Dec. 8, 1942. A. S. GUERARD, JR. 2,304,455

DISPENSING MACHINE

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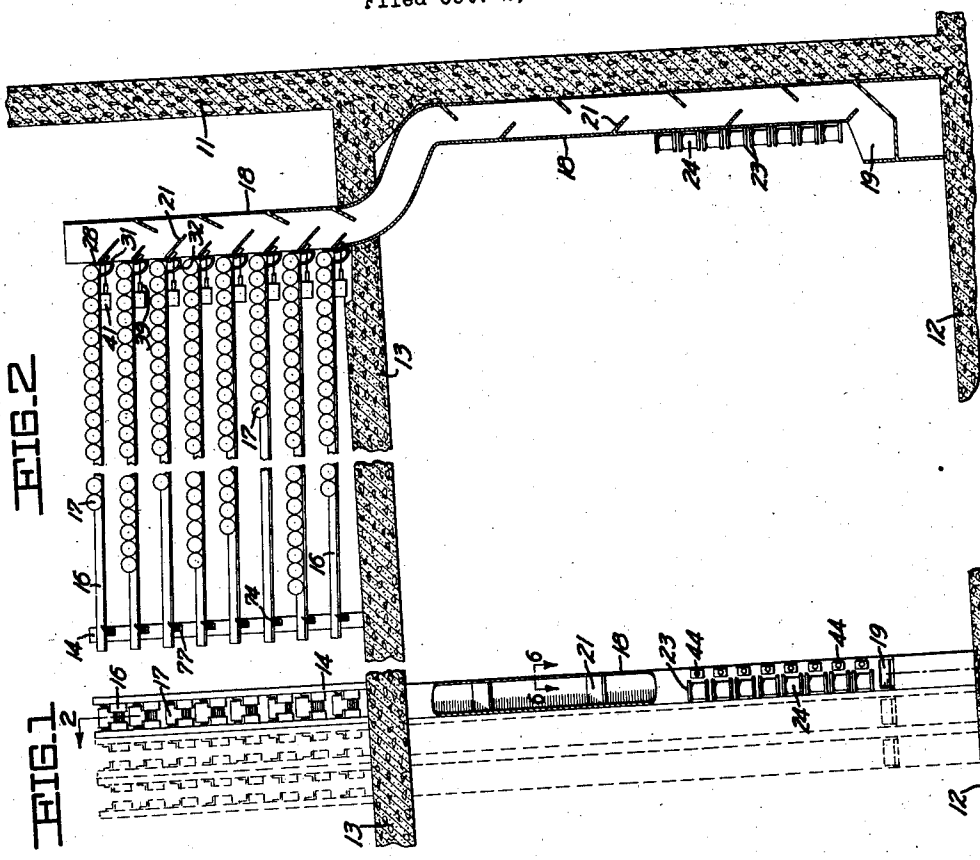


