

Feb. 21, 1956

A. C. WOODRUFF
BEVERAGE VENDING MACHINE

2,735,578

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3 Sheets-Sheet 1

Fig. 1

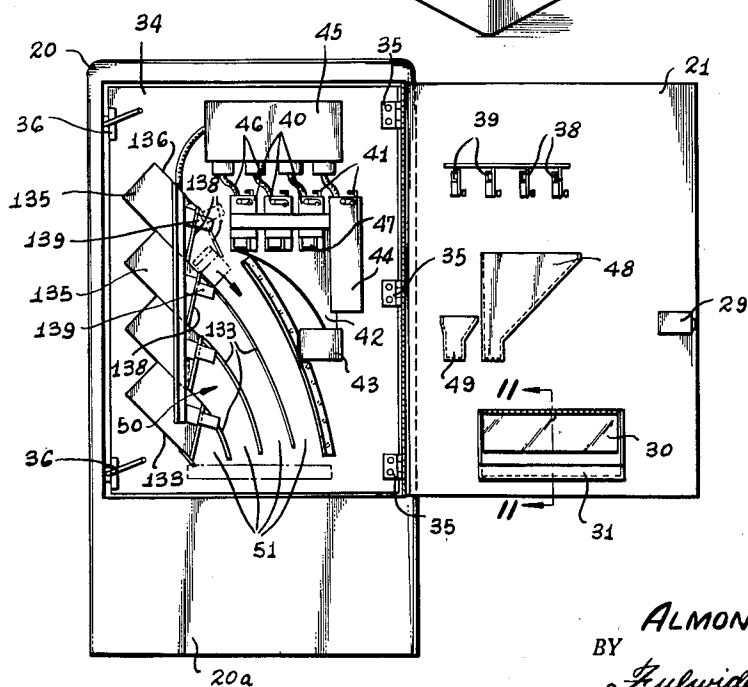
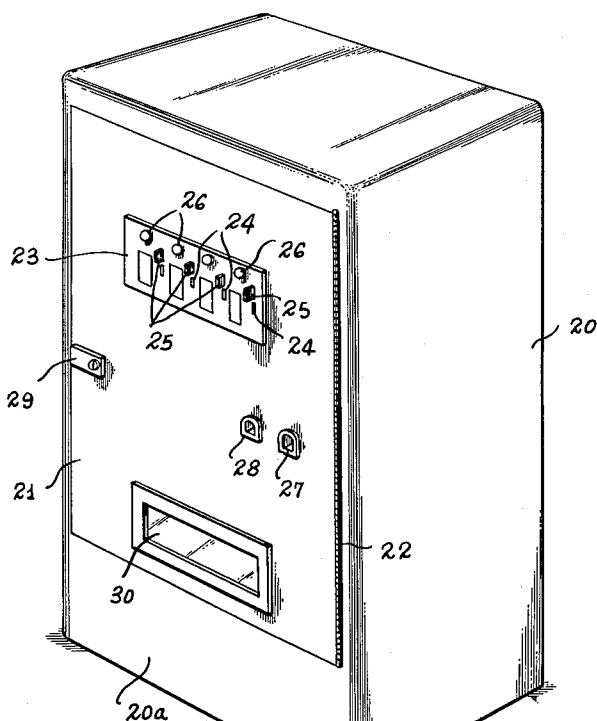


