June 14, 1949. J. R. DONALDSON ET AL 2,473,054

BOTTLE VENDING MACHINE

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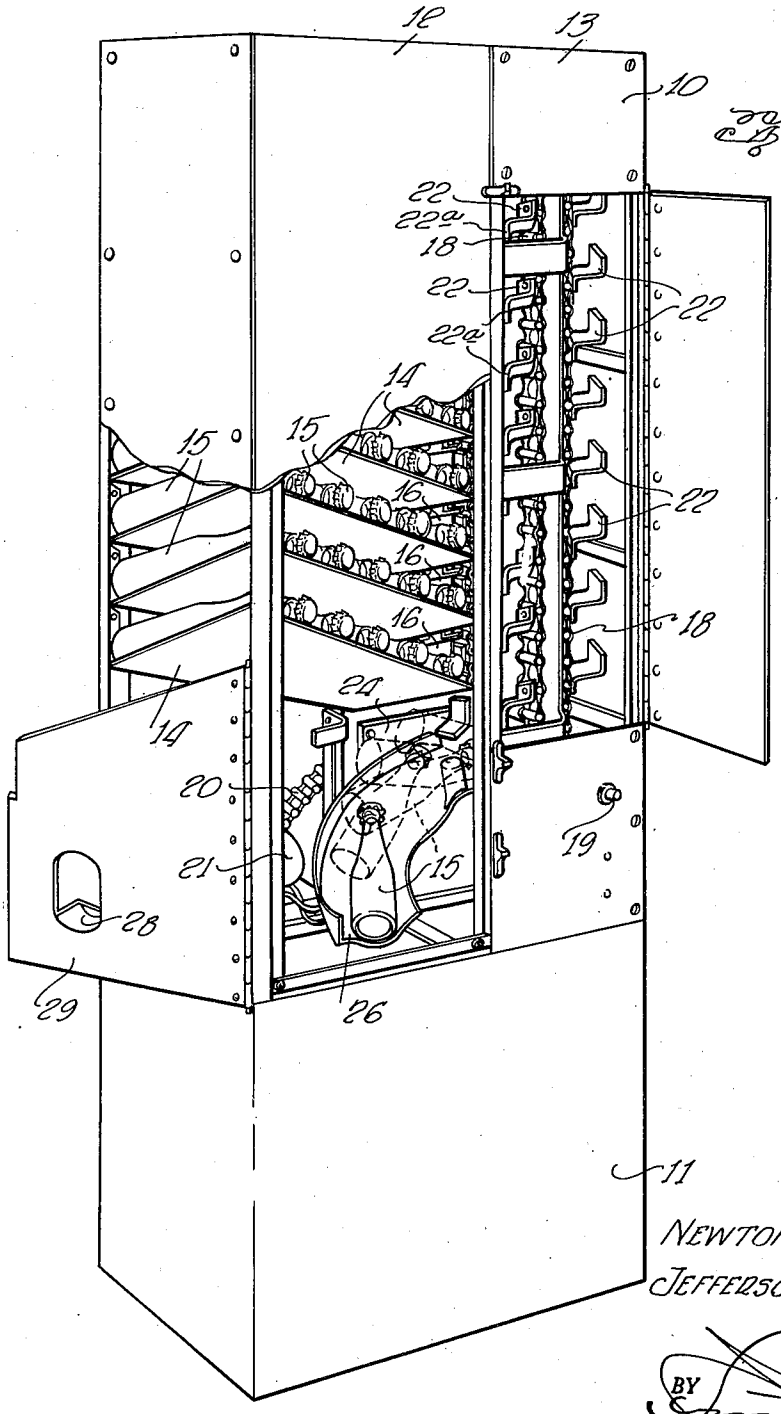


Fig. 1.

