Sept. 17, 1963 K. G. BROWN 3,104,028

ARTICLE DISPENSING MEANS

Filed Sept. 15, 1961 5 Sheets-Sheet 1

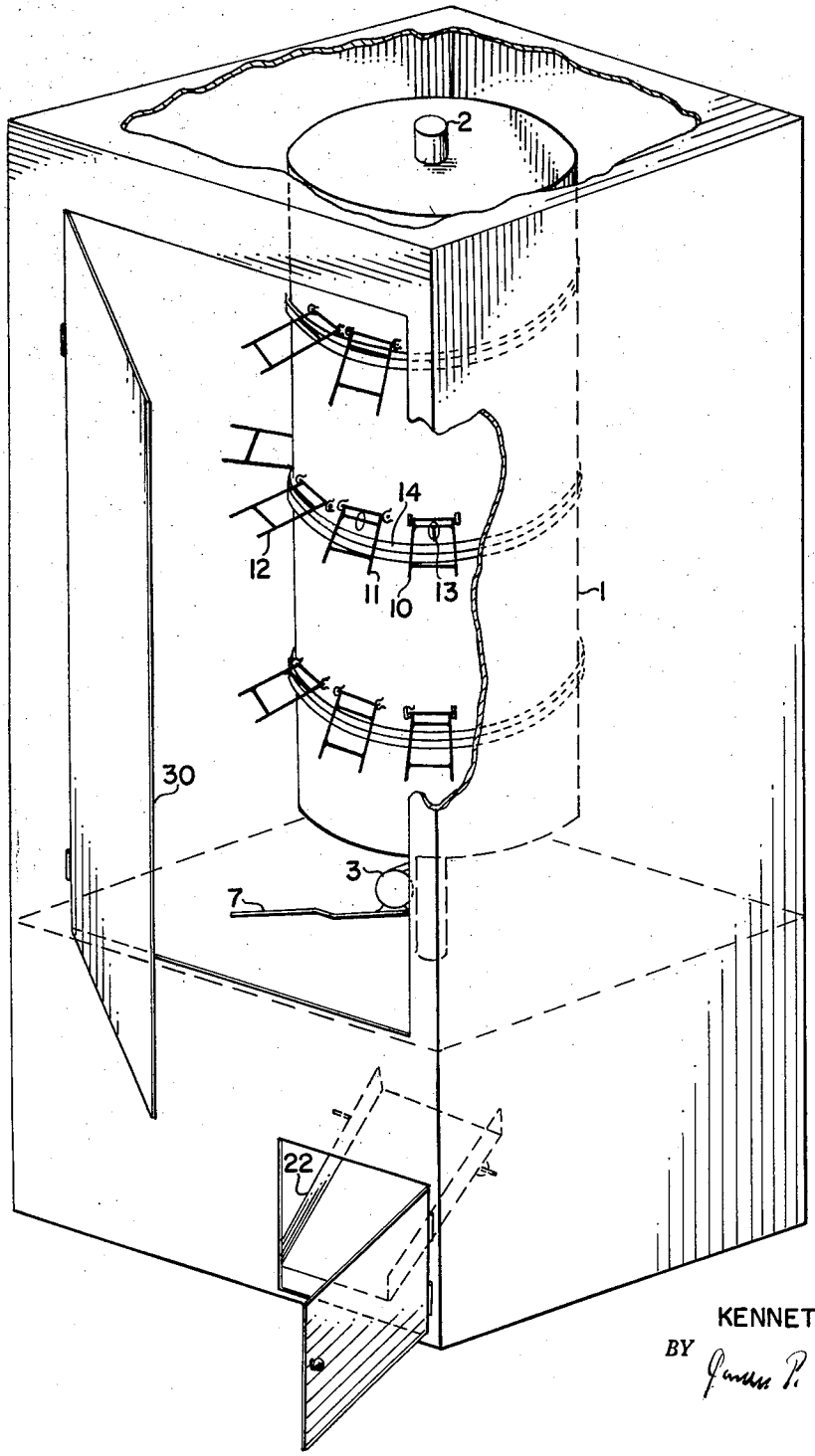


FIG. 1

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