

- [54] **APPARATUS FOR PACKING AND DISPENSING THIN OBJECTS**
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Related U.S. Application Data

- [63] Continuation of Ser. No. 207,076, Dec. 13, 1971, abandoned.
[52] U.S. Cl. **53/54, 53/126, 53/131, 53/154, 53/159, 53/180, 194/4 R, 221/13**
[51] Int. Cl. **B65b 57/14, B65b 9/02, B65b 35/50**
[58] Field of Search **53/28, 54, 126, 131, 154, 53/159, 177, 180, 182; 194/4 R, DIG. 6, DIG. 9 B; 221/2, 12, 13; 235/61.7 B; 340/149 A**

References Cited

UNITED STATES PATENTS

- 1,916,847 7/1933 McCarthy 53/154

2,058,005	10/1936	Donnellan.....	53/154 X
3,339,337	9/1967	Rapp et al.	53/180
3,445,981	5/1969	Hori.....	53/28
3,570,643	3/1971	Maierhofer	194/4 R
3,588,449	6/1971	Patterson	194/DIG. 9 B
3,697,729	10/1972	Edwards et al.	194/4 R
3,701,523	10/1972	Erickson	194/DIG. 9 B

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[57] **ABSTRACT**

Automatic cash dispensing machine wherein a selected number of bills are automatically packed in an envelope, which is then delivered out. The machine is provided with means for storing a number of bills and two rolls of continuous sheets of paper or the like. The sheets are withdrawn from the two rolls to lie parallel one above the other, while a selected number of bills are taken out of the storing means to be inserted between the parallel sheets, which are then formed into an envelope enclosing the bills therein, and the envelope is delivered out of the machine.

