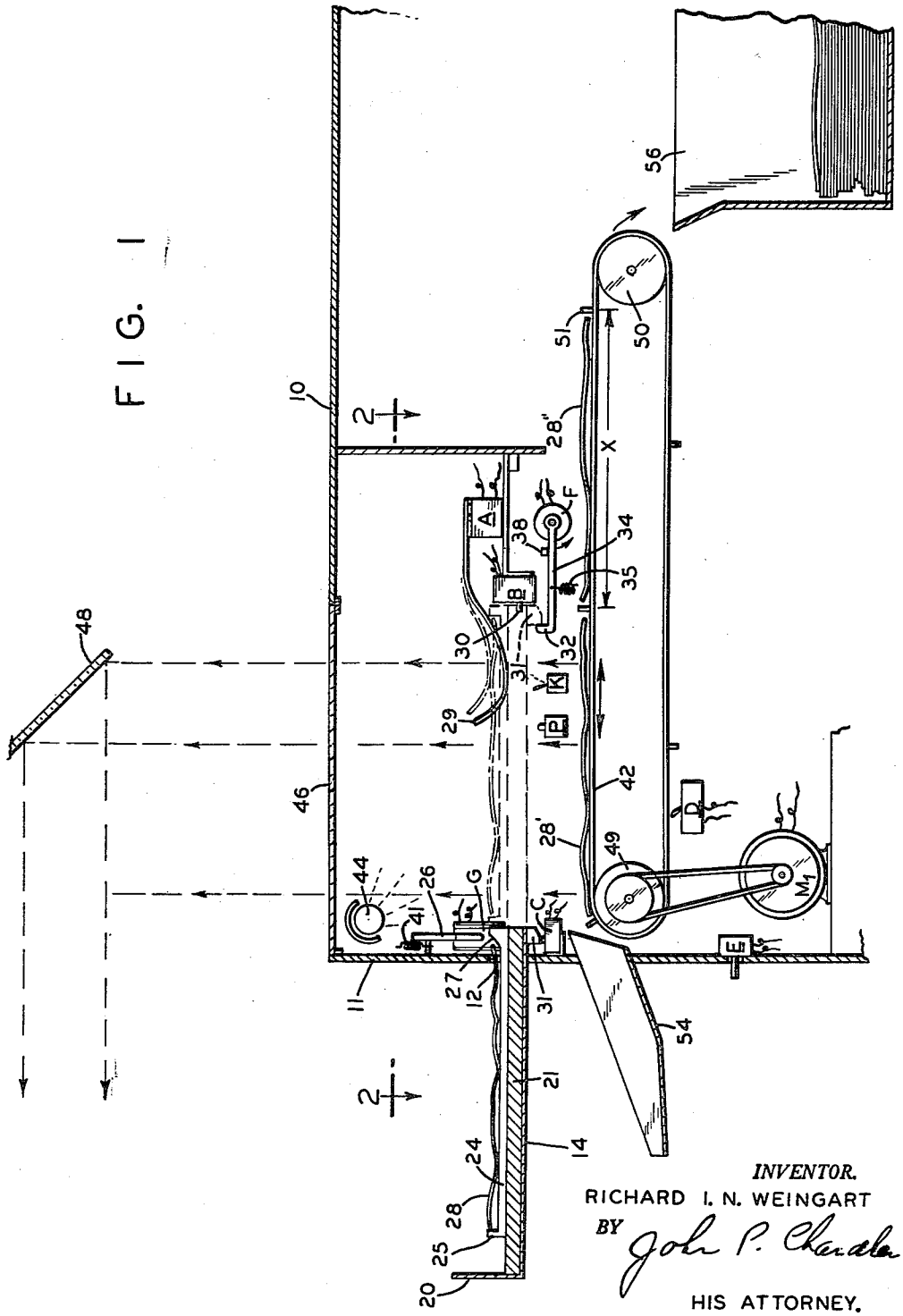
Nov. 20, 1962 R. I. N. WEINGART 3,064,785

