Dec. 7, 1954 J. R. CLEM 2,696,326

VENDING MACHINE

Filed April 13, 1951 4 Sheets-Sheet 1

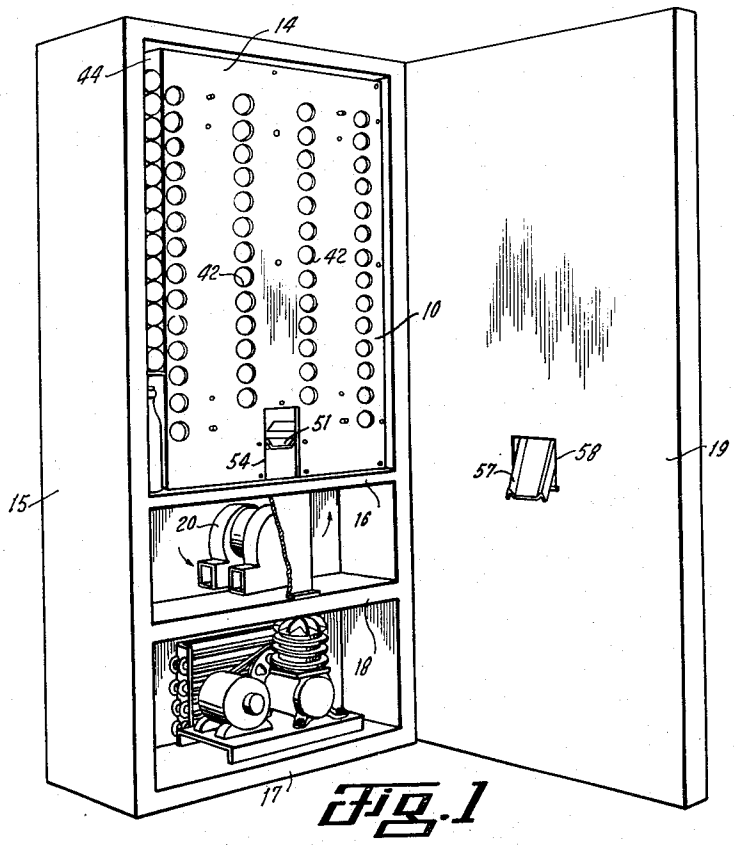


Fig. 1

