Sept. 24, 1963 R. S. DENZER 3,104,779

VENDING MACHINE

Filed Jan. 19, 1961 3 Sheets-Sheet 1

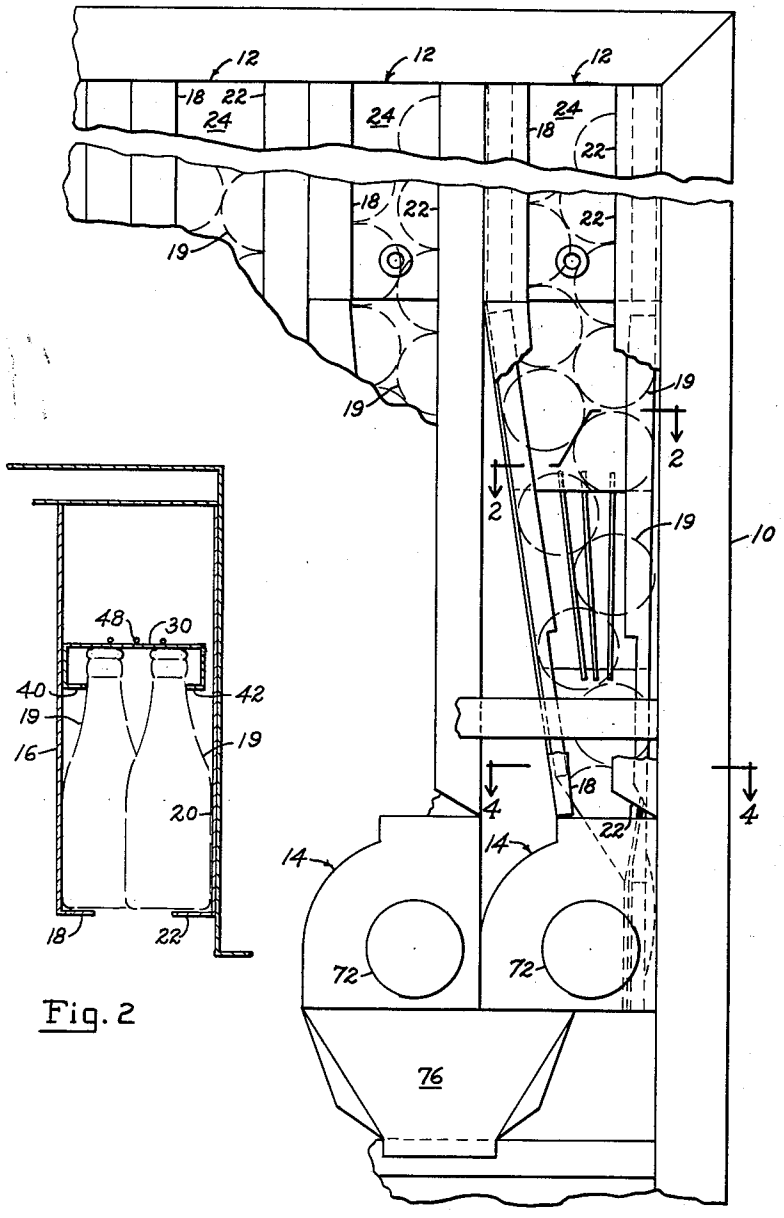


Fig. 1

Fig. 2

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Sept. 24, 1963 R. S. DENZER 3,104,779

