fee documents dispensed; value of fee documents dispensed; number of fee documents dispensed; value of voids; number of voids; documents left; status serial, indicating on report whether each document is a void, no-fee, or void, no-fee document, and value of each document dispensed.

[0123] The daily summary report can include the same items of information, except that, in place of status serial and value of each document dispensed, the report will include the time value status serial, indicating the specific time of transaction for each status serial document, and seller of each document dispensed.

[0124] In procedure 116 to void a transaction, the operator inputs the serial number and the cash value of the money order to be voided in step 140. If the amount inputted is correct for that money order number, then the log is updated in step 142 to indicate that the money order in question is void.

[0125] The executive mode, selected in step 160, allows the performance of various functions which cannot be performed by the ordinary operator, these functions including changing the passwords and other options, loading a new supply of money order forms, etc. The executive mode can be selected by inputting an executive key. One who is authorized to enter the executive mode will also have a key to open at least door 12 (or, alternatively, door 300) for loading new money order forms and a key for turning the executive key switch on. If the system determines that door 12 is open, but that the executive key switch is not on, the system is set to operate in the low level executive mode. If the executive key switch is on, the system is set to operate in the high level executive mode. Otherwise, the system will switch into operator mode.

[0126] When switched into either executive mode, the system performs a routine to determine if any selected events are to occur and, if so, executes those events.

[0127] Certain executive commands, or procedures, are only permitted in the high level executive mode. These are determined by options that are stored in the flash memory and can be changed by commands inputted in the high level executive mode or commands downloaded from the remote central location.

[0128] If the machine is in the executive mode and the load blank money orders procedure 174 is selected, the machine interrogates the operator to determine what is to be done with any blank forms that have not been used. Then, in step 180, the operator inputs the serial numbers and the size of the new stack of forms to be loaded and, in step 182, updates the transaction log with this information. At this time, in addition, bar code reader 63 associated with the printer can read the bar code on the first form to verify that the sequence number information inputted by the operator is correct.

[0129] In the phone out procedure 172, a telephone connection will be established with the remote location in step 190. After that connection has been established, the contents of the transaction log will be uploaded to the remote location in step 192 and any changes to be made to the machine are downloaded in step 194. These changes can include enabling or disabling agent pass codes, resetting current time and date, resetting a fee table, etc. Then, in step 196, the log is updated.

[0130] In report procedure 170, the following reports can be printed, as well as others: A current daily report, a previous daily report, a document list, a machine set up report, a report deleting the oldest day, the oldest day being
the earliest day for which data is currently stored, and a report of the current display version.

[0131] This is performed in step 200, in which it is also possible to set, by inputting via input unit 2, various report options, including selection of the desired device to which reports are to be printed, to which messages are to be printed, and to which an audit trail is to be printed. After all selections have been made, the selected report is printed in step 202.

[0132] In procedure 176, a variety of options can be set or reset, based on information input by the agent via input unit 2 in step 204. Options that can be modified in step 204 include: selection of which executive functions require an executive key, setting of agent timeout; enabling or disabling of a lockout period based on the inputting of a begin time and an end time; calculate change options, such as change the calculation required and change the key required to reset the display; communication options, including: comm. password; baud rate selection; modem dialing mode (tone or pulse); primary telephone number and secondary telephone number; document options, such as whether or not to print a stub, reset options, including resetting the document memory and resetting all of the memory; special function options, including machine number, which is the number assigned to each machine at a particular location, agent number and terminal serial number, which is assigned at the time of manufacture; remote location, or host, communication options, such as real time, number of real entries, response time and command time; and diagnostic options including whether to test the list printer, and/or the main printer, and/or bar code reader 63; and/or communication components. After any desired option changes have been made, the file or files in which these options are stored are updated in step 206.

[0133] Maintenance procedure 178 includes, in step 208, performing any hardware diagnostic operations that have been preselected as diagnostics options.

[0134] There are other options that can also be changed, but preferably only from the remote location via an established telephone link and/or other means of communication mentioned previously. These include setting of the commissions, or fees, that can be charged at the sale location, as well as the following options:


[0136] Communication options: Enable Communications,

[0137] Document Options: Maximum Doc. Amount; Maximum Pack Size; String to print on stub,

[0138] Void Authority options: Void Authority (Any Untransmitted, Current day); MaxAutomatic Void; Max Manual Void,

[0139] Security Values: Modify System Vars; Security Lock; MaxDays without Poll; MaxItems Per Day; MaxAmount Per Day,

[0140] Currency: Which of the three currency symbols to use.