PAPER MONEY VENDING MECHANISM

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FIG. 1



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FIG. 2

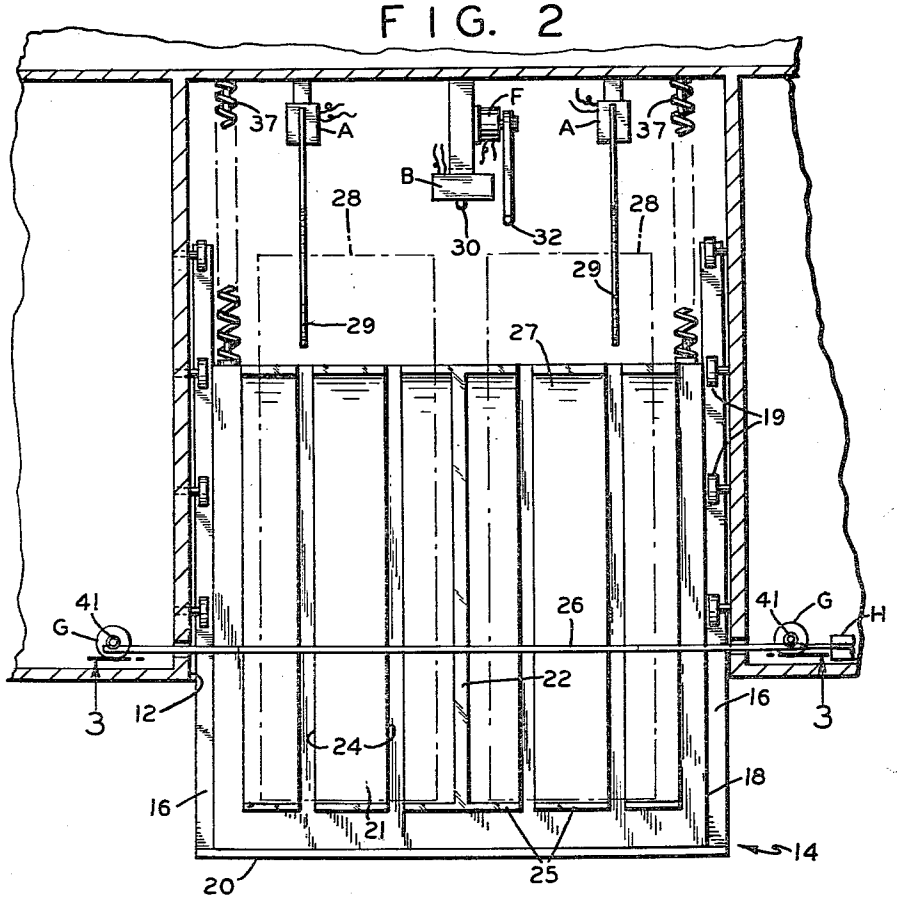
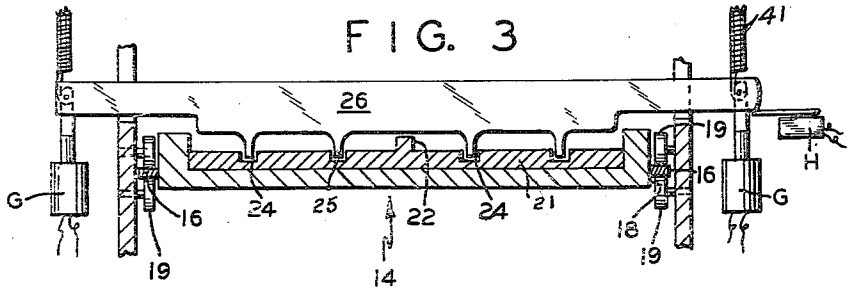