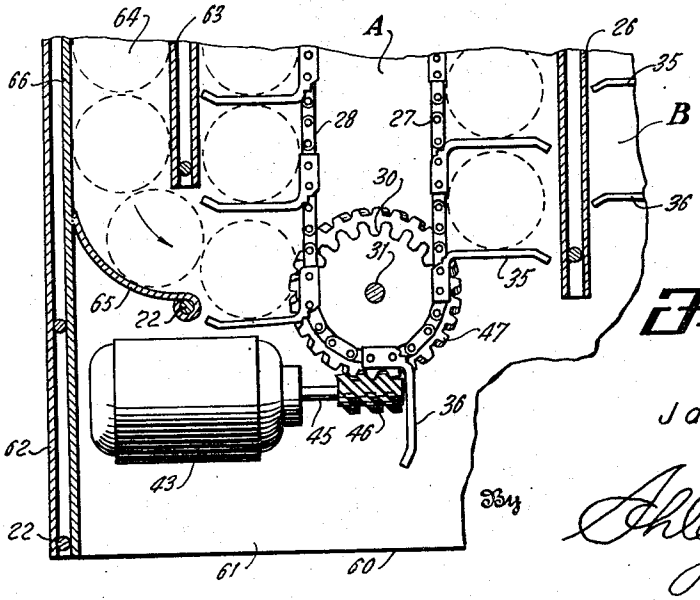


Fig. 9

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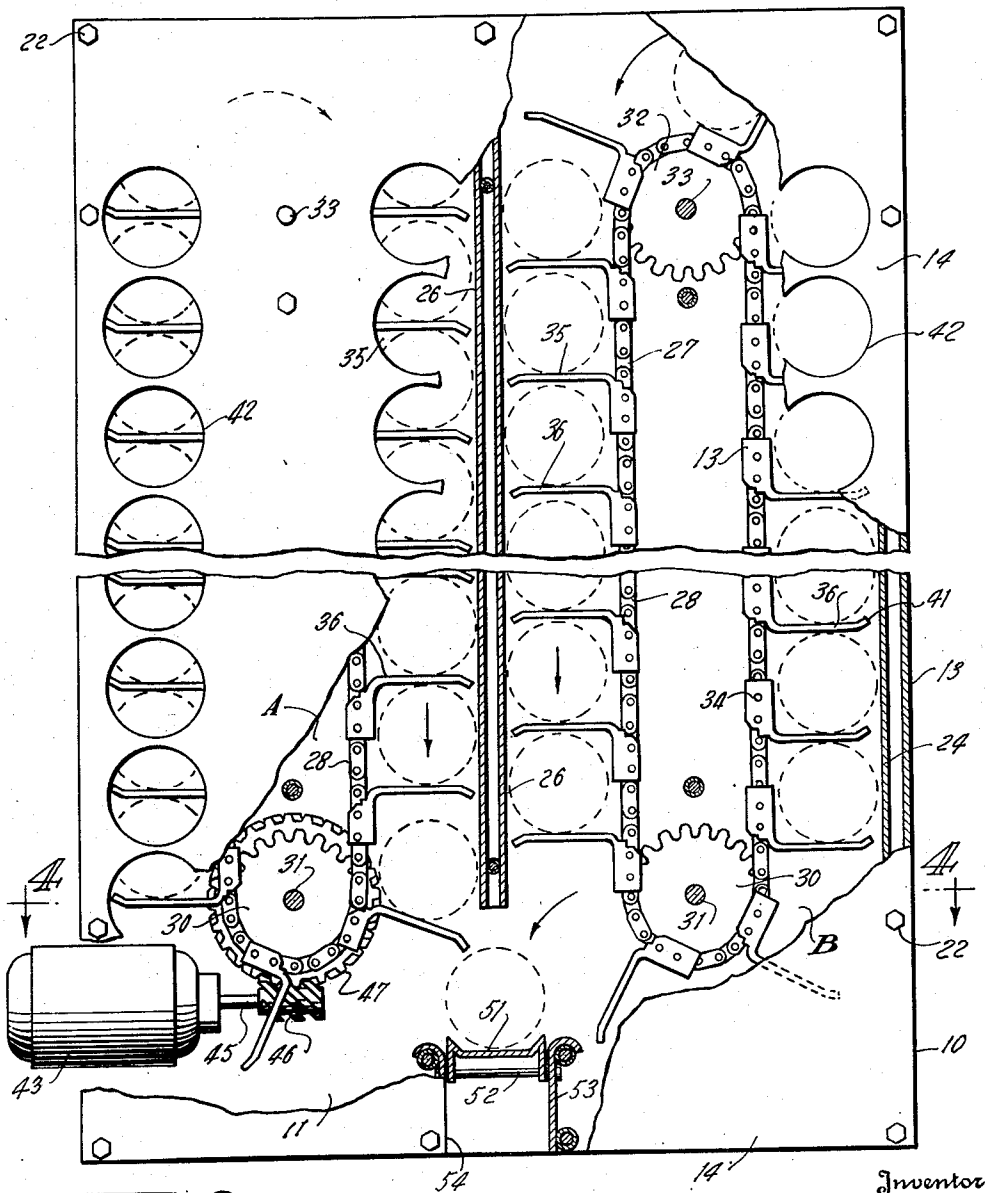