7 Claims, 12 Drawing Figures

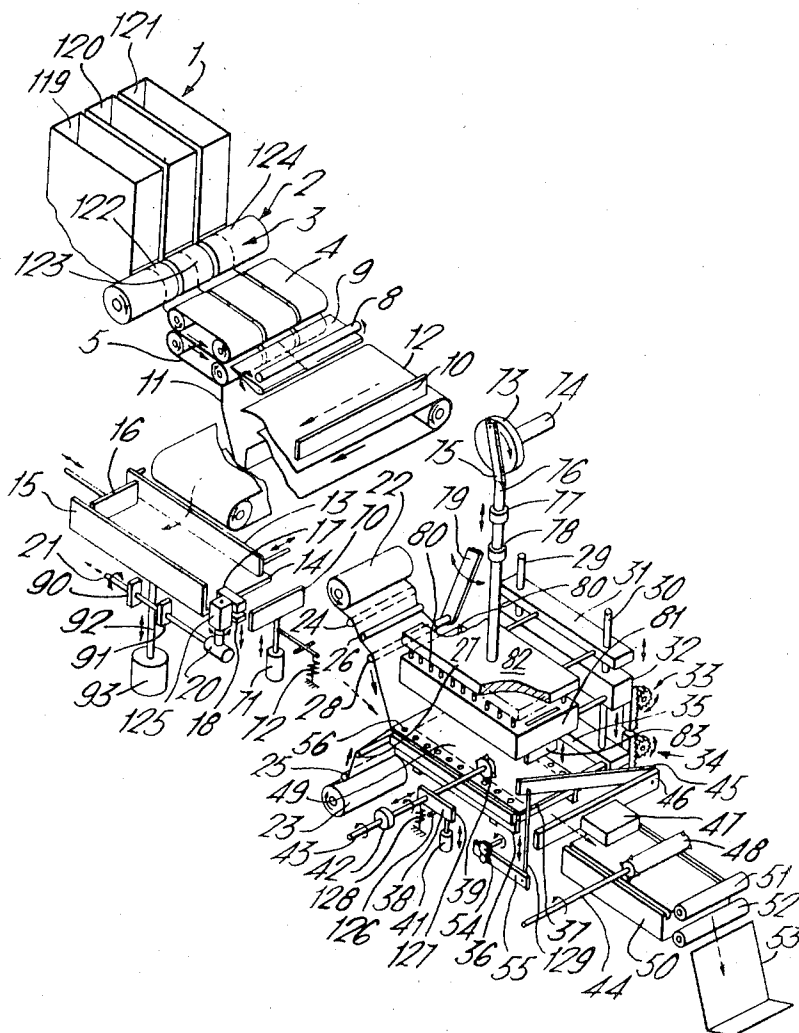


FIG. 1

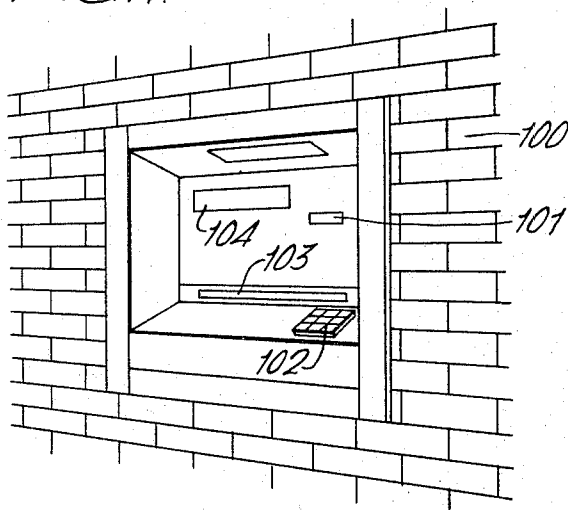


FIG. 2

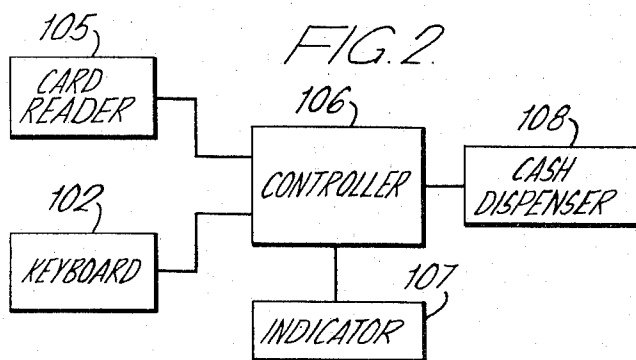


FIG. 3

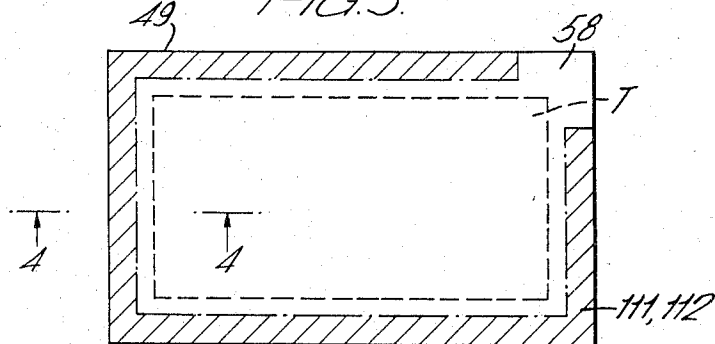


FIG. 4.



FIG. 5.