FIG. 3



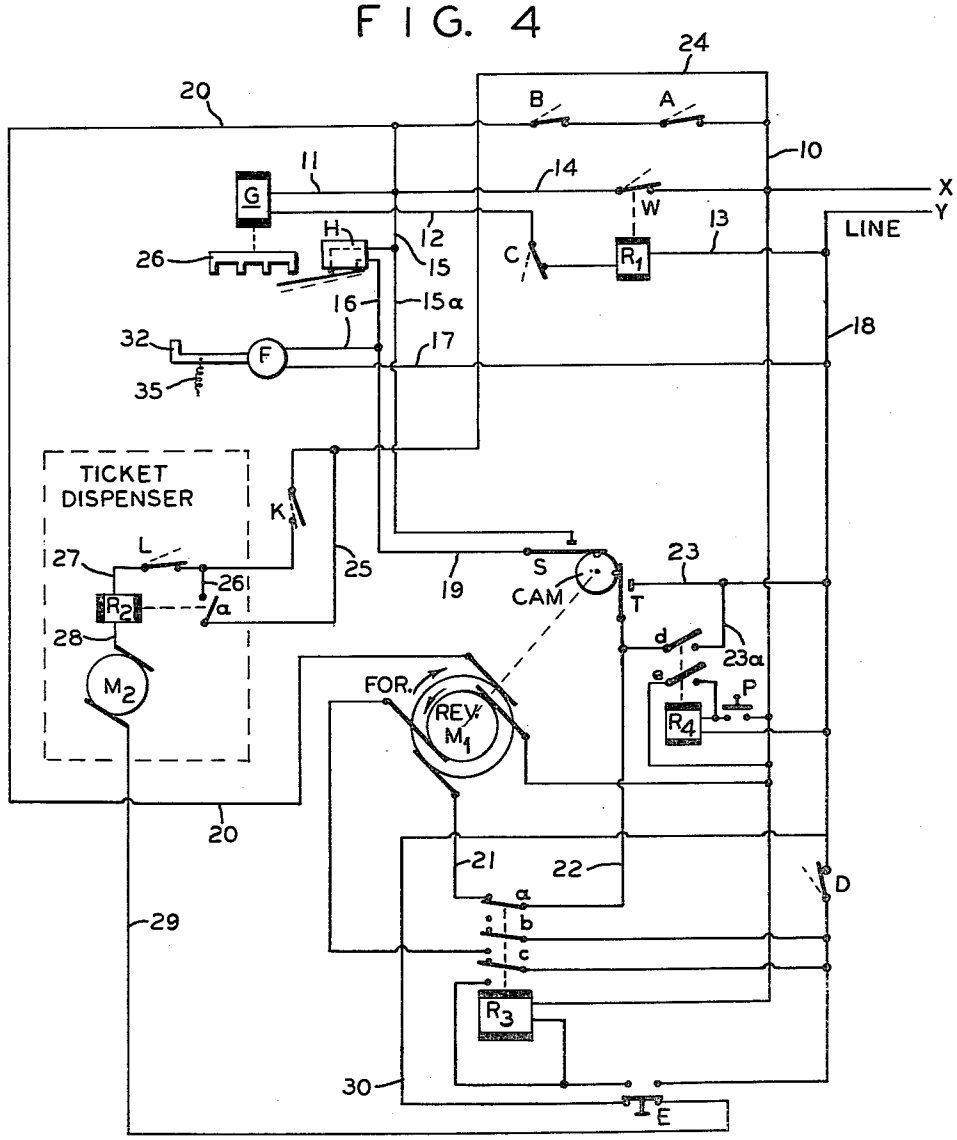
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Filed Feb. 3, 1960 3 Sheets-Sheet 3

FIG. 4



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United States Patent Office 3,064,785 Patented Nov. 20, 1962

3,064,785

PAPER MONEY VENDING MECHANISM

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Filed Feb. 3, 1960, Ser. No. 6,451
6 Claims. (Cl. 194—4)

This invention relates to vending machines and relates more particularly to a machine wherein the article vended is paid for with paper money as distinguished from coins.

An important object of the invention is to provide an apparatus of this character wherein the usual bill scanning device for the detection of counterfeit money is dispensed with and the arrangement is such that no currency detection apparatus is normally necessary because means are provided for projecting the image of the currency on a screen for all customers and attendants to witness.

The machine of the present invention is designed primarily for receiving one dollar or two dollar bills at race tracks where the ticket selling period for each race is relatively short and the customers generally line up, one behind the other, to buy the tickets.

Currency detection devices which operate by scanning the bill are satisfactory but are expensive and delicate in operation. At race tracks, particularly, the volume of $2.00 tickets sold exceeds all others combined, and the machine of the present invention takes advantage of the reluctance of a customer to risk arrest for so small an amount, and the arrangement is such that one supervisor, whose presence is necessary for changing the coding at each race, can easily watch a large number of machines.