[0141] Set Up Report Options: Baud Rate; Flow Control; Control Line; Timeout; End of Line; Select

[0142] When a communication link is established, the operator at the remote location can also transmit instructions to change which executive functions require an executive key. However, this operation is not performed exclusively under control of the remote location, but can also be performed by an individual authorized to operate the machine in the executive mode.

[0143] In addition to the above, the following options can be provided if desired:

[0144] Communication options: Mode; Password for Host; Modem Standard; Enable Auto-Dial; Auto-Dial Begin Time; Auto-Dial End Time; Dial Sunday . . . . Saturday,

[0145] Document options: MaxVendor Payment; Packet Termination; Document Length; Stub format; SN Check; Print Courtesy Amount; Print Void Over; SN Sequencing; Sequence Check Digit,

[0146] Void Authority options: Jam Auto Void,

[0147] Special Function options: Document Print Fmt; Comm Report Fmt; Store Number; Chain Number; Dial out. Digits,

[0148] Security Value options: Recheck items; Recheck Amount,

[0149] Host Comm Setup options: User ID.

[0150] In one embodiment, the process for printing a money order is as follows:

[0151] read the bar code,

[0152] verify it is the next expected in sequence,

[0153] print the money order, receipt, and stub,

[0154] print a machine readable mark/bar code,

[0155] verify the mark is readable (verifies ink is on the paper),

[0156] move the next money order into position, and

[0157] verify that the sequence number on the next money order is the next expected number (verifies paper has moved).

[0158] If the bar code cannot be read, the machine will prompt the agent, print a void money order, and ask the agent for the serial number on the voided document. The machine will then proceed in “softfail” mode, printing without verifying as long as the printer door remains closed and the power remains on.

[0159] If the serial number (either read or entered) is not the next expected number but has advanced by less than 10 numbers, the machine may automatically log the missing documents as void.

[0160] If the ink test fails, the machine will ask the agent if the document is readable and log it as void if it is not readable.
When daily closing is effectuated, a Daily Summary report is scheduled to be printed as soon as a printer is available. Also, a closing communication is scheduled to be sent to the system as soon as the phone is available. A daily closing may only be performed once per calendar day. Any sales after closing go onto the next day's sales. Accumulators for daily limits are also reset at this time.

Daily closing may also be done manually by running the Daily Summary Report (if Op. Daily to Close is true). If it has not been performed manually by the auto close time (Auto Dial Begin Time) it will be performed automatically. If, when a machine is switched on, it detects the auto close time has passed, a close will be performed as if it were that previous day.

The machine will have the ability to store information for at least 2,500 documents.

In this embodiment, there are at least two daily security limits: maximum number of items, or transactions, (MaxItems) per day and maximum total cash value of transactions (MaxAmount) per day. The machine will not interrupt a current purchaser; that is, if an agent is below all security limits before the start of that purchaser's transaction and that transaction causes the agent to pass a limit, the current transaction will be completed and then the machine will sell no more until it has communicated by phone with the central, or remote, system and received authorization to proceed.

Voided documents count toward the daily limit.

The security limit MaxDays Without Poll is enforced at closing.

Printing of a stub can be turned on or off. The stub format is fixed, but it includes a string which is sent from the system and that string can be set by the system any time it is connected by phone (or other means of communication mentioned above).

In alternative embodiments, the machine according to the present invention is capable of operating according to, and in compliance with, security rules and regulations that may be set either by the central administrator (e.g., the money order company) and/or by the local or Federal government. As will be described below, in such embodiments, the machine is operated, and transactions are processed pursuant to a set of configurable security limits, parameters, and/or exclusions. These may include, for example, limits on the transaction amount, on the amount of multiple transactions, and on the amount of structured transactions.

Additional security measures that may be implemented include checking of the names (and/or other identifying information) of purchasers and/or beneficiaries against various lists of restricted customers. Such lists may be generated by the central administrator (e.g., an internal list of blocked customers) or the government (such as, e.g., one generated or mandated by the Office of Foreign Assets Control), and may be maintained at the central location or, alternatively, may be resident locally on each machine, where they are updated periodically by instructions sent from the central location.