Fig. 2

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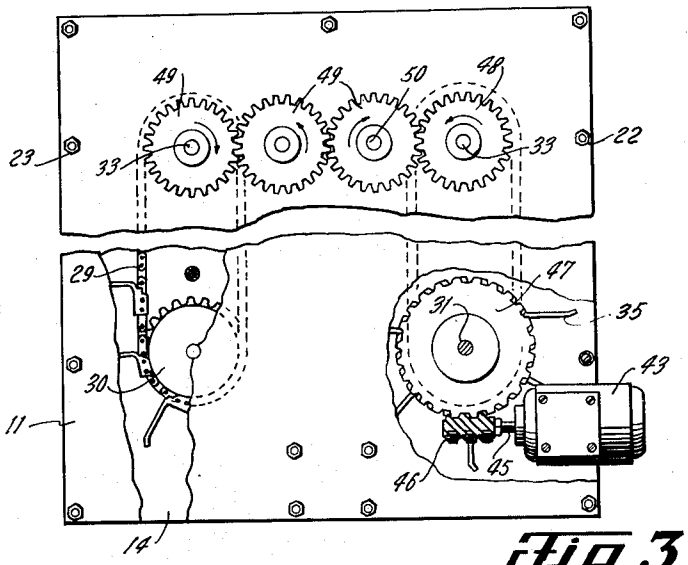


Fig. 3

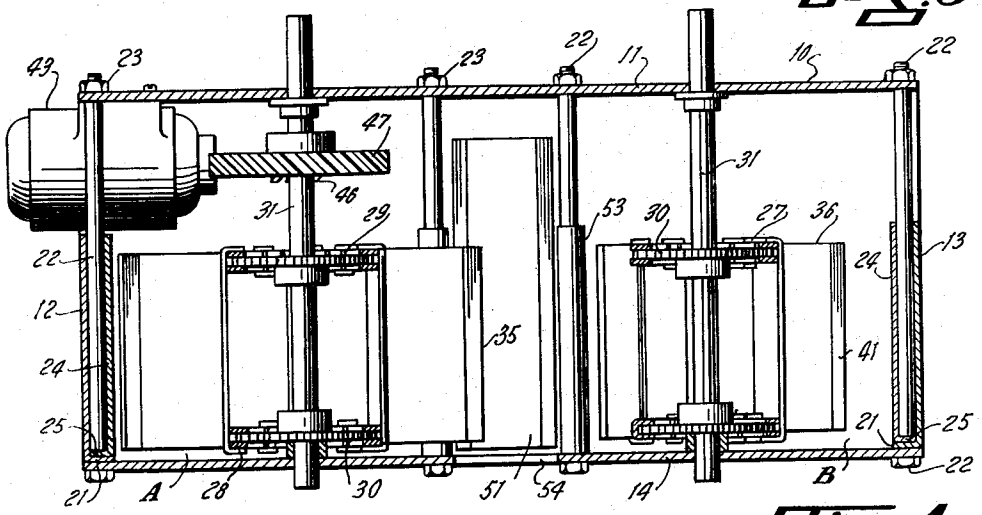


Fig. 4

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VENDING MACHINE

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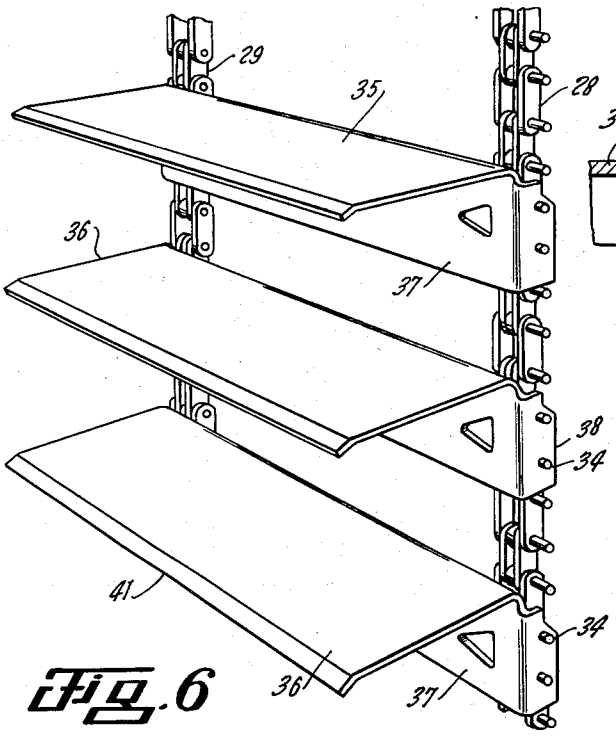