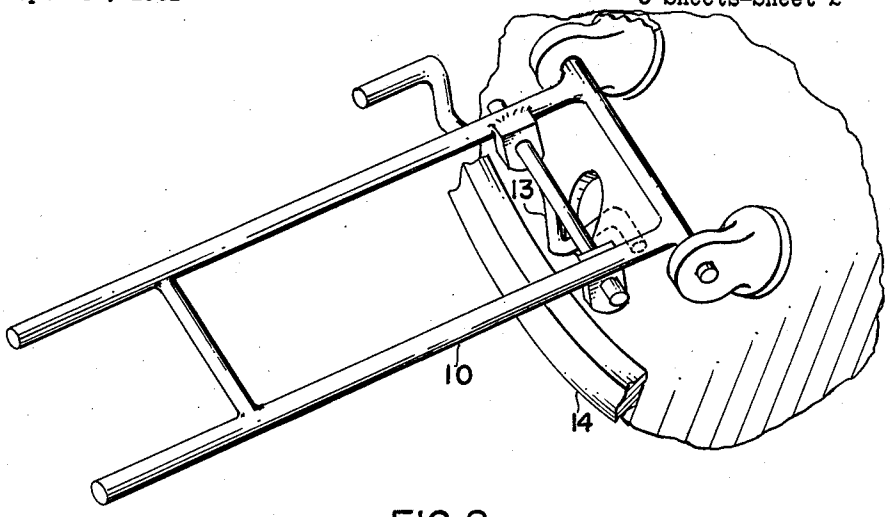


FIG. 2

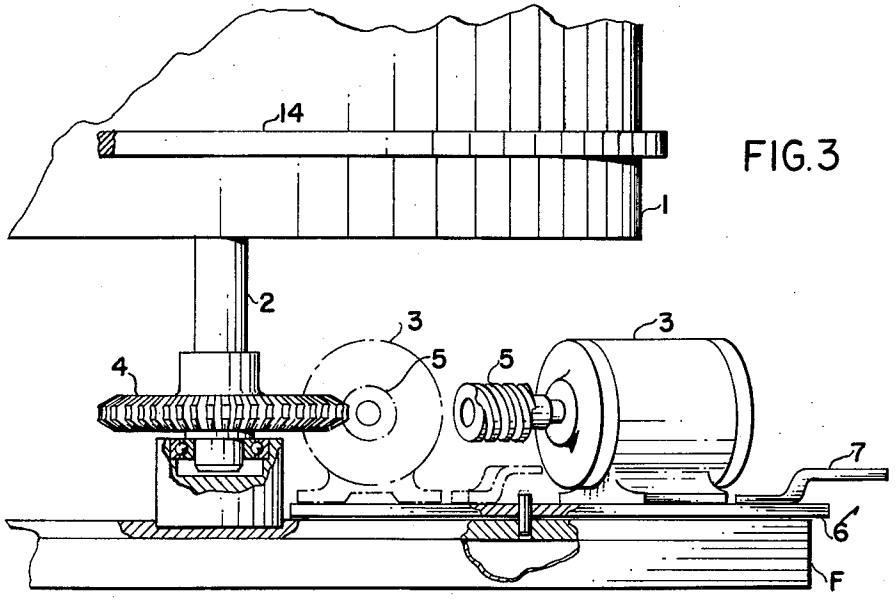


FIG. 3

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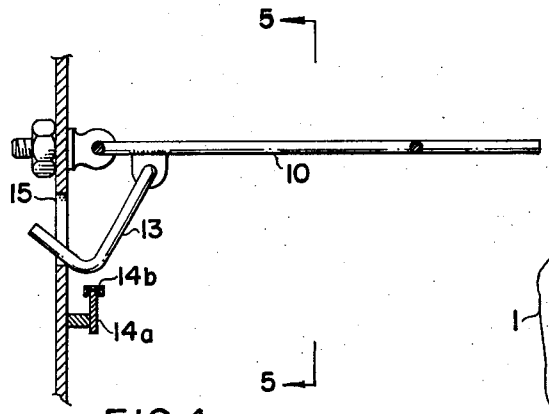


