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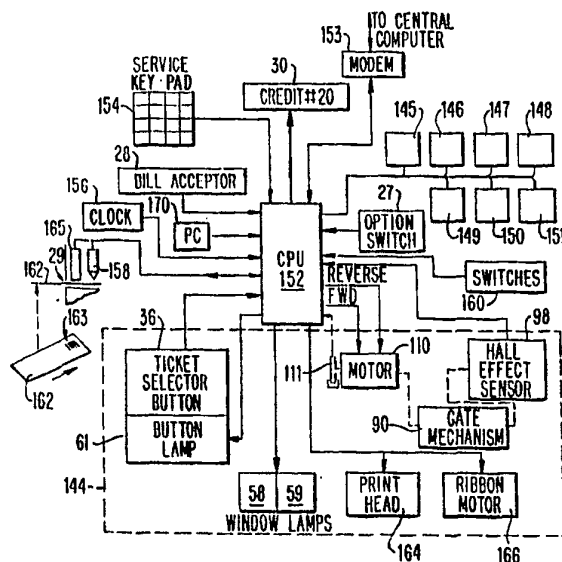
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(54) Title: DISPENSING MACHINE AND METHOD

**(57) Abstract**

A ticket vending machine displays panels of lottery tickets behind windows through which the customer can see the tickets. In order to attract attention, at repeated time intervals, the tickets are moved slightly in a rapid motion called "jogging". This catches the eye of ticket purchasers and enhances sales. A winning ticket validation device is provided. Each ticket has a unique bar code printed on it (163). The dispensing machine has a bar code reader (158) and a printer (164) so that a customer receiving a winning ticket can simply insert the ticket into the machine and the bar code reader will read the code and verify the ticket. The customer then can elect to take the winnings in the form of a credit in the vending machine. A microprocessor-operated printer is provided for printing agent identification information on the tickets just before they are dispensed.

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DISPENSING MACHINE AND METHOD

This invention relates to dispensing devices and methods, and particularly to vending machines and methods for vending tickets such as lottery tickets,
5 debit cards, and similar products.

The invention disclosed herein constitutes an improvement over the devices shown in U.S. Patents 5,160,076, and 5,222,624. The disclosures of both patents hereby are incorporated herein by reference.

10 Lottery ticket and other ticket vending machines suffer from the fact that they are inanimate objects and cannot do much to attract customers to them.

Accordingly, one of the objects of the present invention is to provide ticket dispensing and vending
15 machines which are more attractive and attention-getting so as to increase ticket sales.

Another problem with ticket vending machines is that, where instant-winner lottery tickets are dispensed, the customer usually must trouble the clerk in the
20 business establishment where the vending machine is located to obtain payment for winning tickets. This can be a costly imposition on the time of the clerk.

Furthermore, the clerk of the store in which the machine is located usually must call a central
25 computer through a modem to check to see if the ticket is, indeed, a winner before paying the winner. This requires more of the clerk's time and can be discouraging to customers who wish to receive their winnings more promptly.

30 Accordingly, it is an object of the present invention to provide a vending machine which can facilitate the verification of winning tickets, and can facilitate the conversion of winning tickets into free tickets.

35 Another problem in the vending of lottery tickets is that the name and address of the selling agent usually must be printed on the ticket before it is sold.

This either requires a separate printing operation, or the use of an inked roller type of printer in the machine as disclosed in U.S. patent 4,982,337.

The separate printing operation is costly and
5 time-consuming, and the inked roller requires the provision of special rubber stamps. Further, the ink often smears and makes the printing hard to read.

It is, therefore, a further object of the invention to provide means in the vending machine to
10 print the agent identification on the lottery tickets without such problems.

In accordance with the present invention, the foregoing objectives are met by the provision of a dispensing machine with multiple windows through which
15 the customer can see arrays of tickets. Usually, tickets of different type are located behind each of the windows. Each of the arrays of tickets in each of the windows is intermittently moved or "jogged" so as to produce a movement which is visible through the window.

20 Preferably, in a machine having several windows, the tickets behind each window are jogged in sequence. This creates a very noticeable intermittent movement of the tickets which attracts the attention of buyers and draws them to the machines to make purchases.

25 In accordance with another feature of the invention, each of the tickets bears a unique code, preferably a bar code. The identification of each winning ticket is maintained in a central computer in the lottery system in which the ticket is being sold.

30 A bar code reader is provided in the machine. A printer or cancellation device also is provided. The customer can simply insert his or her winning ticket into the bar code reader, which then will check on the authenticity of the ticket. If the ticket is authentic,
35 the printer or cancellation device will mark the ticket with a verification or cancellation mark. The customer either can take the verified ticket to the store clerk

for payment, or, at the customer's option, the machine will give the customer a credit in the vending machine so that he or she can operate the machine to dispense additional tickets. Thus, bothering the clerk in the
5 store is not necessary and the customer receives his or her winnings more quickly. This also encourages the sale of more tickets.

A computer-responsive printer is provided for printing the identification of the agent on the tickets.
10 Preferably, an ink-jet or dot-matrix printer is used. The agent identification can be stored by operation of a keypad, thus avoiding purchases of rubber stamps for inked-roller printers. Also, the printing is dry and does not smear.

15 The foregoing and other objects and advantage of the invention will be set forth or apparent from the following description and drawings.

IN THE DRAWINGS:

Fig. 1 is a perspective view of a multiple-
20 ticket lottery ticket vending machine constructed in accordance with the present invention;

Fig. 2 is a side elevation view of one of the ticket dispensing mechanisms in the vending machine shown in Fig. 1;

25 Fig. 3 is a rear elevation view of the mechanism shown in Fig. 2;

Figs. 4 and 5 are partially schematic views of a portion of the mechanism of the dispenser structure shown in Figs. 2 and 3; and

30 Fig. 6 is a schematic diagram of the operating circuitry of the vending machine shown in Fig. 1.

GENERAL DESCRIPTION

Fig. 1 shows a lottery ticket vending machine
20 utilizing the present invention. The machine 20 includes a housing 22, two rows 24 and 26 of windows displaying different lottery tickets, a bill acceptor 28, and a message display 30.

The top row 24 of windows includes four windows 32-35, four corresponding push-buttons 36-39 mounted in a projecting panel 40, and four corresponding dispensing openings or slots 42-44. Two instant-winner type lottery
5 tickets 68 and 70 are shown issuing from the slot 44.

The bottom row 26 of windows includes four windows 45-48, four push-buttons 50-53 and a panel 49, and four dispensing slots 54-57.