VENDING MACHINE

Filed Jan. 19, 1961 3 Sheets-Sheet 2

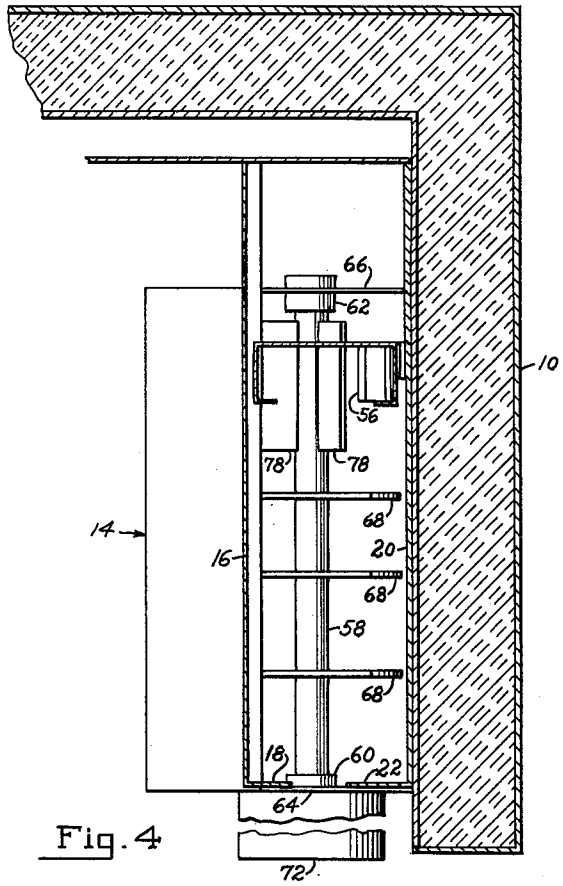


Fig. 4

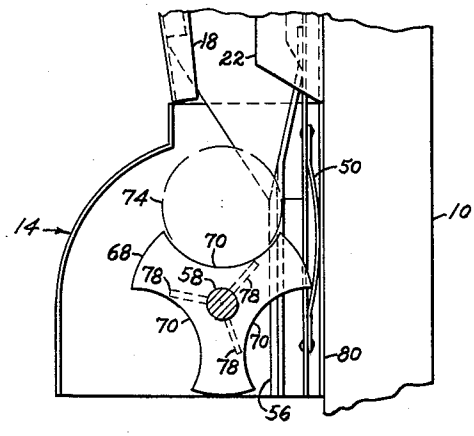


Fig. 3

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Sept. 24, 1963 R. S. DENZER 3,104,779

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Filed Jan. 19, 1961 3 Sheets-Sheet 3

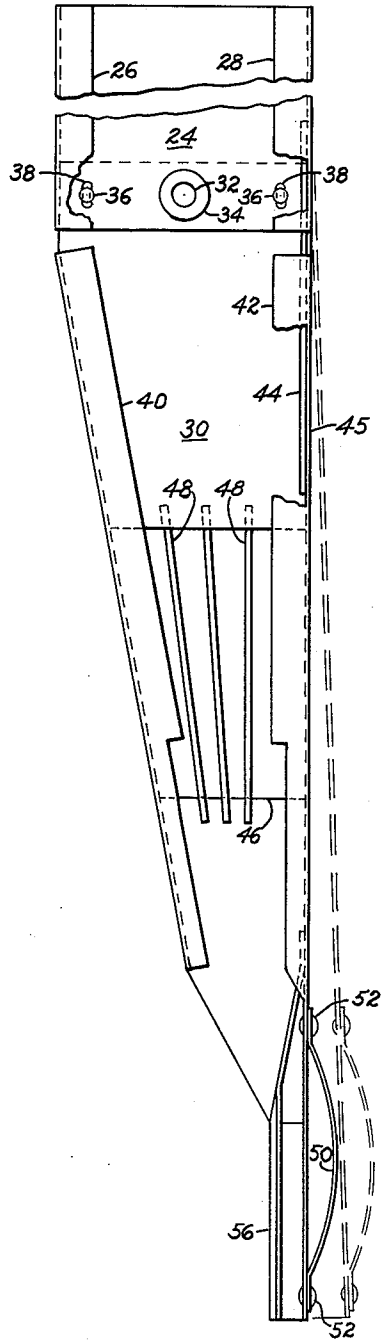


Fig. 5

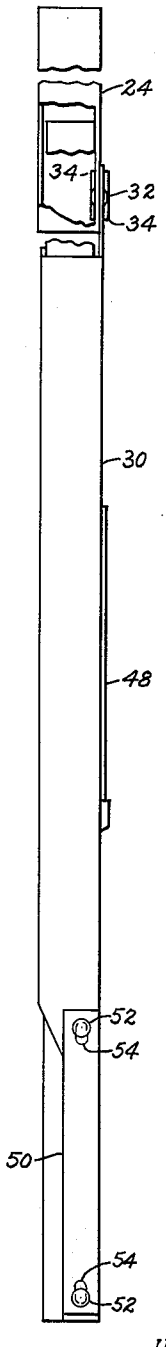


Fig. 6

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3,104,779
VENDING MACHINE

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11 Claims. (Cl. 221—200)

This invention relates to vending machines of the type for dispensing a unit number of articles incident to each operation of the machine. More particularly, this machine is adapted for cooling bottled beverages and dispensing such cooled bottled beverages to an access opening.