FIG. 4

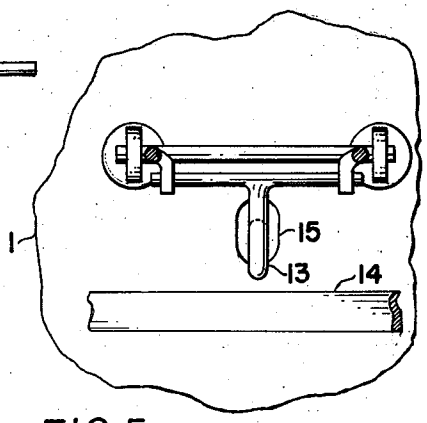


FIG. 5

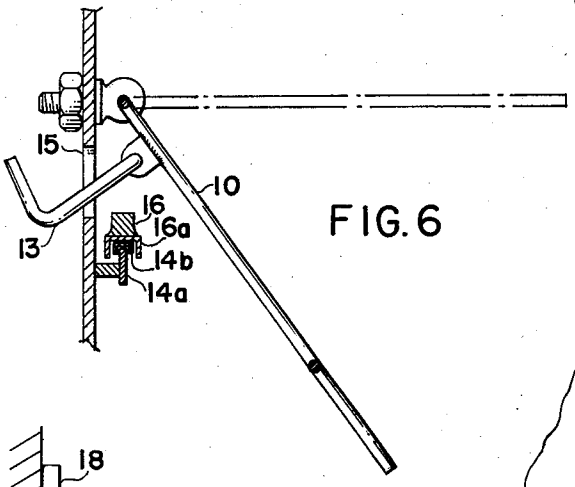


FIG. 6

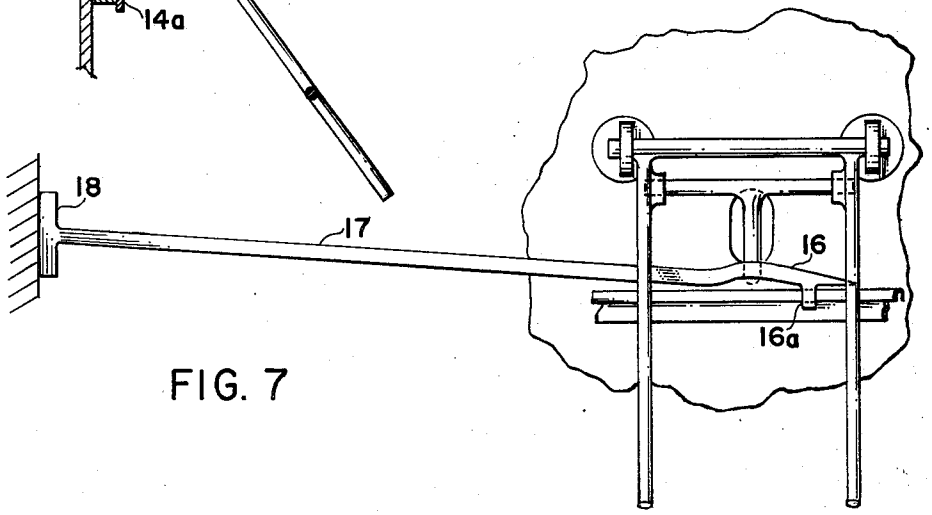