Another object of the present invention is to provide a machine of the character described which fulfills virtually all of the needed requirements for an operation formerly performed by a human ticket seller. For instance, if the customer changes his mind about making any ticket purchase after the machine has accepted his money but before he has made his selection, he need only press a "return" button and his money is refunded, the money returned, however, being the same bill as he tendered. This avoids the possibility of a person securing good money in exchange for bad money.

The machine is also arranged so that the money is placed on a sliding drawer which is then manually moved to inward position and when the drawer reaches this position the image of the tendered bill is projected on the viewing screen. This action closes a circuit and the drawer returns outwardly to starting position and the bill is raked onto a conveyor belt immediately below its first position and the bill is still projected on the screen. A second circuit operating the ticket dispenser is now set up for operation and if the customer depresses a given button for a desired horse he receives the ticket and another customer can now do likewise. Instead of pressing the ticket button he can secure a return of his money by pressing the return button and the conveyor belt, operated by a reversible motor, reverses itself and drops the bill in a return slot. If he chooses to purchase the intended ticket the conveyor remains unmoved, and the bill remains projected on the screen, until the next customer repeats the operation at which time the conveyor advances the bill a distance equal to its length. On the second increment of travel the bill drops into a hopper.

In the drawings:

FIG. 1 is a broken central section taken through the apparatus of the present invention.

FIG. 2 is a plan view of the paper money-accepting drawer and its supporting rollers.

FIG. 3 is a section taken on line 3—3 of FIG. 2.

FIG. 4 is a circuit diagram and showing the components of the entire system.

The apparatus is enclosed within a housing having an upper wall 10 and a front wall 11. The front wall has an opening 12 for a drawer 14 which is mounted for sliding movement into and out of the housing by suitable means such as runners 16 carried by the opposed walls 18 of the drawer, said runners being engaged by upper and lower rollers 19 rotatably mounted on shafts fixed within the housing. The drawer has only two positions of rest, viz., a maximum inward and a maximum outward position. Inward travel of the drawer may be limited by a front wall 20 of greater depth than the opening 12 and whose upper section engages the front wall 11.

The drawer includes a platen 21 having a central longitudinal partition 22 dividing the platen into two areas, each about the size of a dollar bill. If the machine is to be used for a single bill the platen may be made of appropriate size therefor, and without the partition. The platen also has a plurality of spaced longitudinal grooves or slots 24 into which the tines 23 of a vertically movable rake element 26 pass in order to move the bill, only one of which is shown at 28 (FIG. 1), off the drawer as the latter moves outwardly from its inward position. The slots 24 continue through a rim at the rear of the platen which has a curved surface 27 to facilitate removal of the bill. The slots also continue through a front rim 25 which is spaced a few inches from the drawer front 20 to provide an area in which the rake may drop when it is to perform its bill-removing function.

When the drawer is moved inwardly without a paper bill thereon, a curved arm 29 carried by a sensitive switch A, and aligned with one of the slots 24, remains in said slot, and the switch remains in its normally open position. When, however, the bill 28 is on the platen the bill, acting as an interponent, raises the arm and closes the switch.

A switch B has a movable push-button type contact 30 which is engaged by the rear wall of the drawer when the latter is moved to its maximum inward position, thus closing the normally open switch B. Switches A and B automatically open in the first few inches of outward travel of the drawer.

The lower rear terminal of the drawer further has a boss or projection 31 which is engaged by a latch hook 32 on latch arm 34 having a right angular extension at its rear end and which is mounted for rotary movement within a rotary solenoid F which is actuated to raise the latch arm after switches A and B are closed. Thus when the drawer is moved inwardly to closed position, and switches A and B are thereby closed, the latch arm raises to the position of FIG. 1 where it engages boss 31 and secures the drawer within the housing until such time as the circuit is opened. When this occurs a spring 35 lowers the latch arm and releases the drawer for outward travel. Upward travel of the arm is limited by a stop 38. A switch C is normally closed but is opened by contact with boss 31 when the drawer is out (FIG. 1).

The rake 26 is held in its upward position by a spring 41 and is moved downwardly by a solenoid G and when it has descended to its lowermost position it engages and opens a switch H. When the rake is down and the drawer moves out, the bill is swept onto a belt conveyor 42. As will be apparent later, solenoid F, holding the drawer in, must remain energized until the rake is down to bill-removing position.