FIG. 2

FIG. 1

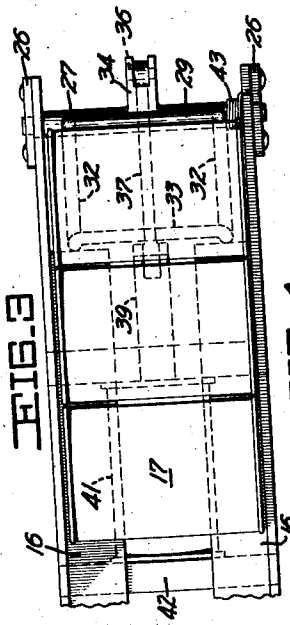


FIG. 3

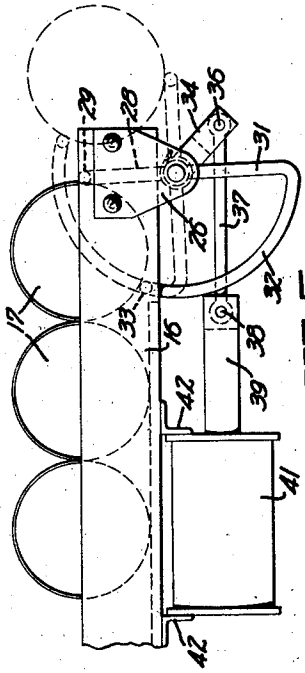


FIG. 4

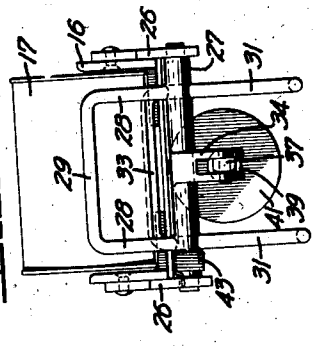


FIG. 5

INVENTOR
Albert S. Guerard Jr.
BY
Harry P. Schroeder
ATTORNEY

Dec. 8, 1942. A. S. GUERARD, JR. 2,304,455

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FIG. 6

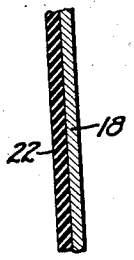


FIG. 7

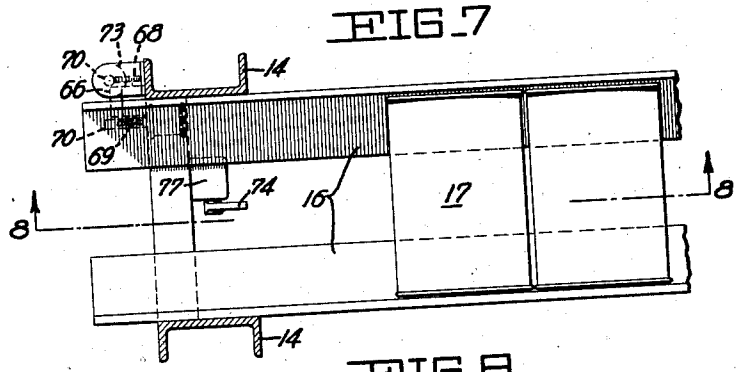


FIG. 9

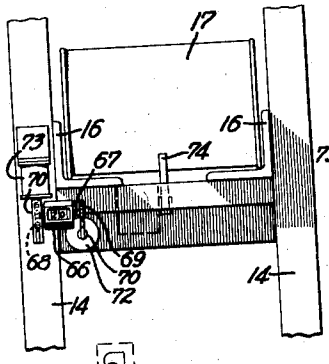


FIG. 8

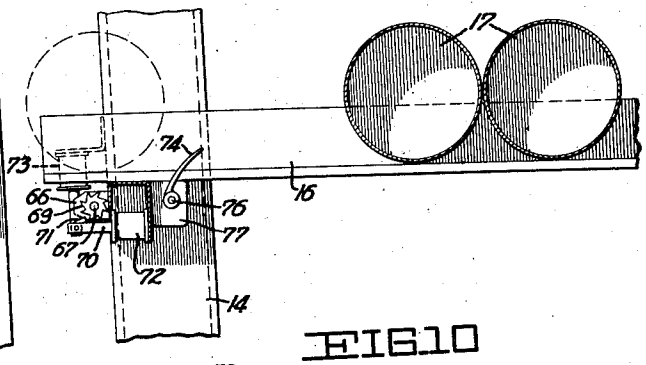
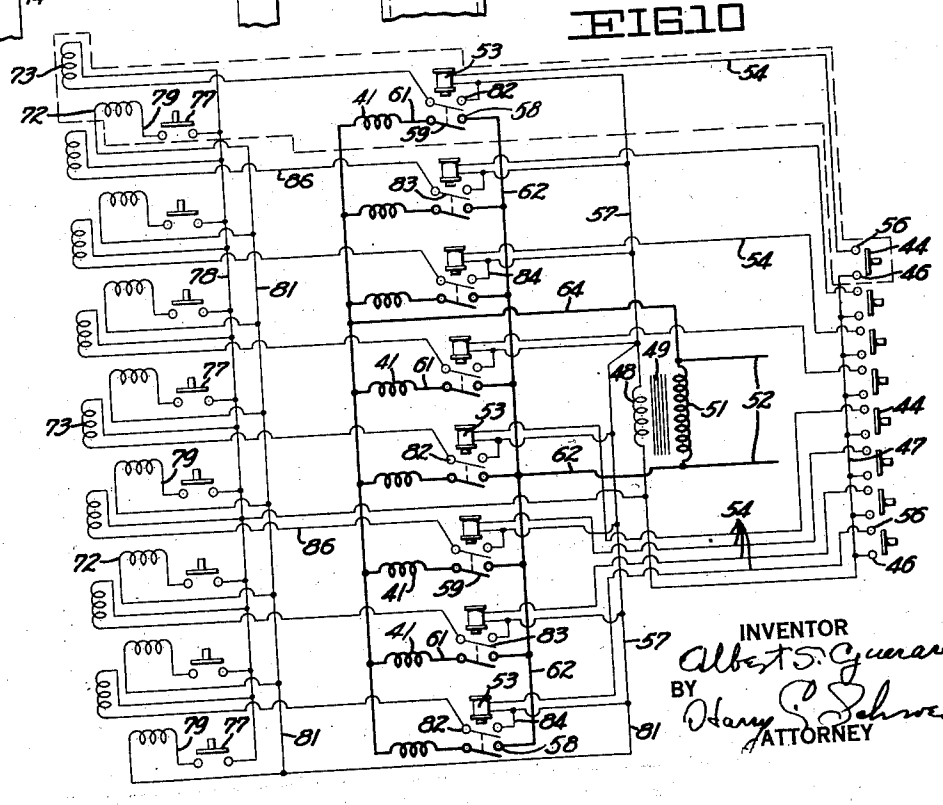