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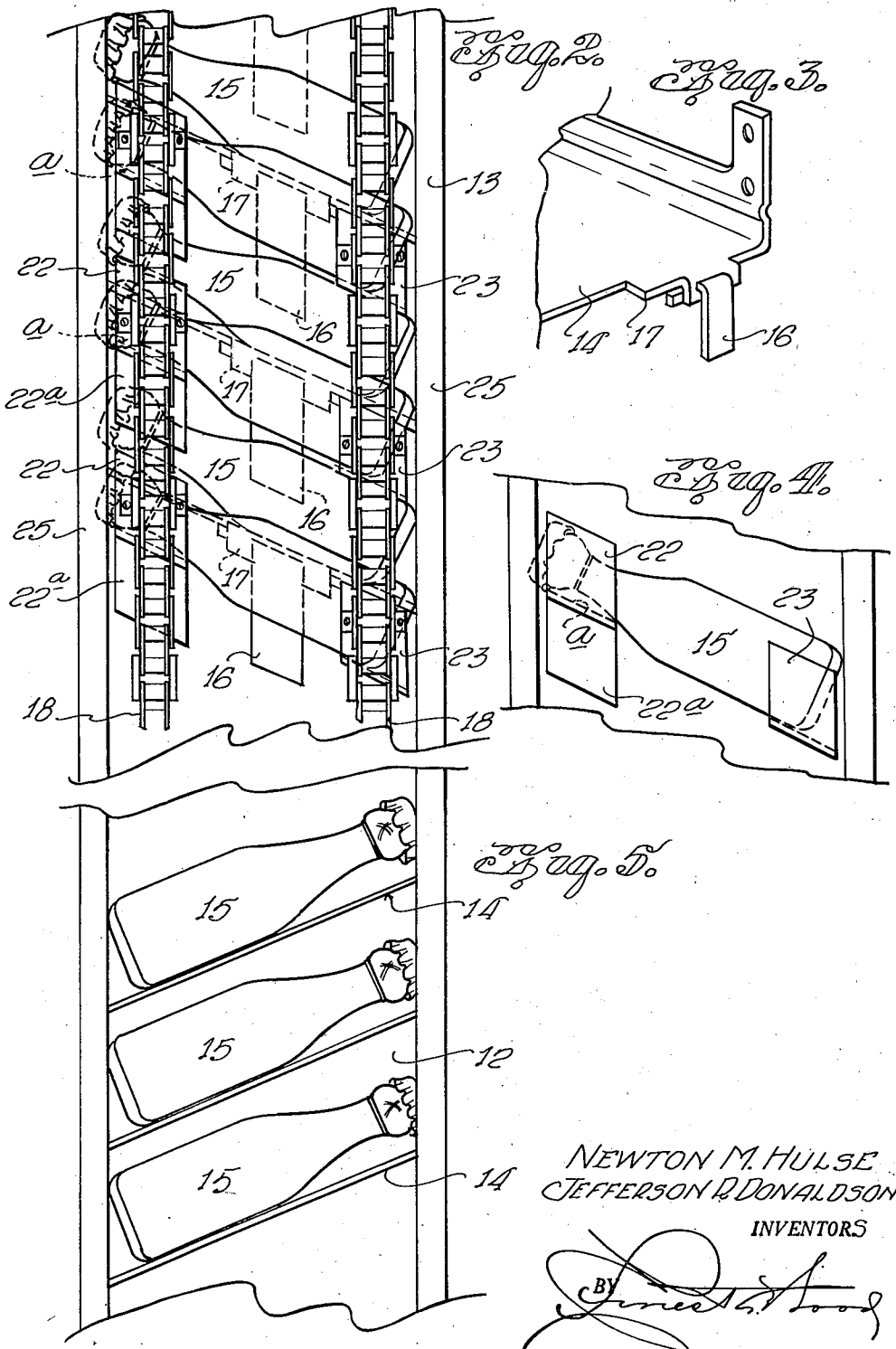


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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BOTTLE VENDING MACHINE

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3 Claims. (Cl. 312—48)

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This invention relates to vending and dispensing apparatus and more particularly to machines for vending bottled merchandise.

The principal object of the invention is to provide, in a bottle vending machine, mechanism for storing bottles in an inclined plane, neck uppermost, held in readiness for discharge onto a transporting means, the transfer being made without affecting the inclined portion of the bottles which is likewise the case in transporting the bottle to a position of access to a purchaser. In maintaining the bottles in an inclined position throughout, the contents are not permitted to come into contact with the cap which sets up a chemical reaction tending to disintegrate the cork seal and rust the cap if permitted to remain in such contact for several hours at a time.

Another object of the invention is to provide a novel form of support for bottles in temporary storage which serves at the same time as a medium for delivering bottles single onto the vertical lead of an endless conveyor chain by virtue of the inclined portion of the support. Moreover, the invention includes a pivoted bottle restraining arm on the delivery edge of each of a plurality of superimposed supports as mentioned, which arms cooperate with specially constructed lugs on the conveyor chain to prevent premature delivery of bottles from storage magazines and to insure transfer from storage to the said conveyor chain singly and in the said inclined position.

Still another object of the invention is to provide at the delivery station of said machine a means by which the bottles, upon being released from the conveyor chain are constrained to reverse their positions of inclination and emerge at the delivery points butt foremost.

With the foregoing objects as paramount, the invention has further reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawing wherein:

Figure 1 is a perspective view of a cabinet, partly broken away to show the principal elements of the invention therein.

Figure 2 is a fragmentary view of the conveyor for transferring bottles from storage to the delivery station, viewing the same from one side.

Figure 3 is a fragmentary view of one of the bottle supporting plates, showing the bottle restraining arm.

Figure 4 is a fragmentary view showing schematically the manner in which a bottle is supported on the conveyor chain, the supports being shown per se, and

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Figure 5 is a fragmentary view of the storage and delivery magazine, viewing the same from the left in Figure 1.

Continuing with a more detailed description of the drawing, reference is primarily made to Figure 1 wherein numeral 10 denotes a cabinet, the lower portion 11 of which is adapted to contain a refrigerating unit of conventional manufacture. It is obvious that this cabinet may be constructed to embrace any desired external design.

The upper portion of cabinet 10 is divided into two vertical compartments 12 and 13. In compartment 12 is arranged a plurality of superimposed plates 14 which are inclined in relation to compartment 13 as well as towards the rear wall of the cabinet 10, hence the bottles 15 supported therein are not only constrained to lie in an inclined plane on the supporting plates but are compelled by gravity to move towards the inner and delivery edge of the said plates 14.

Each of the plates 14 has, at its delivery edge, a depending arm 16 which may be seen in Figure 3. This arm is pivoted to a protuberance 17 on the edge of the plate so that it may be elevated by a bottle seeking escape from the magazine immediately below the plate 14 yet restrains the bottle until such time as all of the bottles in the next higher magazines have been discharged.

To clarify the foregoing, it may be presumed that all of the storage magazines defined by the series of plates 14 are filled to capacity with bottles, as suggested in Figure 1. Due to the inward inclination of plates 14, all of the bottles seek egress from the magazines at the inner edges of the plates. To insure controlled continuity of delivery of bottles first, from the foremost to the rearmost bottle in each magazine and second, from the uppermost to the lowermost magazine of the assembly provision must be made to restrain bottles in a lower magazine until all of the bottles in the next highest magazine have been discharged. This is accomplished by the depending arm 16 which lies in the path of the bottle in the next lowest magazine and is itself restrained against outward displacement by the bottles 15, suspended by conveyor chains 18, two of which are provided, whose leads are parallel, the inner leads moving in juxtapositioned relation to the bottles in the magazines.

It is apparent that with bottles supported by the inner leads of chains 18 up to the first undepleted magazine, the bottles themselves hold the arm 16 in operative position to hold back bottles in the next lowest magazine. However as soon as the highest bottle on the conveyor

makes to a point below the level of arm 16, then the arm may be displaced outwardly by pressure imposed thereon by the bottles in the magazine below. The first bottle in the said latter magazine is then delivered onto the conveyor, followed by the next and finally the last bottle, after which the next succeeding lower magazine is similarly depleted. This continues until the lowermost magazine is discharged of its bottles.