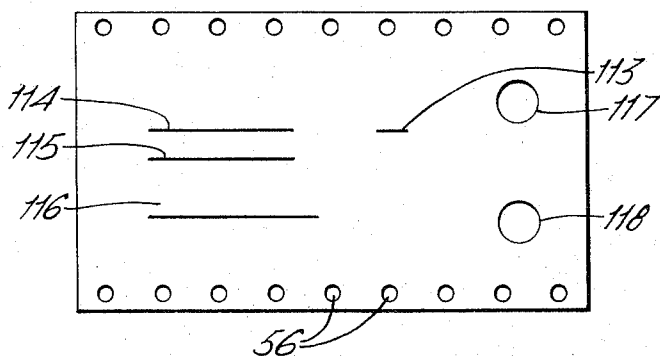
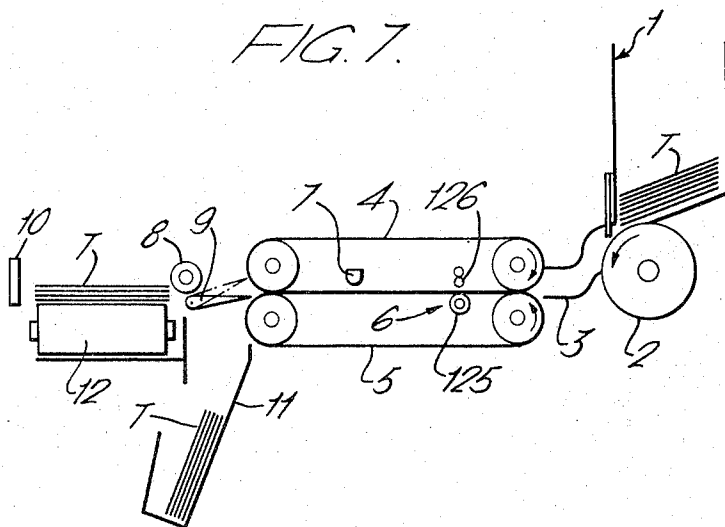
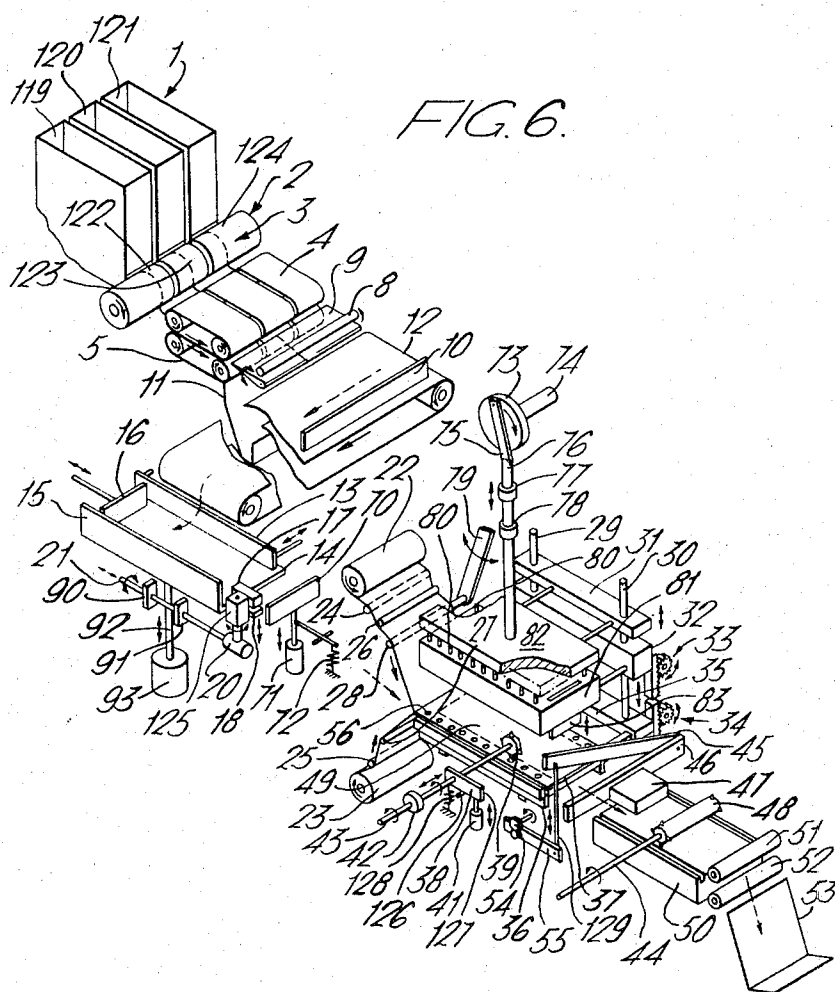
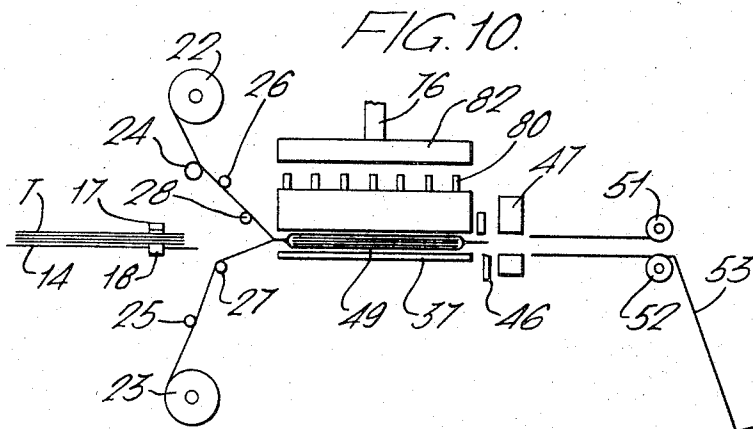
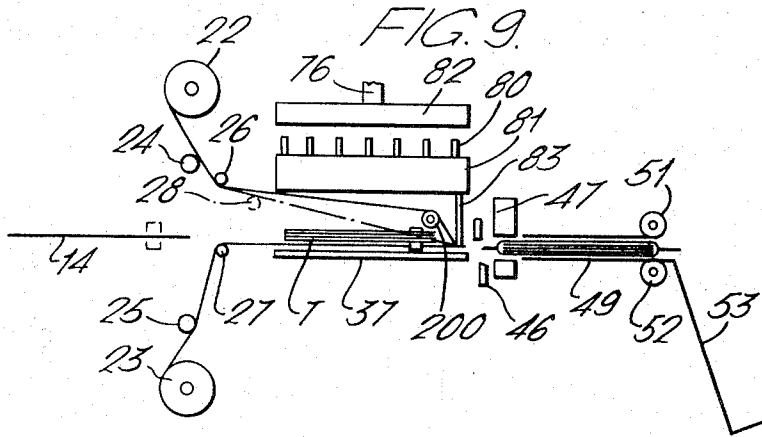
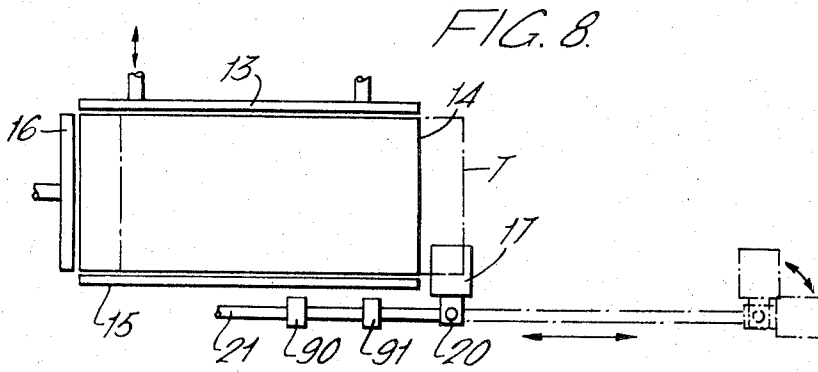


FIG. 7.