So long as the bill 28 is on the drawer, a light source 44 directs a beam of light on the bill and the image is reflected upwardly through a glass window 46 to a mirror 48 disposed at an angle of about 45°. When the bill is swept from the drawer, as the latter moves out, it falls directly downwardly onto the belt and the same image is projected onto the mirror.

The bill conveyor is supported by two rotatable pulleys 49 and 50 and has a plurality of spacers 51 which are

spaced apart a distance x slightly greater than the length of a bill and the axes of the pulleys are spaced apart a distance of about $2x$. A motor M_1 drives pulley **49** forwardly one increment of travel equal to x on each complete cycle and a suittable clutch (not shown) may disable the drive when that distance has been traversed. The motor is a reversible one and when a push-button type of switch E is actuated by a customer, indicating that he has changed his mind about purchasing a ticket or other commodity after he has closed the drawer with his money therein, the motor drives the conveyor in the opposite direction a distance again equal to x and returns the bills to the customer through a return chute **54**.

The first bill to be wiped from the drawer falls to the position of **28'** on the belt. On the next cycle this bill moves to the position of **28''**, and on the third cycle the bill at **28''** is advanced into a hopper **56**.

The operation of the apparatus will now be explained with reference to the wiring diagram of FIG. 4.

When the drawer is pushed in, closing switches A and B, a circuit is closed which may be traced from power line X, through line **10**, switches A and B, line **11**, through solenoid G, line **12**, switch C, relay R_1, line **13** and back to power line Y. The energizing of relay R_1 closes a switch W and completes a circuit which may be traced from X, through line **14**, thereby by-passing switches A and B, so that when the drawer is out and switches A and B are allowed to open, solenoid G will remain energized, holding rake **26** down until the drawer is all the way out and engages switch C to open the circuit to solenoid G, allowing a spring **33** to retract the rake upwardly to starting position.

The circuit including solenoid F is completed from line X, through line **10**, switches A and B (or W and line **14**), line **15** and through switch H and line **16**; through solenoid F and back to Y through lines **17** and **18**. This is one circuit, a parallel circuit through F continues from line **15** through **15***a*, through switch S and line **19** and line **16** through solenoid F, through lines **17** and **18** and back to Y. This parallel circuit is closed only when motor M_1 is operated and the belt **42** is moving.

A reversible motor M_1, is energized by a circuit which can be traced from line X through line **10** and switches A and B (or switch W and line **14**), line **20** through the forward section of motor M_1, through line **21**, switch "*a*" of relay R_3, line **22**, cam switch T and line **23** and line **18** back to Y. A cam which controls switches S and T is mechanically connected to the motor M_1 and timed to make one revolution per section of the belt so the switch T turns off the motor M_1 thereby stopping the belt after it has travelled the distance of a single bill.

As soon as solenoid F effectively locks the drawer in its in position, the ticket dispenser can be actuated. This is shown as including a motor M_2 which is permitted to be energized when the drawer, moving out, closes a switch K which energizes holding relay R_2, completing the circuit from X through lines **10**, **24**, **25**, R_2a, switch L, line **27**, relay R_2, line **28**, motor M_2, line **29**, push button switch E, line **30** and back to Y through line **18**. The ticket dispenser is connected through the push button switch E (which is for returning the bill) so that when the switch E is depressed to secure a return of the bill, the holding relay R_2 is deenergized thereby disconnecting power to the ticket dispenser so that a ticket cannot be obtained.

Push button E energizes holding relay R_3 which disconnects the circuit in forward section of motor through *a*, and completes circuit through reverse section through *b*, and *c*, holding the relay until switch D is opened by belt, thus stopping motor M_1.

After completion of a cycle, the cam switch T breaks the circuit to the motor M_1 stopping it. Inasmuch as switch T remains open until the motor starts, it is necessary to temporarily by-pass switch T in order to start the motor for its next cycle. This is accomplished by a switch *d* of a time delay relay R_4 connected through line **23***a* to **18** and power line Y. Relay R_4 is energized when the depending arm **31** of drawer **14** momentarily depresses a button switch P. Switch *e* of relay R_4 holds the circuit through R_4 until the expiration of the time limit when the cam has operated switch T.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that many modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of equivalency of the claims are intended to be included therein.

