July 26, 1966 J. SCHENDORF ET AL 3,262,603

VENDING MACHINE EJECTOR

Filed Sept. 24, 1964 3 Sheets-Sheet 1

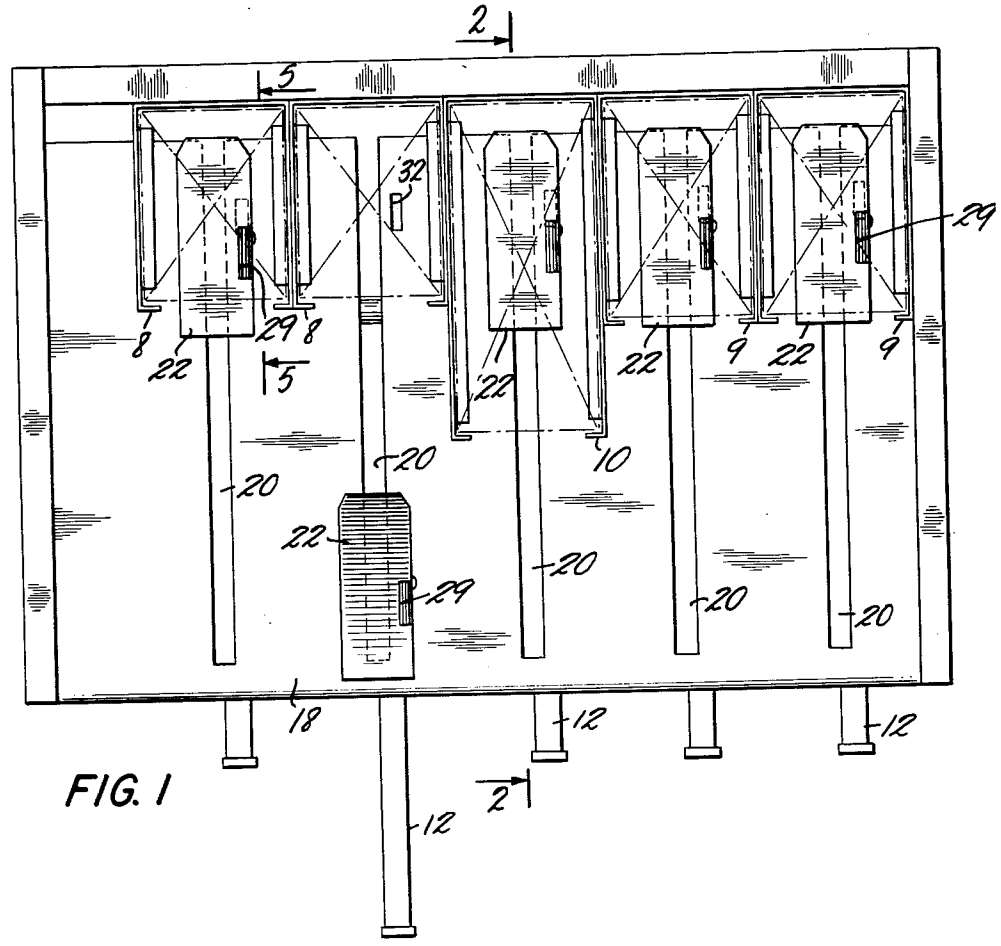


FIG. 1

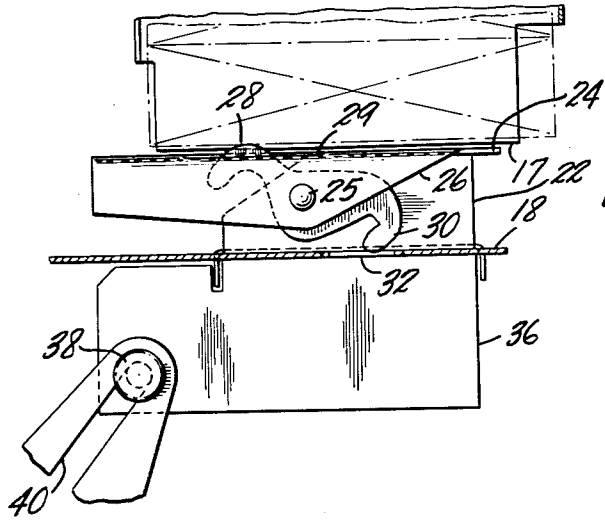