Fig. 2

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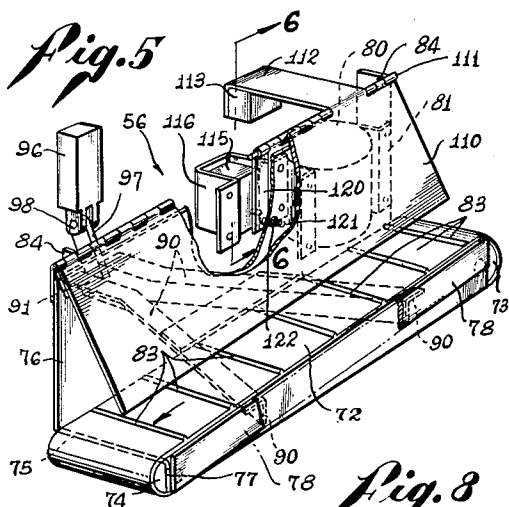
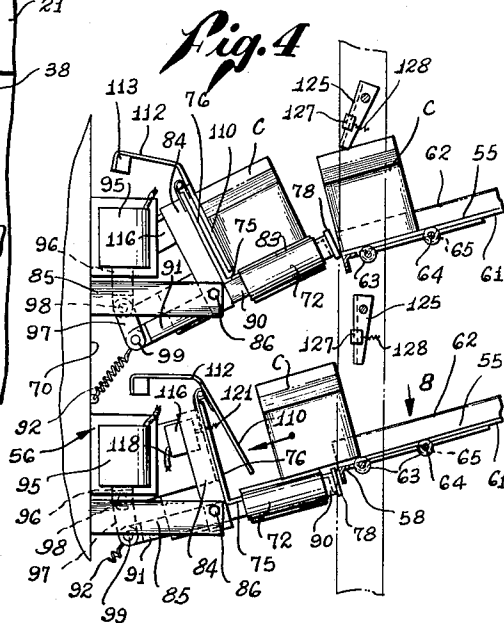
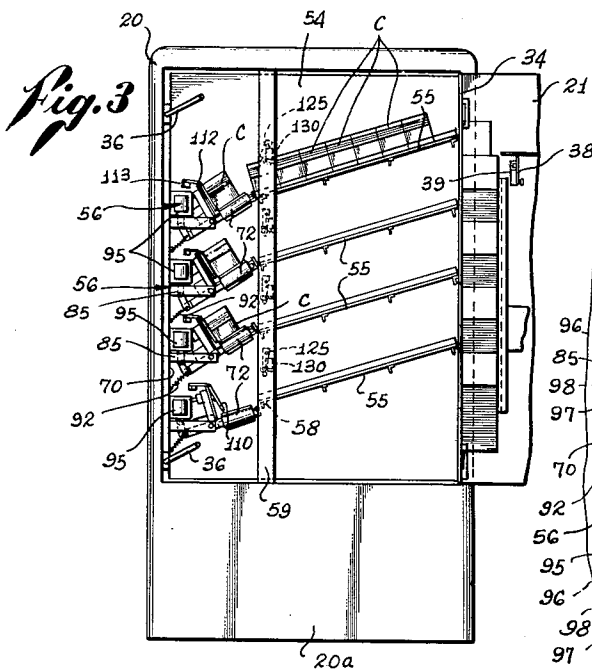
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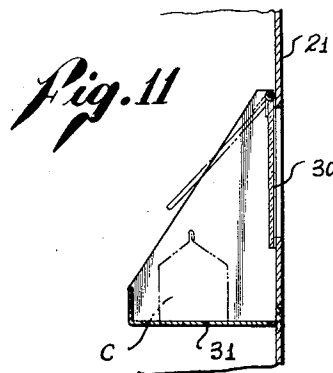
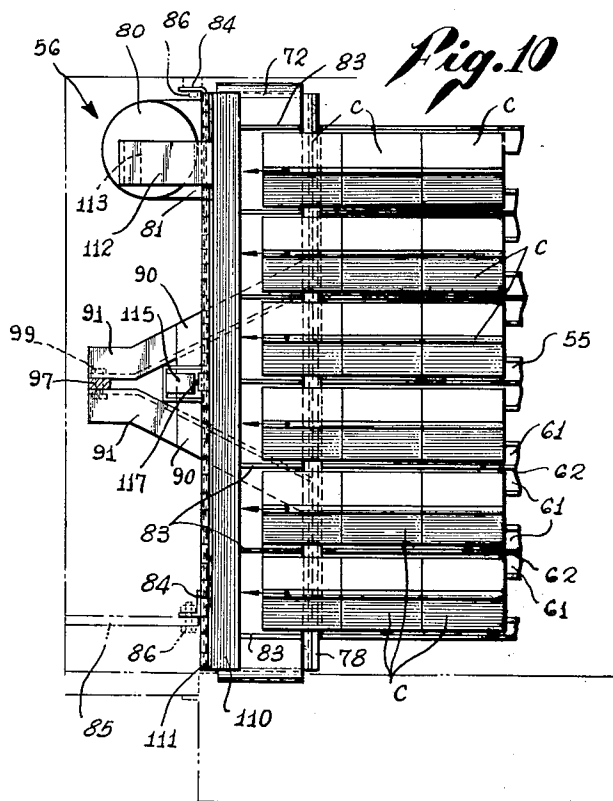
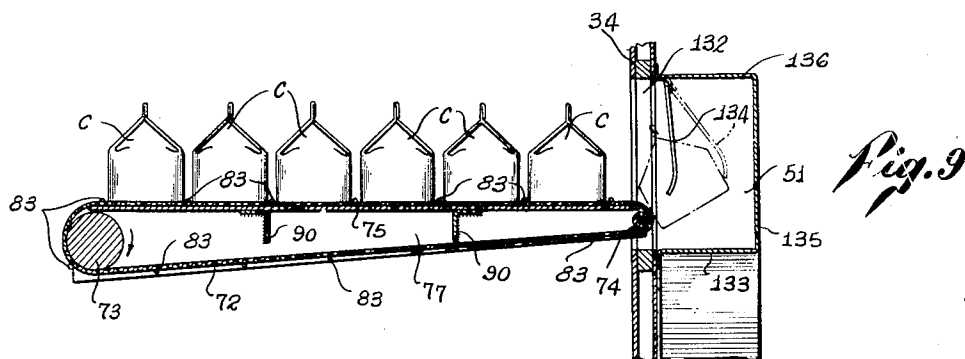
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BEVERAGE VENDING MACHINE