What I claim is:

1. A vending machine for receiving paper money and delivering a commodity to an operator comprising; a drawer for receiving paper money normally disposed in a first position external to a housing, said drawer adapted to be moved to a second position within the housing for positioning the money in an object plane; means within the housing for sensing the presence of money in the drawer and for sensing the condition of a fully closed drawer; an optical system which projects the image of the characters printed on the money onto a viewing screen; a reversible conveyor for receiving the money and conveying it to a storage chamber or for returning it to a position external of the housing; a rake positioned above the drawer and adapted to engage the front edge of the paper money for moving the money onto said conveyor when the drawer is returned to its first position; means for lowering the rake to said engaging position only after the drawer is closed and the presence of the money is sensed; a commodity dispenser for delivering a unit commodity to a position external of the housing; and means for operating the commodity dispenser and controlling the conveyor to deposit the money in said chamber or return it to the operator; said dispenser controlled for operation only when the drawer is open and the money is moved to a deposit position.

2. A vending machine for receiving paper money and delivering a commodity to an operator comprising; a drawer for receiving paper money normally disposed in a first position external to a housing, said drawer adapted to be moved to a second position within the housing for positioning the money in an object plane; switching means within the housing for sensing the presence of money within the drawer and for sensing the condition of a fully closed drawer; a reversible conveyor which includes an endless belt for receiving the money and conveying it to a storage chamber or for returning it to a position external of the housing; a rake positioned above the drawer and adapted to engage the front edge of the paper money for moving the money onto said conveyor when the drawer is returned to its first position; means for lowering the rake to said engaging position only after the drawer is closed and the presence of the money is sensed; a commodity dispenser for delivering a unit commodity to a position external of the housing; and control means for operating the commodity dispenser and controlling the conveyor to deposit the money in said chamber or return it to the operator; said dispenser controlled for operation only when the drawer is open and the money is moved to a deposit position.

3. The structure recited in claim 2 and wherein means are provided for receiving a plurality of pieces of paper money.

4. A vending machine for receiving paper money and delivering a commodity to an operator comprising; a drawer for receiving paper money normally disposed in a first position external to a housing, said drawer adapted

to be moved to a second position within the housing for positioning the money in an object plane; switching means within the housing for sensing the presence of money within the drawer and for sensing the condition of a fully closed drawer; retractible means descending to the drawer to remove the money therefrom as the drawer returns to the first position; a reversible conveyor which includes an endless belt for receiving the money and conveying it to a storage chamber or for returning it to a position external of the housing; a rake positioned above the drawer and adapted to engage the front edge of the paper money for moving the money onto said conveyor when the drawer is returned to its first position; means for lowering the rake to said engaging position only after the drawer is closed and the presence of the money is sensed; an optical system which projects the image of the characters printed on the money onto a viewing screen for inspection by a supervisor when the money is in the drawer as well as when it is on the conveyor; a commodity dispenser for delivering a unit commodity to a position external of the housing; and control means for operating the commodity dispenser and controlling the conveyor to deposit the money in said chamber or return it to the operator; said dispenser controlled for operation only when the drawer is open and the money is moved to a deposit position.

5. A vending machine for receiving paper money and delivering a commodity to an operator comprising; housing, a drawer for receiving paper money normally disposed in a first position external to said housing, said drawer adapted to be moved to a second position within

the housing for positioning the money in an object plane; switching means within the housing for sensing the presence of money in the drawer and for sensing the presence of the drawer in said second position; an optical system which projects the image of the money onto a viewing screen; a reversible conveyor which includes an endless belt for receiving the money and conveying it to a storage chamber or for returning it to the operator; a rake positioned above the drawer and adapted to engage the front edge of the paper money for moving the money onto said conveyor when the drawer is returned to its first position; means for lowering the rake to said engaging position only after the drawer is closed and the presence of the money is sensed; a commodity dispenser for delivering a unit commodity to a position external of the housing; and control means for releasing the commodity dispenser and controlling the conveyor to deposit the money in said chamber or return it to the operator; said dispenser controlled for operation only when the drawer is open and the money is moved to a deposit position.

6. The structure recited in claim 5 and wherein means are provided for receiving a plurality of pieces of paper money.

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