FIG. 7

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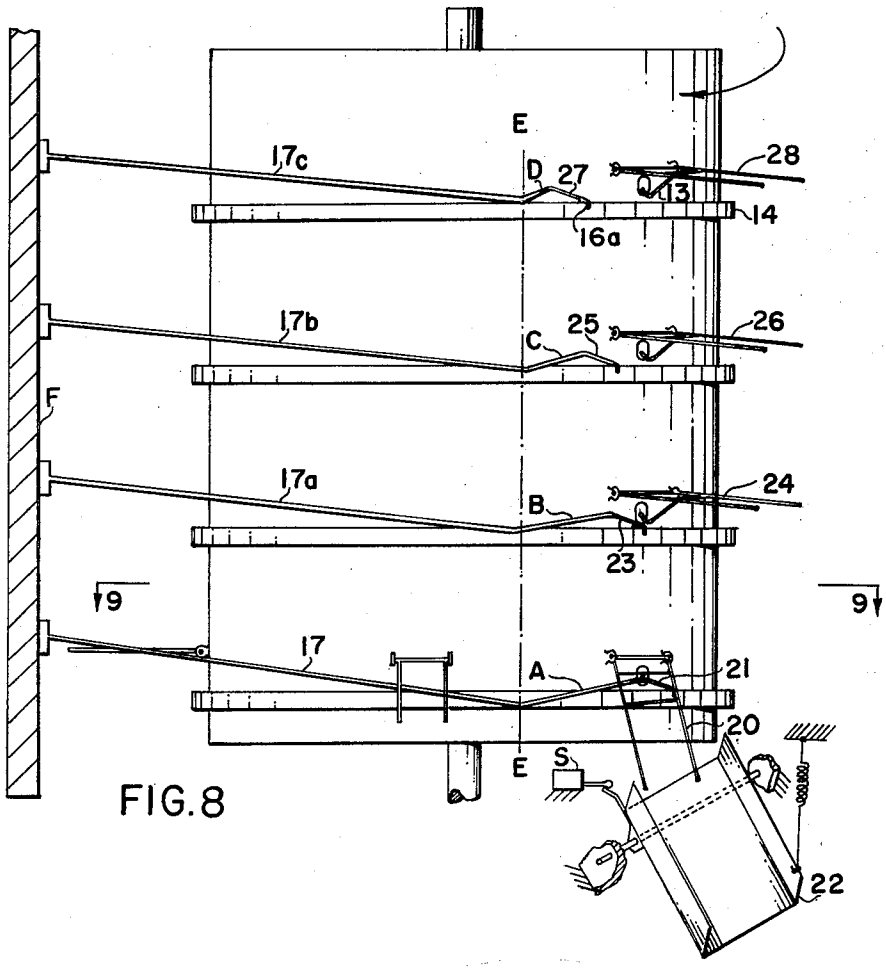
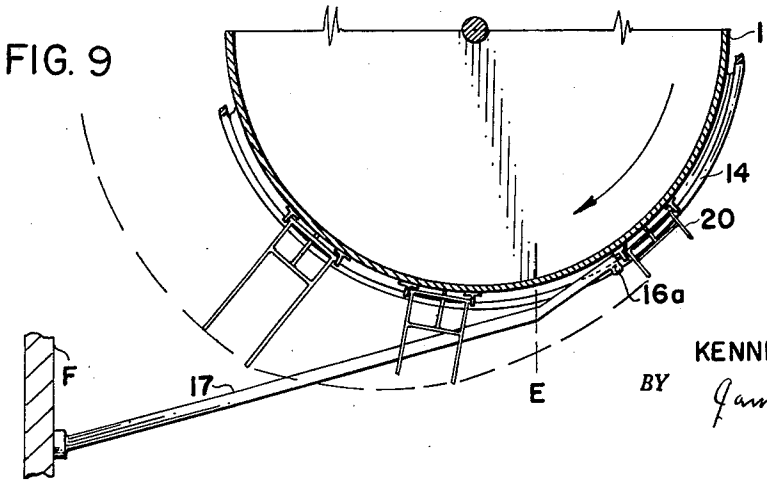