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3 Sheets-Sheet 3



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2,735,578

BEVERAGE VENDING MACHINE

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Application June 27, 1952, Serial No. 295,895

26 Claims. (Cl. 221-11)

My invention relates generally to vending machines, and more particularly, to a coin operated refrigerated beverage machine capable of dispensing several different kinds of beverages.

An embodiment of the invention is particularly advantageous for the handling of rectangular milk cartons or the like, and will be disclosed in connection therewith. It is to be understood; however, that the use of the invention is not restricted to a particular type of packaged beverage, and in fact, one of the important advantages of the device is its ability to handle different beverages within the same cabinet.

The device herein disclosed is a fully automatic machine operable upon the insertion of a coin to deliver the purchased beverage to an accessible front position. Within the cabinet are several independent storage and dispensing units that are operable in the aforesaid manner to deliver a selected beverage. Thus the customer has a choice of beverages merely by inserting his coin within the appropriate slot and the total sales volume of the device is considerably greater than with a conventional machine.

Two important problems have heretofore prevented the construction of a device of the character described from a practical standpoint. The first of these is that of storing the beverage containers in such a manner that an adequate number can be contained within a housing of reasonable size. The second and related problem is to dispense the stored containers by a simple dispensing means which will cooperate with the storage means in such a manner as to make feasible, efficient storage and rapid loading.

In order to fully appreciate these problems, it is desirable to first consider briefly the nature of the beverage containers. Generally, these containers are of such a nature that they cannot be stacked vertically. In the case of milk cartons of individual use size it is conventional to provide a peak or ridged roof thereon which makes it impossible to accomplish vertical stacking. As can also be understood, it is highly desirable to stand the containers in an upright position to minimize the chance of leakage. Again in the case of milk cartons this becomes a necessity because of the nature of the carton closure which would otherwise leak quite frequently.

Under these conditions the most efficient way to stack the containers is in side-to-side relationship on storage shelves. This eliminates dead space between the containers and makes maximum use of the available storage space. However, dispensing cartons one at a time from such a storage arrangement by automatic means has heretofore involved the use of such complicated mechanisms as to be impractical. Consequently, the great majority of prior automatic vending machines have used storage facilities having small relative capacity, and a method of storage not at all suitable for the vending of milk cartons.

With the foregoing in mind, it is a major object of my invention to provide an automatic refrigerated beverage

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vending machine having efficient storage and dispensing means adapted for rapid loading and operation.

An equally important object of my invention is to provide an automatic refrigerated beverage vending machine capable of storing and dispensing several different kinds of beverages.

It is another object of my invention to provide an automatic beverage vending machine having dispensing conveyor means adapted for simple and rapid reloading, and of positive loading action to avoid jamming and skipping.