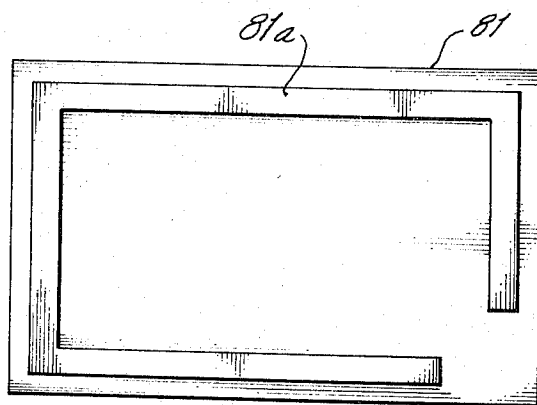


FIG. 11.

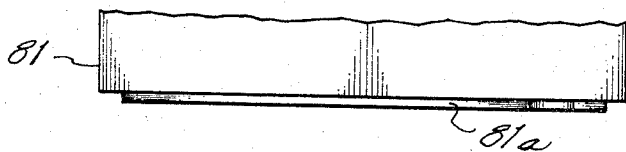


FIG. 12.

APPARATUS FOR PACKING AND DISPENSING THIN OBJECTS

This is a continuation, of application Ser. No. 207,076, filed Dec. 13, 1971 and now abandoned.

This invention relates to an apparatus for automatically packing a selected number of sheet-like objects such as bills in an envelope or envelopes and dispensing them out of the apparatus.

In a bank or the like establishment, when money is paid to a customer, a teller counts the number of bills by manipulating them and hands the required number of bills to the customer. The bank teller must take the utmost care not to err in the counting, and this will cause much psychological stress and physical fatigue to the bank teller. Since payment must be conducted by bank tellers, it is practically impossible to do banking business throughout the 24 hours of a day.

Accordingly, it is one object of the invention to provide an apparatus which can automatically pack a selected number of sheets and dispense the package out of the apparatus.

The invention can take the form of an automatic cash dispensing machine which can be operated by customers so that it becomes possible for customers to withdraw cash from the bank at any time throughout the 24 hours of a day.

In one embodiment of the invention, the bills to be dispensed are stored one piled upon another in a suitable storage box. If bills of different denominations are handled, they are stored in different boxes. When the number of bills to be dispensed has been determined, they are mechanically withdrawn out of the storing box or boxes. The bills are piled up and properly arranged and then transferred onto a packing station, where upper and lower sheets of paper or plastic material are supplied so that the bills are interposed between the two sheets, which are then adhered along their periphery so as to be formed into an envelope containing the bills therein. The envelope is then severed from the succeeding sheets and sent out of the machine.

Preferably, a portion of the periphery of the envelope is not adhered so as to leave there an opening of such a dimension that it is possible to check the number of the bills therein through the opening, but that it is impossible to take out the bills through the opening without breaking the envelope. When the customer receives an envelope from the machine, he checks the amount of money contained therein, and if it is short of the amount he is entitled to have, he may present to the bank the envelope without breaking it and ask for compensation for the shortage. If the envelope presented is broken, the bank is not responsible for any shortage of the contents of the envelope.

The invention will be described in further detail with reference to the accompanying drawings, wherein:

FIG. 1 is a front view of the apparatus as fitted in a brick wall of a building;

FIG. 2 is an electrical block diagram of the apparatus;

FIG. 3 is a top plan view of an envelope enclosing bills;

FIG. 4 is an enlarged sectional view taken along line 4 — 4 in FIG. 3;

FIG. 5 is a top plan view of a bill enclosing envelope having necessary information printed on its upper sur-

face and a series of perforations formed along its opposite lateral sides;

FIG. 6 is a perspective view of the interior mechanism of the apparatus of the invention;

FIG. 7 is a side view of the device used in the apparatus of FIG. 6 for withdrawing bills from a storing device;

FIG. 8 is a top plan view of the device used in the apparatus of FIG. 6 for arranging the bills withdrawn by the device of FIG. 7 and transferring them to the next stage;

FIG. 9 is a side view of the device used in the apparatus of FIG. 6 for packing the bills in an envelope; and

FIG. 10 is a view similar to FIG. 9 but showing the packing device in a different operative position.

FIG. 11 is a bottom plan view of the device used for sealing the envelope.

FIG. 12 is a side elevation view showing the projection for sealing the envelope.

Referring to FIG. 1, there is shown a part of a brick wall 100 of a building having a recess formed therein. The automatic cash dispensing machine of the invention is fixed in the recess, with its front panel being exposed so as to allow access thereto by the customer.

The customer is supposed to put a card he has into a card inlet slot 101, and input into the machine a secret number previously known to him by means of a keyboard 102 and then the amount of money he wishes to withdraw by means of the same keyboard. The machine checks the information read from the card and the information input by means of the keyboard, and when the card has been recognized as valid, it dispenses the required amount of cash enclosed in an envelope out of an outlet slot 103. These operating instructions are successively indicated in a window 104, so that the customer operates the machine in accordance with the instructions.

The card can be a well known credit card which has recorded thereon such coded information or data as the name and the account number of the owner, the balance the owner has at present, the date of the latest use of the card, the number of times the card has been used, etc. These data are advantageously recorded magnetically.