FIG. 8

FIG. 9



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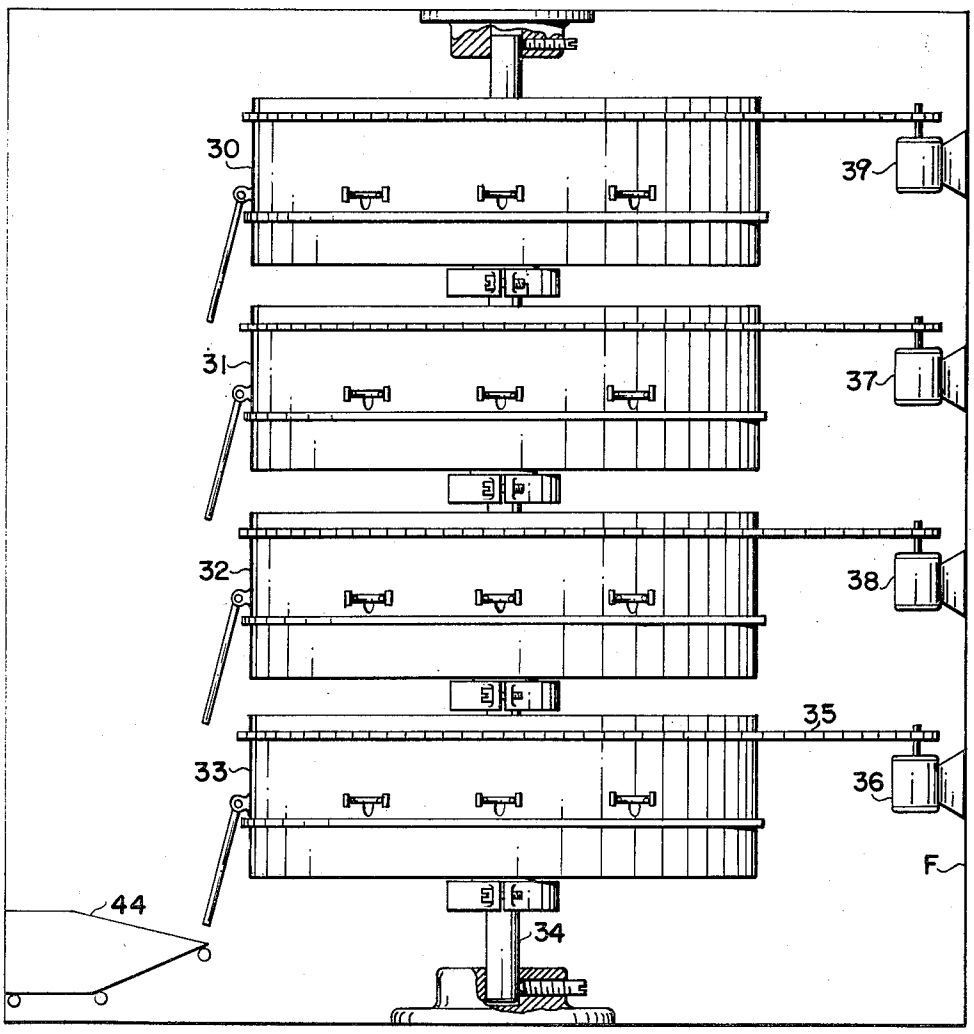


FIG. 10

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3,104,028
ARTICLE DISPENSING MEANS

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2 Claims. (Cl. 221—86)

This invention relates to article dispensing means, and more particularly to means for dispensing stored articles singly to an exit chute.

The present invention provides apparatus for dispensing relatively bulky articles, for instance from a vending machine, such as bags of ice cubes, bags of charcoal, potatoes, or other equivalent articles. The present device is particularly adapted for refrigerated articles, as the design is such that there will be a minimum of moving parts which are liable to become frozen, or otherwise stick or bind.

More particularly, the present invention generally comprises a barrel member rotatably mounted about a vertical axis. One or more rows of wire racks are pivotally mounted on the outer surface of the barrel member so that they normally extend radially in a horizontal plane for carrying the articles. When it is desired to dispense one of the articles, the barrel is rotated by a motor and means are provided to trip one of the racks over an exit chute so that the article on the rack will fall into the exit chute.

The tripping means are as follows: The racks are held in horizontal position by means of a hook shaped member which is pivotally mounted on a rack and which engages a slot in the barrel member. The bottom curved surface of the hooked member is supported at the bottom of its slot on the barrel. At the point where it is desired to trip the rack, a lifting shoe riding on the bearing ring comes in contact with the hook lock and causes it to raise and rotate within the holding slot so that the rack falls down and discharges the article.