FIG. 5

INVENTORS
JOHN SCHENDORF &
IRVING GOLDBERT
BY Richard S. Sheer
their ATTORNEY

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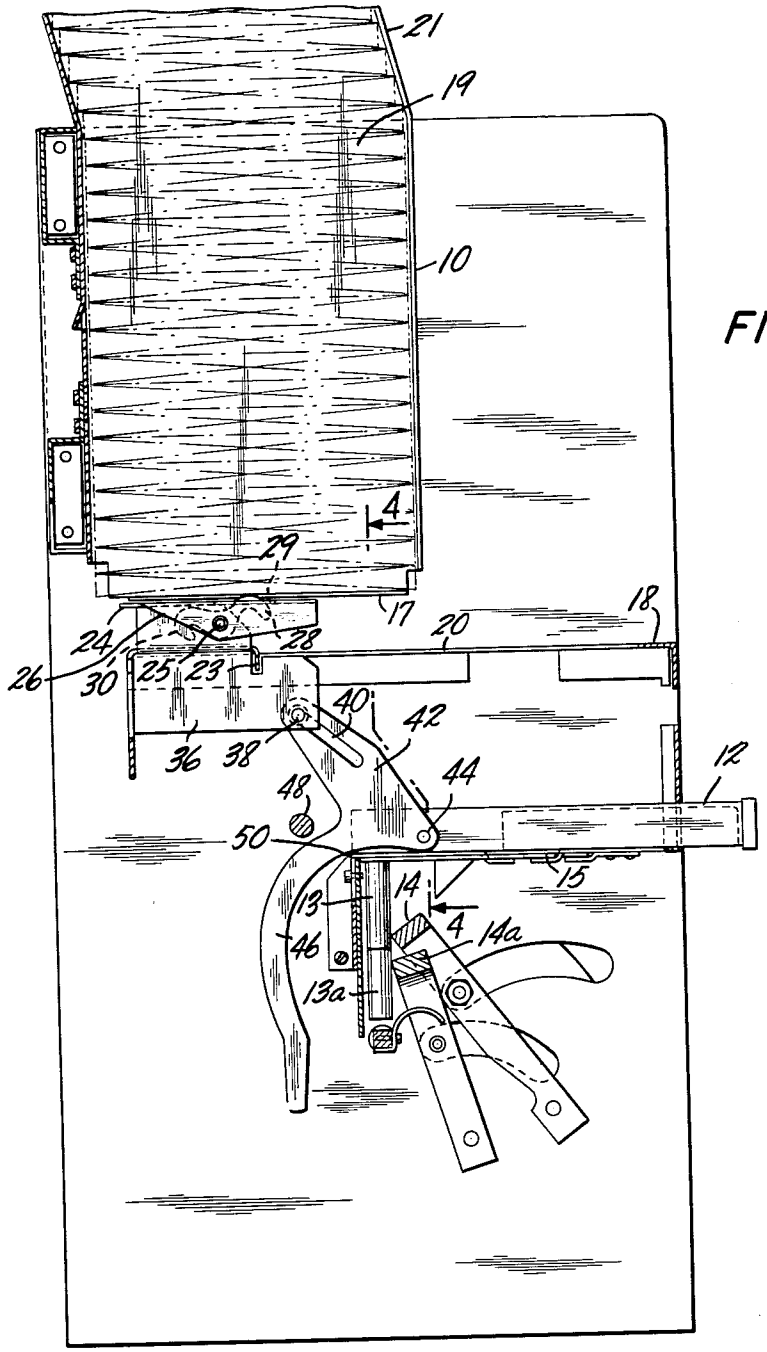