Turning to the block diagram of FIG. 2, the card introduced into the machine has its information read by a card reader 105, so that the information read is applied to a controller 106. The controller determines whether the card data are valid or not. When the card has been recognized as valid, the controller applies a signal to an indicator 107 so that the instructions that the secret number should now be input appear in the window 104. The secret number input through the keyboard 102 is applied to the controller, which compares the secret number and the data read from the card and, if necessary, also the data about the customer previously stored in the controller 106. When a predetermined correspondence has been recognized between the secret number and the card, it is determined that the user of the card is the proper owner of the card. Then the controller 106 applies a signal to the indicator 107, so that the instructions that the amount desired should now be input through the keyboard appear in the window 104. The amount input by the customer is then applied to the controller, wherein the amount is compared with the data read from the card concerning

the balance of the customer's account. When the amount desired to be withdrawn does not exceed the balance left, the controller applies a signal to a cash dispenser **108**, which dispenses the required number of bills enclosed in an envelope or package out of the machine through the outlet slot **103**.

Needless to say, when the card used has been recognized as false or invalid, or the balance left is short of the amount required, the cash dispenser **108** is not operated, but the card is returned to the customer or collected into the machine. In case the card is such that it can be used only once, it is collected into the machine. However, the arrangement is generally such that the card can be used a predetermined number of times within a predetermined period of time. In this case, the card is returned to the customer after it is used in the machine. When the card is returned, a receipt or the like may accompany the card. There are various other ways of using a credit card in the machine, which are all very well known so that no further explanation will be given.

The keyboard **102** comprises ten keys having numerals **0** through **9**, respectively. In case the secret number is a four-figure number, four of the keys are pressed in order to input the number into the machine. Suppose that the amount of money to be withdrawn is \$ **68**. Then the keys bearing the numerals **6** and **8** are pressed. If desired, the kinds or denominations of the bills to be withdrawn may be designated by additionally providing denomination keys corresponding to, say \$ **1**, \$ **5** and \$ **10**, respectively. If the customer wishes to have four **10**-dollar bills, three five-dollar bills and thirteen one-dollar bills, which amount to \$ **68**, he may push first the **10**-dollar dollar key and the numeral **4** key, and then the five-dollar key and the numeral three key, and finally the one-dollar key and the numeral **1** and **3** keys, so that the required amount of money comprising the above-mentioned kinds and numbers of bills will be dispensed.

If the arrangement is such that it is impossible to designate the denominations of the bills to be dispensed, the controller operates to set the kinds and numbers of the bills to be dispensed or calculate the least necessary numbers of bills of different denominations, that is in the above example, six **10**-dollar dollar bills, one five-dollar bill and three one-dollar bills. If there is no more five-dollar bills stored in the machine, eight one-dollar bills as well as six **10**-dollar bills will be dispensed.

The above embodiment is so designed as to be operated by the customer. In a modified form adapted to be installed at a bank teller's window, the teller operates the keyboard **102** to dispense the amount of money requested to be withdrawn.

In the present-day on-line banking system employing a computer, the data from the computer and the window machines may be substituted for the data manually input through the keyboard **102**. In this case the keyboard can be eliminated.

The bills are enclosed in an envelope or package which conveniently is of a rectangular shape. Preferably, the envelope is so constructed that the number of the bills enclosed therein can be counted for confirmation from outside the envelope without breaking it and at the same time the bills cannot be taken out of the envelope without breaking it. This helps determine whether the bank or the customer is responsible for any

shortage of the bills enclosed in the envelope that has been dispensed out of the machine.

An envelope is shown by way of example in FIGS. **3** - **5**, comprising an upper sheet **109** and a lower sheet **110**, with a required number of bills **T** sandwiched therebetween. The two sheets are adhered by means of adhesive layers **111** and **112** along their whole periphery except at a portion thereof forming an opening **58**. The opening is so dimensioned that the number of the bills **T** enclosed can be checked through the opening but it is impossible to take out any of the bills through it.

The adhesive layers **111** and **112** are applied to the sheets **109** and **110**, respectively. The adhesive material used preferably has such a characteristic that when pressure is applied to the adhesive, it becomes activated. As is well known, the layers **111** and **112** consist of different components of the material, which, upon application of pressure thereto, are activated to adhere the sheets to each other. Thus even when the layers **111** and **119** extend along the whole periphery of the respective sheets **109** and **110**, it is easily possible to form the opening **58** by not applying pressure to that portion of the periphery where the opening is to be formed.

FIG. **5** shows the upper surface of the envelope, on which necessary data are visibly written. In case more than two envelopes are dispensed in one operation of the machine, a consecutive number is put at a predetermined place **113** of the surface; the amount of cash enclosed is written at **114**; and the amount required to be withdrawn is written at **115**. If only one envelope is dispensed, the values at **114** and **115** coincide. The data about the customer are written at **116**. When a plurality of envelopes are dispensed, the first one bears a mark **117** while the last one bears a mark **118**. If only one envelope is dispensed, it bears both marks **117** and **118**.

