CASH REGISTER INTENDED FOR SAFE AND FAST OPERATION DURING RECEPTION AND ISSUE OF BANKNOTES AND COMPARABLE DOCUMENTS

Inventors: Sven Lissol Johansson; Leif Lundblad, both of Stockholm, Sweden

Assignee: Norob System AB, Stockholm, Sweden

Filed: Sept. 11, 1972

Appl. No.: 287,685

References Cited

UNITED STATES PATENTS
2,805,675 9/1957 Noyes............................. 235/7 A
2,975,789 3/1961 Schmidt............................ 235/7 A
3,077,299 2/1963 Clark.............................. 235/7 A

Primary Examiner—Stephen J. Tomsky
Attorney, Agent, or Firm—Silverman & Cass

ABSTRACT

A cash register for safe and fast handling of exact amounts of banknotes. Motive operated conveyors feed documents into and one at a time from a banknote bundle storing compartment for each banknote denomination. A keyboard control effects the discrete delivery as well as provides safety controls for alarm conditions.

5 Claims, 6 Drawing Figures
CASH REGISTER INTENDED FOR SAFE AND FAST OPERATION DURING RECEPTION AND ISSUE OF BANKNOTES AND COMPARABLE DOCUMENTS

This invention relates to an apparatus which stores banknotes and also, by means of impulses, receives and issues these according to the instructions of the operator.

The apparatus may be used in particular in banks, post offices and other premises where large amounts of money are kept during the day and where the risk of theft is especially great.

Apparatus so far available which are intended to make robberies difficult at counters in banks, post offices and similar premises generally consist of an alarm system which is switched on automatically or manually in the event of attempted robbery, assistance by the public and/or the police being summoned by means of the alarm. It is also usual to install cine or single-exposure cameras which are set in operation either manually or automatically, for instance at the same time as an alarm device is switched on, and which take photographs of the robber or robbers in order that their eventual apprehension and/or conviction may be facilitated.

However, these known devices have no effect other than that of possibly discouraging robbers. It is well known that many robberies nevertheless take place. In addition, the robber generally takes what he wants and has time to use up or hide the proceeds before he is finally caught.

By means of an apparatus in accordance with this invention, robberies are made difficult or impossible, and according to one constructional version the banknotes (or other documents) which the robber may have succeeded in securing are defaced after a certain delay, so that they cannot be used. In addition, the apparatus makes possible simpler handling and safer storage of banknotes and other documents.

More precisely, this invention relates to a cash register intended for safe and fast operation during reception and issue of banknotes and comparable documents, which cash register comprises a number of infeed compartments and a first group of conveyor devices for feeding banknotes of different denominations into storage spaces inside the cash register, a second group of conveyor devices for issuing different numbers of banknotes of different denominations from the said storage spaces, and also a keyboard which controls the said conveyor devices in accordance with the kinds of banknotes which it is desired that the cash register should issue. The cash register is mainly characterised by the fact that it contains a number of delivery openings and that issue of different numbers of banknotes of different denominations from the said storage spaces takes place through the said delivery openings and is controlled by the keyboard.

The invention will be described below by reference to the attached drawings, in which

FIG. 1 shows a perspective view of a cash register in accordance with the invention,

FIG. 2 shows a schematic view of the inside of the cash register seen from one side,

FIG. 3 shows a simplified diagram of the control devices and internal connections which form part of the cash register and which are preferably completely or partially housed inside the cash register but may also be situated outside it, and

FIGS. 4, 5 and 6 shows a schematic view of a storage compartment contained in the cash register, in three different working positions.

It is assumed that there is a cash register in accordance with this invention at every counter in a bank, post office or similar premises.

When receiving banknotes, the counter clerk places these into the infeed compartment (1) in the cash register. There is such a compartment provided for each denomination. After this the counter clerk starts an infeed device by depressing a special infeed button (1a). The button (1a) actuates a contact unit (12). By means of an electrical equipment (13) (FIG. 3) which appropriately contains electronic components of known properties such as transistors, thyristors, time-delay units etc, and which is actuated by the unit (12), two rolls (13a, 13b) driven by a motor (13d) are started up and feed the banknote or bundle of banknotes placed into the infeed compartment (1) down onto a conveyor which consists of a belt (14a) running over two rolls (14b, 14c). Roll (14c) is driven by a motor (14d) (FIGS. 2 and 3) which is started up by another electrical equipment (14) which, in the same way as equipment (13), is actuated by the unit (12), and which in FIG. 3 is shown as a block.