When purchasing tickets from the machine 20,
10 the purchaser can see each of the eight arrays of tickets through the windows and can read the legends and the prize information on the tickets. When the purchaser has selected the ticket to purchase, he or she inserts a \$1, \$5, \$10, or \$20 bill in the bill acceptor 28 and pushes
15 the appropriate one of the eight buttons to select which type of ticket is to be dispensed. The tickets then are issued from the slot for the selected ticket.

It is preferred that the selector button must be pushed once for each ticket to be dispensed. If a
20 customer desires to purchase several tickets of the same type, they will be issued in a connected group so that the customer need tear off only the one group of tickets and need not tear off each ticket individually.

If the customer then wishes to select a
25 different ticket, the same procedure is repeated for the different ticket and a different push-button is pushed to select the desired tickets.

As the tickets are being dispensed, the ticket panels move downwardly past the windows so that the
30 customer can see the tickets moving.

It should be understood that a vending machine constructed in accordance with the present invention can have any number of dispensing windows and dispensing mechanisms desired, such as one, two, four, six, or eight
35 or more.

The front panel of the housing of the vending machine 20 shown in Fig. 1 is broken away at the top of

the window 32 in the upper left hand corner of Fig. 1 to show two lamps 58 and 59 which are positioned in the housing above the array of tickets so to illuminate the tickets and make them easy to read.

5 The push button 36 for the window 32 also is shown broken away to illustrate a lamp 61 which is housed inside the push button. The push button material preferably is translucent so that when the bulb is lighted within in, the button will be clearly visible.

10 Similarly, there are two bulbs like bulbs 58 and 59 and a push button bulb like the bulb 61 for each of the other windows in the dispensing machine 20. These bulbs are not shown, for the sake of simplicity of the drawings.

15 Still referring to Fig. 1, an additional slot 29 is provided immediately below the bill acceptor 28 for receiving winning tickets. By inserting the tickets through the slot 29, they are inserted into a bar code reader and printer (not shown in Fig. 1) which will read
20 the bar code and verify the winning ticket, and will perform various operations to be described below.

DISPENSING MECHANISM

Figs. 2 and 3 show the dispensing mechanism 60 which is behind each of the windows of the vending
25 machine 20 shown in Fig. 1. Each of the dispensing mechanisms 60 includes two side panels 62 and 64 with internal spacers 66, 69, 71, 72 and 74. Sleeves 76 and 78 are rotatably mounted on the spacers 72 and 74 to form guide rollers.

30 A ticket drive roller 80 (see Fig. 3 and Figs. 4 and 5) is rotatably mounted between the side panels 62 and 64 on a shaft 82 (see Fig. 2). An idler roller 84 is mounted on a shaft 86 which is slidably mounted in a slot 87. A spring 88 biases the idler roller 84 to the left,
35 as shown in Fig. 2, so as to force it into firm engagement with the drive roller 80.

Rotatably mounted on the shaft 82 is a gate structure 90 (see Fig. 2). The gate structure includes at one end an arm 91 and an extension 94 secured to the arm 91. At the end of the extension is a permanent magnet 96. Attached to the side panel 62 closely adjacent the end of the extension 94 is a Hall-effect sensor board which contains a hall-effect sensor to create signals depending upon the relative position of the magnet 96 so as to indicate whether the gate is open or closed.

A ticket-engaging panel 92 (see Fig. 3) is attached to the arm 91. A cutting bar 102 (see Figs. 2, 4 and 5) is positioned so that the panel 92 abuts against the bar 102 when it is in its rest position as shown. The panel 92 is urged against the bar 102 by a spring 140 (Fig. 3) which is connected between an extension 141 of the panel 92 and the frame of the dispenser.

As it is shown in Figs. 4 and 5, the bar 102, which is an extruded plastic part, has a sharp lower edge which is used as a tearing edge to tear off tickets which are being dispensed.

Referring again to Figs. 2, 4 and 5, a curved feed ramp 100 is provided to bend the ticket to be dispensed upwardly and out of the vending machine. The end of a ticket 106 being dispensed is shown in Fig. 2 extending upwardly from the ticket feed ramp 100. The ticket 106 extends through the slot 41 in the housing (Fig. 1) of the vending machine where it can be gripped by the customer, pulled against the sharp edge of the bar 102, and torn off.

Referring now to Fig. 3, a drive motor 110 is mounted on the side panel 64, with a drive shaft 112 extending outwardly through the panel. A spur gear 114 is attached to the shaft 112. A larger spur gear 116 is attached to the shaft 118 driving the feed roller 80.

A ratchet gear 120 also is attached to the shaft 112 and is engaged intermittently by a solenoid 122

to act as a lock each time that a ticket is moved into a dispensing position to make certain that the drive system rollers will not rotate if a customer should try to pull a string of tickets out of the machine for which he or
5 she has not paid. The solenoid disengages from the ratchet gear to unlock the drive system whenever it is desired to move the tickets, either to dispense a ticket or to jog the tickets to attract attention.

Still referring to Fig. 3, a pair of ticket
10 guides 124 and 126 is provided for guiding an array of tickets downwardly past the window, which is not shown in Fig. 2 or 3, but is attached to the flanges 132. The guides 124, 126 are secured in place by means of a threaded rod 128 which is secured in place by means of a
15 wing nut 130.

A feeler switch 134 is secured to a guide 126 in order to detect the trailing edge of the string of tickets and provide a signal indicating that the supply of tickets in the machine is exhausted. Actually,
20 several tickets will remain when the switch 134 is actuated. However, it is preferred not to attempt to dispense all of the tickets in a stack of tickets. Rather, it is desired to leave a panel of tickets of substantial length to facilitate the attachment of the
25 end of the next string to those remaining by means of tape.

Fig. 2 is partially schematic in that it shows a string or array of tickets 104 as it would move from a stack of tickets (not shown) stored in the machine. The
30 string moves either over or underneath the roller 72, over the top of the upper roller 78, downwardly through the ticket guide 126 to the nip of the rollers 80 and 84, and out of the machine. The ticket string 104 is shown in solid lines in Fig. 2 to distinguish it from the guide
35 126, which is shown in dashed lines.

The guide 126 has a flared inlet opening 136 at the top, and a similarly flared outlet opening 138 at the bottom.