Suppose that the customer makes to the person who supervises the machine a claim that he has received a less number of envelopes than he is entitled to. If the first and/or last one of the series of envelopes he has received from the machine bears no mark at **117** or **118**, the situation is considered as such that the customer tells a lie, concealing at least one of the envelopes that have been dispensed. Even when two of the envelopes presented bear a mark at **117** and **118**, if any one of the consecutive numbers at **113** is missing, the situation is considered as such that the customer conceals the envelope bearing that missing number. Thus with this arrangement, it is easily possible to determine whether the customer is telling a lie when he makes a claim that he has received a less amount of money than he should duly receive from the machine.

When a plurality of envelopes are to be dispensed, they may be either continuous or separate. The cases where a plurality of envelopes are dispensed include a case where bills of different denominations are enclosed in different envelopes, and a case where more than a preset number of bills are dispensed, with the preset number of bills being enclosed in one envelope and the excess number of bills in another envelope.

In order to smoothly and conveniently convey the envelope in the machine it is preferably perforated at both longitudinal sides thereof as at **56** so as to be engaged by the teeth of a sprocket wheel as will be described later.

The device 108 for packing the bills in an envelope and delivering the envelope out of the machine will now be described. The whole arrangement of the device is shown in FIG. 6, with different parts thereof being shown in FIGS. 7 to 10.

In FIG. 6, a bill storing device 1 comprises three boxes 119, 120 and 121 storing, say, 10-dollar, five-dollar and one-dollar bills, respectively. The bills in the boxes are taken out one by one from the bottom of the boxes by means of a roller 2. The roller 2 is axially divided into three parts 122, 123 and 124 corresponding to the boxes 119, 120 and 121 respectively. The three roller parts are driven individually and separately from each other by a suitable drive means not shown. The bill withdrawn out of each box is guided by a guide 3, not shown in FIG. 6 for simplicity of illustration but shown in FIG. 7, toward three pairs of upper and lower conveyer belts 4 and 5, each pair corresponding to one of the three roller parts and being driven individually and separately from the others. Each of the upper and lower belts preferably consists of two longitudinally separate belts, though in FIG. 1 it is shown as a single belt for simplicity of illustration. Such separate construction of each belt enables provision of a detector for detecting a bill being carried between the upper and lower belts 4 and 5, as will be described later in detail.

Turning to FIG. 7, the bill passed through the guide 3 is then nipped and conveyed by the belts 4 and 5. In order to ensure correct counting of the number of bills that have been withdrawn out of the storing boxes, the bills must be withdrawn one by one and no two or more bills should lie one upon another. Detection of two or more bills overlying each other is effected by an overlying bill detector 6 as the bill is being conveyed by the belts 4 and 5. The counting of the number of bills is effected by a bill counter 7. The detector 6 is provided along the length of the conveyer and comprises a pair of rollers 125 and 126 vertically spaced a distance greater than the thickness of one bill but smaller than twice the thickness. If two or more bills pass between the rollers 125 and 126, the two rollers are rotated so that one of them, say, 126 actuates a switch not shown. The counter 7 detects bills passing one by one below it and counts the number of the bills that have passed.

When the overlying bill detector 6 operates, a shunt plate 9 provided at the exit end of the belts 4 and 5 is turned upward so as to shunt the bills T into a receptacle 11 (FIG. 7). When the detector 6 operates, the counter 7 is disabled. Unless the detector 6 operates, the shunt plate 9 is positioned so as to receive the bills successively coming out of the belts 4 and 5 and deliver them onto a conveyer belt 12 by the help of a feed roller 8. The bills lie on the belt 12 with their longer side extending longitudinally of the belt or transversely of the width thereof. A stopper 10 prevents the bills from overrunning the belt 12.

In this manner, bills are taken out of the boxes 119 - 121 and are piled on the belt 12. If it is desired to have bills of different denominations enclosed in separate envelopes, after the bills of one denomination has been packed, the bills of another denomination are packed in a similar manner.

When the bills to be packed in a single envelope have been placed on the belt 12, the roller 2 and the belts 4 and 5 are stopped and the belt 12 moves to convey the bills onto a receiving plate 14 provided with a stopper

15 and a bill arranging plate 16. When the bills are transferred onto the plate 14, the bill arranging plate 13 is moved so as to push the longer sides of the bills against the stopper 15, and a bill pushing plate 16 is so moved as to push the shorter sides of the bills against a stopper 70. At this time the receiving plate 14 is preferably vibrated vertically so as to make easier arrangement of the bills thereon. The vibration is created by a vibrator 93 and transferred to the plate 14 through a connecting rod 92.

When the bills are properly arranged on the plate 14, the stopper 70 is lowered by a solenoid 71 and at the same time a solenoid 125 is energized to cause upper and lower jaws 17 and 18 to nip the bills therebetween. The solenoid 125 is attached to the output shaft of a motor 20. The motor 20 is mounted on a shaft 21 which is supported by a pair of bearing blocks 90 and 91 so as to be axially slidable and rotatable one-fourth of a revolution. The axial as well as rotational movement of the shaft 21 is effected by a suitable device not shown.

When the bills are nipped by the jaws 17 and 18, the shaft 21 is axially moved so as to bring the bills as far as they lie between a press head 81 and a support 37 vertically spaced therefrom, whereupon the solenoid 125 is deenergized so that the jaws 17 and 18 release the bills. At the same time the motor 20 rotates the shaft 21 one-fourth of a revolution clockwise so as to remove the jaws 17 and 18 from between the head 81 and the support 37 (FIG. 8). Then the shaft 21 is returned to the original position while the motor 20 is rotated in the opposite direction so as to bring the jaws to the original position. Then the solenoid 71 is deenergized so as to cause the stopper 70 to be raised to the original position by the force of a spring 72.