A further object of my invention is to provide simple and positive dispensing ejection means adapted to receive containers from different locations within the machine and move them to a common accessible position.

It is also an object of the invention to provide inclined gravity feed storage shelves having a large relative capacity and cooperating with individual dispensing conveyor means to form units for handling different kinds of beverages.

An additional object of the invention is to provide a double door housing construction permitting easy reloading of the storage facilities and protecting the electrical components of the coin operating mechanisms from the cold and damp of the interior of the housing.

Still another object of the invention is to provide means for holding each of the containers in an upright position as they pass through the ejecting means so that they will be delivered bottom-first.

A still further object of the invention is to provide a pivotally mounted conveyor assembly adapted to move from an operating position in which the corresponding storage shelf is blocked to a depressed loading position for receiving an entire row of containers simultaneously therefrom.

Yet another object of the invention is to provide a pivotally mounted conveyor assembly having container actuated flap means for controlling the movement of the assembly from loading to operating positions.

These and numerous other objects and advantages of my invention will become apparent from the following detailed description of a preferred form thereof and from an inspection of the accompanying drawings, in which:

Fig. 1 is a front perspective view of the complete machine;

Fig. 2 is a front elevation of the machine showing the outer door opened;

Fig. 3 is a front elevation of the machine with both outer and inner doors opened;

Fig. 4 is a front elevational detail of the conveyor means and storage shelf units showing one conveyor assembly in operating position, and one in loading position;

Fig. 5 is a perspective view of a complete conveyor assembly;

Fig. 6 is a cross-section taken in the direction of the arrow 6 of Fig. 5;

Fig. 7 is a perspective detail of a pendulum control switch for the conveyor actuating solenoid;

Fig. 8 is a partial detail of a storage shelf taken in the direction of the arrow 8 of Fig. 4;

Fig. 9 is a longitudinal section taken through a conveyor assembly;

Fig. 10 is a top plan view of a conveyor assembly and the associated loading shelf; and

Fig. 11 is a cross-section through the access door taken along the line 11-11 of Fig. 2.

Referring now to the drawings and particularly to Fig. 1 thereof, the numeral 20 indicates generally a rectangular cabinet which houses the machine. On the front of cabinet 20 is a large hinged outer door 21 supported by side hinge means 22 and openable into the interior of the cabinet. In a bottom portion 20a of the cabinet is a refrigeration

unit of conventional design to maintain the interior of the cabinet at a reduced temperature.

On the front upper portion of door 21 is a panel 23 which supports a plurality of coin slots 24, coin return buttons 25, and indicator lights 26 arranged in groups corresponding to interior vending units. Preferably, one coin slot 24 is associated with coin changing means having a separate change return slot 27 mounted at one side of door 21. Adjacent to change return slot 27 is a coin return slot 28 for discharging coins rejected through the use of buttons 25, and at the opposite side of door 21 is a lock 29 which holds the door in closed position.

Near the bottom of door 21 is an upwardly swingable panel or gate 30 which opens into a receiving tray 31 supported on the inner side of the door, as is seen in Fig. 2. Gate 30 is freely openable and the purchaser is able to reach into tray 31 and withdraw the contents thereof. As can be understood, the containers of beverage which are to be found within tray 31 are placed there as the result of the operation of the machine through its vending cycle starting with a deposit of a coin within one of the coin slots 24 and ending with the ejection of the selected container into tray 31. It should be noted that there are several coin slots 24 for cooperation with separate vending units within cabinet 10. In the preferred embodiment herein described there are four such vending units adapted to be loaded with different beverages for providing a relatively great selection within a cabinet of convenient size. This is made possible by the use of efficient storage shelves and cooperating dispensing means within the interior of the cabinet, as will later be discussed.

In order to actuate the machine for a vending cycle it is necessary to provide coin actuating means and electrical operating switches of conventional construction. Coin collecting, inspection, and rejecting means are also necessary and are well known in the art. It is desirable that such components of the machine be readily accessible for servicing and repair, and it is also advantageous to protect the same from the damp and relatively cold interior of the cabinet. To this end I provide cabinet 20 with double doors, the outer door 21 opening back as is seen in Fig. 2 to expose an inner door 34 which is supported by side hinge means 35. At the opposite side are hand dogs 36 which normally hold door 34 in a closed position. Door 34 is spaced slightly rearwardly of door 21 so as to define therebetween a space for receiving the coin mechanisms and the electrical operating switches. Since door 34 is normally closed, these components are not in direct contact with the damp interior atmosphere of the cabinet and electrical breakdowns, corrosion, and the like are avoided.