FIG. 10



INVENTOR
Albert S. Guerard Jr.
BY
Harry C. Schroeder
ATTORNEY

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DISPENSING MACHINE

Albert S. Guerard, Jr., Berkeley, Calif.

Application October 2, 1940, Serial No. 359,402

1 Claim. (Cl. 312—48)

This invention relates to mechanism for successively discharging articles from a storage reservoir.

It is among the objects of the invention to provide a dispenser for articles of merchandise, which comprises a multi-chambered storage reservoir, in which a variety of different articles may be stored, and a chute or conveyor common to all of the storage chambers into which articles from the various chambers may be discharged so as to concentrate the articles at a relatively remote centralized delivery point.

Another object of the invention is to provide, in a dispenser of the type described, means positioned adjacent the delivery point for causing selected articles to be discharged from the remote reservoir so that they may be conveyed to the delivery point.

A further object of the invention is to provide, in a dispenser of the class described, novel means for successively feeding articles from the respective chambers or racks of the storage reservoir into the delivery chute.

Yet another object of the invention is to provide, in the type of dispenser referred to, novel means for automatically numerically indicating the difference between the number of articles dispensed from the respective chambers or racks of the device and the number of articles added to replenish the chambers or racks.

The invention possesses other objects and features of advantage which, together with the foregoing, will be specifically brought out in the detailed description of the invention hereunto annexed. It is to be understood that the invention is not to be limited to the specific form thereof herein shown and described as various other embodiments thereof may be employed within the scope of the appended claim.

Referring to the drawings:

Figure 1 is a front elevational view of the dispensing machine of my invention. A portion of the view is broken away and shown in vertical section so as to more clearly disclose the internal construction.

Figure 2 is a vertical sectional view of the machine taken in a plane indicated by the line 2—2 of Figure 1.

Figure 3 is an enlarged fragmental top plan view of the output end of one of the reservoir storage racks.

Figure 4 is a side elevational view of the structure shown in Figure 3.

Figure 5 is an end elevational view of the structure shown in Figure 4.

Figure 6 is an enlarged fragmental horizontal sectional view of a portion of the chute. The plane in which the view is taken is indicated by the line 6—6 of Figure 1.

Figure 7 is an enlarged fragmental top plan view of the input end of one of the reservoir storage racks.

Figure 8 is a longitudinal vertical sectional view of the structure of Figure 7. The plane of section is indicated by the line 8—8 of the latter figure.

Figure 9 is an end elevational view of the structure shown in Figure 8.

Figure 10 is a schematic wiring diagram showing the connections between the various electrically operated component parts of the apparatus.

Due to the ever-increasing number of foodstuffs offered for sale in cans and the large variety of brands under which these articles are sold, the storekeeper is confronted with the serious problem of providing, within the limits of his sales floor, shelf space to hold a sufficient quantity of each commodity so that the stock will not require too frequent replenishing and yet will position each group of goods within convenient reach of his customers. Such shelving, since the height thereof is limited to the reach of the average person, is often wholly inadequate to hold all of the goods offered for sale. In order to make room for all of the goods the storekeeper must either limit the shelf area allocated to each variety or brand or increase the size of the building. The latter remedy is, it is obvious, often impossible since the adjacent property is usually occupied and therefore the business must be conducted with the limited shelf area and under the disadvantages of lessened sales appeal which the condensed displays of the various goods produces, increased difficulty for the customer to quickly find a desired brand or kind of goods, and the handicap of competition of a neighboring store which has adequate floor space to properly display large individual groups of the various brands and types of merchandise and which, due to this convenience, will draw a large percentage of the trade. I have provided a dispensing machine which permits the carrying of large stocks of the various types and brands of merchandise in small stores in which the wall space is limited and which will enable the small shop owner to compete on more equitable terms with merchants who may be conducting their businesses in much larger buildings.

In detail, I have shown a building 11 having a sales floor 12 and a second floor, mezzanine or

balcony 13 above it. Mounted on and rising from the floor 13 I provide suitably spaced supports 14 on which are mounted vertically spaced pairs of angle iron rails 16 forming individual racks positioned so as to form runways for cans 17 or other similar cylindrical containers. The rails 16, as will be noted in the drawings, are inclined toward one end so that the cans 17 may, under the influence of gravity, roll toward the lowered ends of the runways. The elevated end of each runway is unobstructed so that, as the cans are discharged from the lowered end, additional cans may be inserted, by an attendant, into each rack to fill the latter. The lowered end of each rack is secured to and opens into a tubular chute 18, which extends downwardly through a suitable aperture formed in the floor 13, along or adjacent the interior side wall of the building and terminates at its lower end in an open delivery hopper 19. Angularly disposed baffle plates 21 are secured to and project into the chute 18 so that when a can 17 is released from one of the racks into the chute, the gravital accelleration of the can, as it passes downwardly through the chute, is resisted in order that the can may not be dented or otherwise damaged and the likelihood of the customer's hand, which may be within the hopper 19 as the can is discharged thereinto, becoming bruised by the can is prevented. In order to reduce the noise of the can passing through the chute to a minimum, it is preferable, as shown in Figure 6, to construct the chute 18 and the baffles 21 thereof of sheet steel having a rubber facing 22 such as is used in the construction of automobile running boards or stair treads. It will be seen that the transverse width of each tier of racks is only slightly in excess of the length of the can. Thus the amount of wall space required to provide for dispensing of the large number of cans contained in each rack is reduced to an absolute minimum over the space required to display an equal number of cans in the usual manner on shelves. As many delivery chutes and racks as desired may be installed side by side as indicated by the dotted lines in Figure 1. For the convenience of customers the front of each chute 18, adjacent the delivery hopper 19, is provided with brackets 23 in which sample cans 24, the latter being duplicates of the cans in the respective rows of the rack, may be held. It is obvious that an entire rack may be devoted to one brand or kind of goods or the respective rows may be filled with different brands or types of goods. It is desirable however that each rack be devoted to one type of foodstuff, such as milk, and that the various brands of milk be placed in the respective rows of the rack so as to group this and other commodities for the convenience of the customer.

Means is provided for selectively releasing one or any number of cans desired from the various rows of the rack. Referring to Figures 3 to 5 inclusive, I provide, at the lowered end of each pair of rails 16, a pair of downwardly extending brackets 26 apertured to provide journals for a transversely extending rocker shaft 27. Secured to the shaft 27 is a U-shaped rod having a pair of radially upwardly extending arms 28 and a cross bar 29 which extends across in front of the first can 17 on the rails 16. A similar U-shaped rod is provided having a pair of radially extending arms 31 formed with arcuately curved outer extensions 32, whose arc is swung around the axis of the shaft 27 as a center, and a cross bar 33 which lies directly below the aforesaid first can 17. It will be seen that the can is cradled between the cross bars 29 and 33 and is prevented thereby from rolling from the rails into the chute 18. A lever 34, carried by and extending downwardly from the shaft 27, has a clevised outer end in which is secured, by a pivot pin 36, to one end of a link 37. The other end of the link 37 is secured by a pivot pin 38 to the clevised end of an armature 39 which is slidably mounted in a solenoid 41 mounted, by angle clips 42 or otherwise, on the bottom of the rails 16. It will be seen that when the solenoid 41 is energized, the armature 39 will be electromagnetically drawn thereinto thereby causing rotation of the shaft 27. Such rotation will cause the bars 29 and 33 to move about the axis of the shaft thereby carrying the first can to the position shown by the dotted lines of Figure 4 wherefrom it will fall into the chute 18 and will thereafter continue falling through the chute into the delivery hopper 19. During discharge of the first can, the arcuate extensions 32 of the arms 31 will have moved in front of the next succeeding can to hold the latter until the solenoid is deenergized and the bars 29 and 33 are returned, by a torsion spring 43 acting on the shaft 27, to their normal positions. When the bars 29 and 33 return to their said normal positions, the said succeeding can will roll into the cradle so as to be in position to be ejected from the rack when the solenoid 41 is again energized.

Mounted on the front of the chute 18, in number corresponding with the number of horizontal rows of cans in each rack, and positioned adjacent each of the sample cans 24 identifying the contents of the respective rows of the racks, is a plurality of pushbutton switches 44 each of which, as is shown in Figure 10, has one contact 46 thereof connected through a common lead 47 with the secondary winding 48 of a voltage reducing transformer 49, the primary winding 51 of the transformer being connected to input conductors 52 such as the building mains. Each switch 44 has associated therewith a double pole single throw relay whose actuating coil 53 is connected by a lead 54 with the other contact 56 of the switch 44 and by a lead 57, common to all of the relay coils, with the secondary winding 48 of the transformer 49. One pair of relay contacts 58, which may be bridged by a contactor 59 moved by the relay armature, is connected by leads 61 and 62, respectively, with one end of the coil 41 of the solenoid 41 and with one power lead 52 and a lead 64, connected with the other end of each solenoid coil 41, is connected with the other power lead 52. When the pushbutton of a switch 44 is depressed the circuit through the transformer secondary winding 48 and the relay coil 53 associated with the depressed pushbutton, is completed thus causing the relay contactor to bridge the contacts 58. This also completes the circuit from the power mains 52 through the selected solenoid coil 41 thereby causing the armature 39 to move to discharge a can from the selected row of the rack, corresponding to the depressed pushbutton, as was previously described. While an ordinary pushbutton switch 44 may be employed, it is desirable, in order to prevent mischievous persons from repeatedly and rapidly punching a pushbutton thereby causing a quantity of cans to fall from the racks into the chutes, to provide a delayed action pushbutton so that a short wait is re-

quired between depressions of the pushbutton before the apparatus is reconditioned to dispense the successive cans. Such a switch may be provided, the arrangement being well known to mechanics of ordinary skill, by fitting an ordinary push-button switch with an air or liquid controlled dashpot for delaying opening of the contacts after the pushbutton has been depressed to close the contacts.

Means is provided for keeping tally of the number of cans present in each row of the rack so that a stock attendant, whose duty is to see that the racks are kept adequately filled, may ascertain which of the racks are deplenished and require refilling. At the elevated or entrance end of each pair of rails 16 I provide a counter 66 having a rotatable actuating shaft 67 projecting from the opposite ends thereof upon which are secured oppositely toothed ratchet wheels 68 and 69. Each of the ratchet wheels has associated therewith a movable armature 70 carrying a ratchet dog 71 which engages the ratchet wheel during each advance movement of its armature, so as to rotate the ratchet wheel an amount sufficient to register one unit on the counter 66, and which is inactive during recovery movement of the armature. The arrangement is such that one armature, when moved, will add one unit to the total showing on the counter dials while like movement of the other armature will cause the unit added to be subtracted from the total. Actuating coils, which may be aptly called an addition solenoid 72 and a subtraction solenoid 73, are provided for moving the armatures 70. When cans are loaded, by the stock attendant, into the racks, as shown in Figure 8, the cans in rolling along the rails 16 will successively depress a lever 74 which projects above the surface of the rails in the path of the cans. The lever 74 is carried by the shaft 76 of a switch 77 whose contacts are bridged each time the lever 74 is depressed by a can passing thereover. One contact of the switch 77 is connected, as shown in Figure 10, by a common lead 78 with the secondary winding of the transformer 49, and the other contact is connected by a lead 79 with one end of an addition solenoid 72. The other end of each solenoid 72 is connected, by a common lead 81, with the transformer secondary winding 48. Thus whenever a can is added to any rack and rolls over the lever 74 in entering the rack, the switch 77 will be closed thereby energizing the particular addition solenoid associated with the closed switch and causing the registering of one numerical unit on the particular counter associated with the rack to which the can has been added.

The additional pair of contacts 82, with which each relay 53 is provided, is adapted to be bridged by a contactor 83 movable with the contactor 59 and is connected, respectively, by a lead 84 with the secondary winding 48 of the transformer and by a lead 86 with a subtraction solenoid 73. The other ends of the solenoids 73 are each connected, by the common lead 78 with the transformer secondary 48. Whenever a selected push-button switch 44 is actuated, its relay in closing the contacts 58 to cause energization of the ejector solenoid 63 so as to discharge a can from the selected rack, will also close the contacts 82 thereby energizing the subtraction solenoid 73 and causing the subtraction of one numerical unit from the total showing on the dial of the counter 66. Thus the tallying of the number of cans placed in a given rack compared to the number delivered from the rack is accomplished automatically thus removing the mathematical burden from the mind of the stock attendant, enabling him to ascertain at a glance which stocks are low and need replenishing, and also enabling him to prepare inventory reports in but a fraction of the time previously required to laboriously count the separate articles.

While I have chosen to show the various release and counting mechanisms of my apparatus controlled electromagnetically, it is obvious that they may, by the substitution of suitable Bowden cables, also be controlled mechanically without in any way departing from the spirit of the invention.

Having thus described my invention in detail, what I claim as new and desire to secure by Letters Patent is:

A dispensing machine of the class described comprising a delivery hopper, a plurality of superposed racks, in each of which a plurality of different articles to be dispensed may be placed, situated in an elevated position above said delivery hopper, a vertically extending duct common to each of said racks connecting said racks and delivery hopper and through which articles from the racks may fall into the delivery hopper, a plurality of baffles in said duct engageable by an article passing therethrough for urging said article to follow a tortuous zig-zag path in passing through the duct and thereby resist acceleration of the article due to the force of gravity, shafts journaled on and adjacent an end of each of said racks, each of said shafts having thereon pairs of diametrically opposed, radially extending arms and a radially extending control lever, one pair of said arms having extensions thereof arcuately curved on a radius about the axis of said shaft and terminating in spaced relation to the ends of the other pairs of arms so as to form a cradle into which successive of said articles from the associated rack may pass, each of said racks further having a solenoid coil and an armature slidably mounted in said solenoid coil, links connecting the armatures of the solenoid coils with the control levers of said shafts whereby, when the solenoid coils are energized, the armatures will be moved to impart rotary motion to said shafts and carry the articles resting in said cradles outwardly from the ends of the racks so that the articles may fall into the duct, said arcuately curved arm extensions, during rotary motion of said shafts passing in front of a succeeding article in each rack so as to preclude movement of said succeeding article from the rack into said cradle, a plurality of push-button switches, one for each rack, positioned adjacent said delivery hopper, and electric control circuits connecting the respective push button switches with the respective solenoid coils whereby, when a push-button switch is closed, its associated solenoid will be energized to effect rotary movement of the shaft associated therewith.

ALBERT S. GUERARD, JR.