Fig. 6

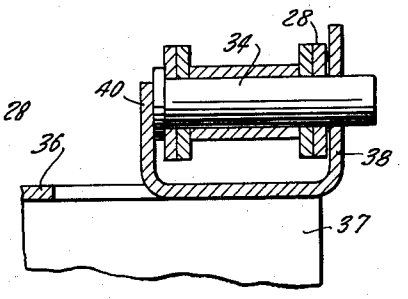


Fig. 5

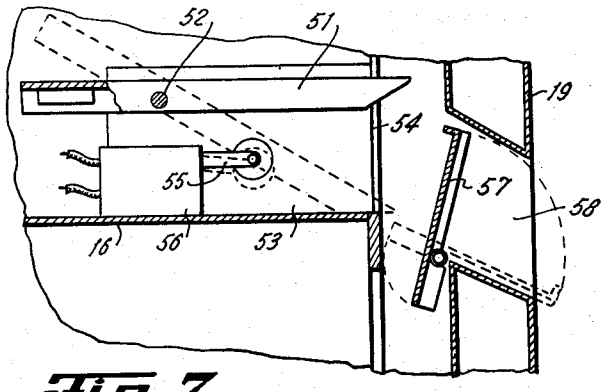


Fig. 7

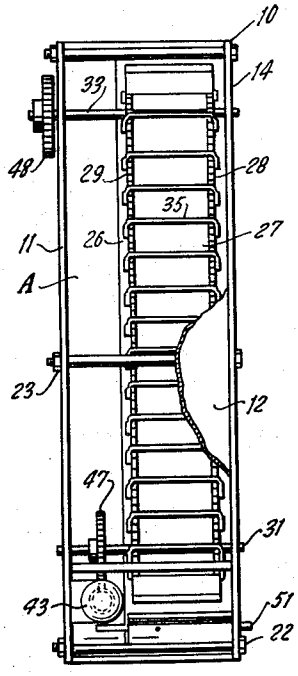


Fig. 8

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VENDING MACHINE

James R. Clem, Dallas, Tex.

Application April 13, 1951, Serial No. 220,923

3 Claims. (Cl. 221—116)

The invention relates to new and useful improvements in vending machines.

One object of the invention is to provide an improved vending machine of the endless chain conveyor type which is particularly adapted to vend bottles or other commodities in a simple and accurate manner.

Another object of the invention is to provide an improved vending machine having a pair of endless conveyors for supporting and delivering articles to a common discharge, there being a common drive for the conveyors and the articles being staggered so as to be discharged alternately from said conveyors.

A particular object of the invention is to provide a vending machine which includes a pair of endless conveyors having a common drive and upright inner and outer flights disposed in a common plane with spaced shelves for supporting and conducting articles to a delivery chute, the shelves of one conveyor being staggered or offset relative to the shelves of the other conveyor whereby the conveyors discharge the articles alternately to the chute.

A further object of the invention is to provide an improved machine, of the character described, having chain conveyors of a novel type involving simplicity and novelty in structure, the details of which will be hereinafter more specifically pointed out.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the specification and by reference to the accompanying drawings, wherein examples of the invention are shown, and wherein:

Fig. 1 is a perspective view of an improved vending machine constructed in accordance with the invention,

Fig. 2 is a view, partly in elevation and partly in section, of the vending mechanism which is mounted in the cabinet,

Fig. 3 is a reduced, broken rear view of the mechanism shown in Fig. 2,

Fig. 4 is a horizontal, cross-sectional view, taken on the line 4—4 of Fig. 2,

Fig. 5 is a sectional detail view of the flight and chain connection,

Fig. 6 is a detail view in perspective of a portion of one of the conveyors,

Fig. 7 is a vertical, sectional view of the delivery mechanism,

Fig. 8 is an end elevational view of the vending mechanism, and

Fig. 9 is a transverse, vertical, sectional view of a portion of a modified vending mechanism.