FIG. 2

INVENTORS
JOHN SCHENDORF &
IRVING GOLDBERT

BY Richard S. Sherer

their ATTORNEY

July 26, 1966 J. SCHENDORF ETAL 3,262,603

VENDING MACHINE EJECTOR

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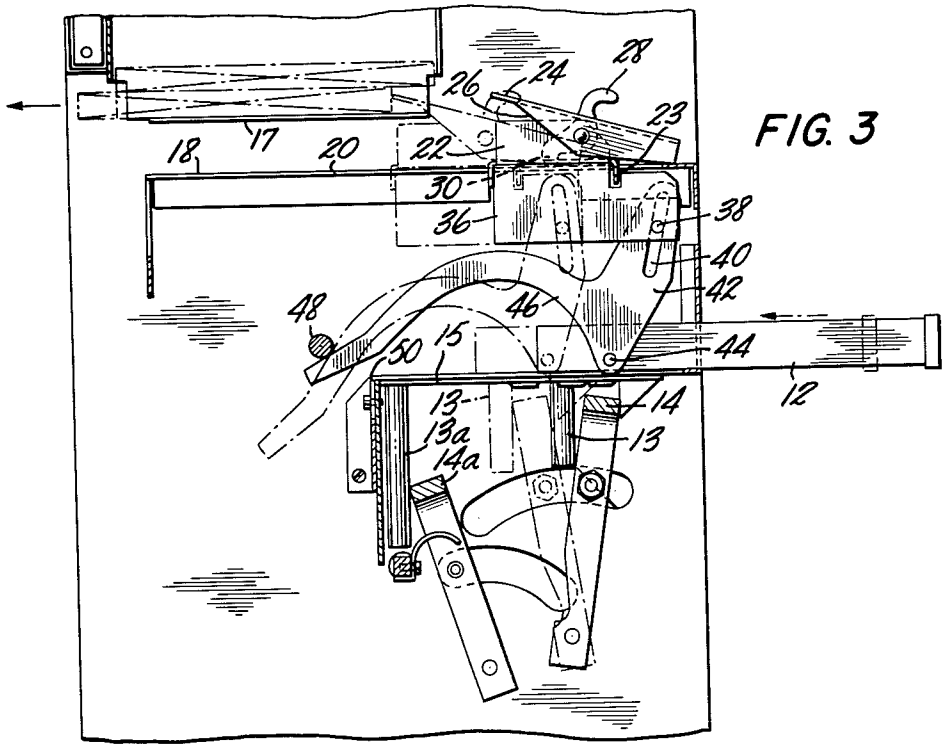


FIG. 3

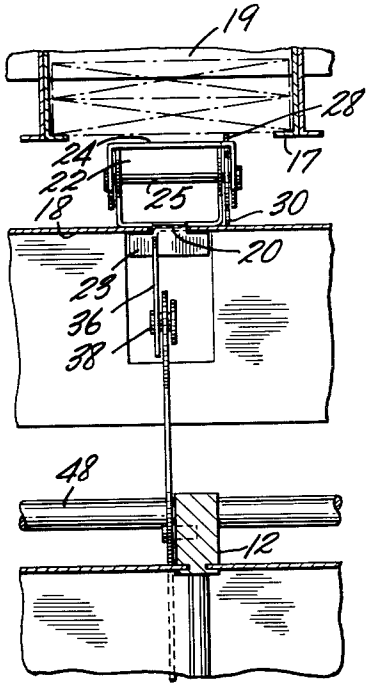


FIG. 4

INVENTORS
JOHN SCHENDORF &
IRVING GOLDBERT

BY Richard S. Shreve Jr.

their ATTORNEY

United States Patent Office 3,262,603 Patented July 26, 1966

3,262,603

VENDING MACHINE EJECTOR

John Schendorf, Metuchen, and Irving Goldbert, Mountainside, N.J. (231 North Ave., Garwood, N.J.); said Schendorf assignor to said Goldbert

Filed Sept. 24, 1964, Ser. No. 398,871
1 Claim. (Cl. 221—273)

This invention relates to vending machine ejectors, and more particularly to devices of this character for delivering from a vending machine the article released by a coin controlled mechanism.