At its lowest position, the conveyor (14a) feeds the bundle of banknotes into a storage compartment (15b) for banknotes. The storage compartment (15b) consists of a stationery, mainly channel-shaped, rectangular container (150) which in FIGS. 4 and 5 is shown in cross section. The container (150) has two longitudinal grooves (151, 152) in its base. Inside the container there are two guide walls (153, 154) which are each supported by a fixing bolt (155, 156) respectively. These fixing bolts run along vertical tracks in the walls of the container (150) and are each supported outside these walls by the legs (157, 158) respectively of a U-shaped yoke whose centre section (158a) is attached to a push rod (159). Each guide wall (153, 154) is fitted at its lower end with a carrier strip for banknotes (160, 161) respectively, which consists of a longitudinal section which, along the line that passes through the point of the angle section, is connected by a hinge to the bottom edge of the appropriate guide wall (153, 154) respectively. Owing to the action of, for instance, the force of gravity, the carrier strips normally assume the position shown in FIG. 6.

The upper belt portion of the conveyor (14a) runs above the bottom of the container (150).

By means of the push rod (159) which is mechanically connected to an actuating device (15d) which is started by a third electrical equipment (15) which is also actuated by the unit (12), the bundle of notes (162), FIG. 4, which may already be inside the storage compartment (15b) and which rests on the carrier strips (160, 161) is kept, during the infeed operation, elevated from the conveyor (14a) so that the bundle of notes brought up on the conveyor (163). FIG. 4 is fed in underneath the bundle of notes (162). When the conveyor (14a) has in this way brought up the new bundle of notes (163) to a position which coincides with that of the bundle of notes (162) in a direction at right angles to the direction of motion of the conveyor, the conveyor is stopped by a function of the equipment (12), possibly as a result of the action of a limit switch actuated by the conveyor (14a) or the bundle of notes (163). After this, under the control of the equipment
(15) and the actuating device (15d), the push rod (159), yoke (157, 158), guide walls (153, 154) and carrier strips (160, 161), the bundle of notes (162) already in the compartment (15b) is lowered down towards the new bundle of notes (163), so that all banknotes are combined into one single bundle.

As the push rod (159) and the guide walls (153, 154) continue their movement downwards, the bottom edges of the guide walls are moved past the bundle of notes (163) and through the grooves (151, 152) right down into the position shown in FIG. 6. On their passage past the bundle of notes (163) the carrier strips (160, 161) are tipped upwards as shown in FIG. 5. After this they again fall down into the position shown in FIG. 6.

When the next infeed operation is initiated by actuation of the button (11a), the push rod (159) is first of all again lifted up under the control of the equipment (15), the carrier strips engaging with the bundles of notes (162 and 163) which have now been combined into one bundle, so that the device assumes the position shown in FIG. 4 and is ready to receive a new bundle of notes.

There is a pair of rolls (13a, 13b), a conveyor (14a) and a storage compartment (15b) with a lifting device (15d), for each denomination of banknotes.

There may be a separate infeed button (1a) with its associated contact unit (12) for every banknote compartment, or such a button may also serve for all denominations of banknotes, in which case a switch, not shown here, which is situated in the infeed compartments and is actuated by the banknotes placed in these, may be designed to distribute the control signals emanating from the common device (12) to the devices (13, 14, 15) serving the banknote compartment into which the banknotes have been placed.

When issuing banknotes from the cash register, the counter clerk actuates a keyboard (11a), and first depresses keys corresponding to the amount which is to be issued. The clerk then actuates a spacer key (11c) and finally keys in accordance with a code individual to the cash register and/or the counter clerk, which may for instance consist of three digits.

Below the keyboard (11a) there are a number of contacts comprised in an electrical equipment (11) which also contains electronic switching units such as transistors, thyristors, time-delay units etc. When a number of keys is actuated in a certain order, the equipment (11) arranges for the banknote delivery devices to be set in motion.