In the drawings, the numeral 10 designates the upright frame of a vending mechanism which is rectangular in cross-section. The frame includes a back plate 11, end plates 12 and 13, and a front plate 14. The frame is disposed in an upright cabinet 15 and is mounted upon a medial horizontal shelf 16 as shown in Fig. 1. Between the shelf 16 and the bottom 17 of the cabinet is an intermediate horizontal shelf 18. A door 19, extending the full height and width of the cabinet, is hinged along the right vertical edge thereof in any suitable manner, not shown. The interior of the cabinet may be cooled in any suitable manner. Portions of the shelf 16 may be open and blowers 20 may be disposed on the shelf 18 to supply circulation of cold air to the cabinet above the shelf 16,

the details being unimportant and not claimed or shown.

The frame 10 is suitably secured together and in Fig. 4 I have shown the end plates 12 and 13 provided with inturned flanges 21 along their front vertical edges engaging the rear sides of the front plate 14. Transverse bolts 22 extend through the front and back plates and the flanges, being secured by nuts 23 on their rear ends. Within the cabinet, vertical guide plates 24 are separated from the end plates 12 and 13 by the bolts 22 and each plate has an outturned flange 25 along its front edge through which the bolts 22 pass. Inner, vertical guide plates 26 are secured at the center of the cabinet as shown in Fig. 2 and the lower ends of these plates terminate a substantial distance above the bottom of the cabinet. It is noted that the rear vertical edges of the plates 24 and 26 are located immediately behind the transverse center of the cabinet and that said plates are not as wide as the end plates.

The plates 26 coact with the plates 24 to divide the cabinet into two vertical sections or compartments A and B, respectively. An endless conveyor 27 is mounted in each compartment and includes front endless sprocket chains 28 and rear sprocket chains 29. The chains are mounted on lower sprockets 30 secured on transverse shafts 31 and upper sprockets 32 secured on transverse shafts 33. The rear or inner sprockets 30 and 32 are secured on the medial portions of the shafts, which shafts extend through the front and rear walls of the frame. Each chain has some of its links provided with hinge pins 34 extending laterally outward or forwardly of the front chains 28 and rearwardly of the rear chains 29.

A plurality of flights 35 are mounted on the chains as shown in detail in Figs. 5 and 6. Each flight is formed of a shelf 36 directed horizontally and outwardly from the vertical portions of the chains and bent downwardly along its inner side to form a depending back or skirt 37. The end portions of each skirt lie in front of the chain and have outwardly directed flanges 38 engaging over the outer sides of the chains and secured on the extended chain pins 34. Fingers 40 struck from the skirts are bent outwardly so as to project adjacent the inner sides of the chains. As is best shown in Fig. 5, each finger 40 rests against the head of the chain pin 34 and holds the latter in place. The front edge portion of each shelf 36 is bent downwardly at a slight angle to form a longitudinal lip 41.

Each shelf is of sufficient length to support a bottle to be vended. The width of the shelves of the conveyors is such that, during vertical flights, the lips 41 will pass in close proximity to the plates 24 and 26. The shelves are spaced apart on the chains far enough to freely receive a bottle therebetween. The front plate 14 is provided with vertically disposed rows of circular openings 42, arranged and spaced so that the chains may be stopped with the shelves 36 between the openings, thus permitting bottles to be slid endwise through the openings and onto the shelves.

For driving the conveyors, an electric motor 43 is mounted on the back plate 11 and extends through the lower portion of the left-hand end behind the plates 12 and 24 (Figs. 2 and 4). A vertical space 44 is provided in the left-hand side of the cabinet for this purpose as well as for the storage of additional bottles (Fig. 1). The motor has an armature shaft 45 on which a worm 46 is mounted to engage the under side of a worm gear 47 carried by the rear end of the shaft 31 of the left-hand conveyor. As shown in Fig. 3, the upper shaft 33 of the conveyor which is driven by the gear 47 has a spur gear 48 which meshes with a gear train of three complementary gears 49 mounted behind the back plate 11, the first two gears of the train being journaled on stub shafts 50 supported by said back plate and the last or third gear being mounted on the upper shaft 33 of the other conveyor.