Vending machines are being made and are already in use for vending articles such as cigarette packs, which are of a relatively short length of for example three inches. It has become desirable to adapt such machines to dispense longer articles, such as packs of cigars, which are of a length for example of six inches. It is also desirable to adapt such machines to dispense articles of intermediate length.

However, such machines are actuated by plungers having a relatively short stroke, and the coin control mechanism is fixed for operation by the same short stroke.

For delivering longer articles from a short stroke plunger machine, the longer articles have been stacked on the relatively short supporting rack in front of a delivery opening, so that the relatively short stroke plunger can push the longer pack off the rack to fall through the delivery openings. However the stack of long packages resting on the short rack was subject to toppling. Such toppling was prevented by weights applied to the top of the stack to descend as the packs were removed from the bottom. These weights were expensive, and time consuming in loading the machine.

It is therefore the main object of the present invention to provide mechanism to be installed in a dispensing machine having a short stroke dispensing plunger, and actuated by such plunger for pushing an article to be delivered for a travel longer than said plunger stroke.

Another object is to provide mechanism for such short plunger stroke machines, whereby the same mechanism can be employed to deliver articles of shorter, intermediate and longer lengths from respective stacks thereof.

In an endeavor to increase the capacity of the machines, the height of the supply bins has been increased. However, this increases the weight upon the lowermost article, and consequent friction thereon, rendering it difficult to remove. It is therefore a further object of the invention to take a component of the weight of the upper articles off of the lowermost article thereunder.

According to the present invention, the dispensing machine comprises a pusher movable along a supporting rack below a supply bin and above a housing for a short stroke dispensing plunger, which pusher is movable for a travel longer than the plunger stroke, and mechanism connecting said pusher to said plunger for driving said pusher along said rack for said longer travel in response to said short stroke of said plunger.

Preferably the supply bin has an upper portion inclined with respect to its lower portion at a small angle, to take a part of the component of the weight of the upper articles off of the lowermost article and avoid excessive friction thereof.

Preferably the driving mechanism comprises a lever pivoted on the plunger having an upper arm in camming relation to the pusher, and a lower arcuate arm extending rearwardly between bearing guides, preferably the lower of which is on top of the rear of the plunger housing.

In the drawings:

FIGURE 1 is a plan of the bottom portion of a vending machine adapted for dispensing larger packages, according to the preferred embodiment of the present invention;

FIGURE 2 is a vertical section taken along the line 2—2 of FIG. 1, showing the parts in rearmost position;

FIGURE 3 is a similar view, showing the parts in foremost position in full lines, and in the early part of the delivery stroke in dotted lines;

FIGURE 4 is a section taken along the line 4—4 of FIG. 2; and

FIGURE 5 is an enlarged view of the delivery carriage.

The vending machine is preferably a rectangular box containing a row of storage bins. As shown in FIG. 1, the bins **8** are the shortest, the bins **9** are of intermediate length and the central bin **10** is the longest. The articles stored in the bins are indicated by dot and dash lines.

As shown in FIGS. 2 and 3, the machine is operated by short stroke plungers **12** provided with coin controlled mechanism according to U.S. Patent 2,948,378, of which plunger fingers **13**, **13***a* and rocker arm bars **14** and **14***a* are shown. The plungers **12** slide in plunger guide **15** above the coin controlled mechanism.