In one embodiment of the invention different classes of articles may be dispensed interchangeably. In this modification a plurality of separate drums are mounted on a stationary vertical shaft and separately driven. This is possible, for all drums will have their racks in the dumped position at the exit point, thereby causing no interference from ones below.

Accordingly, a principal object of the invention is to provide new and improved article dispensing means.

Another object of the invention is to provide new and improved article dispensing means for handling bulky and heavy articles, such as bags of ice, charcoal, or potatoes.

Another object of the invention is to provide new and improved article dispensing means suitable for vending machines which are simple in construction and economical to build and maintain.

Another object of the invention is to provide new and improved article dispensing means which are adapted to handle refrigerated articles.

Another object of the invention is to provide new and improved article dispensing means which are adapted to dispense different classes or categories of articles.

Another object of the invention is to provide new and improved article dispensing means which are easy to load and in which the products first loaded are dispensed first.

These and other objects of the invention will become apparent from the following specification and drawings of which:

FIG. 1 is a side perspective view of an embodiment of the invention,

FIGS. 2 and 3 are side detail views of the embodiment of FIG. 1,

FIGS. 4, 5, 6, and 7 are diagrams illustrative of the operation of the invention.

FIGS. 8 and 9 are diagrams illustrative of the timing sequence of the invention, FIG. 9 being in section.

FIG. 10 is a perspective view of another embodiment of the invention.

Referring to the figures, the invention generally comprises a metal barrel **1**, which is fixedly mounted on a rotatable vertical shaft **2**, rotatably mounted in frame F and which is adapted to be driven by means of a motor **3**, FIG. 3. Motor **3** is connected to the shaft **2**, by means of a ring gear, **4**, mounted on the shaft and a worm gear **5**, mounted on a motor shaft. The motor is mounted on a bracket **6**, which is pivoted on the frame F and a handle **7** is connected to the bracket **6**, so that by rotating the handle the motor may be disconnected from the shaft. This permits easy rotation of the shaft which is desirable when loading the apparatus with articles.

A plurality of racks **10**, **11**, **12**, etc. are pivotally mounted in horizontal rows on the surface of the barrel **1**, and the racks are adapted to be held in horizontal position, extending radially from the barrel, by means of hook members **13** (see FIGS. 4 to 7) which are pivotally mounted on the rack member. The hooked members **13** have an angle shape and when the rack is in horizontal position the angled bottom portion of the hook **13** rides slightly above or on a bearing ring **14**, which may be of nylon, which is mounted on the barrel **1**. With the hook **13** in the position shown in FIG. 4, the hook extends through a slot **15** in the barrel **1**, so that the lower curved portion of the hook bears against the lower lip of the slot **15** and holds the rack **10** in horizontal position.

In order to trip the rack down at a predetermined point over the exit chute **22**, a lifting shoe **16** rides on the bearing ring **14** so that as the barrel rotates past it causes the hook to rise on the lifting shoe **16** and fall through the slot **15**, thereby permitting the rack **10** to fall as shown in FIG. 6, thereby discharging the article. The bearing ring **14** may be an iron or steel strip **14***a* preferably with a nylon cap **14***b*. The shoe **16** has a U shaped guide or staple **16***a* which rides on ring **14**.

The lifting shoes **16** are mounted on rod members **17**, the other end of which are rigidly connected to the frame F for instance by means of a lock **18**. The rod members **17** act as guides so that upon further rotation of the barrel **1** the racks will ride up on the guide **17** as shown in FIG. 9 until the hooks **13** are pulled out of the slots into the locking position for holding the racks in normal horizontal position.

FIGS. 8 and 9 show the placing of the rods **17** and lifting shoes **16** for a four layer arrangement of racks. The lifting shoes are placed so that the racks on the lower level trip first then the rack on the second level, third level, fourth level. Thereafter, after all of the racks in one vertical set have been tripped, the racks are then restored to normal horizontal position on further rotation of the barrel, whereupon the racks are lifted to loading position by rod **17**.