Thus, the conveyors 27 are driven so that the inner flights 35 adjacent the plates 26 travel downwardly simultaneously with the left-hand conveyor moving clockwise and the right-hand conveyor counter-clockwise (Fig. 2). It is noted that the shelves 36 of the conveyor in section A are staggered or offset vertically with respect to the shelves of the conveyor in section B, whereby the

conveyors alternately discharge their bottles at the lower ends of their travel. Due to the staggered relation of the conveyor flights, it is manifest that the spaces between the shelves of one conveyor are misalined with its openings 42 when the spaces between the shelves of the other conveyor are alined with its openings.

As is best shown in Figs. 2 and 7, a common delivery or receiving chute 51 is disposed below and between the conveyors. A transverse shaft 52 pivotally supports the chute in the top of a receiving trough 53 disposed horizontally and extending rearwardly from an opening 54 in the front plate 14 at the bottom thereof. The chute 51 is weighted at its inner end and is normally horizontal to receive a bottle from either conveyor. When a bottle is landed on the chute, the latter is immediately swung downward so as to engage the plunger 55 of a cut-off switch 56 to stop the motor 43 and halt travel of the conveyors. A receiving or delivery tray 57 is pivoted off center in an opening 58 in the door 19 and is counterbalanced so as to be normally in an upright position in the path of the bottle which slides thereinto from the chute 51. The tray 57 swings downwardly as shown in dotted lines and supports the bottle in the opening 58 for removal.

It is believed the operation will be obvious without detailed explanation. By suitable means, such as a coin controlled mechanism (not shown), a step-by-step movement is applied to the conveyors 27 by energizing the motor 43, whereby a bottle is delivered to the chute 51 and the switch 56 is actuated to stop the motor and conveyors by downward swinging of said chute. In order to synchronize the conveyors and to assure the delivery of a single bottle upon each operation of the vending mechanism, the conveyor shelves must be staggered approximately one-half the space between said shelves and the sprockets must have the proper circumference to provide an equal length of travel. Due to this spacing and travel, the shelf spaces of each conveyor register with the openings 42 upon each alternate operation of the mechanism. It is noted that the shelves prevent the unauthorized removal of bottles through the opening 58 since the conveyors are immovable except on operation of the vending mechanism.

A modified vending mechanism of increased capacity is shown in Fig. 9 and includes the conveyors 27 and the upright, intermediate guide plates 26 mounted in a frame 60 similar to the frame 10 and having similar front and back plates 61 and end plates 62. Only the back plate and one end plate are shown and said back plate is of greater width than the plate 11 whereby said end plate is spaced from the outer flights of the adjacent conveyor. Upright guide plates 63, similar to the plates 26, are mounted adjacent the outer flights of each conveyor and provide an upright space or compartment 64 between the end and guide plates. The lower ends of the plates 63 terminate above the lower end of the conveyor whereby the lower end of the compartment 64 communicates with the space between the lowermost outer flights of said conveyor. A curved chute 65 forms the bottom of the compartment and extends inwardly from a guide plate 66, similar to the plates 24, with its inner extremity supported by one of the bolts 22 below in spaced relation to the lower ends of the guide plates. Thus, bottles may be placed in the compartment and directed by the chute 65 onto the empty shelves of the conveyor. Of course, so long as the shelves are occupied by bottles, the bottles in the compartment 64 are retained therein. This arrangement permits the vending of bottles in addition to the bottles initially supported by the conveyors so as to increase the capacity of the machine. Since the outer flight of each conveyor travels upwardly, the shelves moving into said flight are empty to receive the bottles from the compartment and carry the same upwardly over the upper sprocket 32 to the inner flight. If desired, the compartment may be constructed in the form of an attachment for connection to the ends of the frame 11.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A bottle vending machine including: an upright frame having a transverse front side and a transverse rear side; a pair of upright conveyors, each conveyor being rectangular in cross-section and having a transverse front side facing the transverse front side of the frame and a transverse rear side facing the transverse rear side of the frame; an upright guide disposed transversely between the front and rear sides of the frame and also between the conveyors, each conveyor including an upright front endless chain and an upright rear endless chain, both chains having up and down flights, front and rear sprockets on which the chains are mounted journaled in the front and rear sides of said frame so as to extend parallel to said sides; spaced shelves carried by each conveyor, each shelf being adapted to support and convey a single bottle in a substantially horizontal position, the inner portion of each shelf being attached at its ends to the front and rear chains of a conveyor, each shelf extending outwardly from its supporting chains and having its outer edge free and adjacent the guide during its downward flight so that bottles carried by the shelves on each downward flight of each chain ride against and down each side of the guide, the shelves of the downward flight of one conveyor being intermediate the shelves of the downward flight of the other conveyor on the opposite side of the guide, interconnected driving means connected to the conveyors whereby single bottles are successively delivered under the guide at the bottoms of the conveyors, and delivery means below the guide for receiving the single bottles.