When such lists are used, there may also exist lists of exceptions. Thus, for example, there may be a list of persons (including entities) that have been cleared by the government and, as such, have been certified by the government as not being the person listed on the Office of Foreign Assets Control list. In addition, where an agent is the purchaser, and one of the agent's vendors is the beneficiary, a list of pre-approved vendors may be stored in each machine (such that the list is specific to the particular agent's retail location where that machine is located) such that less restrictive security rules may be applied. For example, creating $5,000 worth of money orders to a certain beneficiary may not trigger the security measures that dispensing $5,000 worth of documents would normally trigger. These details are usually contractually agreed-to between the money order company and the selling agent. In such situations, once the agent indicates that the transaction is a "vendor" transaction, then the machine presents a list of vendors from which the beneficiary must be chosen.

Thus, in embodiments of the invention, the machine can store locally a list of rules for dispensing documents. These may include, for example: stop the machine once a certain face value limit has been reached or if a transmission fails to occur; stop the machine from completing the current transaction; require the operator to gather additional documentation from the customer (e.g., photocopy of ID or driver's license); require the operator to enter the purchaser's data into the machine (e.g., name, phone, ID numbers, etc.); compare purchaser identification information to internal lists and, depending on whether a match exists, decide to approve/cancel the current transaction; and force certain information to be printed on the document being sold.

As part of the operations process in this embodiment, the following information may be periodically transferred from the central location to the machine (either automatically, or upon command): Configuration—All configuration parameters that control how the machine functions; default and alternate security rules; clearance to continue dispensing documents; security rules—Limits on the number of documents that the machine can print and/or the total combined face value that can be printed per unit time (e.g., hour, day, month, etc.) on the machine; lists of customers that are restricted, either by the company using the machine or a government entity, from doing business (e.g., as described above); and lists of pre-entered beneficiaries and any applicable alternate security rules.

Similarly, the following information may be transferred periodically (either by schedule or upon command) from each machine to the central location: Information about dispensed documents; information about security violations/inquiries (e.g., which transactions were cancelled because of a name match, etc.); and changes in local machine configuration.

With the above in mind, FIGS. 12-14 present, respectively, illustrative flowcharts of the process of printing a financial document, processing and dispensing a financial document, and communicating between a machine and the central location. It is noted again that, for ease of reference and illustration, a money order has been used as a specific type of financial document in the aforementioned flowcharts. In addition, as was mentioned previously, the machine may be connected to a remote device or a POS system. When this is the case, a statement in the flowcharts
indicating that “the user enters” may, in operation, involve the transmittal of instructions by the user through one of the ports of the machine. Thus, if the description provides that the “user enters document amount,” the machine may actually be receiving the document amount from the connected external device, POS, etc.

Thus, with reference to FIG. 12, the process of printing a document may entail the following steps:

[0176] 401. Begin the print process;

[0177] 402. The machine may have a barcode reader built in. If the machine detects this is the case, then it proceeds to verify correct function through methods using the barcode reader as described previously;

[0178] 403. If a barcode reader is not built into the machine, then the machine tests for the presence of a built-in MICR reader. If a MICR reader is detected, then the machine proceeds to verify document sequencing by using the MICR reader. If a MICR reader is not detected at this point, then the machine has neither type of reader installed and/or the reader(s) is/are turned off. If this is the case, then no document sequencing verification is performed, and the printing process proceeds as though the documents are in sequence;

[0179] 404. The MICR information is read off the document at this step;

[0180] 405. The machine can be configured to print the encoded face value of the document as part of the barcode. This step checks to see if the setting is enabled;

[0181] 406. The document face value should not be encoded as part of the printed barcode in the document, such that only the serial number of the document is encoded;

[0182] 407. The machine is configured to encode the face value of the document as part of the barcode, so do so and print it;

[0183] 408. Try to read the barcode that just printed;

[0184] 409. If the barcode cannot be read, cancel the transaction;

[0185] 410. Read the pre-printed barcode on the document (which has the document serial number encoded in it);

[0186] 411. Is the document serial number not what was expected (is it out of sequence)?

[0187] 412. Recover from the out of sequence condition by voiding all skipped documents, recording this fact in long-term memory, and adjusting the internal counters so the system regains integrity. A message is displayed to the operator, e.g., through one of the displays 26, 326, 327, through a POS, etc. to inform the operator of the events;

[0188] 413. Is the document being printed a vendor payment?

[0189] 414. If this is a retail document (i.e., one that is not a vendor document, and that the agent is selling to a purchaser for the benefit of a non-vendor payee) was the operator required to enter additional information about the buyer or payee during amount/data entry (see FIGS. 13A and 13B)?