As the ticket string moves over the upper
5 roller 78, the relatively thick tickets do not readily bend around the roller 78, but rather the ticket panel bends at the perforation lines such as the line 108 shown at the top of Fig. 2. This facilitates in the dispensing of the tickets in that it weakens the perforations
10 between adjacent tickets and makes it easier for the mechanism to bend the ticket string at the perforation when the lead ticket hits the guide 100, and makes it easier for the customer to tear the ticket off.

If the ticket material is relatively stiff, the
15 ticket string is made to pass over the roller 72 because the angle at which it passes over the roller 78 need not be as acute as when the ticket material is relatively more flexible in order to produce the desired amount of bending at the perforations.

20 GATE STRUCTURE

Figs. 4 and 5 show the gate structure 90 of the invention in two different positions.

The first position, shown in Fig. 4, is one in which the ticket array 104 is at rest after a ticket has
25 been removed. The lower end 168 of the ticket array is slightly spaced from the outlet guide 100 and the gate structure is in its rest position against the bar 102 with the ticket held firmly against the flat surface of the bar 102. The upper portion of the bar 102 is curved
30 so as to guide the ticket array to the right location.

As a ticket is being dispensed, it moves downwardly to abut against the guide 100, as it is shown in Fig. 5. As the ticket array moves downwardly it bends towards the left as shown in Fig. 5, and rotates the arm
35 91 about the pivot point 82 in a clockwise direction. This causes the magnet 96 at the end of the extension arm 94 to move relative to the sensor on the panel 98 and

cause the output of the Hall-effect sensor to change. Preferably, the sensor is sensitive and will signal even a small movement of the gate by a movement of only 1/16 of an inch, for example.

5 When the next perforation after the leading edge 168 reaches the cutting edge of the bar 102, the ticket tends to bend at the perforation. The ticket is deliberately moved slightly past the point where the perforation is aligned with the cutting edge, and then it
10 is moved backwardly until the gate comes to the rest position shown in Fig. 4. This sends a signal to the control circuitry indicating that the ticket array is properly aligned with the cutting edge of the bar 102, and the ticket is ready to be torn off. By this means,
15 the Hall-effect sensor is used to detect when the foremost ticket in the string is extending from the machine properly and the cutting edge of the bar 102 is properly aligned with the perforation so as to highly accurately locate the ticket for accurate tearing along
20 the perforation. This almost entirely avoids the tearing of tickets at a location other than the perforation.

CONTROL CIRCUIT

Now referring to Fig. 6, the control circuit of the vending machine includes system circuitry which is
25 common to all of the dispenser units, and circuitry which is separate and distinct for each dispenser unit.

The common circuitry, located on a "system" circuit board, includes a microprocessor or CPU 152 and a clock source 156 supplying clock signals to the CPU.

30 A service keypad 154 is provided for performing service functions and inputting information, as it will be described below. The keypad normally is locked inside the cabinet shown in Fig. 1 and is not accessible to the public using the equipment or
35 to the personnel in the shop or store where the equipment is located.

The bill acceptor 28 and the display 30 are also shown in Fig. 6, and are connected to the microprocessor.

There is a total of four doors for the cabinet 22 shown in Fig. 1, and each door operates a switch when it is open and closed. The door switches and the ticket string and detector switch are shown schematically at 160 in Fig. 6. Those switches also communicate with the microprocessor 152.

10 The CPU preferably is one of a number of standard commercial types, and includes random access memory ("RAM"), a read-only memory ("ROM") to store an operating program and other program material to be described below, etc.

15 The electrical circuits which are located within each of the separate dispensing units 60 is shown at 144-151 in Fig. 6. The details of only one such unit, No. 144 are shown in Fig. 6. The others are identical and thus are merely shown as blocks in the drawing. The
20 purpose of this is to avoid repetitious illustration.

 Most of the components within the dashed outline 144 of Fig. 6 are mounted on the printed circuit board 144 shown in Fig. 3, which is mounted at the rear surface of the dispenser unit 60. The components within
25 the outline 144 are those associated with window 32 of the vending machine shown in Fig. 1.

 The signal from the ticket selector button 36 is delivered to the microprocessor 152, which lights the button lamp 61 in accordance with stored program stored
30 in the microprocessor.

 The window lamps 58 and 59 also are energized in accordance with a stored program.

 The motor 110 preferably is a reversible synchronous AC motor. It is instructed to move in the
35 forward or the reverse direction by the microprocessor 152.

As an alternative embodiment, an optical shaft position encoder 111 is attached to the shaft of the motor 110 to indicate its instantaneous position and keep track of its location.

- 5 The gate mechanism 90 actuates the Hall-effect sensor 98, which sends its sensing signal outputs to the microprocessor 152.

TICKET JOGGING

- 10 Ticket jogging is accomplished in each of the dispensing units by energizing the drive motor 110 to move the array of tickets 104 back and forth rapidly. This is done intermittently at a frequency that typically can vary anywhere from once per second to once per hour or longer.

- 15 Ideally, each ticket array should be jogged at least once every ten seconds, during normal operation. This is believed to produce adequate attractiveness, while not excessively wearing the machine or the tickets, or unduly disturbing people nearby.

- 20 Preferably, the jogging activity is programmed to be disabled during night-time hours, or whenever the vending machine is not accessible by customers.

- The jogging operation is produced by programming the microcomputer by use of the service
25 keypad 154 and other programming means to be described below.

- A standard timing routine is programmed into the microprocessor to instruct it to produce jogging action on a pre-determined schedule. For example, using
30 the clock source 156 and a counter formed in the microprocessor, the program will start a cycle of jogging actions in which it causes each of the separate dispensing units to sequentially jog the ticket array, one after the other. For example, the preferred sequence
35 is the first ticket array in window 32 is jogged, and then it is followed in sequence by windows 33 through 35, and then in windows 45-48. The program is set to repeat

this cycle once every pre-determined period, such as once every ten seconds or once every five minutes. The specifics of the program used to perform these timing functions are well within the skill of the art to
5 provide, and will not be described in detail herein.

The specific routine used for jogging each array is as follows. First, the motor 110 is turned on for a period of time sufficient to move the array backwardly approximately a quarter of an inch. This
10 takes about one eighth of a second in the vending machine which currently is being marketed using this invention. Then, after a delay of about one sixteenth of a second, the motor 110 is reversed and is driven for a time sufficient to move the ticket array forward by one-half
15 inch. The timing, in each case, is provided by reference to the signals provided by the clock source 156.

The forward movement by one-half inch takes approximately one-fourth of a second. After about another one-sixteenth second delay, the motor 110 is
20 reversed again to drive the ticket array rearwardly by one-quarter inch, and then it stops. The ticket array has been returned to its original starting position.