2. A bottle vending machine including: an upright frame having a transverse front side and a transverse rear side; a pair of upright conveyors, each conveyor being rectangular in cross-section and having a transverse front side facing the transverse front side of the frame and a transverse rear side facing the transverse rear side of the frame; an upright guide disposed transversely between the front and rear sides of the frame and also between the conveyors, each conveyor including an upright front endless chain and an upright rear endless chain, both chains having up and down flights, front and rear sprockets on which the chains are mounted journaled in the front and rear sides of said frame so as to extend parallel to said sides; spaced shelves carried by each conveyor, each shelf being adapted to support and convey a single bottle in a substantially horizontal position, the inner portion of each shelf being attached at its ends to the front and rear chains of a conveyor, each shelf extending outwardly from its supporting chains and having its outer edge free and adjacent the guide during its downward flight so that bottles carried by the shelves on each downward flight of each chain ride against the guide on opposite sides thereof, the shelves of the downward flight of one conveyor being spaced intermediate the shelves of the downward flight of the other conveyor on the opposite side of the guide, whereby single bottles are successively delivered under the guide at the bottoms of the conveyors, delivery means below the guide for receiving the single bottles; and a stationary front plate attached to the frame across the fronts of the conveyors having single upright rows of bottle openings on each side of said guide, each opening being adapted to permit lengthwise passage of a bottle therethrough when the shelves associated therewith are disposed between openings of a row.

3. A bottle vending machine including: an upright frame having a transverse front side and a transverse rear side; a pair of upright conveyors, each conveyor being rectangular in cross-section and having a transverse front side facing the transverse front side of the frame and a transverse rear side facing the transverse rear side of the frame; an upright guide disposed transversely between the front and rear sides of the frame and also between the conveyors, each conveyor including an upright front endless chain and an upright rear endless chain, both chains having up and down flights, front and rear sprockets on which the chains are mounted journaled in the frame; spaced shelves carried by each conveyor, each shelf being adapted to support and convey a single bottle in a substantially horizontal position, the inner portion of each shelf being attached at its ends to the front and rear chains of a conveyor, each shelf extending outwardly from its supporting chains and having its outer edge free and adjacent the guide during its downward flight, the shelves of the downward flight of one conveyor being intermediate the shelves of the downward flight of the other conveyor on the opposite side of the guide, whereby bottles carried by the shelves ride down opposite sides of the guide and single bottles are successively delivered under the guide at the bottoms of the conveyors, interconnected driving means connected with the conveyors delivery means below the

guide for successively receiving the single bottles; upright guide members adjacent the outer ends of the shelves of the up flights of the chains; upright outer compartments contiguous to the guide members; and a chute at the bottom of each compartment below the lower end of the adjacent guide member terminating adjacent the upright line of travel of the outer ends of the shelves of the up flight of each chain for discharging a bottle from the compartment onto each empty shelf of the adjacent chain flight.

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