[0190] 415. Print the document with the buyer and payee names. Since this document is a vendor payment, the buyer name is the retail location name, and the payee name is the vendor name;

[0191] 416. Since this is a document for which additional data entry was required, print the document with the buyer and payee names;

[0192] 417. Since this is a retail document for which no additional data entry was required, print the document with blank buyer and payee fields;

[0193] 418. The document is done printing, and the document is advanced to the tear-out position;

[0194] 419. Is there another document to print as part of this transaction?

[0195] 420. The printing of documents is finished, and so the print operation is deemed a success.

[0196] Similarly, as shown in FIGS. 13A-13B, the processing and dispensing of a document may entail the following steps:

[0197] 501. At the beginning of the transaction, the machine is at the “Enter passcode” prompt, which means the machine is ready for user interaction. If the machine is connected to a POS system, then the machine communication state is at the “ready” state, which means the machine is waiting for a transaction to be initiated;

[0198] 502. If the current transaction is a vendor payment, it is initiated by pressing the “Vendor Payment” key. If the machine is connected to a POS system, then the vendor payment is initiated by sending the “vendor payment” instruction to the machine;

[0199] 503. User/operator enters the amount of the vendor payment;

[0200] 504. Check for a valid amount. Vendor payments may have a maximum document amount limit that is different from that of retail documents;

[0201] 505. Vendor payments have a finite, pre-approved list of vendors as beneficiaries. In this step the user selects the vendor to pay from that list. An arbitrary name cannot be entered;

[0202] 506. If the user entered an invalid/illegal vendor pay amount, the error is displayed in this step;

[0203] 507. If there was no error up to this point, the amount and vendor name are stored in temporary memory;

[0204] 508. If user presses the print key at this point, then the user is indicating that all of the documents in this transaction have been entered, and that the machine should dispense the documents entered so far;
In order to dispense a retail document (at a retail location), the purchaser first walks into the location and expresses his wish to buy a document; the user enters the amount of the document to be dispensed; the amount is checked against the configured maximum value; if amount in step 511 is not valid, then an error about the illegal amount is displayed and the user prompted to re-enter the amount; the document amount is added to the transaction running total and stored in short-term memory; if the user presses the “print” key, then the user is indicating that there are no more document amounts to be entered and, as such, the user is requesting that the documents entered so far be printed; depending on the machine’s configured security parameters, further information regarding this transaction may be required (to be entered into the machine). This information may include one or more of the following: the purchaser’s and/or the beneficiary’s full name, complete address, date of birth, social security number, telephone number, occupation, a first type of ID (e.g., a Driver’s license, a passport, an alien registration card, a native country ID card, etc.), including the ID number and issuer, a second type of ID, including number and issuer, and the (purchaser’s) source of funds—if no additional transaction information is required, then the process continues at step 531 (designated as node “A” in FIG. 13B); if additional transaction is required, then the user enters the additional information, requesting the information from the buyer; the information entered is checked against the Office of Foreign Assets Control list; if the customer (i.e., either the buyer or the beneficiary) is in the Office of Foreign Assets Control list, then the Office of Foreign Assets Control’s exception list is checked. As mentioned previously, this is a list of persons (including entities) that have been cleared by the government and, as such, have been certified by the government as not being the person listed on the Office of Foreign Assets Control list; the machine can be configured on how to respond when a match has been found. Thus, for example, the machine can block the transaction, or it may allow the transaction to finish, while recording information about the match; an error message is displayed about the customer being in the blocked list (see step 522) or the Office of Foreign Assets Control list; the transaction is terminated because of a match; check for a match of either the buyer or payee in the blocked persons list; check security configuration to see if a faxed ID image to the central location (e.g., headquarters) is required for this transaction. The information needed for this decision is the security configuration and the transaction data gathered to this point; if the user is required to fax ID images to the central location, the user does so at this point; there are configurable security parameters that are checked at this point in the transaction process because violations of such parameters may potentially prevent documents from being dispensed. Examples of such security rules/parameters may include: the maximum face value amount per transaction, the maximum amount of vendor payments dispensed in a single transaction or as a combined amount per time period (e.g., daily, hourly, etc.), etc. If security limits are not violated at this point, then the process continues at step 531 (designated as node “A” in FIG. 13B). If, on the other hand, such a violation exists, then the process continues at step 526 (designated as node “B” in FIG. 13B); depending on the security violation that occurred, the machine may need to be locked, and the decision as to whether such action should be taken will be made based on predetermined parameters relating to the specific security violation; if the decision from step 526 is that the machine should not be locked, then an error message is displayed about the aborted transaction; the transaction is terminated because of the security violation; if, on the other hand, the decision from step 526 is that the machine should be locked, then the security lock is set on the machine so that it ceases to dispense documents; the transaction is terminated because of the error or the newly-imposed security lock; documents are printed (e.g., according to the process of the flowchart shown in FIG. 12); the results of the document print process are checked; documents that were misprinted are noted, and voided out, data regarding these documents is stored in permanent memory; the transaction details are stored in the permanent memory; money and documents exchange hands at this point, such that the transaction may be considered to be legally “finished”; the transaction is now finished; after this transaction have any security rules been violated? Did this transaction cause any security limits/rules to trigger? Some of the security rules that can be checked at this point include:
Maximum daily transaction count, maximum allowed combined face value dispensed within a certain amount of time (e.g., $5,000 within an hour), maximum amount dispensed per operator, etc.;