The movement rearwardly, forwardly and then rearwardly again is done in order to make certain that
25 the leading edge of the ticket array returns accurately to its starting position. In one embodiment of the invention, where the motor 110 is an AC synchronous motor, its movements are not reliably accurate enough to ensure the return of the leading edge of the ticket to a
30 specific starting location. Although one possible additional source of error might be the slippage of the ticket in the nip of the rollers 80 and 84, slippage is very unlikely, because the rollers have been designed to operate with essentially zero slippage. This is done, in
35 part, to ensure that tickets will not be withdrawn from the machine without being paid for.

The forward motion of the ticket is illustrated in Fig. 5 of the drawings. This movement is substantially less than the width of a full ticket, which typically is of the order of two inches or so across.

5 As the lower edge 168 of the lead ticket strikes the guide 100, and causes the ticket to bow, this swings the gate open slightly and causes a change of the state in the Hall-effect sensor to indicate electrically that the ticket has arrived accurately at a desired
10 stopping location. Then, the motor stops upon receipt of the signal from the Hall-effect device, and returns the ticket by one-quarter inch to its location shown in Fig. 4, ready to be dispensed, or to be jogged, whichever occurs first.

15 **PHOTO DETECTOR POSITION SENSOR**

In accordance with the present invention, two alternative methods can be used for accurately stopping the leading edge of the ticket array at the proper location.

20 Shown in dashed outline in Fig. 4 is a photo cell detector 170 and lamp 171 which are positioned so as to detect the leading edge 168 of the ticket when it reaches the proper location.

The photo cell 170 is mounted in a hole in the
25 bar 102, and the lamp 171 is mounted in a hole in the guide 100. There is a hole (not shown in Fig. 4 or 5) in the gate panel 92 to allow light from the lamp 171 to reach the photo cell 170. As it is shown in Fig. 6, the photo cell delivers a signal to the microprocessor 152.
30 the signal is delivered whenever the photo cell 170 receives radiation from the lamp 171, as it does whenever a ticket does not block the light.

In jogging the ticket array, the signal from the photo cell 170 is used to shut off the motor 110
35 after it has driven the ticket array a quarter inch in the reverse direction, and has moved the ticket in the forward direction by the same distance. When the leading

edge of the ticket breaks the beam of light from the lamp upon returning to its starting position, this causes a change of state of the signal sent to the microprocessor, and this is used to turn off the motor.

- 5 Preferably, the lamp 171 is a radiation-emitting diode, and the photo cell 170 is receptive to radiation in the infra-red range emitted by the lamp.

SHAFT POSITION ENCODER

- Another method of stopping the ticket advance
10 accurately is by use of a shaft position encoder 111 on the end of the shaft of the motor 110, as shown in Fig. 6. This device can be used to accurately measure the actual extent of travel of the motor shaft. Since the drive roller 80 is driven through gears instead of belts
15 or pulleys, and since there is little or no slippage of the tickets in the nip of the rollers 180 and 184, accuracy of location of the ticket can be maintained by this means. If desired, in this modification, a DC motor can be used instead of the AC synchronous motor. The DC
20 motor will give an increase of torque and cost savings to offset the extra cost of the shaft position encoder.

If desired, the shaft position encoder can be used together with the photo detector 170 to give even better accuracy.

- 25 The advantage of the two alternative arrangements described above over the method using the actuation of the gate 90 for locating the leading ticket edge is that the alternatives eliminate or greatly reduce the ticket wear which occurs when the gate is opened.

- 30 If the alternative location methods are not used, the frequency of the jogging motion should be reduced to reduce the wear. For example, jogging the tickets once every minute or five minutes instead of once every ten seconds has been found to be desirable.

- 35 If, for some reason, the ticket jogging feature is not desired at a particular location, it can be disabled by programming in a zero time cycle. The timing

of each jogging cycle can be programmed in through the service keypad 154 as shown in Fig. 6.

Normally, it is necessary to gain access to the service keypad by opening the vending machine cabinet.

5 Such access usually is restricted to authorized service personnel. However, if desired, the specific function of setting the timing of the jogging cycles, or the total disablement of the jogging function, can be controlled by means of a switch or other means accessible at the
10 outside of the cabinet to a store representative who has instructions on how to set the timing. This can be done with any of the ticket jogging embodiments described herein, but is more practical with one of the second and third-described embodiments in which ticket wear is
15 minimal.

LAMP CONTROL

The lamps for the ticket selector buttons and the windows are controlled in accordance with a program input to the microprocessor through the service keypad
20 154.

The push-button lamps are turned on and off in a rapid sequence which appears to be random in nature, as long as the vending machine has not received and accepted cash for dispensing tickets. Thus, first the button for
25 window 36 (Fig. 1) will light briefly, then perhaps number 52 might flash next, then number 39, then number 50, etc., until all of the buttons have flashed. Then a new cycle of flashing occurs in which the buttons flash in a different sequence. This is very attractive and
30 also calls attention to the machine so as to increase ticket sales.

This function is programmed into the microprocessor 152 through the keypad 154 shown in Fig. 6. The way this is done, preferably, is to store a look-
35 up table in the form of code stored in a ROM in the CPU. The look-up table stores a substantial number of different operating sequences for the lamps. For

example, 24 different sequences can be stored, together with program instructions for stepping through the sequence, and then returning to the start of the sequence once again. This makes the flashing of the lamps appear to be totally random, although it is not strictly random. Of course, the time duration of each lamp can be set by programming to a duration which is deemed most desirable to produce the desired aesthetic effect.

If desired, the window lamps such as lamps 58 and 59 for each of the windows can be turned on and off in a similar sequence which appears to be random.

When a bill or other monetary medium of exchange has been inserted in the machine 20 and has been accepted, the flashing of the lamps on the machine is disabled. Instead, each of the button lamps is lit steadily for every dispenser which is available for use in dispensing tickets.

If a particular dispenser is out of order, or if it is out of tickets, then the window and push button lamps will not light.

If any of the access doors to the vending machine cabinet is opened, this event is signaled by one of the switches 160 (Fig. 6). Then all of the push-button lamps and all of the window lamps are turned on so as to give good lighting for the service person to work on the machine.

After a dispenser is repaired, or its ticket supply replenished, the window and the button lights are turned on again.

When the door is closed after servicing has been completed, the window lights are turned on steadily, and the dispenser selection resume flashing.

The state of repair of the dispenser is indicated by detecting several different fault conditions. For example, one fault condition is detected when the gate does not operate in response to instructions to dispense a ticket.

Thus, as it can be seen, the lights are controlled in a manner so as to provide an attractive, interest-generating light display while the machine is waiting for customers, and then an informative display of lights aiding the customer in using the machine.

WINNING TICKET VERIFICATION AND CONVERSION

The ticket verification feature of the invention uses the opening 29 in the front of the cabinet of the vending machine 20 shown in Fig. 1, as well as the option switch 27 next to the opening 29.

Referring to Fig. 6, the lottery ticket 162 has a unique bar code 163 on one side which identifies the ticket.

In the central computer of the lottery system (not shown) the unique identifying code for each lottery ticket is stored, together with the amount of winnings to which the buyer is entitled, if it is a winning ticket.

Normally, when instant-winner lottery tickets are sold, a clerk or attendant must use a special machine provided for the purpose to call up the central computer, verify the number of the ticket and assure that it is o.k. to pay the winnings to the buyer of the ticket. Then, the computer eliminates the code for that ticket from memory so that only valid, uncashed tickets remain. Thereafter, the same ticket cannot be cashed again.

This chore is eliminated by use of the present invention. As it is shown in Fig. 6, behind the opening 29 in the front of the cabinet of the vending machine is a printer 165 and a bar code reader 158. As the ticket 162 is pushed into the opening 129, it moves the bar code past the reader 158. The reader 158 reads the code and sends it to the central computer through a modem 153. The central computer sends a signal back indicating whether the ticket is an uncashed, valid ticket, and the amount of the winnings to which the buyer is entitled, if any. Then, the printer 165 is actuated to print a validation on the ticket and the amount of the winnings.

The customer then can either push the button 27 to credit the amount of the winnings on the ticket to the amount of credit to which he or she is entitled in the machine, or he or she can take the ticket to a clerk who
5 pays the customer the winnings.

If the winnings are added to the credit total in the vending machine, upon subsequent selection of an appropriate selector switch, one or more additional tickets corresponding to the amount of the credit will be
10 dispensed to the customer, just as if he had inserted more money.

IDENTIFICATION PRINTER

Another feature of the invention is the providing of improved means for printing information on
15 tickets to be dispensed.

Typically, lottery tickets are imprinted with the name of the authorized agent who is selling the tickets. Usually, this is the owner of the store in which the vending machine is located. In the past, the
20 agent's name has been printed in a special printing operation which takes place before tickets are loaded into the vending machine. This generates extra labor costs in preparing the tickets for loading. In addition, if the tickets then are not delivered to the agent whose
25 name is on them, the job may have to be re-done, or other expensive measures taken to correct the problem.

In accordance with one feature of the invention, this laborious step is avoided by the provision of a printer which is responsive to
30 microprocessor control and prints the identification information on the tickets just prior to their being dispensed from the vending machine.

Referring to Fig. 6, in one of the preferred embodiments, the printer is a dot matrix printer. The
35 print head 164 and the ribbon motor 166 to drive the ribbon for the print-head are connected to the CPU 152.

Preferably, the printer mechanism 164 is located just above the idler roller 84, as it is shown in Fig.s 4 and 5. The printer operates to print information on the reverse side of the ticket just after the ticket
5 has stopped moving backwardly from the ticket dispensing location to seat the perforation against the edge of cutting bar 102. Thus, printing is accomplished while the ticket is stationary for a brief moment.

The imprinting of lottery tickets in a
10 dispenser of a type different from the one disclosed herein is disclosed in U.S. patent 4,982,337. However, that imprinter is undesirable because the ink used tends to smear, and the printer is hard to maintain and modify for printing different messages. The agent's name and
15 address usually are printed on the tickets. A new rubber stamp must be ordered every time a machine is installed in a new location, or the agent changes. This is time-consuming and is expensive.

In accordance with the present invention, a
20 printer is provided in which the message to be printed is controlled by the microprocessor 152 is provided. Thus, the identification or other message to be printed on the ticket can be input and programmed by use of the service keypad 154. This greatly facilitates installing machines
25 at new locations, changes of agents, etc.

Although a dot-matrix printer is desirable for this purpose, an ink jet printer actually is the most preferred printer, since the ink supply can be replenished simply and neatly by replacing an ink
30 cartridge, and since such a printer does not require a separate ribbon drive motor like a dot matrix printer. Both printers have the advantage that the printing they produce is dry and will not smear.

The above description of the invention is
35 intended to be illustrative and not limiting. Various changes or modifications in the embodiments described may occur to those skilled in the art. These can be made

without departing from the spirit or scope of the invention.

CLAIMS

1. A ticket dispensing machine, said dispensing machine comprising, in combination,
a housing having at least one window,
5 a structure for holding at least one ticket within said housing adjacent said window in a position to be seen from outside said housing, and
a drive device for attracting attention by visibly moving said ticket intermittently in a timed
10 sequence of movements.
2. A method of attracting attention to tickets displayed behind at least one window in a ticket dispenser housing, said method comprising the steps of
supporting said tickets behind said window so
15 they can be seen through said window,
utilizing drive means for intermittently moving said tickets back and forth while maintaining their position behind said window, and
using said drive means to move said tickets to
20 dispense one or more tickets in response to operator action.
3. A lottery ticket dispensing machine for dispensing lottery tickets in an amount corresponding to payment into the machine by a customer,
25 each of said tickets bearing a unique code to identify it, said code corresponding to a code stored in a computer together with information as to whether the ticket is a winning ticket, and the identification of the amount of the winnings for the ticket,
30 winning ticket verification means comprising customer-accessible code reading means for reading said code from a ticket presented to said reading means,
means for comparing said code with code stored in a computer, and means for indicating the amount of
35 winnings for said ticket.

4. A method of verifying winning lottery tickets issued by a ticket vending machine, said method comprising the steps of

storing in a computer a code identifying each
5 of a plurality of lottery tickets and the amount of any
winnings to be given to the buyer of each winning ticket,
using a code reader in said machine to read the code from
said ticket, interrogating said computer, and
ascertaining the validity of the code as representing an
10 issued and uncashed ticket, and the amount of said
winnings.

5. A lottery ticket vending machine, including
at least one electrically operated ticket dispensing
mechanism, a microprocessor for controlling said
15 dispensing mechanism, an input for inputting information
into said microprocessor, a printer responsive to
instructions from said microprocessor for printing
information on each of said tickets before it is
dispensed, the information to be printed being alterable
20 by means of said input device.

