

[54] ROTARY DEPOSITORY CONSTRUCTION

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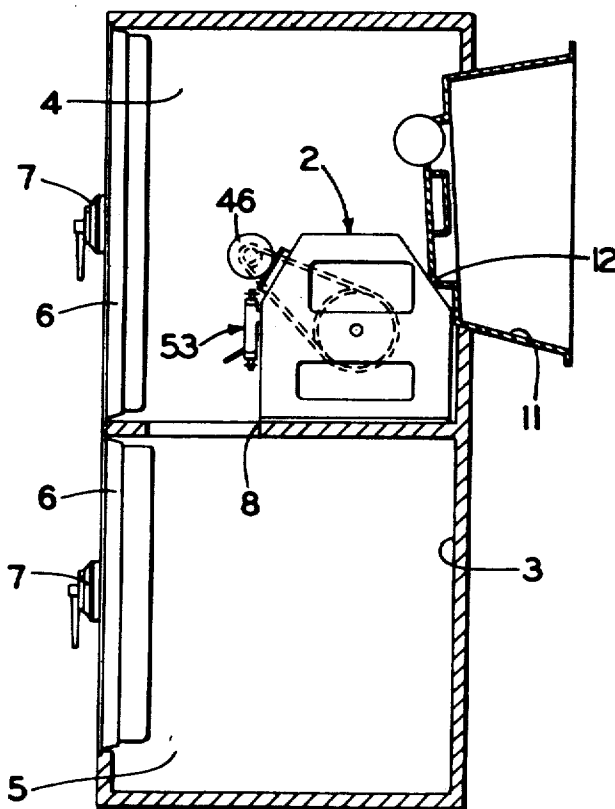
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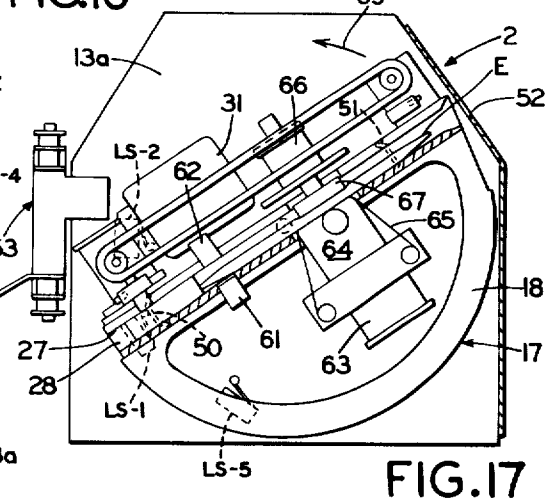
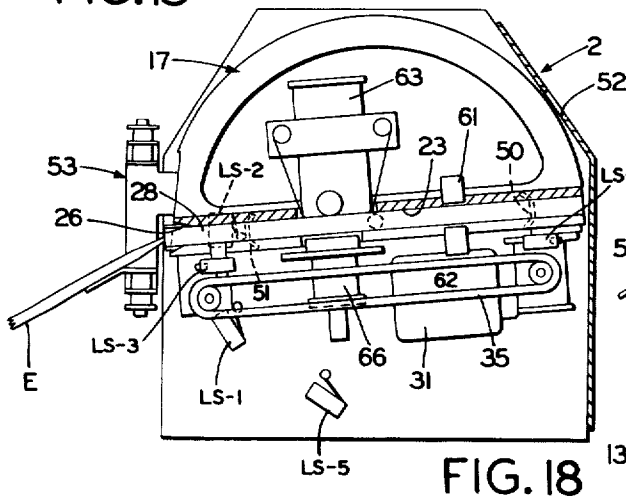
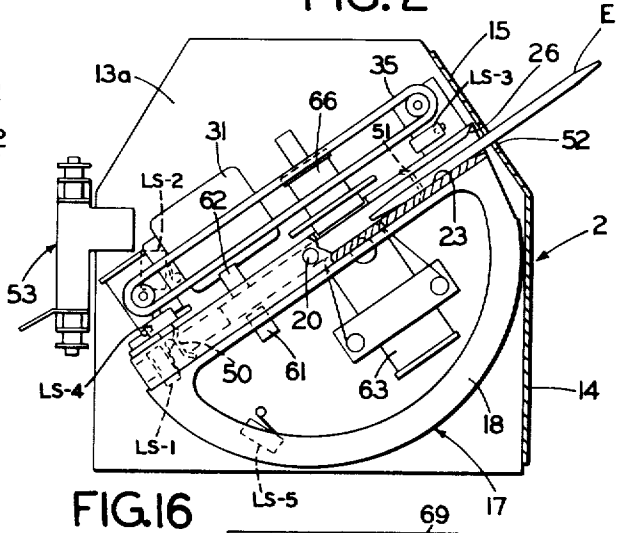
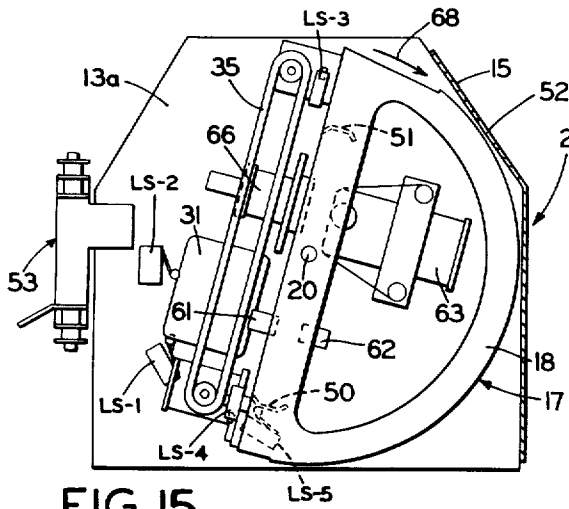
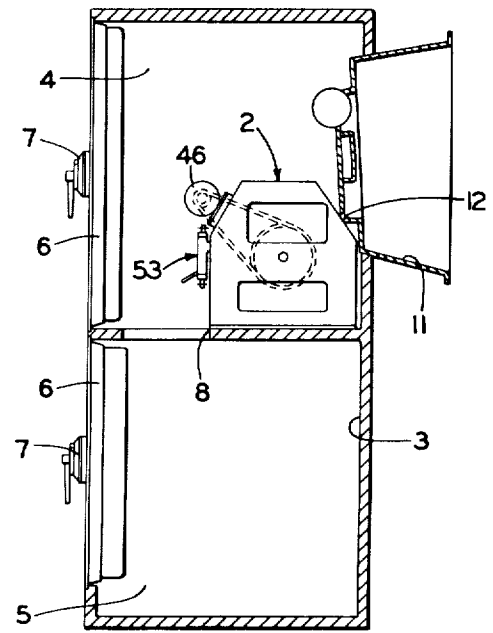
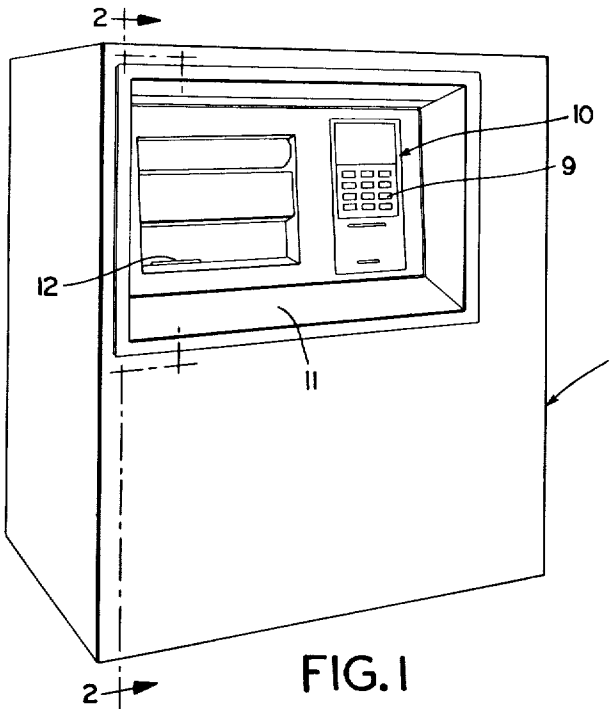
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[57]

ABSTRACT

A construction of a rotary depository for accepting bank deposits at an unattended deposit station unit which is installed as an individual unit or in conjunction with remote automatic cash dispensing banking equipment. The depositing procedure is initiated for automatic operation by any desired actuating means, such as by pressing a button or actuating a key. The unit has a rotor therein movable in a cycle of operation between "home," "deposit" and "eject" positions. The rotor includes a drum which has a cover and is enclosed in a drum housing, and the drum has a center passageway open at one end to accept a deposit-containing envelope introduced through a slot in the housing when the rotor is in "deposit" position. The housing slot is closed by the drum cover when the rotor is in "home" or "eject" position; and the passageway is only aligned with the slot in rotor-deposit position. The passageway at its end opposite the open end is closed by a movable ejector piston, which may be actuated to eject a deposit envelope from the passageway through the open end. The rotor also has a printer actuated during movement of the drum to print identifying indicia on a deposit envelope in the passageway before being ejected. Sensor means is provided to control the cycle of movement of the drum in response to relative positions of the deposit envelope with respect to the passageway.

5 Claims, 18 Drawing Figures



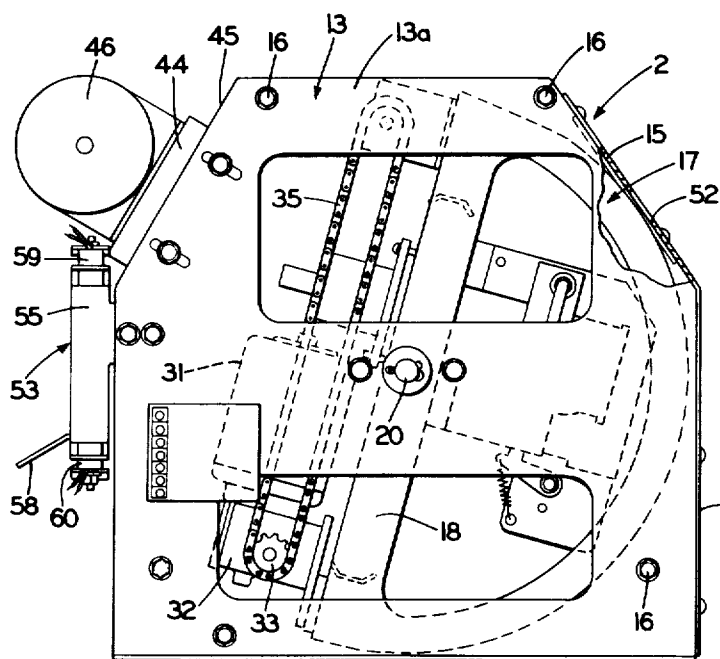


FIG. 3

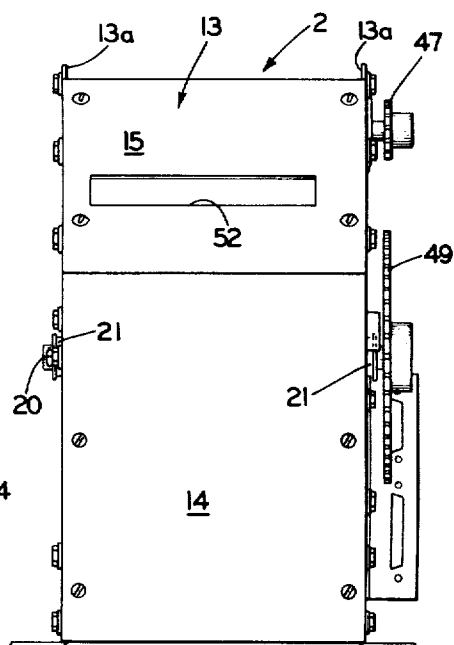


FIG. 4

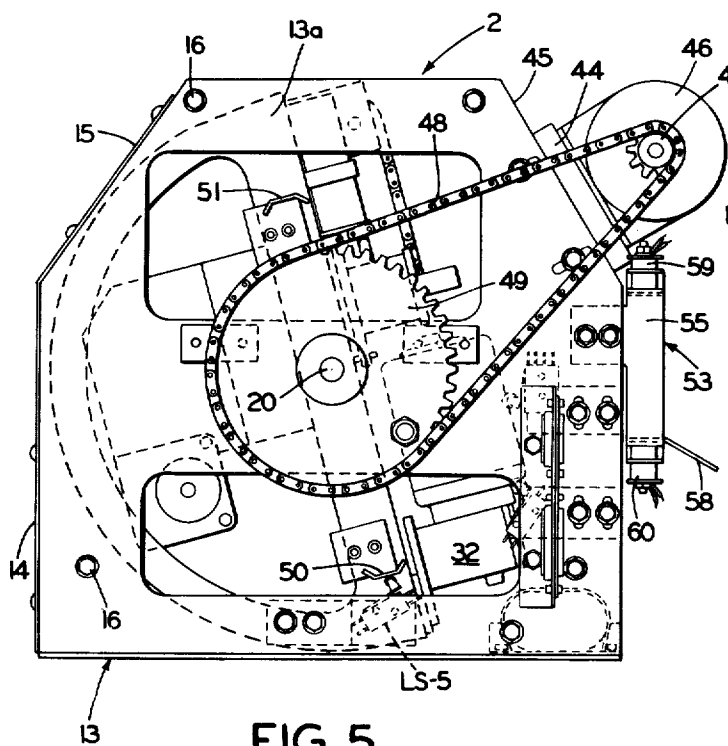


FIG. 5

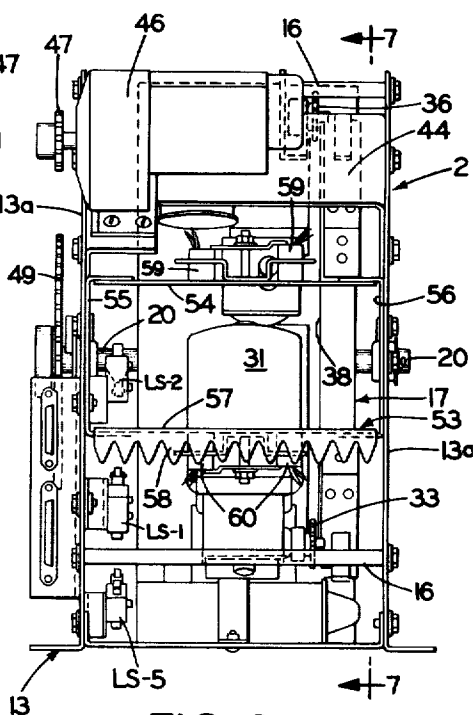


FIG. 6

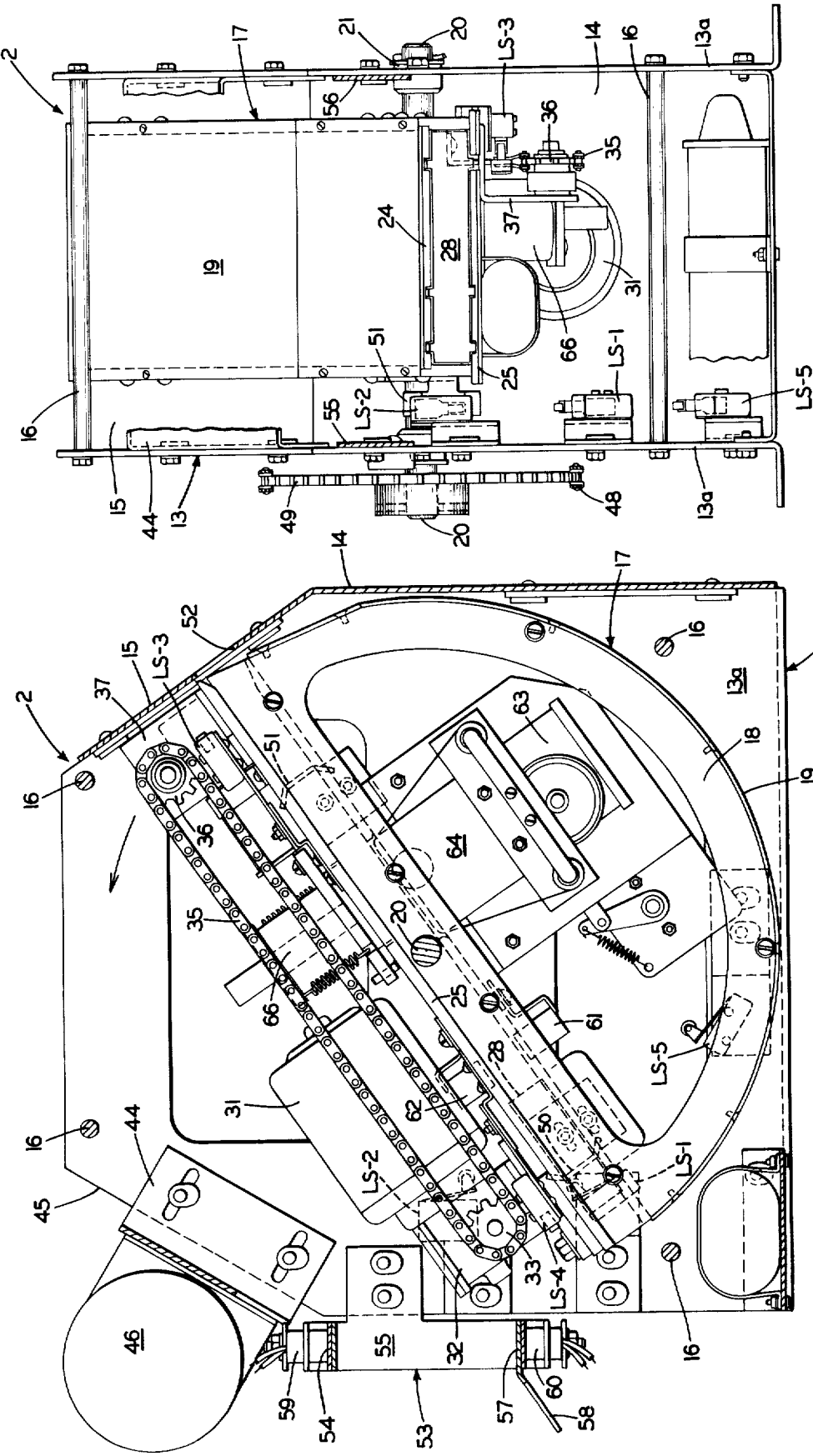


FIG. 10

FIG. 7

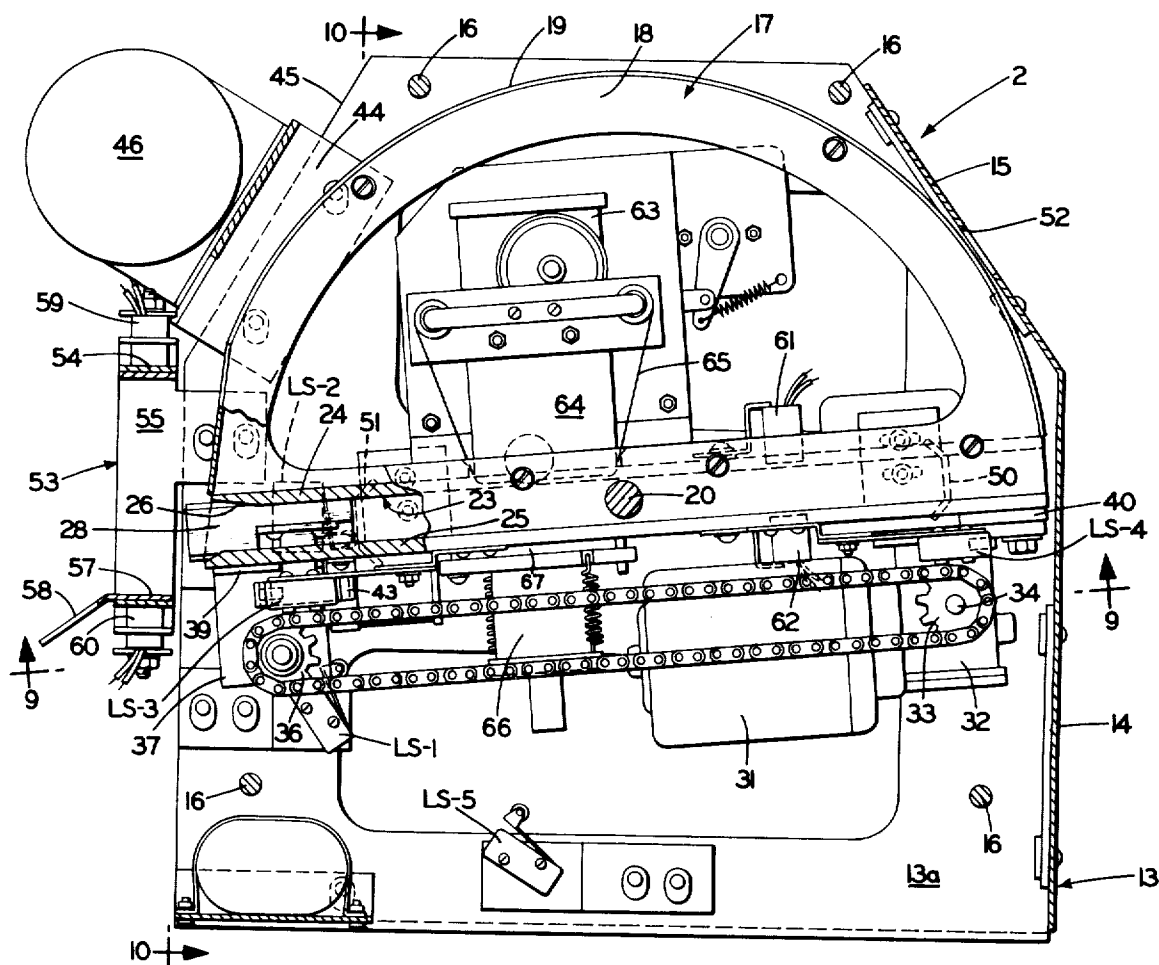


FIG. 8

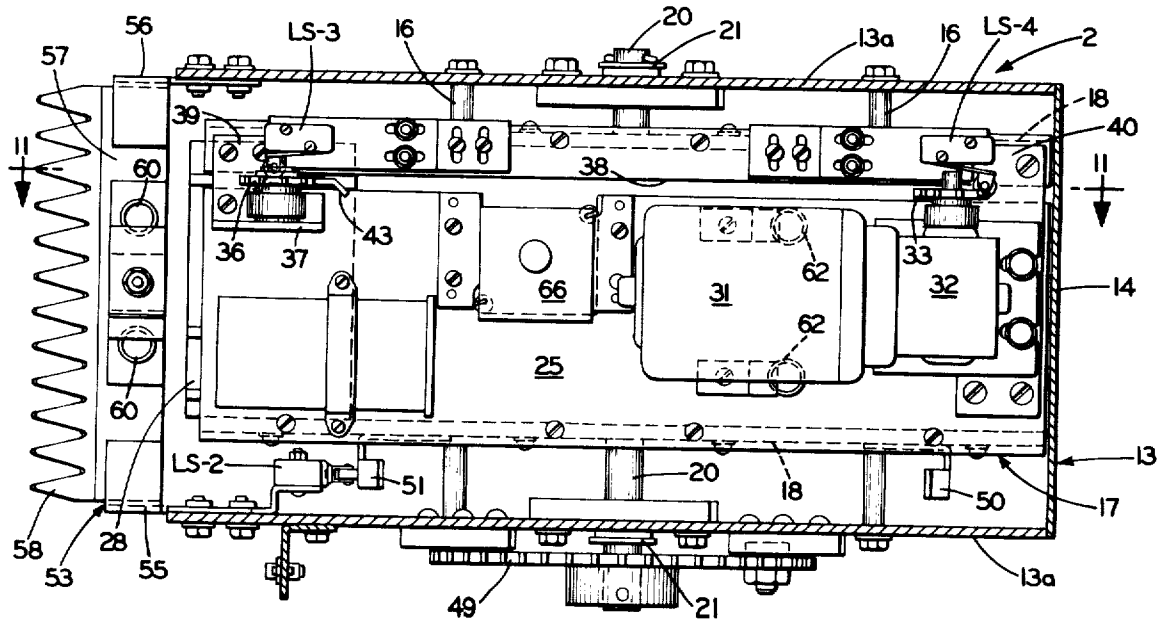
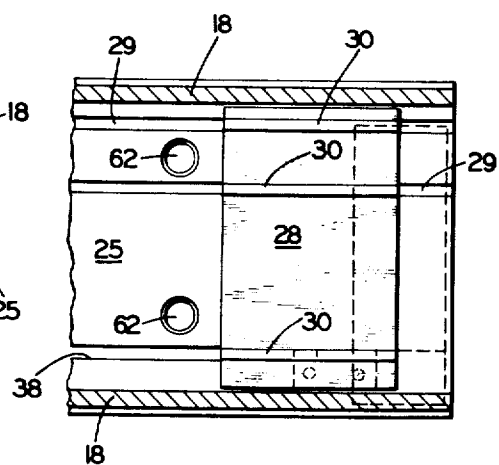
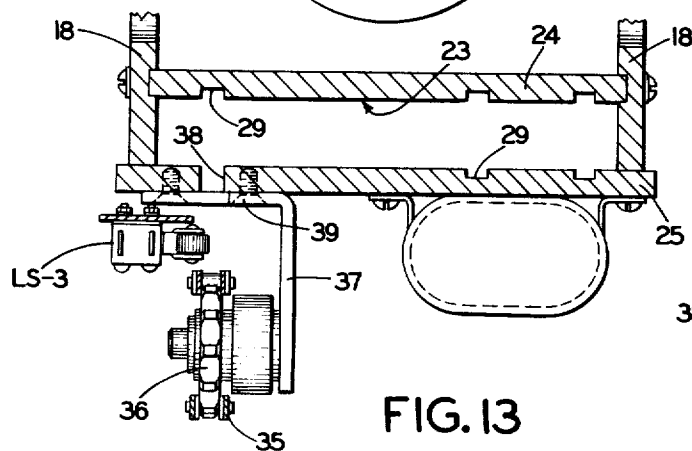
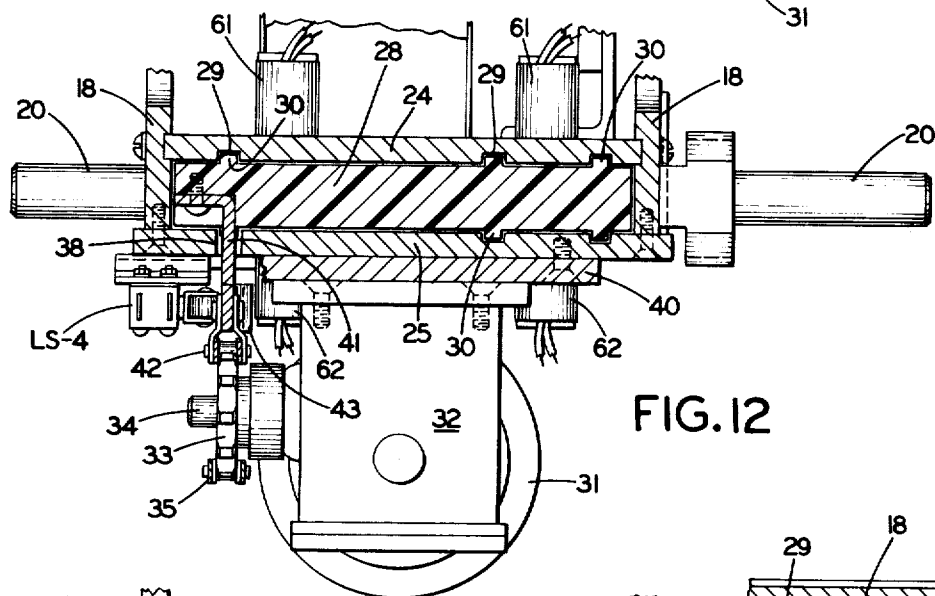
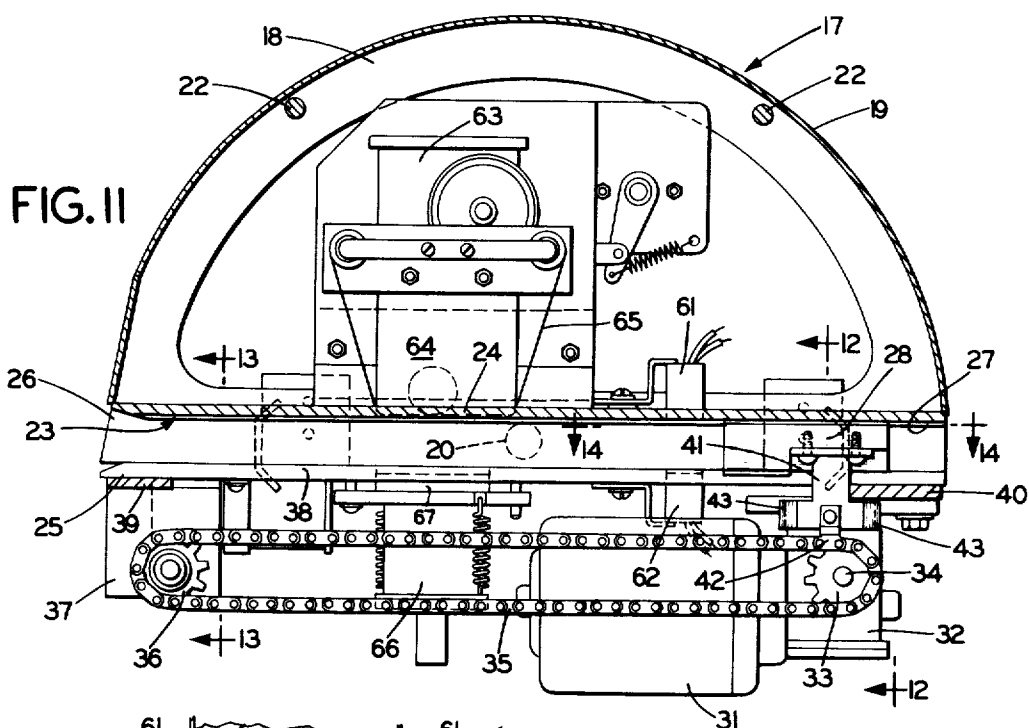


FIG. 9



ROTARY DEPOSITORY CONSTRUCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a rotary depository which accepts and identifies deposit envelopes containing banking media having rotor means which is power-driven in a cycle of operation initiated upon pressing a button, actuating a key, or using other selected activating means.

The rotary depository unit may be installed as a part of automatic currency dispensing equipment so that various banking services may be conducted at a remote unmanned station continuously, day in and day out, twenty-four hours a day. Operation of the rotary depository construction may be coordinated with or actuated by devices also used in controlling currency dispensing operation.

2. Description of the Prior Art

Depositing equipment at unattended locations of various types have been used for receiving customer deposits for banking purposes. Such depository devices are shown, for example, in U.S. Pat. Nos. 3,059,839, 3,114,499 and 3,615,050. Certain of these prior devices involve rotary mechanisms, but the operation of each is related to the movement of one or two or both doors for envelope or bag-receiving openings.

It has been desirable to eliminate, where possible, the provision of doors, the movement of which controls operation of the mechanism, particularly in units that are unattended or are located at locations remote from a bank.

An improved remote depository construction is shown in the pending Grosswiller et al. application Ser. No. 356,715, filed May 3, 1973 now U.S. Pat. No. 3,836,980. Such construction eliminates door control but involves complicated mechanisms for protection of the deposit at all times while providing for rectilinear motion of a deposit-containing envelope from one end to the other of a fixed passageway in the unit.

There exists a need in the field of bank depository services for an unmanned facility which may have a location remote from a main bank building but available at all times for an authorized customer to carry out a depositing operation, and which provides desirable characteristics of prior rotary depository constructions, while eliminating control of the depositing cycle by movement of door means for the deposit entry slot, and while providing maximum security at all times for the deposited material, either as a remote depository unit per se, or as a unit which may be combined with unmanned currency dispensing equipment.

SUMMARY OF THE INVENTION

Objectives of the invention include providing a new rotary depository device which may be actuated by pressing a button, or a keyboard key, or by activating a key-controlled switch to initiate a cycle of operation, in which cycle a rotor normally in a "home" position with a protected deposit entry slot, is moved to a "deposit" position aligning a deposit-receiving passageway in the rotor with the deposit entry slot, and then is moved to a rotor "eject" position where the received deposit is ejected by ejector means into a storage compartment, and then is moved back to a rotor "home" position, all while protectively closing the entry slot ex-

cept when the rotor is in "deposit" position; providing such rotary depository construction in which a deposit-containing envelope may be stamped while in the passageway with indicia for identifying the deposit; providing such rotary depository construction with a deposit-receiving passageway open at one end for receiving deposited material in and ejecting it from the passageway, and in which movable ejector means closes the other end of the passageway and is reciprocally movable in the passageway to eject deposited material from the passageway; providing such a new rotary depository construction with sensor means actuated by movement of the deposited material into and from the passageway to control the step-by-step cycle of movement of the rotor between the "home" "deposit" and "eject" positions; and providing a construction which is simple in arrangement and operation and for servicing and which satisfies the indicated objectives.

These and other objects and advantages may be obtained by a rotary depository construction, which, in general terms, may be stated as including a housing having front and side walls, a deposit slot formed in the front wall; rotor means journaled for rotary movement in the housing, the rotor means being movable between "home," "deposit" and "eject" positions and having a drum provided with side members and an arcuate cover having terminal ends; a passageway or compartment formed by top and bottom walls and said drum side members having an open end and a second end, the passageway preferably extending diametrically of the drum and being generally rectangular in cross section; piston-like pusher means normally located in the passageway at said second end movable between the second passageway end to an "eject" position at said open end and operative positively to eject material from said passageway through said open end when moved to "eject" position; preferably complementary tongue and groove means formed in the pusher means and the passageway top and bottom walls and extending longitudinally of the passageway; the terminal ends of the drum cover being located at the ends of one of the passageway walls; power means for the drum including control circuitry having limit switch means and limit switch actuators on the drum and housing for rotating the drum selectively between and for stopping the drum selectively at "home," "deposit," and "eject" positions; the open end of the passageway being aligned with the housing deposit slot when the drum is in "deposit" position, and the drum cover closing the housing deposit slot except when the drum is in "deposit" position; other power means for the pusher means including control circuitry having limit switch means and limit switch actuators mounted on the drum and pusher means for moving the pusher means selectively between and for stopping the pusher means selectively at normal and "eject" positions; preferably printer means mounted on the rotor operative when actuated to print indicia on material in the passageway; first photocell means on the rotor operative to detect the presence of material in the passageway; other photocell means mounted on the housing operative to detect the ejection of material from the passageway; and means accessible for actuation by a customer operative when actuated to activate the drum power means to move the drum from "home" position to and to stop the drum at "deposit" position for receiving in the passageway deposited material through the housing slot and passage-

way open end; the arrival of deposited material in the passageway adjacent the normal-positioned pusher means activating through the first photocell means the drum power means to move the drum to and to stop the drum at "eject" position, and preferably also activating the printer means to print indicia on deposited material in the passageway; the arrival of the drum at "eject" position stopping the drum power means and activating the pusher means power means to move the pusher means from normal position to and to stop the pusher means at "eject" position for positively discharging deposited material from the passageway through the passageway open end; the arrival of the pusher means at "eject" position reversing the pusher means power means to return the pusher means to normal position, and also activating the drum power means to move the drum from "eject" position to and to stop the drum at "home" position; the arrival of the pusher means at normal position stopping the pusher means power means; and the ejection of deposited material from the passageway activating the other photocell means to a signal that a deposit has been made.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention — illustrative of the best mode in which applicants have contemplated applying the principles — is set forth in the following description and is particularly and distinctly pointed out in the appended claims.

FIG. 1 is a schematic perspective view of automatic banking equipment which may include the improved rotary depository construction of the invention;

FIG. 2 is a somewhat diagrammatic sectional view looking in the direction of the arrows 2—2, FIG. 1;

FIG. 3 is a side view, with parts broken away, of the rotary depository unit generally illustrated in FIG. 2, removed from the banking equipment, with the drum in "home" position;

FIG. 4 is a front elevation looking toward the right or "deposit" end of the parts shown in FIG. 3;

FIG. 5 is a side view, looking toward the chain drive or opposite side of the unit shown in FIG. 3, with the drum in "home" position;

FIG. 6 is a rear elevation looking toward the right or "eject" end of the parts shown in FIG. 5;

FIG. 7 is a sectional view similar to FIG. 3 looking in the direction of the arrows 7—7, FIG. 6 with the drum shown in "deposit" position;

FIG. 8 is a view similar to FIG. 7 with parts broken away and in section, and showing the drum in "eject" position;

FIG. 9 is a sectional view looking in the direction of the arrows 9—9, FIG. 8;

FIG. 10 is a sectional view looking in the direction of the arrows 10—10, FIG. 8;

FIG. 11 is a vertical sectional view of the drum only looking in the direction of the arrows 11—11, FIG. 9;

FIG. 12 is an enlarged fragmentary sectional view taken on the line 12—12, FIG. 11;

FIG. 13 is an enlarged sectional view taken on the line 13—13, FIG. 11;

FIG. 14 is a fragmentary sectional view taken on the line 14—14, FIG. 11;

FIG. 15 is a diagrammatic view similar to FIG. 3 showing the drum in "home" position;

FIG. 16 is a view similar to FIG. 15 but showing the drum in "deposit" position with an envelope being inserted;

FIG. 17 is a view similar to FIG. 16 but showing the envelope completely received in the drum, with the drum ready to move from "deposit" to "eject" position; and

FIG. 18 is a view similar to FIGS. 15 through 17 but showing the drum in "eject" position.

Similar numerals refer to similar parts throughout the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A remote, unattended, automatic banking unit is indicated somewhat diagrammatically generally at 1 in the drawings, and the improved rotary depository construction, generally indicated at 2, may be incorporated in the unit 1.

As shown, the unit 1 may be a vault or safe-like structure 3 (FIG. 2) built to form security protection against unauthorized access to equipment or objects housed within the structure 3. Various compartments, such as a depository unit compartment 4 and a chest compartment 5, may be formed within the structure 3; and each compartment 4 and 5 is closed by a typical safe-like door 6 locked by usual lock means 7, which may include a combination lock. An access opening 8 communicates between compartments 4 and 5, so that deposited material ejected from the depository 2 may drop through opening 8 into chest compartment 5 (FIG. 2).

Other compartments (not shown) may be formed in structure 3 containing currency storage and dispensing means which may be actuated by a keyboard 9 and controlled by other devices generally indicated at 10 in FIG. 1. A recessed facia 11 may be provided for the structure 3, having a deposit slot 12 formed therein communicating with the depository unit 2.

As indicated, the rotary depository 2 is illustrated as being incorporated in an automatic banking unit 1. Nevertheless, the unit 2 in a safe-like structure provided with a deposit compartment 4 and a chest 5 with communication 8 between compartments 4 and 5 having a deposit slot may be used as a free-standing unit in accordance with the invention, forming a typical after-hour depository. Whether serving as a depository unit, per se, or as a depository unit combined in an automatic banking system unit, the present invention and concept in particular involves the construction and operation of the rotary depository unit 2, shown in detail in the remaining FIGS. 3 to 18 of the drawings.

The rotary depository unit 2 includes a housing 13 formed by side members 13a, a lower front or deposit end wall 14, an upper front angled housing wall 15, and a series of tie rods 16 extending between the side members 13a.

A rotor, generally indicated at 17, is mounted within the housing 13 and includes a drum formed by drum side members 18 having an arcuate drum cover 19. The rotor 17 also includes stub shafts 20 which mount the rotor 17 for rotation in the housing 13. The shafts 20 are journaled at 21 in housing side members 13a. Tie rod 22 (FIG. 11) may extend between the drum side members 18 inside the arcuate drum cover 19.

Looking at the rotor 17 in the position shown in FIGS. 11, 12, 13 and 14, which is generally the "eject"

position, later described, as shown in FIGS. 8, 9 and 18, a center security passageway 23 extends diametrically of rotor 17, formed by a top wall 24, a bottom wall 25, and the drum side walls or members 18.

The passageway 23 is rectangular in cross section and has an open end 26, as best shown in FIG. 11, and the other or second passage way end 27 is closed by a rectangular or block-like piston 28 when piston 28 is in normal position. Piston 28 may be formed of nylon and is slidably movable longitudinally of passageway 23 between the ends 26 and 27 thereof. Top and bottom passageway walls 24 and 25, and piston 28 have complementary groove and tongue formations 29 and 30. These tongue and groove formations extend longitudinally of the passageway 23 and in addition to guiding the piston 28 in its movement along passageway 23, they serve another purpose to be described.

A chain drive motor 31 and gear box 32 are mounted on passageway bottom wall 25. Drive sprocket 33 on a shaft 34 projecting from gear box 32 drives chain 35 trained around another sprocket 36 journaled on an L-shaped bracket 37, also mounted on passageway bottom wall 25 (FIGS. 11 and 13).

A longitudinally-extending slot 38 is formed adjacent one drum side member 18 (FIGS. 12 and 13) extending between passageway ends 26 and 27. The top leg 39 of bracket 37 (FIGS. 11 and 13) extends across the slot 38 at the open passageway end 26. A strap plate 40 is mounted on the passageway bottom wall 25 adjacent the other passageway end 27, and plates 40 extends across slot 38 at said other or right-hand passageway end 27 and also adjacent the normal position of piston 28 (FIG. 11).

An L-shaped arm 41 is connected to piston 28 and extends downward through slot 38 and is connected at 42 with chain 35 to provide the drive connection between piston 28 and drive motor 31 for moving piston 28 in passageway 23 by the chain drive system.

Piston drive arm 41 is engaged by strap plate 40 to stop further piston movement of the right (FIG. 11) for locating the piston 28 in the normal position shown. The piston drive arm 41, when moved from the position shown in FIG. 11 to that shown in FIG. 8 by the chain drive, engages the top leg 39 of bracket 37 at the passageway open end 26 so as to prevent further movement of piston 28 to the left beyond the "eject" position shown in FIG. 8.

A limit switch LS-4 is mounted on the passageway bottom wall 25 adjacent passageway end 27 (FIGS. 8, 9 and 12) and may be termed the normal piston position limit switch. Another limit switch LS-3 also is mounted on the passageway bottom wall 25 adjacent the passageway open end 26 and may be termed the piston "eject" position limit switch. The piston drive arm 41 preferably has limit switch actuator formations 43 projecting laterally thereof (FIG. 11). One of the actuator projections 43 engages and actuates limit switch LS-4 when the piston has been moved by the chain drive 35 to the limit of its movement for locating piston 28 at normal position (FIGS. 11 and 12). The other limit switch actuator formation 43 engages and actuates limit switch LS-3 (FIGS. 8 and 9) when piston 28 reaches the "eject" position limit of movement.

Generally, the rear or left-hand side of the housing 13, viewing FIGS. 3, 7 and 8, is open, as distinguished from the closing of the front of the housing 13 by front wall portions 14 and 15; and this housing open portion

may be termed the "eject" end of the housing 13. A drum motor bracket 44 is mounted on and extends between the rear top portion 45 of housing side members 13a. A drum motor 46 is mounted on the bracket 44. Motor 46 has a drive pinion 47 which drives chain 48 trained around drum gear 49 mounted on one of the rotor stub shafts 20 outside of the housing side member 13a at the left in FIG. 10.

A series of limit switches LS-1, LS-2 and LS-5 are mounted inside the housing 13 on the left-hand housing side member 13a (FIG. 10). These limit switches are arranged in two spaced circumferential paths around the center or axis of the drum or rotor stub shafts 20. LS-2 is radially closer to the axis than LS-1 and LS-5.

Limit switch actuator clips 50 and 51 are mounted on the left-hand drum side member 18, viewing FIG. 10, diametrically opposite each other outside of the passageway 23 at different radial distances from the axis of the rotor shaft 20. The actuators 50 and 51 and the limit switches LS-1, LS-2 and LS-5 control the cycle of rotary movement of rotor 17.

Limit switch actuator clip 50 at different positions of the rotor, actuates limit switches LS-1 or LS-5, and actuator clip 51 actuates limit switch LS-2.

When clip 50 engages LS-1, the rotor is at "deposit" position (FIGS. 16 and 17). When clip 51 engages LS-2, the rotor is in "eject" position (FIG. 18). When clip 50 engages LS-5, the rotor is in "home" position (FIG. 15).

The housing 13 has a deposit slot 52 formed in the upper housing front wall 15 (FIGS. 3, 4 and 7) which is aligned with the deposit slot 12 in the recessed facia 11 (FIG. 2). When the rotor 17 and its drum are in "home" position, shown in FIGS. 3, 5 and 15, the drum arcuate cover 19 closes deposit slot 52 and adjacent facia slot 12.

When the rotor 17 and its drum are in "deposit" position, shown in FIGS. 7, 16 and 17, the open end 26 of passageway 23 is aligned with deposit slots 52 and 12 so that an envelope or other banking material being deposited may enter the center security passageway 23 in the drum through the deposit slots 52 and 12. An envelope E is shown entering the passageway 23 in FIG. 16.

When the rotor 17 and its drum are in the "eject" position, shown in FIGS. 8, 9 and 18, the open end 26 of passageway 23 is at the left-hand open "eject" end of the housing 13.

A rectangular frame generally indicated at 53 formed by top strip 54, side plates 55 and 56 and a bottom plate 57 which terminates in an outwardly downwardly directed sawtooth flange 58, spans the "eject" end of the housing 13 and frames the open end 26 of the passageway 23 when the rotor 20 and its drum are in the "eject" position, as shown in FIGS. 8 and 18.

Pairs of photocells 59 and 60 are mounted on the top strip 54 and bottom plate 57 of frame 53, directed toward each other so that light beams passing between the cells 59 and 60 are interrupted in the event that some object such as an envelope containing banking media passes through frame 53, as when an envelope is ejected from the drum as illustrated by the envelope E in FIG. 18.

The sawtooth flange 57 is provided as an anti-trap device typically used in depositories to prevent a deposit envelope from being lifted after ejection by a fishing line introduced in some manner from the exterior of the unit into the depository.

Another set of pairs of photocells 61 and 62 are mounted respectively on the passageway top and bottom walls 24 and 25 adjacent the normal position of the piston 28 in the passageway 23 for detecting and sensing the presence and absence of material introduced into or ejected from the passageway 23. The photocells 61 and 62 are directed toward each other so that light beams passing between the cells are interrupted in the event that some object such as an envelope containing banking media is present in the region of the passageway where the light beams intersect the passageway.

Referring particularly to FIGS. 8 and 11, a printer unit 63 is mounted on the passageway top wall 24, which may include a standard sequential numbering device and means to print numbers and any other desired transaction data, and to record the numbers printed at a head 64 and tape 65, the printing being carried out by actuation of a solenoid 66 mounted on the passageway bottom wall 25. Energizing the solenoid 66 moves its head 67 (FIG. 11) upwardly into passageway 23 to press an object therein (envelope E) against the printer head 64 to print indicia from the printer on the object.

In illustrating the rotary depository mechanism in the drawings, for clarity, one housing side plate has been removed in FIG. 8, and the piston 28 is illustrated in an "eject" position, having moved from its normal position at the end 27 of passageway 23 to the passageway open end 26. The chain 31 in FIG. 9 of the chain drive for the piston 28 has been removed so as to illustrate the slot 38 along which the piston drive arm 41 is moved by the chain 35.

The drum only of rotor 17 is shown in FIG. 11. As illustrated by the section line 11—11 in FIG. 9, the sectional view of FIG. 11 is taken extending through the slot 38 in order to clearly show passageway 23, piston 28 and the piston drive connections, as well as the actuator formations 43 which engage the limit switches LS-3 and LS-4, which in turn control movement of the piston 28. The piston 28 is shown in normal or retracted position in FIG. 11.

Furthermore, FIGS. 15, 16, 17 and 18 are somewhat diagrammatic to clearly illustrate the various positions of the rotor 17, and the control of rotor or drum movement, by the limit switches LS-1, LS-2 and LS-5 and the actuators 50 and 51 for these limit switches. FIG. 15 shows the normal or "home" position of the rotor drum. FIG. 16 shows the rotor drum in "deposit" position, and shows an envelope E being deposited in the drum passageway 23 through the deposit slot 52.

FIG. 17 shows the envelope E completely entered into passageway 23 and resting against piston 28 in the normal piston position where the envelope E interrupts the light beams passing between photocells 61 and 62.

FIG. 18 shows the rotor drum in "eject" position and shows the piston 28 also moved to "eject" position to eject the envelope E from the passageway 23, as illustrated.

The tongue and groove formation 30-29 between the piston 28 and passageway 23, best shown in FIG. 12, prevents any object such as a slip of paper, envelope or the like, which has been inserted into the passageway 23 from slipping into the clearance space between the piston 28 and passageway walls. Such occurrence could result either in damaging the envelope or jamming piston movement.

Operation of Depository

Typical operation of the automatic depositing cycle, carried out in the use of the new rotary depository 2 incorporating the concepts of the invention, is illustrated in FIGS. 15 through 18. If the depository 2 is a part of a remote banking station 1 which also has cash dispensing equipment, then the use of the equipment generally may have been initiated by a customer using whatever means is provided to energize the unit 1. This may include entry of an identification number in the keyboard 9, following which one of the buttons of the keyboard may be pressed to energize the rotary depository 2.

However, if the rotary depository 2 constitutes a remote deposit station by itself, it can be energized directly merely by pressing a button controlling or energizing the circuitry and supplying power to the depository motors. Such programmed circuitry may include the limit switches, photocells, etc., described. The button for energizing a remote deposit station may, if desired, be protected by a lock and key or may be a part of a key switch, which is unlocked by a key in the authorized possession of the depositor or customer, similar to keys which have been used for unlocking prior art depository units.

Regardless of the manner in which the control circuitry for the rotary depository 2 is activated or energized, when the activation step is taken with the rotor 17 and its drum in the "home" or at rest position illustrated in FIG. 15, the drum motor 46 is energized. The drum motor 46 then rotates the rotor 17 clockwise, as indicated by the arrow 68 in FIG. 15, to the "deposit" position of FIG. 16. When the rotor 17 is in "home" position (FIG. 15) the drum cover 19 closes the deposit slot 52 in the upper housing wall 15.

As the rotor 17 approaches the position of FIG. 16, limit switch actuator clip 50 engages "deposit" position limit switch LS-1, which stops the drum motor 46. At this time, the passageway 23 is aligned with and has its open end 26 adjacent the deposit slot 52. Thus, the center security passageway 23 in the rotor drum is accessible for the reception of the object, such as an envelope E, to be deposited, as illustrated in FIG. 16 by the envelope E being inserted in the unit.

As the envelope E enters the passageway 23 and drops to the position shown in FIG. 17, resting against piston 28 in the other end 27 of the passageway 23, the envelope E interrupts light beams projected between the photocells 61 and 62. This light beam interruption is transmitted to the control circuitry, energizes the drum motor 46 to drive the rotor 17 in the reverse direction, that is counterclockwise from the "deposit" position shown in FIG. 17 to the "eject" position shown in FIG. 18, as illustrated by the arrow 69 in FIG. 17.

In the event that a customer has energized the rotary depository 2, and the rotor has moved to the "deposit" position of FIG. 16, and then for some reason the customer decides not to make a deposit, time delay components in the control circuitry, operates after say 20 to 30 seconds waiting time, to energize the drum motor to move the rotor in the cycle of operation described, away from "deposit" position.

At the same time that the drum motor 46 is energized to move the rotor 17 from the "deposit" position of FIG. 17 to the "eject" position of FIG. 18, the printer 63 and its solenoid 66 are energized to print a receipt number and other desired transaction data on the enve-

lope E in the passageway 23. As the rotor 17 approaches the "eject" position of FIG. 18, the limit switch actuator clip 51 actuates "eject" position limit switch LS-2 (FIG. 18), which stops the drum motor 46 and starts the piston drive motor 31.

Thereupon, the piston 28 moves from its normal position, such as shown in FIG. 11, to the "eject" position, shown in FIGS. 8, 9 and 18 and ejects the envelope E from the passageway 23 through its open end 26, which is the same end into which the envelope E was introduced into the passageway 23 as shown in FIG. 16.

As the piston 28 arrives at the "eject" position, the limit switch actuator formation 43 on the piston drive arm 41 engages limit switch LS-3 at the passageway open end 26. Actuation of limit switch LS-3 reverses the piston motor 31 and starts the drum motor 46.

When the piston 28 returns to normal position (FIG. 11), one of the limit switch actuator formations 43 engages limit switch LS-4, located adjacent the passageway end 27, and stops the piston motor 31 so that the piston comes to rest at the normal position.

Meanwhile, as the rotor 17 on clockwise rotation from the "eject" position of FIG. 18 approaches the "home" position of FIG. 15, limit switch actuator clip 50 engages "home" position limit switch LS-5 (FIG. 15) and stops the drum motor 46. At this time, the rotor 17 and other components of the depository 2 come to rest completing the cycle of operation and are in position once more to accept a deposit.

Meanwhile, the envelope E as shown in FIG. 18, during ejection from the passageway 23, passes through the frame 53 and interrupts light beams between photocells 59 and 60. The photocells, by the interruption of the light beam, send a signal to the control circuitry to indicate that a deposit has been made. The envelope E, in being ejected from the depository 2, drops through the opening 8 into the protective chest compartment 5 where it is stored or held temporarily in a secure manner until removed from the chest 5 by bank personnel following manipulation of the lock means 7.

As previously described, the arcuate drum cover 19 closes the deposit slot 52 in the housing front wall 15 at all times except when the drum is in "deposit" position of FIGS. 7, 16 and 17. As shown in FIG. 11, the arcuate drum cover 19 extends from the passageway open end 26 to the other passageway end 27 and the terminal ends of the cover 19 are located at the ends of the passageway top wall 24.

The actuation of the printer 63 is accompanied by advancing the number of the sequential numbering component thereof, as well as advancing the ribbon or tape 65 wherein the stamped number is recorded.

The circuitry for controlling the sequential operation of the cycle described may include a series of relays controlled by a computer device in which the cycle of operation is programmed in a usual manner. The computer and relay panel, not shown, may be housed within the safe structure 3 to protect the same from unauthorized access.

To summarize, in use of the new rotary depository the operational steps carried out automatically upon energizing the unit by actuating a start button, or the like, involves driving the depository rotor drum (normally in a "home" position in which a deposit entry slot is effectively closed), rotatably to a "deposit" position in which a compartment in the drum open at one end

is aligned at its open end with a deposit slot; retaining the rotor at such "deposit" position only for a limited time of say 20 to 30 seconds if no deposit is made, and at the expiration of such limited time moving the drum away from "deposit" position; activating the rotor by the presence of deposited material if a deposit is made while the rotor is at "deposit" position to rotate the drum from the "deposit" position to an "eject" position; at the same time actuating a printer to print indicia on the deposited material; on arrival of the rotor drum at the "eject" position, pushing the deposited material with pusher means to discharge it from the drum compartment into a deposit chest; sensing the deposited material pushed to the chest and signalling that a deposit has been made; then returning the pusher means to a normal position in the drum and returning the drum to "home" position.

An important facet of the concept involves the rotary movement of a drum having a deposit-receiving compartment therein open at one end, between "home," "deposit" and "eject" positions, and with the drum closing an entry slot in a housing surrounding the drum at all times, except when the drum is in "deposit" position.

Another facet of the concept is the positive pusher or eject means carried by the drum automatically movable to purge deposited material from the drum compartment on arrival of the drum at "eject" position.

Depository equipment combining the described facets is characterized by numerous advantages. It may be operated on a programmed cycle. It may be installed as a free-standing depository unit or combined with other banking equipment at a remote installation location.

Accordingly, the concept and various aspects of the invention described in detail provide equipment and operations by which an unattended deposit station unit may be energized or activated at a remote location and operation thereof initiated by pressing a button or the like by an authorized person whereupon the depositing cycle proceeds automatically, without the manipulation of any doors, while at the same time maximum protection is provided at all times for the material deposited; provide a construction in which deposited material is positively ejected from the rotary drum compartment after identifying indicia has been applied thereto; provides a construction with cooperative means for preventing jamming of the pusher means by the deposited material; and provides a rotary depository and a mode of operation which achieve the stated objectives, eliminate difficulties arising with prior devices, and solve problems and obtain the described new results.

Furthermore, the operation of the various components, motors, solenoids, switches, photo-electric cells and components of the equipment are programmed with typical circuitry and electrical and electronic control devices automatically operating the equipment in the manner described upon activation of the equipment.

In the foregoing description, certain terms have been used for brevity, clearness and understanding; but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art because such terms are used for descriptive purposes and are intended to be broadly construed.

Moreover, the description and illustration of the invention is by way of example, and the scope of the in-

vention is not limited to the exact details shown or described.

Having now described the features, discoveries, and principles of the invention, the manner in which the equipment is constructed and operated, and the advantageous, new and useful results obtained; the new and useful structures, devices, elements, arrangements, parts combinations, systems, equipment, operations and relationships are set forth in the appended claims.

We claim:

1. In rotary depository construction, a housing having front and side wall means open at the rear, deposit slot means formed in the front wall means; rotor means journaled in the housing having a drum; drum top, bottom and side walls forming an elongated center security deposit-receiving passageway in the drum generally rectangular in cross section and being open at one end and having a second end; pusher means mounted in the passageway normally located at said second end and movable between said second and open passageway ends; the drum being provided with cover means extending from the open to the second passageway end; the drum normally being located at a "home" position and being rotatable in one direction to a "deposit" position, and also being rotatable in the other direction from the "deposit" position past the "home" position to an "eject" position, and also being rotatable from said "eject" position in said one direction back to said "home" position; motor means for rotating the drum rotor selectively between said "home", "deposit" and "eject" positions; the drum cover means closing the deposit slot at all times when the drum is out of "deposit" position, the open passageway end being aligned with the deposit slot when the drum is in "deposit" position to receive deposited material through the deposit slot and open end; complementary tongue and groove means formed in the pusher means and passageway top and bottom walls extending longitudinally of the passageway; photocell means mounted on the drum projecting a light beam across the passageway operative to sense the receipt of deposited material in the passageway adjacent to the pusher means; said motor means including drum rotor drive means and means for energizing the drum motor drive means when the drum is in "home" position to rotate the drum in said one direction from "home" to "deposit" position; interruption of the photocell means light beam upon arrival of deposited material in the passageway adjacent the pusher means when the drum is in "deposit" position activating the drum motor drive means to rotate the drum in the other direction from "deposit" to "eject" position; pusher means drive means mounted on the drum for moving the pusher means between said second and open passageway ends; said motor means also including limit switch means and limit switch actuators on the housing and drum operatively connected with the drum motor drive means; and said limit switch means being actuated on arrival of the drum at "eject" position to stop the drum motor drive means and to start the pusher means drive means to move the pusher means from said second to said open passageway end to eject deposited material from the open end of said passageway at said "eject" position.

2. The construction defined in claim 1 in which the pusher means drive means includes a pusher drive motor mounted on the drum and limit switch means and limit switch actuators on the drum and pusher

means; in which actuation of the pusher means limit switch means upon arrival of the pusher means at said open passageway end reverses the pusher means drive means to move the pusher means back to the second passageway end and activates the drum motor drive means to move the drum from "eject" to "home" position; in which actuation of the pusher means limit switch means upon arrival of the pusher means at said second passageway end stops the pusher means drive means; and in which actuation of the drum motor limit switch means upon arrival of the drum at "home" position stops the drum motor drive means.

3. The construction defined in claim 1 in which the drum cover means is arcuate in shape; in which the deposit-receiving passageway extends diametrically of the drum between said open and second ends; and in which the deposit slot is in the upper portion of the front wall means.

4. The construction defined in claim 1 in which printer means is mounted on the drum operable to print indicia on deposited material located in the passageway between the open and second ends.

5. In rotary depository construction, a housing having front and side walls, a deposit slot formed in the front wall; rotor means journaled for rotary movement in the housing, the rotor means being movable between "home," "deposit" and "eject" positions and having a drum provided with side members and an arcuate cover having terminal ends; a passageway formed by top and bottom walls and said drum side members having an open end and a second end, the passageway extending diametrically of the drum and being generally rectangular in cross section; piston-like pusher means normally located in the passageway at said second end movable between the second passageway end to an "eject" position at said open end and operative positively to eject material from said passageway through said open end when moved to "eject" position; complementary tongue and groove means formed in the pusher means and the passageway top and bottom walls and extending longitudinally of the passageway; the terminal ends of the drum cover being located at the ends of one of the passageway walls; power means for the drum including control circuitry having limit switch means and limit switch actuators on the drum and housing for rotating the drum selectively between and for stopping the drum selectively at "home," "deposit," and "eject" positions; the open end of the passageway being aligned with the housing deposit slot when the drum is in "deposit" position, and the drum cover closing the housing deposit slot except when the drum is in "deposit" position; other power means for the pusher means including control circuitry having limit switch means and limit switch actuators mounted on the drum and pusher means for moving the pusher means selectively between and for stopping the pusher means selectively at normal and "eject" positions; printer means mounted on the rotor operative when actuated to print indicia on material in the passageway; first photocell means on the rotor operative to detect the presence of material in the passageway; other photocell means mounted on the housing operative to detect the ejection of material from the passageway; and means accessible for actuation by a customer operative when actuated to activate the drum power means to move the drum from "home" position to and to stop the drum at "deposit" position for receiving in the pas-

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sageway deposited material through the housing slot and passageway open end; the arrival of deposited material in the passageway adjacent the normal-positioned pusher means activating through the first photocell means the drum power means to move the drum to and to stop the drum at "eject" position, and also activating the printer means to print indicia on deposited material in the passageway; the arrival of the drum at "eject" position stopping the drum power means and activating the pusher means power means to move the pusher means from normal position to and to stop the pusher means at "eject" position for positively discharging de-

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posited material from the passageway through the passageway open end; the arrival of the pusher means at "eject" position reversing the pusher means power means to return the pusher means to normal position, and also activating the drum power means to move the drum from "eject" position to and to stop the drum at "home" position; the arrival of the pusher means at normal position stopping the pusher means power means; and the ejection of deposited material from the passageway activating the other photocell means to a signal that a deposit has been made.

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