The conveyor chains 18 being link chains, operate over sprockets in the upper and lower portions of compartment 13. While the sprockets are not shown, shaft 19 whose end is shown protruding from cabinet in Figure 1, is the drive shaft which carries sprockets under which the foremost and rearmost chains 18 extend and by which they are driven. At the rear of cabinet 10 in Figure 1, a chain 20 may be seen which is operated by a motor 21 to drive shaft 19 to in turn drive the chains 18 in the manner described.

It will be observed in Figures 1, 2 and 4 that the chain 18 nearest the front of the cabinet 10 is equipped with relatively spaced, Z-shaped lugs 22, while the companion chain 18 disposed rearwardly carries substantially L-shaped lugs 23 (Figures 2 and 4). To describe the purpose of these lugs and to define the reason for the difference in design thereof, it is pointed out that the bottles, in moving from a support 14 onto the conveyor chains 18, had a tendency to rotate on these shoulders, that is, on an axis at right angles to their major axes, causing their upper ends on necks to move into the delivery compartment in advance of their bases. This obviously interfered with smooth performance and to overcome this condition, the Z-shaped lug 22 is provided, the depending or tail portion 22a thereof first moving to restrain the upper end of the bottle and, as the conveyor continues downwardly, the bottle rolls off the support 14 onto the lugs 22 and 23 without axial displacement. The neck being supported on the shelf *a* (Figures 2 and 4) formed by the break in the Z-lug while the butt of the bottle lies in the L-shaped lug 23, as shown.

As the bottles descend with the conveyor, supported thereon as described, they are released singly therefrom through the opening 24 (Fig. 1), since they have no restraining means, such as presented by the frame 25 (Fig. 2). At the delivery station and communicating with the opening 24, there is arranged a curved chute 26 into the upper end of which the bottles roll off the lugs 22 and 23 of the conveyor chains 18. In rolling down this chute the necks of the bottles engage an upstanding rubber pin 27 on one side of the chute as shown in Figure 1, which causes the bottle to change ends and report in the tray 28 in door 29 butt foremost and from which the bottle is removed by the purchaser. The door 29 is shown open to reveal the mechanism just described.

In the course of the foregoing description no mention was made of the coin actuated mechanism by which to control the movements of the conveyor chains 18. It is obvious that any suitable mechanism may be employed for this purpose so long as it is effective to cause the motor 21 to operate, upon the insertion of a coin only long enough to advance the conveyor a distance equal to the diameter of a bottle at the delivery end, to permit release of but a single bottle at a time.

The invention, of course, resides in the vending mechanism per se, as described.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. A bottle vending machine including juxtapositioned storage and delivery compartments, inclined superimposed bottle supporting plates in said storage compartment defining magazines from which bottles are transferred into said delivery compartment individually and successively from the uppermost to the lowermost magazine, endless conveyor means in said delivery compartment, outwardly hanging means depending from each of said plates, restrained by bottles on said conveyor means for holding bottles against release from a magazine until the next highest magazine is depleted, spaced means on said conveyor means for receiving bottles singly from said magazines and for maintaining axial alignment thereof during transfer and means at the lower end of said storage compartment for receiving bottles singly from said conveyor means and for reversing their positions for delivery.

2. A bottle vending machine including vertically spaced bottle supporting plates elevated at one corner to maintain inclined position and gravitational displacement of bottles supported thereon, conveyors having downwardly moving leads in juxtapositioned relation to the delivery edges of said plates, inclined means in spaced relationship on said conveyor for receiving bottles singly from each of said plates, pivoted means depending from the delivery edge of each of said plates and constrained by bottles on said conveyor to operatively restrain bottles on the next lowest plate against displacement until the last bottle on the next highest plate has been delivered to said conveyor and means at the delivery end of said conveyor for reversing but maintaining inclined position of said bottles for discharge.

3. A bottle vending machine including a plurality of vertically spaced plates elevated at one corner and defining inclined bottle containing magazines, endless conveyor chains whose vertical, downwardly moving leads are in juxtapositioned relation to the discharge ends of said magazines, means in one magazine, constrained by bottles on said conveyor for restraining bottles in the next lowest magazine against release until the next highest magazine is depleted and means below said magazine assembly for reversing but maintaining inclined position of said bottles for discharge.

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