Before the bills are brought between the head 81 and the support 37, a pair of upper and lower sheets already lie therebetween, ready to be formed into an envelope enclosing the bills therein. The upper and lower sheets are supplied from upper and lower rolls 22 and 23, respectively. The sheets are made of paper or plastic material with a suitable adhesive being applied to the sheets in such a pattern as to define a series of successive rectangles along the length of the sheets. The sheet withdrawn from the upper roll 22 is passed about tension rollers 24 and 26 while the sheet from the lower roll 23 is passed about tension rollers 25 and 27. A support roller 28 is moved by a lever 79 from the position shown in FIG. 6 to a position adjacent the exit end of the press head thereby to raise the upper sheet and make the space between the upper and lower sheets greater so that it becomes easier for the bills to be inserted between the two sheets.

A more detailed explanation of the operation of the roller 28 will now be given with reference to FIG. 9. When the roller 28 is at the dotted line position, the upper sheet extends between the press head 81 and the support 37 as shown by a broken line. Under the condition, the forward ends of the bills T would have to raise the upper sheet as they are inserted therebetween. This would surely cause disorder to occur in the properly arranged bills. In accordance with the invention, however, the roller 28 can be brought as far as a position 200 near the opposite end of the press head. At the position the roller 28 supports the upper sheet sufficiently above the lower sheet along substantially the whole length of an envelope, so that the bills can lie at the re-

quired proper position on the lower sheet without being disturbed. Then the roller 28 is returned to its original position, leaving the upper sheet a little slackened. This slackening, however, is absorbed by the tension rollers 24 and 26. To this end, the tension rollers 24 and 26 are biased by springs not shown, so that when the upper sheet is pulled out of the roll 22, the tension rollers are moved against the force of the tension springs and when the roller 28 is returned to its original position, the slackening of the sheet is absorbed by the movement of the rollers 24 and 26 caused by the resiliency of the tension springs.

The forward ends of the sheets are held by a plate 83 downwardly projecting from the forward end of the upper press head 81, so that even when the roller 28 is moved toward this end of the upper sheet, tensioning the sheet as mentioned above, the forward end of the sheet is held there without being displaced therefrom. The plate 83 is biased by a spring not shown but enclosed inside the upper press head 81 so as to normally project downwardly therefrom. When the upper head 81 is pressed against the lower support 37 as will be described hereinafter, the holding plate 83 is pushed back into the upper head against the resiliency of the spring.

The upper head 81 is provided at the opposite longitudinal sides thereof with a series of pins 80 for making perforations 56 at the opposite side edges of each envelope (FIG. 5). The pins are spring-biased so as to be normally retracted from the under surface of the upper head 81. In order to effect adhesion between the upper and lower sheets of the envelope only at the hatched portion of its periphery, the under surface of the upper press head 81 has a projection 81a corresponding to that portion of the periphery where adhesion must be effected, as shown in FIGS. 11 and 12. A heater may be enclosed in the head 81 so as to enable adhesion if thermoplastic sheets are used.

The upper press head 81 is laterally supported by a block 32 which is vertically movable along a pair of guide posts 29 and 30. A rack-and-pinion drive 33 is provided for vertical movement of the block 32 and, consequently, the head 81. Similarly, the lower support 37 provided with a pin die 36 is supported by a block 35 which is vertically movable along the guide posts 29 and 30 by a rack-and-pinion drive 34.

When the roller 28 is returned to the original position after the bills were inserted between the two sheets, the upper head 81 and the lower support 37 with the pin die 36 are moved by the respective drives 33 and 34 toward each other so as to adhere the upper and lower sheets into an envelope enclosing the bills therein, as shown in FIG. 10. Simultaneously with this operation, a pin head 82 is lowered to push the pins 80 downward so that they project from the under surface of the head 81 into the pin die 36, thereby forming a series of perforations 56 at the opposite lateral sides of the envelope just being formed. The pin head is 82 secured to a piston rod 76 supported by a pair of bearings 77 and 78. The rod 76 is connected to one end of a crank lever 75, the other end of which is pivoted to a crank disk 73 rigidly mounted on a drive shaft 74. As is easily seen, one revolution of the shaft 74 and consequently the disk 73 causes one reciprocating axial movement of the piston rod 76, with resulting formation of the perforations 56 in the envelope.

When the formation of the envelope with the bills enclosed therein and the perforations formed at the opposite lateral sides thereof has thus been completed, the press head 81 and support 37 are returned to their respective original separated positions. Then, a sprocket wheel 39 is projected into the space between the head 81 and the support 37 by means of a screw drive 42 which causes axial movement of a shaft 43 to which the sprocket 39 is secured. Then a solenoid 41 is deenergized, whereupon a bearing 127 for the shaft 43 is rotated by the resiliency of a spring 128 counterclockwise (in FIG. 6) about a pin 126 so as to bring the sprocket wheel 39 into engagement in the perforations 56. Normally, the solenoid 41 is energized to urge the bearing 129 clockwise about the pin 126 thereby keeping the sprocket wheel 39 out of engagement with the perforations 56.