6. A method of printing information on tickets
to be dispensed from a ticket dispenser which is
microprocessor controlled and has input means for
inputting into said microprocessor information to be
25 printed on said tickets, said printer being responsive to
signals from said microprocessor for printing, the steps
of inputting the information to be printed by means of
said input means, and causing said printer to print said
information on each ticket to be dispensed.

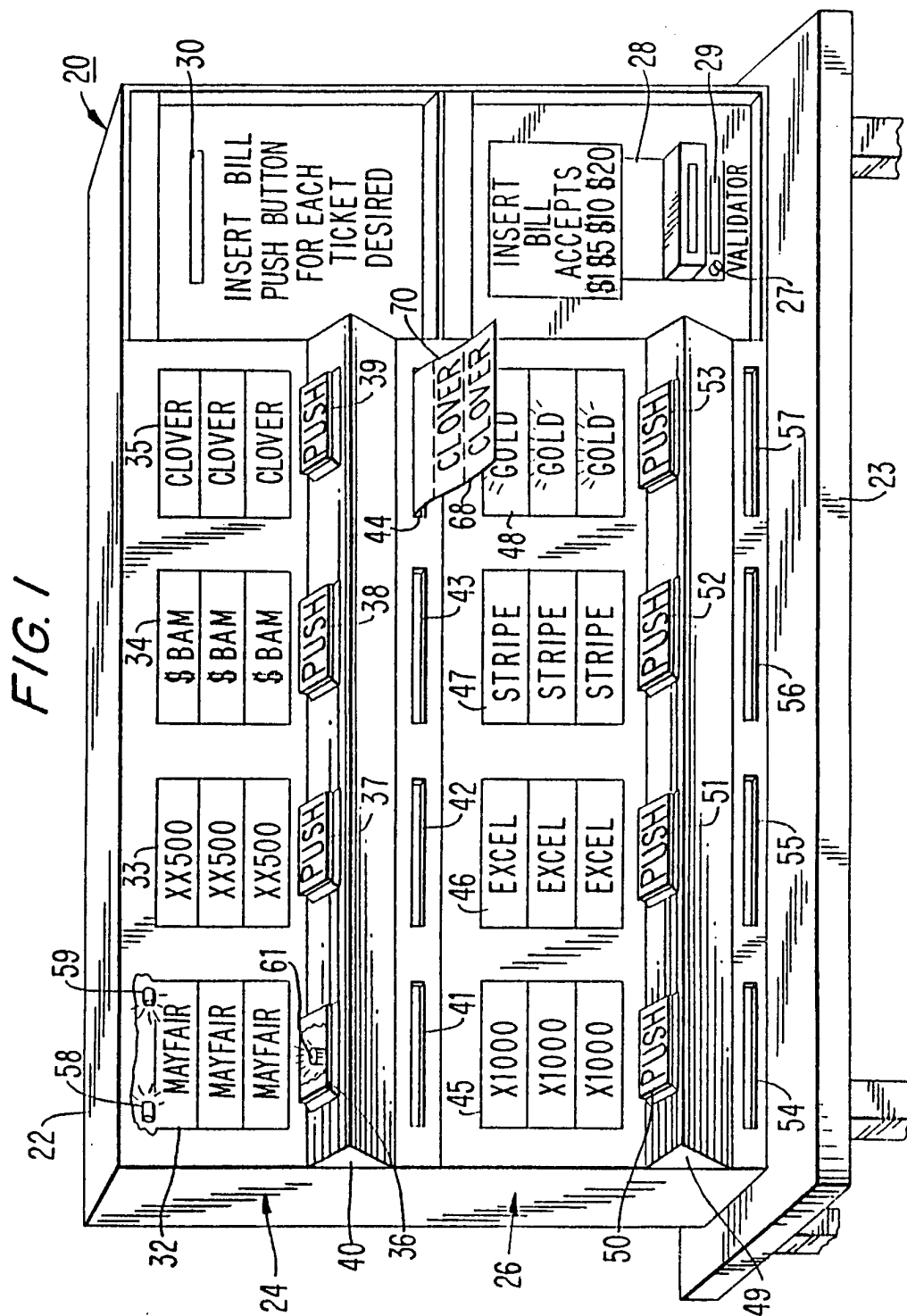


FIG. 2

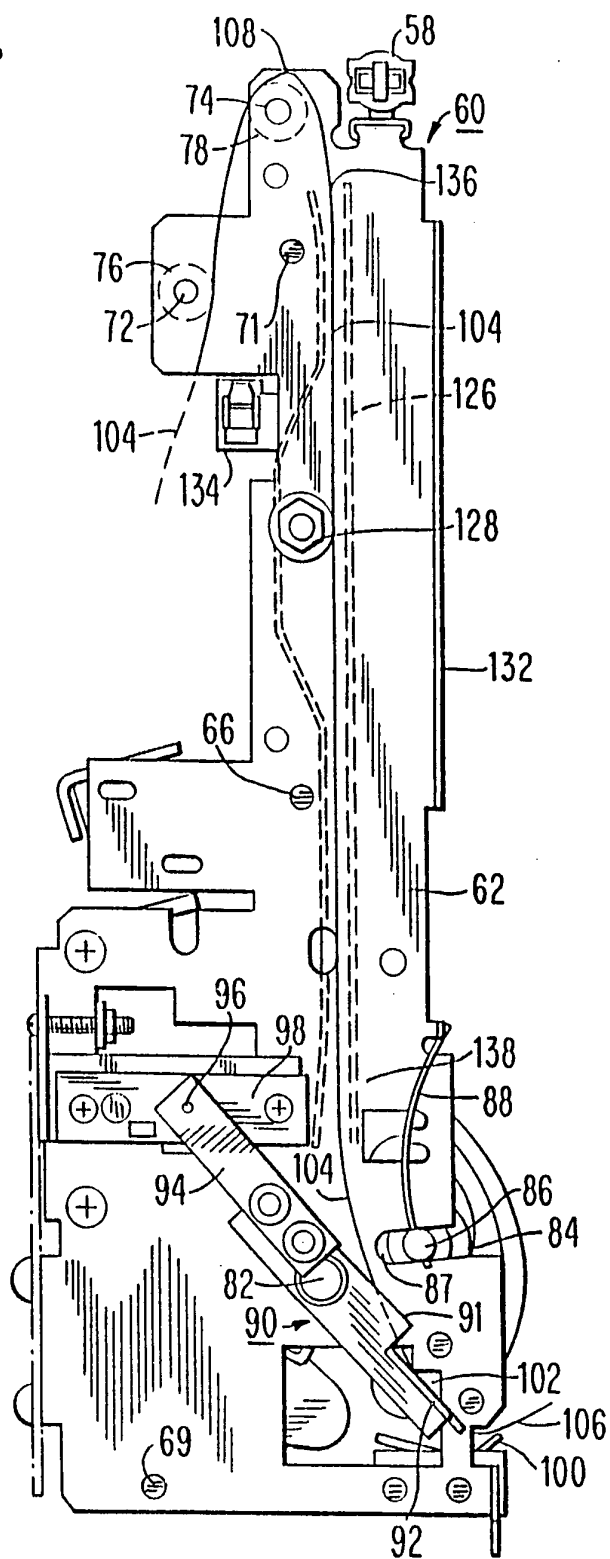
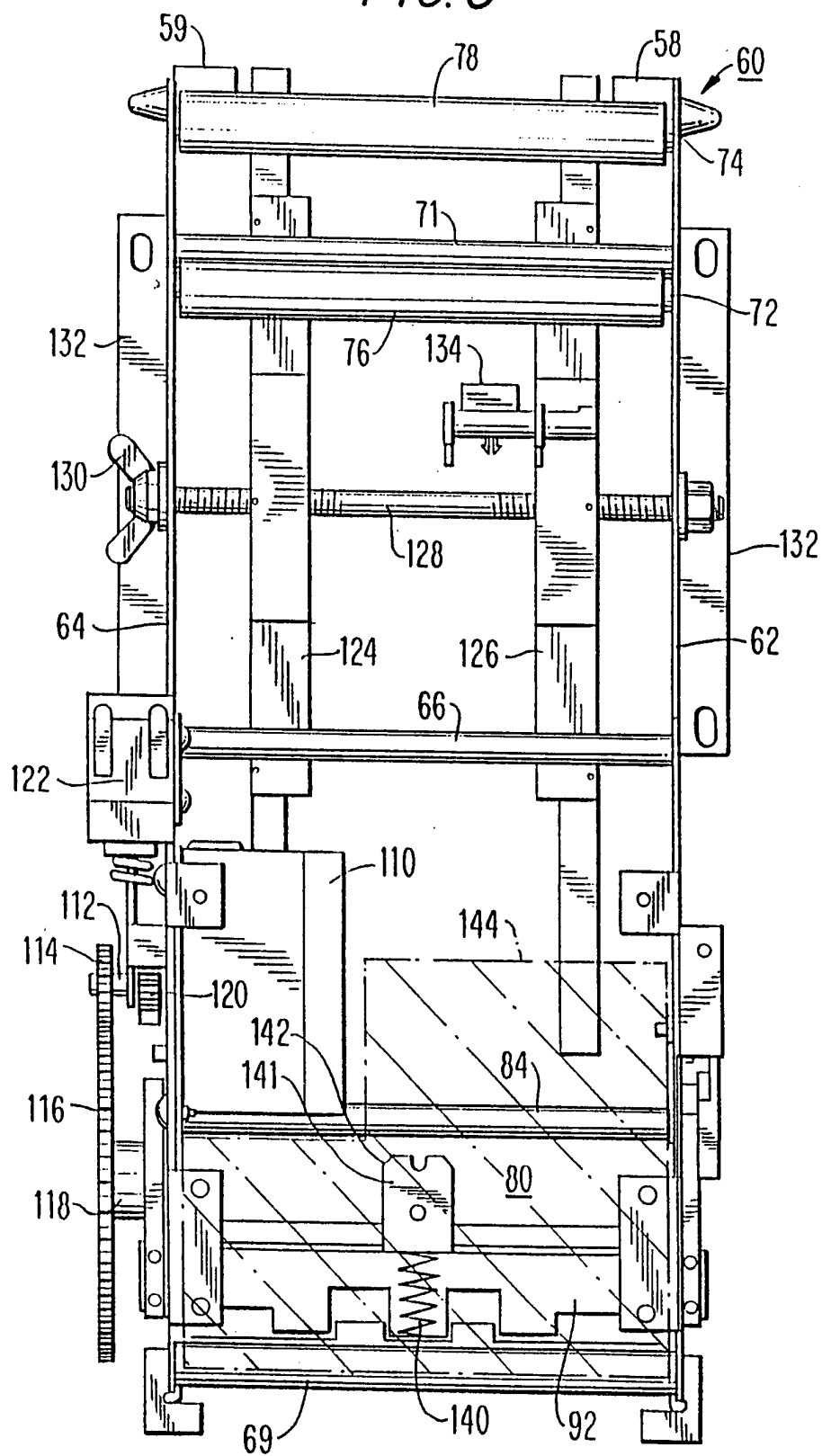
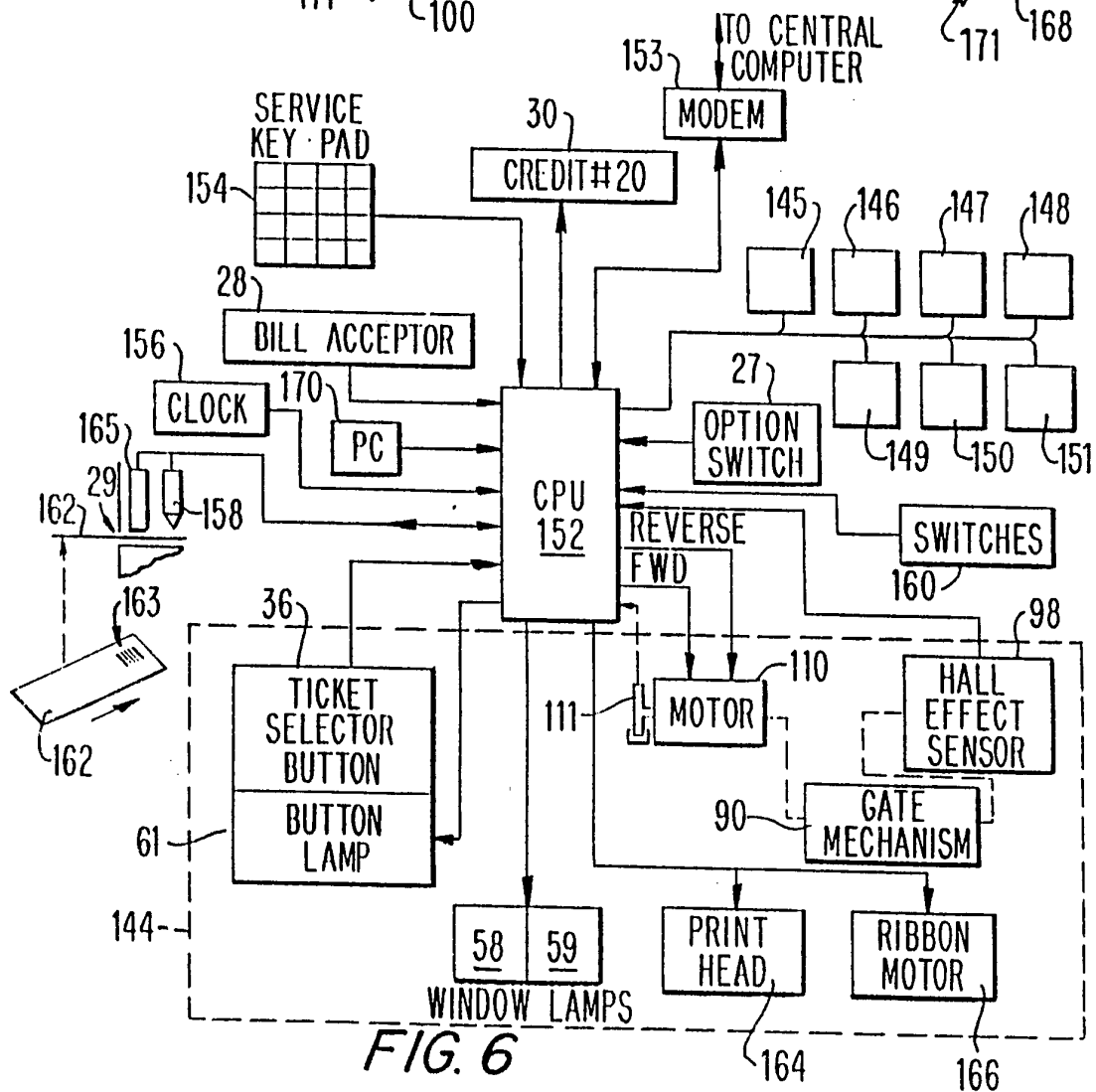
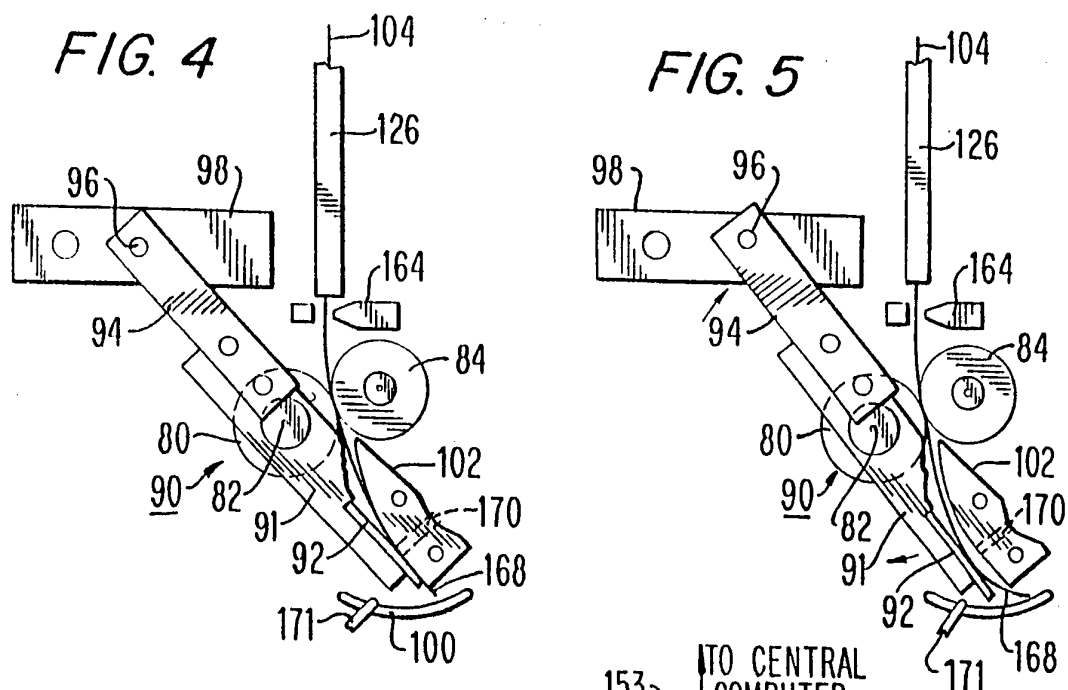