The supply bins are provided with supporting racks **17** at the bottoms thereof, comprising inturned horizontal flanges on which the lowest articles rest. As shown in FIG. 2, each supply bin has a vertical portion **19** delivering to the platform **17**. For bins more than a certain height, the bin also has an upper portion **21** delivering to the lower portion **19** and inclined thereto for an angle of 15° to 20°, the form shown being 16½°. This takes a component of the weight of the articles in the inclined portion off of the articles therebelow to prevent excessive friction on the lowermost article on the supply rack.

A transverse floor or support **18** extends across the machine below the bottoms of the racks, and is provided with slots **20** parallel to the plungers **12**. These slots **20** serve as guides for slides **22** of generally rectangular shape, as shown in FIG. 4. Each slide **22** has a flange **23** depending through the slot **20** and extending laterally thereunder.

A pusher **24** is carried by each slide **22** and comprises a channel shape having side flanges fitting over the carriage **22** and pivoted thereto by a pin **25**. The rear ends of the flanges are tapered as at **26** more than their forward ends which are therefore heavier to overbalance the pusher **24**, which rises above the flanges **17** and engages the package at the bottom of the rack, as shown in FIG. 3.

Pivoted on the same pivot **25** on each slide **22** is an empty lock having one arm **28** shown in FIG. 5 registering with a slot **29** in the top of the slide **22** to engage the bottom of the article on the flanges **17**. When the rack is depleted, the arm **26** rises and the hook **30** at the other end thereof descends into a slot **32** in the partition **18**, to prevent further operation of the plunger.

As shown in FIG. 4, the slide **22** has a longitudinal flange **36** riding on the slot **22** and depending therebelow. This flange carries a pin **38** which as shown in FIG. 3, rides in a slot **40** extending longitudinally of the upper arm of a lever **42** pivoted on a pin **44** on the plunger **12**. This lever has an arcuate arm **46** extending rearwardly between bearing guides **48** and **50**. The guide **48** is a cross rod and the guide **50** is on top of the rear of the plunger housing **15**.

In operation, assuming that the proper coinage has been supplied to clear the coin controlled mechanism, and the parts are in the position shown in FIG. 2, the customer pulls the plunger **12** out for the forward stroke, which carries therewith the lever pivoted thereto. The arcuate arm **46** rides over the bearing guide **50**, which cams the arm **46** upwardly, turning the arm **42** rapidly forwardly about the pivot **44**, which is also moving with

th plunger **12**. The combined motion causes the slot **40** to cam the pin **38** forwardly, increasing the travel of the slide **20**, and bringing the parts to the position shown in full lines in FIG. 3.

The customer then pushes the plunger inwardly for the rearward stroke, causing the bearing surface **48** to cam the arcuate upper surface of the arm **46** rapidly downwardly about the pivot **44**. This causes the slot in arm **42** to cam the pin **38** and slide **22** rapidly rearwardly toward the platform **17** to the position shown in dotted lines, at which time the pusher **24** engages the bottom package.

Further or continued push on the plunger **12** ejects the package, and the next package descends onto the top of pusher **24** to swing it about pivot **25** into horizontal position as shown in FIG. 5, and to slide under the package on the next forward stroke. At the same time, the package descends onto the empty lock arm **28**, to pull the hook **30** out of the path of the slot **32**, to free the carriage for the next forward stroke.

What is claimed is:

An article dispensing machine having a short stroke dispensing plunger, a guide for said plunger, a storage bin for the articles positioned above said guide having at the bottom thereof a supporting rack, a support positioned between the rack and the guide, a pusher movably mounted on said support for a travel longer than said plunger stroke, a lever pivoted on said plunger having an upper arm connected to said pusher by means of a pin and slot connection and a lower arcuate arm extending rearwardly therefrom, upper and lower camming members, said upper camming surface pushing said arcuate arm downwardly about its pivot as said plunger moves forward, said lower camming member for camming said arcuate arm upwardly during the return stroke of the plunger.

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ROBERT B. REEVES, *Primary Examiner.*

WALTER SOBIN, *Examiner.*