While the machine is shown and described as being constructed and arranged for dispensing bottled beverages, it is apparent that it is adapted to dispense other types of articles.

More particularly this invention is directed to vending machines for storing a large number of bottles for gravity feed to a motor driven mechanism which is energized by a coin control mechanism to discharge a bottle when a coin is inserted in the coin control mechanism.

It is an object of this invention to provide a storage chute which will store a double row of bottles and feed such bottles one at a time to a bottle discharge mechanism.

It is another object of the invention to arrange adjacent assemblies of chutes and discharge mechanisms to direct bottles from a plurality of chutes to a single access area.

It is another object of the invention to provide a motor driven bottle discharge mechanism which moves to simultaneously discharge a bottle and move a portion the chute to cause the bottles in the chute to move downwardly by gravity toward the discharge mechanism.

Other objects and advantages of this invention will become apparent as the specification proceeds to describe the invention with reference to the accompanying drawings in which:

FIGURE 1 is a partial front elevational view of the machine with the door removed to more clearly show the mechanism.

FIGURE 2 is a cross-sectional view taken on line 2—2 of FIGURE 1.

FIGURE 3 is a partial enlarged front elevational view showing the bottle discharge mechanism with its front plate removed to show the interior including the chute moving mechanism.

FIGURE 4 is an enlarged sectional view taken on line 4—4 of FIGURE 1.

FIGURE 5 is an enlarged front view of the bottle neck guide.

FIGURE 6 is a nenlarged side view of the bottle neck guide.

Referring now to the drawings and FIGURE 1 in particular, numeral 10 indicates a heat insulated cabinet. In the upper portion of the cabinet 10 are a plurality of bottle chutes indicated generally by numeral 12. At the lower end of each chute 12 is a bottle discharge mechanism indicated generally by numeral 14.

The bottle chutes 12 each have a side plate 16 which has a flange 18 to engage and guide the bottoms of the bottles 19. The bottle chutes 12 each have a side plate 20 which has a flange 22 which engages the bottoms of the bottles 19. The side plates 16 and 20 incline toward each other at their lower portions. Referring to FIGURES 5 and 6, a guide 24 is secured to the side plates 16 and 20 and extends therebetween. The guide 24 engages and guides the tops of the bottles 19 and it has flanges 26 and 28 which engage and guide the necks of the bottles 19.

A lower guide 30 is pivotally secured to guide 24 by a

rivet 32 and washers 34. Rivets 36 are secured to guide 30 and slide in arcuate slots 38 in guide 24 to limit pivotal movement of guide 30. Guide 30 has flanges 40 and 42 which engage and guide the necks of the bottles 19. A bar 44 extends downwardly from guide 24 and is engaged by flange 45 on guide 30 to limit the extent of clockwise pivotal movement of guide 30 as viewed in FIGURE 5.

Guide 30 has an opening 46 for the passage of cold air for cooling the bottles 19. Bars 48 are secured to guide 30 to guide the bottles across the opening 46.

A leaf spring 50 is mounted by rivets 52 on the lower end of flange 45 of guide 30. The spring 50 has slots 54 which permits the ends of the spring 50 to move relative to the rivets 52 when the spring 50 is compressed.

A follower 56 is secured to the lower end of guide 30. Follower 56 is preferably of plastic material having a relatively low co-efficient of friction.

Discharge mechanism 14 has a shaft 58 rotatably mounted in bearings 60 and 62 which are secured respectively to the front plate 64 and rear plate 66. Mounted on the shaft 58 and rotatable therewith are three discs 68 having three bottle receiving recesses 70.