With the sprocket wheel 39 engaged in the perforations 56, rotation of the shaft 43 and, consequently, the sprocket wheel 39 causes the envelope 49 to be transferred from the press support 37 onto a bed 50 provided at the next stage. During the course of transfer a printer 47 prints the necessary informations 113 - 116 and the mark 117 and/or 118 on the envelope. On the bed, a sprocket roller 48 on a shaft 44 engages in the perforations 56 of the envelope. The shaft 44 is driven synchronously with the previously mentioned shaft 43.

When the envelope has been completely transferred onto the bed 50, a cutter is operated to cut the rear end of the envelope from the succeeding sheet 22 and 23. The cutter comprises a stationary lower blade 46 and a movable upper blade 45 which latter has its outer end connected to a lever 55 through a connecting rod 129. The lever 55 is moved by a cam drive 54, so that as the cam drive rotates, the upper blade 45 is moved relative to the lower blade 46 thereby to cut off the envelope from the sheets.

The envelope is then farther conveyed by the sprocket 48 and a pair of rollers 51 and 52 onto a chute 53 and thence dispensed out of the machine through the outlet slot 103.

In case more than two envelopes are to be dispensed, if the cutter is operated only when the last of the required number comes to lie on the bed 50, the required number of envelopes are dispensed as a continuous whole. However, if the cutter is operated every time each envelope comes on the bed, the required number of envelopes are dispensed separately.

What I claim is:

1. An apparatus for dispensing money in envelopes, wherein the apparatus is responsive to a card inserted therein bearing first data, comprising:

means for reading said first data, said first data being uniquely associated with second data stored in the apparatus;

means actuated by a customer for entering information into the apparatus;

comparing means for comparing information entered by said customer with said second data; and,

paper money dispensing means actuated upon a correct comparison between said information and said second data to dispense a selected amount of paper money in the form of bills to the customer, wherein said paper money dispensing means comprises: means for storing said bills; means for removing one or more bills from said storing means; means

for arranging said one or more bills in a predetermined manner; means for positioning said removed bill between overlying portions of envelope material; means including a press head and a support member vertically spaced therefrom for forming an envelope enclosing said bills from said overlying portions of envelope material, said press head including an elongated rib positioned adjacent the periphery of the underside of said press head and projecting therefrom for sealing said overlying portions of said envelope material so as to form an envelope substantially about said bills, said elongated rib having two ends, one end of which terminates in the vicinity of the other end thereof, leaving an opening in the otherwise sealed envelope sufficiently large to permit inspection of the enclosed bills, but not so large as to permit removal of the bills from the envelope without disturbing the seal thereof; and, means for delivering said envelope with the bills therein to said customer.

2. An apparatus of claim 1, including printing means operative to print identification marks on the dispensed envelopes, said marks identifying consecutively formed envelopes.

3. An apparatus of claim 1, wherein said positioning means in said paper money dispensing means includes first and second jaw means operative to clamp therebetween the bills present in said arranging means and means for moving said jaw means with the clamped bills into position between said overlying portions of envelope material, said jaw means being partially rotatable about an axis perpendicular to the positioned bills so as to facilitate disengagement of the jaw means from the bills without disturbing the position thereof and repositioning said jaw means adjacent said arranging means.

4. An apparatus of claim 1, wherein said arranging means includes means to vibrate the pile of bills present

in the arranging means, and movable plates positioned adjacent at least one end and one side of the bills, said movable plates being movable in conjunction with the vibration of said bills by said vibrating means to arrange the bills such that they are substantially longitudinally and transversely coincident.

5. An apparatus of claim 1, including means for recognizing that two or more bills are overlapped as said bills are removed from said storing means, and further including means for preventing said overlapped bills from reaching said arranging means.

6. An apparatus of claim 1, wherein said overlying portions of envelope material are initially joined at one end thereof, and includes means for spacing said overlying portions vertically apart from one another, the spaced overlying portions thereby forming a cavity into which said bills are positioned, and further includes a plate projecting from said press head for holding said one end in place while said bills are positioned between said spaced overlying portions.

7. An apparatus of claim 6, wherein said overlying portions include top and bottom overlying portions, and wherein said spacing means includes a first set of roller means positioned so as to maintain the bottom overlying portion on which said bills are positioned substantially horizontal, and a second set of roller means positioned vertically therefrom, including one roller means partially supporting said top overlying portion away from said bottom overlying portion, said one roller means being movable beneath said top overlying portion in the direction of said one end thereof, so that when said one roller means is positioned at one end of its movement nearest the one end of the overlying portions, a cavity between the overlying portions is formed which is sufficiently large to permit the positioning of bills therebetween.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

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Dated November 26, 1974

Inventor(s) Kazuma Tateisi

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Page 1, in the heading insert the following:

--Foreign Application Priority Data:

December 23, 1970, Japan, No. 45-118093--

Signed and sealed this 11th day of February 1975.

(SEAL)

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks