June 10, 1952 D. J. ROURKE, JR., ET AL 2,599,722

COIN-OPERATED DEPOSITORY FOR CLOTHING AND THE LIKE

Filed May 24, 1949 3 Sheets-Sheet 1

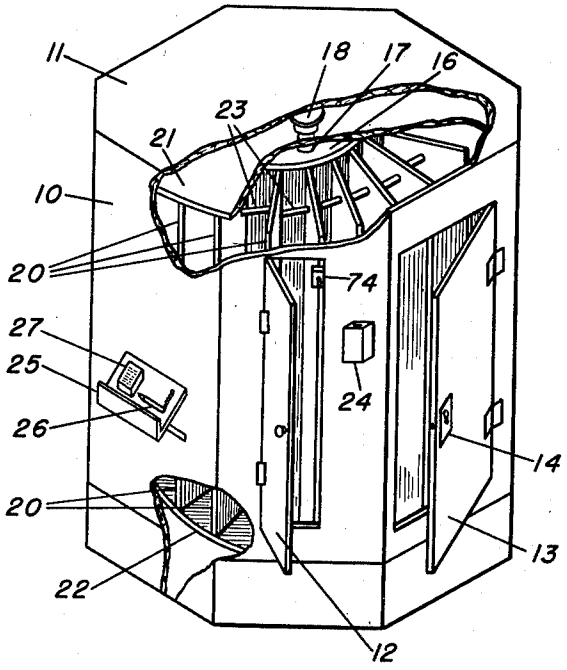


Fig-1

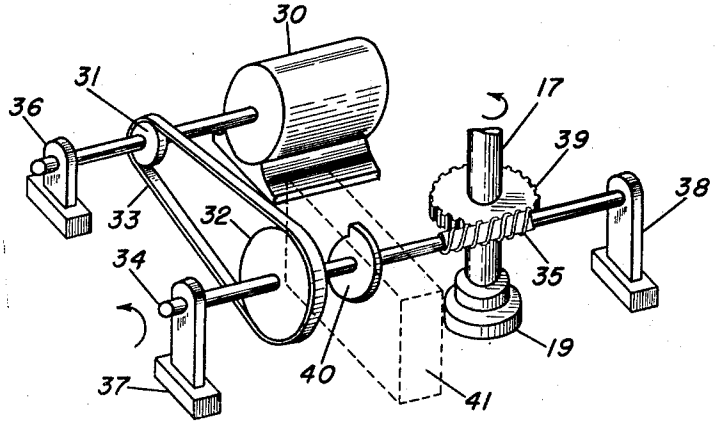


Fig-2

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COIN-OPERATED DEPOSITORY FOR CLOTHING AND THE LIKE

Filed May 24, 1949 3 Sheets-Sheet 2

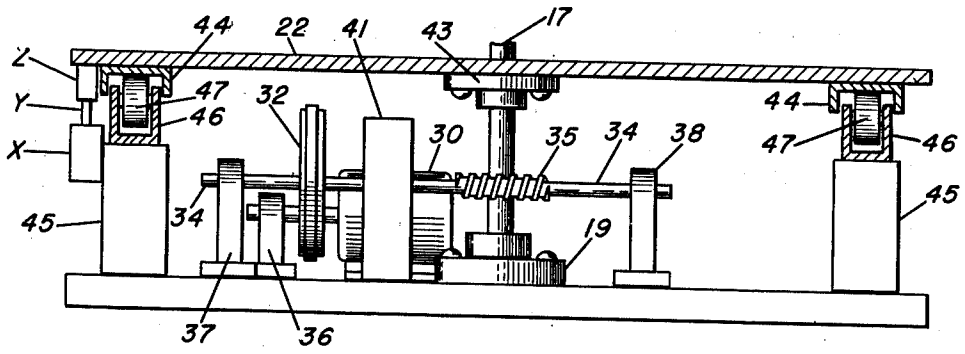


Fig-3

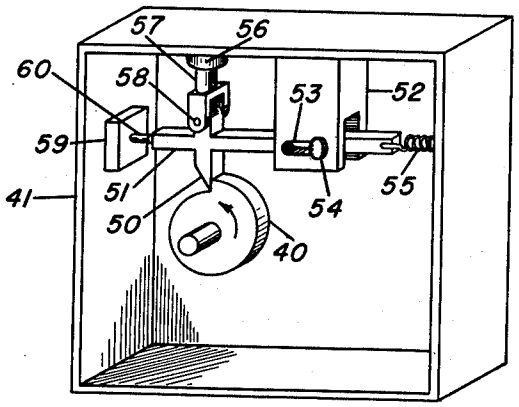


Fig-4

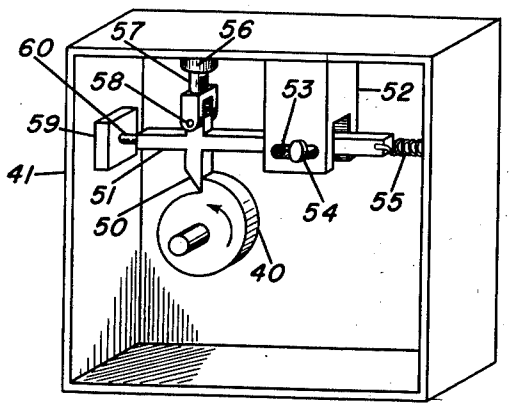


Fig-5

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COIN-OPERATED DEPOSITORY FOR CLOTHING AND THE LIKE

Filed May 24, 1949 3 Sheets-Sheet 3

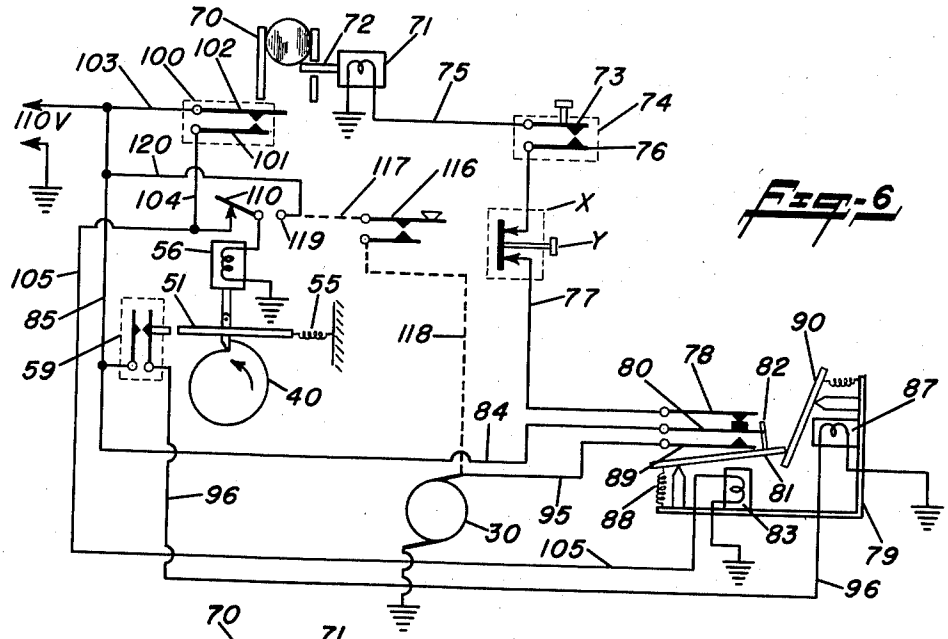


Fig-6

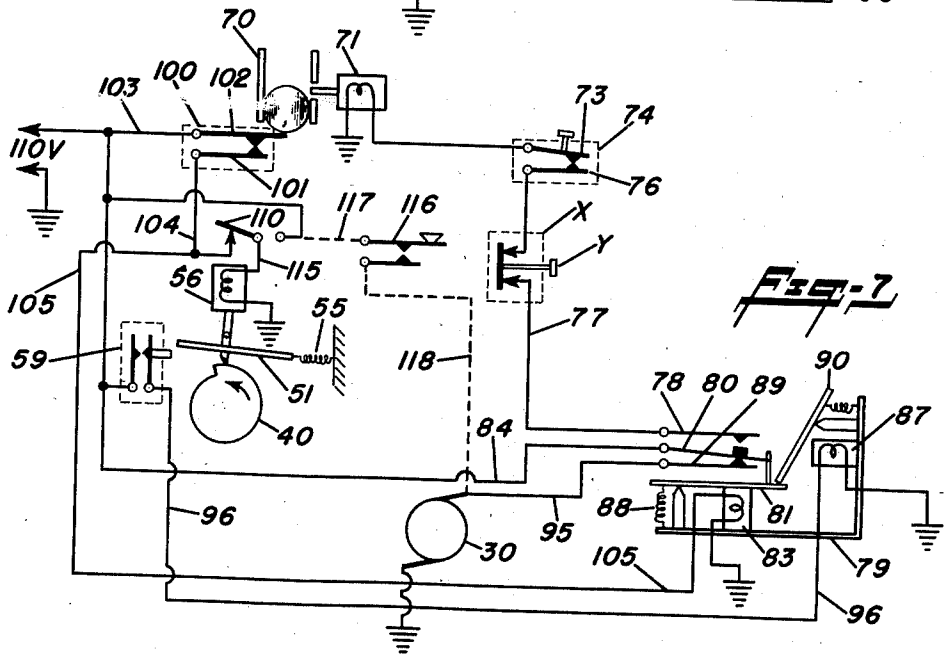


Fig-7

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Patented June 10, 1952

2,599,722

UNITED STATES PATENT OFFICE

2,599,722

COIN-OPERATED DEPOSITORY FOR CLOTHING AND THE LIKE

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Application May 24, 1949, Serial No. 94,994

5 Claims. (Cl. 194—9)

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This invention relates to a coin-operated depository for clothing and the like and more particularly to a rotatable carrier having a plurality of compartments in combination with control and operating means for individually presenting succeeding compartments to access by the public.

While the known prior art includes various coin-operated receptacles for dispensing and/or depositing various items we are not aware of a device provided with the novel features incident to a satisfactory and acceptable depository for the accumulation of clothing to be dry-cleaned.

More specifically the invention contemplates the provision of a cabinet including an outer casing within which is provided a rotatable carrier divided into a plurality of compartments designed to receive the clothing. Automatic means are provided for the progressive rotation of the carrier to afford the user access to a single, empty compartment while all other compartments are effectively sealed against tampering. Additional means are provided for servicing the device, that is, for the periodic removal of the contents to a central laundry or cleaning establishment from which point the cleaned garments are delivered to the home of the depositor.

An object of this invention is the provision of a coin-operated depository for clothing and the like.

An object of this invention is the provision of a compartmental receptacle adapted for coin-operation whereby succeeding compartments are individually available for the deposit of clothing.

An object of this invention is the provision of a coin-operated compartmental depository provided with means for preventing unauthorized access to compartments already occupied.

An object of this invention is the provision of a coin-operated compartmental depository for clothing and the like and including means effective to return the deposited coin in the event an empty compartment is not available to the user.

An object of this invention is the provision of a clothing depository comprising a casing having an access door, a rotatable carrier having a plurality of compartments, a coin-operated control box, means effective upon deposit of a coin in the control box for rotating the carrier to aline an empty compartment with the access door in the casing, means effective to prevent unauthorized access to occupied compartments and means effective to prevent operation of the device when all compartments are occupied.

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An object of this invention is the provision of a public depository for clothing comprising a casing having an access door, a rotatable carrier having a plurality of compartments individually alinable with the access door, a coin-operated control box, means for rejecting a coin deposited in the control box when the access door is in the open position power means for rotating the carrier to present the next succeeding compartment in alinement with the access door, means effective to cause actuation of the power means upon deposit of a coin in the control box when the access door is in the closed position, means for preventing rotation of the carrier when all available compartments are occupied, and manual control means effective to permit authorized personnel to empty the compartments and set the device to an initial starting position.

These and other objects and advantages will become apparent from the following description when taken with the accompanying drawings illustrating one embodiment of the invention. The drawings are for purposes of illustration and are not to be construed as defining the scope or limits of the invention which resides in the construction, combination and arrangement of parts as recited in the appended claims.

In the drawings wherein like reference characters identify like parts in the several views:

Figure 1 is an isometric view of a depository made in accordance with this invention and with certain sections cut away to show the compartmental carrier;

Figure 2 is a somewhat enlarged view of the operating mechanism that is located in the base of the device;

Figure 3 is an elevation view of the base showing the means for supporting the carrier;

Figures 4 and 5 are views of the control cam and associated mechanism;

Figure 6 is a circuit diagram showing the various components in the normal or non-operating position; and

Figure 7 is a circuit diagram showing the components in the operating position.

While the invention will be described with respect to a receptacle for the accumulation of clothing to be dry-cleaned it will be apparent the device is not limited to such use. In its broad aspect the invention provides a device which can be located in a place convenient to the public such as, for example, in stores of the super market type. People patronizing such stores may, at the same time, deposit their clothing in the depository with the assurance their belongings will

be safe and will be delivered to their home after proper cleaning, laundering, or etc.

Referring now to Figure 1 our device comprises an outer casing 10, made of metal or wood, which extends down to the floor and which includes a top 11. The casing is provided with an access door 12 and a service door 13, the latter being provided with a mechanical lock 14 requiring the use of a key to open same. The access door 12 may be opened and closed at will and cooperating with this door is a conventional push-type electrical switch 74 such that the said switch is in the open circuit position when the door 12 is open and in the closed circuit position when the door is closed.

Located within the casing is a rotatable carrier comprising a drum 16 which rotates with the vertical shaft 17 operating within the upper bearing 18 and a lower bearing 19 (see Figures 2 and 3). Secured to the drum 16 are a series of radially extending partitions 20 which extend between and are secured to a top plate 21 and a bottom plate 22. There is thus provided a plurality of individual, radial compartments. It is to be noted that the circumferential width of each compartment is equal to, or slightly less than, the width of the access door 12 in the casing. Inasmuch as the casing 10 circumscribes the entire rotatable carrier it will be apparent access normally is available to only a single compartment at any given time. The purpose of the normally locked service door will be explained more fully hereinbelow. Each compartment is provided with a diagonally extending rod 23 for the support of conventional clothes hangers.

Disposed on the front face of the casing is a coin-box 24 of the conventional type wherein the deposit of a coin closes an electrical switch upon proper conditions, and a writing table 25 carrying a pencil 26 and a receipt pad 27. The functional aspects of the coin-box and the purposes of the pencil and pad will be explained hereinbelow with respect to the use and operation of the device as a whole.

Reference is now made to Figures 2 and 3 for a description of the power mechanism employed to rotate the compartment carrier. Mechanical power is furnished by an electric motor 30 having a pulley 31 coupled to a pulley 32 by means of a suitable belt 33. The pulley 32 is secured to a shaft 34 which includes the worm gear 35. Conventional bearings 36, 37 and 38 support the shafts as shown. Cooperating with the worm gear 35 is a spur gear 39 that is firmly secured to the vertical shaft 17 extending upwardly through the carrier. By proper choice of the ratio between the pulleys 31, 32 and the gears 35, 39, the carrier can be made to rotate at any desired speed. Rigidly secured to the shaft 34 is a control cam 40 which is disposed within a closed housing 41 indicated by the dotted lines in Figure 2. Other mechanical and electro-mechanical mechanisms associated with the control cam 40 are likewise disposed within the housing 41 and will be described with reference to Figures 4 and 5.

As shown in Figure 3, the lower plate 22 of the rotatable carrier is secured to the shaft 17 by a flange coupling 43. Secured to the underside of the plate 22 is a circular channel 44 made of iron and which serves as a track. Supported from the base, as by means of suitable blocks 45, are casters 46 having freely rotatable wheels 47 riding within the channel 44. Such construction removes most of the weight of the carrier from the lower bearing 19 and affords smooth rotation of the carrier as a whole.

Referring now to Figure 4, the cam 40 normally is prevented from rotating by the dog 50 forming an integral part of the lever 51 which operates within a slotted member 52, the latter being secured to and depending downwardly from the housing 41. The member 52 is provided with horizontally extending slots 53 in the opposite legs thereof. A double headed pin 54 extends through the slots 53 and the lever 51 from which it will be apparent that the lever is subject to either angular rotation about the pin 54 or a limited horizontal movement within the range permitted by the slots 53. A relatively strong spring 55 is attached to the lever and to the housing whereby the lever normally occupies the position shown in Figure 4, that is, at the extreme limit of movement to the right. An electrical solenoid 56 is also secured to the housing 41 and has a slotted plunger 57 connected to the lever 51 by a pin 58. When the solenoid 56 is energized the plunger is thereby retracted causing the lever to be lifted upwardly and thereby disengaging the dog 50 from the cam 40. Upon subsequent de-energization of the solenoid the lever tends to drop downward under the action of gravity. An electrical switch 59 of the push-button type is secured to the housing 41 such that the button 60 is alined with, but normally spaced from, the end of the lever 51. The switch 59 is of the normally open type, that is, the switch contacts will close an electrical circuit only when the button 60 is depressed.

As shown in Figure 4 the various components are in the normal or non-operating position. As will be explained later in detail, the electrical control circuit is such that, under proper conditions, the deposit of a coin in the coin-box causes a momentary energization of the solenoid 56. The lever 51 is thereby raised disengaging the dog 50 from the rise on the cam 40 freeing the latter for rotation in the direction shown. Although the solenoid is energized but momentarily, once the cam 40 starts to rotate the subsequent de-energization of the solenoid merely results in the dog 50 riding on the edge surface of the cam. As the cam completes a single revolution the rise on the cam will strike the dog 50 and the lever 51 will move to the left in spite of the normal tension of the spring 55, see Figure 5. However, when the end of the lever strikes the button 60 the contacts of the switch 59 will close and, through an associated power relay, will result in an opening of the electrical circuit to the driving motor. As soon as the power to the motor is cut off, the spring tension of the spring 55 becomes effective to pull the lever 51 back to the normal position, Figure 4, the cam 40 simultaneously being rotated in a reverse direction. As such reverse rotation of the cam is only of minor extent, it is feasible to accomplish this by reason of the normal play in the driving belt 33, Figure 2. In the event sufficient free play does not exist, the spring 55 is sufficiently strong to cause the necessary, slight, reverse rotation of the motor armature. Alternatively, the control cam 40 can be made part of a friction clutch or an electrical clutch, both devices being well known in the art.

The gear ratio between the worm gear 35 and the spur gear 39 is such that one complete revolution of the control cam 40 results in an angular rotation of the shaft 17 (and, therefore, the entire carrier) equal to the circumferential width of a single compartment.

The electrical circuit diagram of the device is shown in Figures 6 and 7, certain components being shown schematically for purposes of description. Coin-boxes of the type used in our device are well known in the art. Briefly, such boxes are provided with an electrical or mechanical interlock mechanism whereby a deposited coin will be returned to the user in the event conditions are such that proper service cannot be rendered by the device with which the coin-box is associated. For purposes of simplicity, Figure 6 shows the coin shute 70 of a coin-box, together with an electrical solenoid 71 having a plunger 72 extending into the coin shute when the said solenoid is not energized. Under this condition the coin cannot pass through the shute to cause operation of our depository. It will be noted one side of the solenoid is connected to the contact 73 of the door switch 74 by the wire 75. As explained hereinabove, the door switch 74 is operated by the access door 12 (Figure 1) such that when the access door is open the coacting contacts 73, 76 of the switch are "open," and when the door is closed the contacts engage to complete an electrical circuit therethrough. The contact 76 is connected by the wire 77 to the back contact 78 of a mechanical latch relay 79. The back contact 78 is normally in contact with the movable contact 80, the latter moving with the armature 81, through the mechanical connecting link 82, as the operating coil 83 is energized and deenergized. Movable contact 80 is connected to the "hot side" of a 110 volt A. C. line by the wires 84, 85. Thus, upon closure of the access door the switch 74 closes thereby energizing the solenoid 71 to clear the shute 70 for the passage of the coin therethrough.

The mechanical operation of the control cam 40 and lever 51 has already been described and there remains now the matter of describing the operation of the mechanical latch relay 79 before proceeding to a detail description of the entire circuit. The mechanical latch relay 79 consists of two coils, namely, an operating coil 83 and a reset coil 87. The pivoted armature 81 is associated with the operating coil 83 and normally occupies the position shown in Figure 6 in response to the tension exerted by the spring 88. In this position of the armature the movable contact blade 80 engages the back contact blade 78. When the operating coil 83 is energized the armature is attracted thereto causing the movable contact 80 to leave the back contact 78 and engage the front contact 89. Once the armature 81 is attracted to the coil 83 it passes beyond the free end of the armature 90 which is associated with the reset coil 87. Upon a subsequent deenergization of the operating coil 83 the armature 81 cannot return to its normal position by reason of the overlying position of the reset armature 90, see Figure 7. In order for the armature 81 to return to the normal position the reset coil 87 must be energized to withdraw the associated armature 90 out of the path of travel of the armature 81. From an electrical standpoint the momentary energization of the operating coil 83 causes a transfer of the line voltage from the back contact 78 to the front contact 89 and this condition prevails until the reset coil 87 is momentarily energized.

It will be noted that the front contact 89 is connected to the motor 30 by the wire 95. Consequently the motor will run during the time interval when the mechanical latch relay is "locked-in." Also, the reset coil 87 of the latch relay is

connected by the wire 96 to one contact of the switch 59. The other contact of the switch 59 is connected to the "hot side" of the line by the wire 85. After the cam 40 has completed one revolution the lever 51 causes a momentary closure of the switch 59, as explained hereinabove, and, consequently, a momentary energization of the reset coil 87 takes place each time the cam 40 revolves. Therefore, the mechanical latch relay is reset upon the completion of each single revolution of the cam 40.

Associated with the coin shute 70 is an initiating switch 100 having a fixed contact 101 and a movable contact 102, the latter extending into the shute whereby a coin passing through the said shute will cause a momentary closure of the contacts. The movable contact 102 is connected to the line by the wire 103 while the fixed contact is connected to the operating coil 83 of the latch relay through the wires 104 and 105. Thus, momentary closure of the switch 100 causes the mechanical latch relay to "lock in." Closure of the switch 100 also results in a momentary energization of the solenoid 56 (associated with the lever 51) through the single-pole-double-throw switch 110.

Provision is also made to prevent more than one complete revolution of the compartmental carrier in the event all compartments are in use, that is, containing clothing. The means for accomplishing this end comprises a limit switch X, Figures 6, 7, which switch may be mounted in any convenient place such that it will open the electrical circuit each time the carrier occupies a given position. As shown in Figure 3 the limit switch X is mounted on the support 45 such that the operating button Y is depressed to open the electrical circuit by the dog Z which is affixed to the lower plate 22 of the carrier. It will be apparent that when the limit switch is in the open circuit position the solenoid 71 associated with the coin-box cannot be energized and, therefore, the device cannot be set into operation by an intended user. However, we provide means whereby a service man authorized to remove the deposited clothing can condition the device for further use, as will be explained hereinbelow.

We shall now describe the use and operation of the device. It is again pointed out that the service door 13 is locked in the closed position and that the access door 12 is closed but unlocked.

The customer opens the access door 12 and places his clothing into the single compartment alined with the door opening. He then writes his name, address, list of clothing deposited, and comments relating to the service desired, on the pad provided on the writing table 25. This record is made out in duplicate. The original is then placed into the compartment and the carbon copy retained by the customer as a receipt. After being satisfied that all matters under his control are in proper order the customer closes the access door 12 which causes the door switch 74 (Figures 6 and 7) to close the electrical circuit to the coin-box solenoid 71 thereby conditioning the coin-box for the acceptance of a coin of proper denomination. The electrical circuit to the solenoid 71 comprises the wire 75, the now closed door switch 74, normally closed limit switch X, wire 77, normally closed contacts 78, 80 of the latch relay, and the wires 84, 85.

The customer now deposits a coin into the coin-box which results in a momentary closure of the contacts 101, 102 of the initiating switch 100, as

the coin passes through the shute 70. The momentary closure of the switch 100 sets the device into operation, see Figure 7.

Closure of the switch 100 completes the electrical circuit to the operating coil 83 of the latch relay through the wires 104 and 105. Therefore, the latch relay "locks in" causing a transfer of the movable contact 80 from the back contact 78 to the front contact 89. As the movable contact 80 is connected directly to the line, and the front contact 89 is connected directly to the motor 30, a closure of these two contacts causes immediate rotation of the motor. It will be noted that when the latch relay is "locked in" the circuit to the coin-box solenoid 71 is opened which effectively prevents the deposit of another coin while the device is in operation.

Closure of the initiating switch 100 simultaneously completes the electrical circuit to the solenoid 56, through the wire 104, normally closed switch 110 and wire 115. The solenoid 56 raises the lever 51 to free the cam 40. Inasmuch as the motor 30 is energized simultaneously with the freeing of the cam the latter rotates in the indicated direction.

Although the closure of the initiating switch 100 by the coin is but of momentary duration the motor 30 continues to run by reason of the locked-in latch relay, and the cam 40 continues to revolve as the dog 50 merely rides on the circumferential edge thereof. The motor and the cam continue to operate until the cam has completed one revolution at which time the rise on the cam will again strike the dog 50 causing the lever 51 to close the contacts of the switch 59. The gearing is so arranged that one complete revolution of the cam 40 is sufficient to aline the next succeeding, and empty, compartment with the access door, by which time the filled compartment will be effectively closed behind the outer casing of the device.

Closure of the switch 59 by the lever 51 causes the energization of the reset coil 87 of the latch relay permitting the armature 81 to return to its normal position as shown in Figure 6. The separation of the contacts 80, 89 opens the circuit to the motor and the carrier stops. The stopping of the motor also removes the force tending to rotate the cam 40 and the lever 51 is disengaged from the switch 59 by reason of the tension exerted by the spring 55. The device is now ready for use by the next customer.

When the last empty compartment is alined with the access door 12, the limit switch X is opened automatically by the dog Z attached to the carrier plate 22, as explained hereinabove. As the limit switch X is connected in series with the door switch 74 the closing of switch 74 by the closing of the access door is no longer effective. Consequently, the solenoid 71 remains deenergized and the coin-box will not accept a coin to cause further operation of the device. Such last, and unusable, compartment may carry an appropriate sign indicating the device is filled to capacity together with a notation indicating the time when the service man is due to arrive to empty the depository, and such other information as may be appropriate.

However, it is contemplated that the schedule of the service man, or pick-up man, will be so arranged that the clothing will be collected for delivery to the dry cleaning plant before the depository becomes filled.

The service man is provided with a key for opening of the service door 13 which is purposely made relatively wide so that he can remove the contents from several compartments without the necessity of rotating the carrier.

A set of switches adapted to control the operation of the device are located on the inside wall of the casing 10 and within easy reach of the service man when the service door is open. One of these switches is the single-pole-double-throw switch 110 (Figures 6, 7). The other switch 116 is connected between the switch 110 and the motor 30 as indicated by the dotted lines 117 and 118, respectively. The service man throws the switch 110 over to the contact 119 thereby connecting the solenoid 56 directly to the line through the wire 120. The cam 40 is then free to rotate. He then closes the switch 116 which connects the motor 30 to the line through the wires 118, 117 and 120. After the carrier has rotated an amount sufficient to present another group of compartments to the service door, the service man releases the switch 116, the motor stops and he proceeds to remove the clothing. With complete control of the device in the hands of the service man it will be apparent he can quickly empty the compartments and preset the position of the carrier with respect to the limit switch so that the device is again conditioned for maximum use by the public.

The clothing collected by the service man is delivered by truck to the cleaning establishment where the garments are cleaned, laundered, etc. and delivered to the customer's home, all in accordance with the information contained on the slip of paper identified with the garments of each customer.

Having now described our invention with reference to the specific embodiment illustrated in the drawings, certain variations and modifications in the choice and arrangement of the parts will be apparent to those skilled in the art. Such changes may be made without departing from the spirit and scope of the invention as set forth in the claims.

We claim:

1. A coin-actuated depository for clothing and the like comprising a rotatable carrier having a plurality of radially extending compartments, a casing surrounding the carrier, an access door in the casing, said door normally alined with a single compartment, a coin-box including an initiating switch adapted to close a set of contacts momentarily upon deposit of a coin in the coin-box, an electric motor, means for rotating the carrier when the motor is energized, means for continuously energizing the motor upon momentary closure of the said initiating switch, a cam having a spiral periphery terminating in a radial rise, a pivoted lever having a projecting dog normally in face contact with the rise of the cam, means supporting the lever for limited movement in a direction tangent to the cam, a spring normally opposing tangential movement of the lever, electro-mechanical means disengaging the dog from the cam upon momentary closure of the said initiating switch, means coupling the cam to the motor to cause rotation of the cam when the motor is energized, a stop switch normally spaced from the said lever, said stop switch having a set of normally open contacts, and means effective upon momentary closure of the said stop switch to deenergize the motor; the recited combination being such that upon each complete revolution of the cam the rise on the cam will strike the dog whereby the lever will cause closure of the stop switch.

2. The invention as recited in claim 1 and including a door switch having a set of normally open contacts, means closing the contacts of the door switch when the access door is in the closed position, rejecting means associated with the coin-box, and circuit elements effective when the contacts of the door switch are open to cause the rejecting means to prevent closure of the initiating switch contacts by the deposited coin.

3. The invention as recited in claim 1 and including means preventing the closure of the initiating switch when the rotatable carrier occupies a predetermined position with respect to the access door.

4. The invention as recited in claim 1 and including hand operable means for energizing the motor independently of the initiating switch.

5. The invention as recited in claim 1, wherein the casing includes a normally locked service door, said service door having a width spanning a plurality of compartments.

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