[0234] 538. If no security rules were violated, then machine continues to operate normally;

[0235] 539. If, on the other hand, a security rule was violated, then a security lock is set on the machine, preventing future transactions from taking place until headquarters clears the security lock.

[0236] As has been mentioned previously, in order to carry out step 539, among others, the machine and the central location conduct communications that may be either automatically and/or manually initiated. To this end, FIG. 14 provides a flowchart for such communication process, involving the following steps:

[0237] 601. Communications are started when triggered by the machine operator, or automatically by schedule, or when there has been a security violation;

[0238] 602. The machine dials the primary phone number;

[0239] 603. A determination is made as to whether the connection was successfully made;

[0240] 604. If connection was unsuccessful, the configured secondary phone number is dialed;

[0241] 605. A determination is made as to whether the connection was successfully made;

[0242] 606. Has the maximum number of dial re-tries been reached? If the maximum number of re-tries has been reached, then the dialing process is aborted and recorded as a failed attempt to communicate;

[0243] 608. Wait a configurable length of time before attempting to connect again;

[0244] 609. If connection was successful, then the machine starts communicating with headquarters. At this point the machine transmits its identity and security information;

[0245] 610. Determine whether the identity information was valid;

[0246] 611. If the initial phase of communications failed, then disconnect and deem the communications attempt a failure;

[0247] 612. Determine whether a newer version of the machine firmware exists at headquarters;

[0248] 613. If a newer version of the firmware is available, it is downloaded at this point;

[0249] 614. Disconnect from headquarters so that the new firmware can be installed;

[0250] 615. Install the new firmware;

[0251] 616. Another communications session is scheduled for after the firmware update in order to ensure that there is a complete communications session with headquarters (given that the previous "session" was interrupted by a firmware update);

[0252] 617. The machine is reset so that the new firmware will be activated. Once the machine is done initializing, it will restart the communications process;

[0253] 618. The machine time and date are synchronized with headquarters, accounting for any time zone differences;

[0254] 619. A determination is made by the machine as to sale dates for which that has been closed, but not yet transmitted. Any such data that is found is transmitted to headquarters;

[0255] 620. Data transmitted successfully to headquarters is marked as such by the machine so that it will not be re-transmitted automatically at a later date;

[0256] 621. If there are pending machine unlock instructions from headquarters for this machine, they are downloaded at this time. If the downloaded instructions match the machine lock status, then the machine is unlocked and is operational again after this step;

[0257] 622. If there are pending requests for data re-transmittal, they are serviced at this step;

[0258] 623. Determine whether the machine has been flagged for reconfiguration;

[0259] 624. If the machine has been flagged for reconfiguration, then all of the machine settings are downloaded by the machine at this point;

[0260] 625. Determine whether there are any pending changes to the names lists (e.g., Office of Foreign Assets Control list, list of exceptions thereto, and block list);

[0261] 626. Any names lists changes are downloaded and applied;

[0262] 627. Communications session is complete and is deemed a success.

[0263] While there has been provided a detailed description of the operations involved in printing a money order, one significant advantage of the machine according to invention is that it can be easily programmed to dispense other types of documents. For example, by simple software modifications and the provision of a different type of document form, the machine can be configured to handle charge and debit transactions. For example, a credit, debit, or smart card may be inserted into reader 30 and the amount of a transaction can be keyed into unit 2. Then, optionally, keypad 24/keyboard 325 can be employed to dial out to an authorizing location, or such dialing out can be controlled automatically by the program. When authorization to accept the charge has been received via the telephone connection, a credit card transaction receipt can then be printed out by printer unit 50.