When banknotes are being issued, the belt conveyor (14a) is again started up by virtue of the fact that equipment (14) is also actuated by the device (11). The lowermost banknote in the bundle of notes is then extracted and carried between two guide plates (17b, 17c) down to the nip between two rolls (19a, 19b) which, as a result of actuation by the keyboard (11a), have been started by a control device (19) and a motor (19c).

The banknote is fed by the rolls (19a, 19b) down along a curved guide plate (21) to an open compartment (23) where the banknotes of a certain denomination which are being issued collect as long as the issuing mechanism is in operation. The banknotes are taken out of the compartment (23) by hand. The electronic equipment in the device (11) ensures that the number of banknotes issued corresponds to the sum registered on the keyboard. It is best if the said electronic equipment is designed in such a way that the required sum is obtained by means of the least possible number of banknotes. If, however, it is desired to obtain ten one-hundred-krona notes instead of one thousand-krona note, this can be done by actuating a key in another keyboard (22) which has a key for each denomination. By depressing, for instance, the key marked 100 and thereafter depressing the key marked 10 on the keyboard (11a), ten one-hundred-krona notes will be issued.

Above the keyboard (11a) there is a set of lights (44), one for each denomination of banknotes. By a contact device, not shown, in the appropriate storage compartment (15b) for banknotes, the light is made to come on when the compartment is empty. There may also be an indicator to show that the compartment is so full that it cannot receive any more banknotes.

As will have been seen from the foregoing, every issue of banknotes must, according to a preferred constructional version of the invention, be initiated by the counter clerk registering the amount and then, after a space impulse, his personal code on the keyboard. This code may for instance consist of three digits. It is however also possible to provide a separate keyboard for registering the code, and such a keyboard is shown in FIG. 1 by the designation (33). The electronic unit actuated by this keyboard is not shown. The code may consist of letters instead of digits.

There is no need for anyone else but the counter clerk to know his personal code, and unauthorised withdrawal of banknotes therefore cannot take place.

The cash register may be designed in such a way that it is put completely out of action if the wrong code is registered. In order to prevent this occurring merely because the counter clerk by mistake registers the wrong code, the cash register may be designed in such a way that it will be rendered unserviceable only after the wrong code has been registered three times.

The cash register may also be designed in such a way that if there is an attempted robbery so that the counter clerk is forced by threat of gun or in some other way to attempt to issue banknotes, a special effect is achieved if he registers a special code, appropriately his own code in the reverse order. Registration of this code then results in the initiation of an alarm situation, suitably one with a delayed action. In the event of such an alarm situation, the alarm should be communicated only to the police or other guard personnel in premises separate from the one where the attempted robbery is taking place, so that the robber may be given the impression that the counter clerk is complying with his wishes. It is best if in the event of such an alarm situation a device (18), which is housed inside the cash register and is shown schematically in FIG. 2, is also actuated. The device (18) contains a dye which is sprayed on to every banknote as it is being issued. It is best if the dye has a delayed action so that it will not be noticed for some time, say 10–30 minutes, after it has been sprayed on. Instead of being sprayed on, the dye may also be applied to the banknote by a printing roll (not shown) which forms part of the device (18). The dye can then be applied in the form of wording which may read "Stolen during a robbery at the office of X Bank, Y Street, Z Town."
An alarm situation triggered off by a special code may also have the effect that a comparatively small number of banknotes is issued, and the robber has to be satisfied with a small amount and be given the impression that he has obtained all the money contained in the cash register.

For normal monetary transactions the apparatus in accordance with the invention may also be equipped with a counter and indicating devices which will show at all times the amounts in different denominations which are inside the cash register.

It will be appreciated that FIG. 2, which illustrates the basic internal construction of the apparatus, is schematic in nature and not drawn to scale. Rather, this figure merely presents the primary components, particularly with regard to the infeed transport, storage and outfeed transport, in what generally constitutes a cooperative operating relationship with each other.