FIG. 3





INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/02054**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(5) : Please See Extra Sheet.

US CL : 235/375

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 235/375, 380; 364/410, 412; 040/470, 514; 221/2, 8, 13

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

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

APS

search terms: lottery, ticket, card, dispenser, dispensing, dispensed, display, moving

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 2,272,750 (Miller) 10 February 1942, Figs. 1-2, col. 1, lines 26-55.	1-2
Y	US, A, 2,655,242 (Chalfin et al.) 13 October 1953, Fig. 1, col. 3, lines 46-62.	1-2
X	US, A, 4,832,341 (Muller et al.) 23 May 1989, Figs. 1, 4, 5, col. 10, lines 8-9, col. 11, lines 7-14.	3-4
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Y		5-6
Y	US, A, 1,180,630 (Armstrong) 25 April 1916, col. 1, lines 9-13.	1-2
A	US, A, 4,833,307 (Gonzalez-Justiz) 23 May 1989.	3-6

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

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

Date of the actual completion of the international search

19 May 1994

Date of mailing of the international search report

01 JUN 1994

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US94/02054

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Telephone Practice

Please See Extra Sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐

The additional search fees were accompanied by the applicant's protest.

☒

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/02054

A. CLASSIFICATION OF SUBJECT MATTER:

IPC (5):

G06F 15/20

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

- I. Claims 1, 2, 5, and 6, drawn to a ticket dispensing apparatus, Class 221, Subclass 13.
- II. Claims 3 and 4, drawn to a ticket dispensing apparatus in which a ticket having a unique code is read by a code reading means, Class 235, Subclass 375.

Group I and Group II do not form a single general inventive concept. The inventive concept of Group I is drawn to displaying and dispensing a lottery ticket with no mention of machine readable code on the lottery ticket. The inventive concept of Group II is drawn to lottery tickets with machine readable code printed thereon, and a comparison of the machine readable code on each ticket with corresponding information on a computer identifying whether the ticket is a winning one and, if so, the amount of winnings.

See PCT Rule 13.2