[0264] Similarly, bill payments can be made, by use of a credit, debit, or smart card, or by transferring cash to an agent, who then uses keypad 24/keyboard 325 to input identification of the payee, the amount paid and the phone
number of the financial institution to which payment is to be transferred. Here again, printer unit 50 is used to print out a receipt.

[0265] In addition, a machine according to the invention can be used to effect wire transfers or to generate phone cards, ID cards, gift certificates, or travelers checks. Other types of financial transactions will become apparent to those skilled in the art.

[0266] According to a further feature of the invention, if the machine should be disconnected from its power source and subsequently reconnected, the control system can be configured to report the disconnection of the machine to the remote supervisory location and to prevent further transactions until a new authorization has been received from the remote supervisory location.

[0267] While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

[0268] The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims, rather than the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. A machine for preparing and dispensing documents relating to financial transactions, said machine comprising:

(a) a stand-alone, self-contained document dispenser having a housing;

(b) a manually operable input unit for input of data and operating commands, said input unit being external to and coupled through said dispenser housing;

(c) a document printer unit for printing readable information, including a monetary value, on documents based on data inputted at said input unit, wherein said document printer unit is contained entirely within said dispenser housing and comprises:

(a) a printer having a print head configured to move back and forth along a guiding rod in a scanning path that is transverse to the direction of advancement of the documents; and

an optical reader for reading barcode information on said documents, said optical reader being mounted so as to be aligned with the print head and move along said rod with the print head, wherein the print head prints a barcode on each said document as it moves in one direction and, as it returns along said rod in the opposite direction, the optical reader reads the barcode just printed by the print head, thereby verifying proper functioning of the printer unit without advancing the document;

(d) an internal control unit contained entirely within said dispenser housing and directly electrically coupled to said input unit and said printer unit for controlling operation of said printer unit in response to data and commands inputted at said input unit, wherein the control unit comprises a memory means for receiving and storing data received from said input unit and representing at least the monetary value of each document; and

(e) a communication interface for conducting communications with an off-site central location remote from said dispenser and operative to transmit the data stored in said memory means to said central location, wherein the control unit is operative to receive authorization instructions from the central location via said interface.

2. The machine according to claim 1, wherein said input unit is an alphanumeric keyboard with a full set of alpha-character keys and a separate full set of Arabic numeral keys.

3. The machine according to claim 2, said keyboard further including a display.

4. The machine according to claim 2, wherein said keyboard is a standard personal computer keyboard and is directly electrically connected to the control unit.

5. The machine according to claim 2, further including a keypad that is directly electrically connected to the control unit.

6. The machine according to claim 1, wherein the data stored in said memory means further includes the cumulative monetary value of a succession of documents.

7. The machine according to claim 6, wherein said control unit is operative to block dispensing of printed documents when said cumulative monetary value exceeds a predetermined value and an authorization instruction to dispense further printed documents has not been received from the central location.

8. The machine according to claim 1, wherein each of the documents is a preprinted form provided with information uniquely identifying that document.

9. The machine according to claim 8, wherein the information uniquely identifying each document is in the form of a bar code.

10. The machine according to claim 1, further including a time keeping device, wherein the control unit is operative under control of said time keeping device to block dispensing of printed documents when no transmission of the data stored in said memory means to the central location has occurred for a first predetermined period of time or when reception of an authorization instruction from the central location has not occurred for a second predetermined period of time.

11. The machine according to claim 10, wherein each of said first predetermined period of time and second predetermined period of time is approximately equal to 24 hours.

12. The machine according to claim 1, wherein the document printer unit further includes a document storage receptacle for holding the documents prior to being printed and a feed mechanism for feeding the documents in succession from said receptacle to said printer and for dispensing the documents upon completion.

13. The machine according to claim 1, wherein the internal control unit further includes a central processing unit containing a microprocessor operable in response to program instructions and an input/output means connected for receiving the data and operating commands inputted at said input unit and for supplying data and control signals to said printer unit, and wherein the memory means further stores said program instructions for the microprocessor.
14. The machine according to claim 1, further including at least one of a serial interface, a parallel interface, a PS/2 interface, an Ethernet interface, and a USB interface for direct electrical connection to one or more external devices.

15. The machine according to claim 14, further including an external printing device connected through said parallel interface.

16. The machine according to claim 15, wherein the external printing device is configured to print at least one of a receipt and a periodic report.

17. The machine according to claim 15, wherein the external printing device is at least one member selected from the group consisting of a dot matrix printer, laser printer, inkjet printer, and thermal printer.