In actual operation, as detailed supra, the rolls 13a and 13b will be so oriented relative to the upper end of conveyor belt 14a as to feed banknotes thereon. The belt 14a is so angled and so directed as to carry the banknotes thereon into the storage compartment 15b. The belt 14a travels through the compartment 15b and, when discharge or outfeeding of the banknotes is to be effected, will extract the banknotes from compartment 15b and discharge them between the guide plates 17a and 17c. These guide plates are so oriented relative to the lower end of the belt 14a and the outfeed rolls 19a and 19b as to feed the banknotes between the rolls 19a and 19b for subsequent discharge into compartment 23.

A cash register in accordance with the invention may be augmented by special actuating buttons and pedals, placed in different positions, by which the alarm can be given. It may also be fitted with a shot indicator that will cause the alarm to be given when a shot is fired in the premises. When the alarm is given for this or some other reason, the banknotes stored in the cash register may be destroyed, for instance by being sprayed with a dye by some device that is not shown, which may for instance be housed in all compartments (15b).

The cash register may be equipped with devices for correcting errors in the amounts registered and also devices for the indication of defects in the infeed or delivery processes for the banknotes, due for instance to a banknote being crumpled.

A notice giving information to this effect may be displayed at the entrance to a bank where there is a cash register in accordance with the invention.

The cash register may naturally also be augmented by cameras etc which are brought into operation in the known manner in an alarm situation.

The apparatus in accordance with the invention may be modified in many ways without the framework of the invention, as specified in the Patent Claims, being exceeded. The conveyor devices for banknotes which are shown may for instance at least partly be replaced by pneumatic devices of known properties.

The rolls (13a, 13b, 19a, 19b) and possibly also the conveyor belt (14a) may be coated with rubber of suitable hardness incorporating carborundum, in order that a high degree of friction may be achieved between the banknotes being conveyed.

The apparatus in accordance with the invention must naturally be firmly affixed to the counter.

The different storage compartments (15b) for banknotes should furthermore be replaceable, so that a counter clerk may be able to remove his storage compartments when he leaves his place of work, and to bring them with him when he begins a period of duty. It is best if all storage compartments are combined into one integral unit which can be removed. It is best if the storage compartments cannot be removed until a lock has been opened, the key to this lock being kept in a place other than at the counter.

We claim:

1. An apparatus for receiving, storing, and delivering money in the form of documents, such as different values of banknotes, comprising: a group of document infeed compartments and an associated group of document delivery compartments, there being one such infeed and delivery compartment for each kind of document to be stored; a group of document storage compartments, each storage compartment comprising means for storing a bundle of documents; a first motive operated document to infeed transport means coupling in a document infeed mode each infeed compartment to its respective storage compartment; a second motive operated document to outfeed transport means coupled to each storage compartment for taking one document at a time from the bundle therein and for transporting such document to its respective delivery compartment; and a keyboard coupled to each said to transport means for selective actuation thereof for transporting documents into and from said storage compartments.

2. Apparatus according to claim 1 in which each of said storage compartments comprises a channel shaped container, a bridge vertically movable in said container, said bridge comprising two side members adapted to support a bundle of documents between them, each side member having a rib, each of said ribs carrying one side of said bundle, each of said ribs being turnable about a longitudinal pivot from an active position to a non-active position, longitudinal windows in the bottom of said container underneath each of said side members, means for moving said bridge vertically to and from a lower position where said ribs have penetrated said windows and are under the bottom of said container from and to an upper position, where said ribs are above said bottom, and said bundle of documents is lifted from said bottom by said ribs, means for feeding further documents to the space under said bundle when said side members are in said upper position, means for temporarily turning said ribs from their active to their non-active position when they pass said further documents on their way down to the lower position of said side members and means for turning said ribs back to their active position when they have passed said further documents and to maintain them in such position during their movement upwards so as to pick up said further documents together with said bundle of documents to form a common bundle, and means for removing said documents, one at a time, from the underside of said bundle.

3. Apparatus according to claim 1 in which each storage compartment includes mechanism for transferring at least one document from said to infeed transport means into a document bundle holding means.

4. Apparatus according to claim 3 in which said transferring mechanism includes means for translating the document bundle holding means relative to said in-
feed transport means and for operating the bundle holding means to effect the document transfer to the bundle.

5. Apparatus according to claim 4 in which said bundle holding means includes a yoke mounted for translation by said translating means through a wall of said storage compartment, adjacent said to infeed transport means.

* * * * *