A gear motor 72 is secured to front plate 64 and is drivingly connected to shaft 58. Gear motor 58 is a well known device which is energized through a check control mechanism (not shown). The gear motor 72 drives the shaft 58 through a third of a revolution each time that it is energized. The check control mechanism energizes the gear motor 58 when a coin of the proper denomination is deposited, all in a well known manner.

It is thus evident that upon deposit of a coin, the gear motor 72 drives the shaft 58 through a third of a revolution to discharge the bottle 74 in the upper recess 70 as shown in FIGURE 3. The bottle 74 then falls by gravity to an inclined tray 76 on which it slides forwardly to a point opposite an access opening in the door of the machine. The buyer can reach through the access opening to obtain the bottle.

I have found that it is necessary to agitate the bottles in the chute in order to insure that they will not "hang up" but will move downwardly by gravity to fill the upwardly facing recesses in the discs 68. In order to agitate the bottles 19 in the chute 12, I have provided cam means in the form of vanes 78 mounted on shaft 58. The three vanes 78 are angularly arranged with respect to the cavities so that upon initial rotative movement of the shaft 58, a vane 78 moves against the follower 56 to pivotally move the lower guide 30 counterclockwise about the pivot 32. This pivotal movement compresses the spring 50 against the side of 80 of the release mechanism 14. Upon further rotation of the shaft 58 the operative vane 78 moves in a direction away from the follower 56, and the compressed spring 50 pivotally moves the lower guide 30 clockwise to its original position.

When the lower guide 30 is moved counterclockwise, the flange 40 moves against the necks of the bottles 19 at the left side of the chute 12 to move them to the right. When the lower guide 30 is moved clockwise, the flange 42 moves against the necks of the bottles 19 at the right side of the chute 12 to move them to the left. The movement of each bottle with respect to its adjacent bottles prevents the bottles from "hanging up" in the chute 12.

Although the release mechanism has been shown and described as having three recesses 70 in the discs 68 and three vanes 78, a different number of vanes and recesses may be used. For instance, if the discs 68 should have two recesses, there would be two vanes and the gear motor 72 would drive the shaft through one half of a revolution for each energization.

Although I have shown and described a specific embodiment of this invention, it is to be understood that various modifications may be made without departing from the

spirit and scope of the invention, and therefore I desire to be limited only by the claims.

I claim:

1. In a vending machine having discharge mechanism adapted to deliver single articles, a storage chute for storing and delivering articles by gravity toward said mechanism and having an upper portion in which a plurality of rows of articles are stored side by side, said chute having a width materially exceeding the width of one such article, whereby the articles stored in said chute exceed in width a single row of articles, a guide unit comprising connected guide means spaced at their upper ends by an amount materially in excess of the width of a single article whereby to receive articles from the upper portion of the chute, the guide means being downwardly convergent toward said mechanism and spaced at their lower ends by a distance which does not materially exceed the width of a single article whereby to direct into a single row in the lower portion of the chute the articles approaching said mechanism, and means for facilitating single row rearrangement of articles traversing the lower portion of the chute and comprising means pivotally mounting said guide means for limited oscillatory movement, said discharge mechanism including cam means and said guide means having cam follower means connected therewith for effecting oscillation of said guide means incident to the functioning of the discharge mechanism in the delivery of an article.

2. In a vending machine for elongated articles the combination with delivery mechanism including a rotor elongated in the direction of the length of the articles and having a cavity for a single article, a storage chute above said rotor having an upper portion of a width materially in excess of the width of a single article, whereby the storage chute upper portion accommodates a plurality of articles side by side, said chute including in its lower portion interconnected downwardly convergent guide means spaced at opposite sides of the path of downward movement of articles in the chute, the said guide means being widely spaced at their upper ends by a distance materially exceeding the width of one article and being sufficiently close together at their lower ends to deliver successive articles in a single row as the articles approach said rotor, means for pivotally supporting a part of said guide means and about which the lower part of said guide means is oscillatable, and means for intermittently oscillating said guide means to engage and manipulate end portions of successive articles to facilitate their arrangement in a single row as they approach said rotor.