18. The machine according to claim 14, further including a mouse connected through said PS/2 interface.

19. The machine according to claim 14, further including at least one of an external optical scanner, an external Magnetic Ink Character Recognition (MICR) scanner, an external printing device, an external communications device, and a cash register connected through said USB interface.

20. The machine according to claim 14, further including at least one of an external optical scanner, an external MICR scanner, an external printing device, an external communications device, a cash register, and a Point of Sale (POS) device connected through said serial interface.

21. The machine according to claim 1, wherein said communications with the off-site central location are conducted at predetermined, regular intervals.

22. The machine according to claim 21, wherein each said interval is about 24 hours.

23. The machine according to claim 21, wherein said communications are initiated at the same time every day.

24. The machine according to claim 1, wherein said communications with the off-site central location are initiated manually on an as-needed basis.

25. The machine according to claim 1, wherein the control unit is operative to periodically receive from said central location at least one member selected from the group consisting of machine configuration parameters, default and alternate security rules, authorization to continue dispensing documents, a list of restricted purchasers, a list of exceptions to said list of restricted purchasers, and a list of restricted beneficiaries.

26. The machine according to claim 25, wherein said security rules include at least one of a predetermined limit on the number of documents that can be dispensed and a predetermined combined face value of dispensed documents in a given period of time.

27. The machine according to claim 25, wherein at least one of said list of restricted purchasers, list of exceptions, and list of restricted beneficiaries is an Office of Foreign Assets Control list.

28. The machine according to claim 25, wherein at least one of said list of restricted purchasers and list of restricted beneficiaries is created by a central administrator.

29. The machine according to claim 1, wherein the control unit is operative to periodically transmit to said central location at least one member selected from the group consisting of information about dispensed documents, information about security violations, information about interrupted or cancelled transactions, and changes in local machine configuration.

30. The machine according to claim 1, wherein the printer unit further includes a MICR reader.

31. The machine according to claim 30, wherein the MICR reader is mounted so as to be aligned with said print head and optical reader.

32. The machine according to claim 1, wherein the control unit is configured to locally store a set of rules for dispensing documents.

33. The machine according to claim 32, wherein said set of rules includes a list of pre-approved beneficiaries of said documents.

34. The machine according to claim 33, wherein said set of rules includes both a default set of security limits and an alternate set of security limits, said alternate set being applicable to preparation and dispensing of documents for said approved beneficiaries.

35. A machine for preparing and dispensing documents relating to financial transactions, said machine comprising:

(a) a stand-alone, self-contained document dispenser having a housing;

(b) a manually operable input unit for input of data and operating commands, said input unit being external to and coupled through said dispenser housing;

(c) a document printer unit for printing readable information, including a monetary value, on documents based on data inputted at said input unit, wherein said document printer unit is contained entirely within said dispenser housing and comprises:

a printer having a print head configured to move back and forth along a guiding rod in a scanning path that is transverse to the direction of advancement of the documents; and

an Magnetic Ink Character Recognition (MICR) reader for reading information on said documents, said MICR reader being mounted so as to move along said guiding rod;

(d) an internal control unit contained entirely within said dispenser housing and directly electrically coupled to said input unit and said printer unit for controlling operation of said printer unit in response to data and commands inputted at said input unit, wherein the control unit comprises a memory means for receiving and storing data received from said input unit and representing at least the monetary value of each document; and

(e) a communication interface for conducting communications with an off-site central location remote from said dispenser and operative to transmit the data stored in said memory means to said central location, wherein the control unit is operative to receive authorization instructions from the central location via said interface.

36. The machine according to claim 35, wherein said input unit is an alphanumeric keyboard with a full set of alpha-character keys and a separate full set of Arabic numeral keys.

37. The machine according to claim 36, said keyboard further including a display.

38. The machine according to claim 36, wherein said keyboard is a standard personal computer keyboard and is directly electrically connected to the control unit.
39. The machine according to claim 36, further including a keypad that is directly electrically connected to the control unit.

40. The machine according to claim 35, wherein each of the documents is a preprinted form provided with information uniquely identifying that document.

41. The machine according to claim 35, further including at least one of a serial interface, a parallel interface, a PS/2 interface, an Ethernet interface, and a USB interface for direct electrical connection to one or more external devices.

42. The machine according to claim 35, further including at least one of an external optical scanner, an external MICR scanner, an external printing device, an external communications device, a cash register, and a Point of Sale (POS) device directly electrically connected through a serial or a USB interface.