More specifically, referring to FIGURES 8 and 9, the barrel is rotating in the direction of the arrow. Therefore, the rack **20** will encounter the lifting shoe **21** and will be the first rack tripped down to discharge its article into the common guide chute **22**. Upon the next rotation movement of the barrel **1**, the lifting shoe **23** on the second lowest level will trip the rack **24**. Upon the next rotation movement the lifting shoe **25** will trip the rack **26**. Upon the next rotation movement thereafter, the lifting shoe **27** will trip the rack **28**. The amount of the rotation movements of the barrel are controlled by the time which the motor operates which is controlled for instance by a limit switch S at the chute that a package falls on. The drum will rotate until a package falls. Each motor cycle may be actuated by a conventional coin

control if it is desired to use the present invention in a coin controlled vending machine.

Note that the lowest rack is tripped first then the next lowest, etc., so that articles discharged from the higher levels will not be caught by the lower racks, but will fall in chute **22**. As the barrel rotates the tripped racks on the lower levels remain in tripped or vertical position until all of the racks in a vertical set are tripped. Thereafter upon further rotation of the barrel the racks will ride up on the guide rods **17**, **17***a*, **17***b*, **17***c*, so that the racks will then be restored to normal horizontal position. This is accomplished by making portions A, B, C, and D of the guide members of different lengths. For instance, the portion A of the guide member **17***c* is made longer than the portion B of the guide **17***b*, which in turn is longer than the portion C of the guide **17***a*. Therefore, all of the racks in one vertical set will remain in tripped position until they reach the position indicated by the line E, after which point, upon further rotation of the barrel, the racks will ride up the guide member **17**, **17***a*, etc. until the hooks **13** are pulled out of the slots in the locking position. After the hooks are locked the racks ride off the guides, as illustrated in FIG. 9.

Referring again to FIG. 1, the apparatus may be loaded manually by opening the loading door **30** and operating the handle **7** to disengage the motor drive. The barrel may then be easily turned by hand for loading all of the racks.

FIG. 10 shows a modification of the invention for dispensing different classes of articles. In this arrangement a plurality of drums **30**, **31**, **32**, **33** are rotatably mounted on a stationary shaft **34**. Each drum is adapted to be separately driven by means of a separate chain and motor. For instance, the drum **33** is adapted to be driven by means of the chain **35** connected to motor **36** and the other drums are adapted to be driven by the motors **37**, **38**, **39**, all of which are fixedly mounted on the frame F and adapted to be separately controlled for instance, by a conventional selective coin control.

Each of the drums contains a plurality of pivotally mounted racks which operate in the same manner as previously described. All racks are in a tripped position when in the designated area over the chute **44**. These racks cannot be loaded by reason of the tripper. Therefore, no package can fall on any other. In other words one vertical set of racks over the exit chute is always in dumped position, as previously described. Therefore, the fully loaded capacity of each drum is the number of racks minus one. The racks are tripped and restored to position as previously described.

Many modifications may be made by those desiring to practice the invention without departing from the scope thereof which is defined by the following claims.

I claim:

1. Article dispensing means comprising a barrel member mounted about a rotatably vertical shaft, a row of slots in said member equally spaced around the periphery of said member in a horizontal plane, a bearing ring connected to said member in a horizontal plane below said slots, a plurality of racks pivotally mounted on said member, means to support said racks in a horizontal plane comprising a hook member pivotally mounted on each of said racks, each of said hook members engaging one of said slots in said member said hooks riding on said bearing ring, means to trip one of said racks to cause said rack to fall from the horizontal position comprising a lifting shoe on said bearing ring said shoe causing said hook member to rise and rotate in the said slot, guide means to restore said rack to horizontal position upon further rotation of said barrel, a motor and means to connect and disconnect said motor and mid shaft.

2. Article dispensing means as in claim 1, wherein said member has a plurality of horizontal rows of racks, said racks being arranged in vertical sets, a plurality of tripping means, one adjacent each horizontal row of racks said tripping means being displaced horizontally in such manner that a rack on the lowest plane is tripped first then the rack on the next highest plane and so on, and guide means to restore said racks to horizontal position after all the racks in one vertical set have been tripped.

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