3. In a vending machine for horizontally disposed bottles of elongated form, the combination with a dispensing rotor having a generally horizontal axis and horizontally extending bottle receiving channels, of a bottle chute generally upright above the rotor and including an upper portion of sufficient width to receive a plurality of rows of bottles in which the bottles of respective rows are stacked in mutual contact, said chute including a lower portion having convergent means for receiving bottles from said plurality of rows and concentrating them into a single row as they approach the rotor, and means for facilitating the rearrangement of the bottles into a single row from said plurality of rows, said last means including convergent guide elements engageable with neck portions of successive bottles, means mounting said guide elements for oscillation transversely respecting the direction of downward movement of the bottles, and means for oscillating the guide means to engage successive bottles to facilitate the rearrangement thereof.

4. A vending machine according to claim 3 in which the guide means is independent of the lower portion of said chute, the lower portion of the chute being fixed against oscillation and the guide means being oscillatable with respect thereto, the guide means including portions at a lesser spacing than the convergent side walls of the chute at any given level and disposed in the chute to engage the necks of the bottles therein.

5. In a vending machine for horizontally disposed articles of elongated form, a storage chute of dimensions such as to receive a plurality of vertical rows of such articles, said chute being provided with downwardly convergent guide means having an upper receiving end at which the guide means are spaced materially in excess of the width of a single article to receive articles from the separate vertical rows and having a lower discharge end dimensioned to pass articles in a single row, means for delivering successive single articles from the discharge end of said guide means, and means for facilitating the rearrangement of articles into a single row from said plurality of rows of said articles, the rearrangement facilitating means comprising guide elements constituting a part of said guide means, means pivotally mounting the guide elements at their upper ends, means connecting the guide elements for concurrent movement about the pivotal mounting means, means for limiting the amount of such pivotal movement to a movement which does not interfere with the movement of articles to the discharge end of the guide means, and means for intermittently effecting such pivotal movement to engage said elements oppositely with articles from said plurality of rows to urge such articles into said single row.

6. A vending machine according to claim 5 in which the delivering means includes a part movable in the course of article delivery and mechanism connects said part with at least one of said guide elements at a point below said pivot means to constitute the means for intermittently effecting pivotal movement of said elements.

7. In a bottle vending machine for discharging horizontal bottles, the combination with a dispenser having movable means for delivering a single bottle, of a gravity storage chute leading downwardly to said dispenser and comprising upper and lower portions, the upper portion of said chute having a width materially exceeding the width of one bottle and sufficient in capacity for a plurality of vertical rows of bottles and the lower portion of said chute including front and rear walls downwardly convergent to pass bottles in a single row to said dispenser, said walls having bottle confining flanges engageable with the bottoms of bottles between said walls, an oscillatable unit including downwardly converging guide elements disposed between said walls in a position for engagement with the necks of bottles to facilitate their rearrangement from said plurality of rows to said single row, and means above said lower chute portion for pivotally supporting said oscillatable unit, and motion transmitting connections between said dispenser means and the said oscillatable unit for the oscillation of said unit upon the dispensing of a bottle.

8. In a dispenser for horizontally elongated articles, the combination with an article discharge mechanism comprising means for passing a single such article, of a generally upright storage chute leading to said mechanism and including an upper portion having a width greatly exceeding the width of a single article, whereby articles are stored in side by side offset relation in said upper portion, the storage chute further including a lower portion having opposed, connected, downwardly converging article guiding means spaced adjacent the upper chute portion to receive articles therefrom and spaced adjacent said discharge mechanism to pass only a single article at a time to said mechanism, and means for providing pivotal mounting upon which said guiding means oscillate, said guiding means including article engaging portions which are alternately engageable with selected articles in the oscillation of said guiding means, and means for oscillating said guiding means to facilitate rearrangement of articles traversing the lower portion of said chute toward said mechanism.

9. A dispenser according to claim 8 in which said mechanism is adapted to dispense bottles and said guiding

means portions are exposed in positions to engage only the neck portions of bottles traversing the lower portion of said chute toward said mechanism.

10. A dispenser according to claim 8 in which said mechanism includes a rotor having cam means mounted thereon and said guiding means has cam follower means engaged by said cam means for the oscillation of said guiding means.

11. A dispenser according to claim 10 in which said guiding means and the lower portion of said chute have spring means for limiting and cushioning displacement of said guiding means by said cam means.

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