43. The machine according to claim 35, wherein the control unit is operative to periodically receive from said central location at least one member selected from the group consisting of machine configuration parameters, default and alternate security rules, authorization to continue dispensing documents, a list of restricted purchasers, a list of exceptions to said list of restricted purchasers, and a list of restricted beneficiaries.

44. The machine according to claim 43, wherein at least one of said list of restricted purchasers, list of exceptions, and list of restricted beneficiaries is an Office of Foreign Assets Control list.

45. The machine according to claim 35, wherein the printer unit further includes an optical reader.

46. The machine according to claim 45, said optical reader being mounted so as to be aligned with the print head and move along said rod with the print head.

47. The machine according to claim 46, wherein the print head prints a barcode on each said document as it moves in one direction and, as it returns along said rod in the opposite direction, the optical reader reads the barcode just printed by the print head, thereby verifying proper functioning of the printer unit without advancing the document.

48. The machine according to claim 35, wherein the control unit is operative to periodically transmit to said central location at least one member selected from the group consisting of information about dispensed documents, information about security violations, information about interrupted or cancelled transactions, and changes in local machine configuration.

49. The machine according to claim 35, wherein the control unit is configured to locally store a set of rules for dispensing documents, including a list of pre-approved beneficiaries of said documents.

50. A method for preparing and dispensing documents relating to financial transactions, said method comprising:

(a) providing a machine comprising a stand-alone, self-contained document dispenser, said dispenser including a printer and an internal control unit having a memory means for receiving and storing data relating to each said transaction;

(b) obtaining identification information relating to at least one of a purchaser and a beneficiary of each document to be dispensed;

(c) accessing at least one of a list of restricted purchasers and restricted beneficiaries to determine whether there is a first type of match between the purchaser’s identification information and the list of restricted purchasers or a second type of match between the beneficiary’s identification information and the list of restricted beneficiaries;

(d) when at least one of said matches is found, recording in said memory means information about the at least one match that has been found; and

(e) determining whether to dispense said document based on a predetermined set of parameters.

51. The method according to claim 50, wherein said parameters include the face value of said document, the overall transaction amount, and the type of match that is found.

52. The method according to claim 50, wherein the machine is configured such that, in step (e), dispensing of the document is blocked at least one of said parameters is satisfied.

53. The method according to claim 50, wherein said machine further comprises an external, manually-operable input unit that is directly electrically connected to the internal control unit and, in step (b), the identification information relating to said at least one of a purchaser and a beneficiary is gathered by an operator of said machine and inputted through said input unit.

54. The method according to claim 53, wherein said input unit is an alphanumeric keyboard with a full set of alphanumeric keys and a separate full set of Arabic numeral keys.

55. The method according to claim 54, wherein the keyboard includes a display.

56. The method according to claim 55, further including displaying an error message on said display when at least one of said matches is found.

57. The method according to claim 50, wherein, in step (c), at least one of said lists is an Office of Foreign Assets Control list.

58. The method according to claim 50, wherein said lists are stored in said control unit such that steps (b)-(e) are automatically performed by said control unit once said identification information has been received.

59. The method according to claim 50, said machine further including a communication interface for conducting communications with an off-site central location remote from said dispenser, wherein the lists are maintained at said central location, and step (e) is performed by transmitting the identification information to the central location in real time.

60. The method according to claim 59, wherein the control unit is operative to receive instructions from the central location via said interface, step (e) is performed at said central location, and the control unit receives either an authorization to complete, or an instruction to block, the transaction.

61. The method according to claim 50, wherein the machine further includes an external reader and, in step (b), the identification information relating to the purchaser is obtained by processing an identification document of the purchaser’s through said reader.

62. The method according to claim 61, wherein the identification document is a member selected from the group consisting of an identification card, a driver’s license, a passport, a social security card, an alien registration document, and a native country identification document.
63. The method according to claim 50, further including determining, after a match of the first type has been found, and prior to step (e), whether there is a third type of match between the purchaser’s identification information and a list of exceptions to said list of restricted purchasers.

64. The method according to claim 63, further including determining, after a match of the third type is found, and prior to step (e), whether there is a fourth type of match between the purchaser’s or beneficiary’s identification information and an auxiliary list of restricted persons/entities.

65. The method according to claim 50, further including obtaining a physical image of an identification document of the purchaser’s, said identification document being a member selected from the group consisting of an identification card, a driver’s license, a passport, a social security card, an alien registration document, and a native country identification document.

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