On the back upper portion of door 21 are mounted crank linkages 38 connected with each of the front coin return buttons 25, and spaced coin chutes 39 leading from slots 24. In a corresponding position on the outer side of inner door 34 are mounted a series of coin inspection and actuating boxes 40 having coin return plungers 41 projecting from the top thereof, and a common coin collecting chute 42 at the bottom leading into a coin box 43. One of coin actuating boxes 40 includes a coin changing mechanism 44 with the change returning therefrom through the lower end. Above coin actuating boxes 40 is an enclosed electrical panel box 45 containing various electrical switches, relays, and the like. Connectors 46 lead from panel box 45 to coin actuating boxes 40. When door 21 is closed, coin chutes 39 lead downwardly into actuating boxes 40, and crank linkages 38 are positioned to activate coin return plungers 41. Movement of plungers 41 causes the coin to be rejected from actuating boxes 40 and drop out of the bottom thereof through openings 47 which lie forwardly of coin collecting chute 42.

Also mounted on the back of outer door 21 are coin return chutes 48 and 49 which are adapted to lie in communication with the coin return openings 47 and

the change mechanism 44, respectively. These, of course, lead forwardly to the previously-mentioned change and coin return slots 27 and 28. Thus as can be seen, with door 21 closed all of the elements of the coin mechanism are moved into cooperating positions, and are separated for ease of servicing upon the opening of said door.

The receiving tray 31 is mounted on the lower back side of outer door 21 and has a horizontal bottom portion which projects rearwardly to lie in a position closely adjacent to inner door 34 when the outer door is closed. Tray 31 has substantial width and is adapted to act as a common receiving station for ejection means 50 mounted upon the outer face of door 34. Ejection means 50 comprise, briefly, a plurality of downwardly inclined ejection chutes 51 having their upper ends spaced at different vertical locations on door 34 corresponding to the interior position of individual vending units within cabinet 20. In the preferred form there are four ejection chutes 51 to take care of the individual vending units. Opening and closure means as will later be described are provided in door 34 so that the ejection chutes 51 are communicated to the interior of the cabinet space. As can be appreciated, if containers of beverage are delivered to ejection chutes 51 in response to the insertion of a coin they will be dumped into tray 31 and be available to the purchaser through gate 30.

The interior of cabinet 20 with door 34 opened outwardly is seen in Fig. 3. The walls of cabinet 20 define a large rectangular chamber 54 which has a substantial depth and extends from side to side of the cabinet. Within chamber 54 are four individual vending units, each comprising a storage shelf 55 and an associated conveyor means 56. Shelves 55 extend from the front to the back of chamber 54 and are arranged in vertically spaced relationship, inclining downwardly from one side of the chamber toward the opposite side. However, shelves 55 do not extend completely across chamber 54 but terminate at lower ends spaced a substantial distance away from the adjacent cabinet wall. The upper ends of shelves 55 are secured to an interior surface wall 57 of cabinet 20, while the lower ends are supported by cross-channels 58 connected to a vertical support member 59.

Each shelf 55 lies perpendicular to the back wall of chamber 54 so that it extends horizontally at any fore to aft section. The upper surface of the shelf 55 thus provides a large rectangular area for the storage of beverage containers. I have herein illustrated the machine as dispensing generally rectangular milk cartons C of the rectangular type having a peaked top or roof. These cartons C are typically formed of cardboard or other disposable material holding an individual portion such as a half pint fluid measure. Because of the shape of the top it is impossible to stack such cartons C vertically, and because of their collapsible construction and the type of closures provided it is necessary that they be stored in an upright position. Therefore, it is to be understood that in illustrating my invention in connection with such cartons I am not limiting its use but merely point out the advantages thereof. It is also to be understood that other beverages besides ordinary milk are packaged in cartons C and that the shelves 55 are each adapted to store a different beverage.

The manner in which cartons C are arranged upon shelves 55 is best seen by a consideration of Figs. 3 and 10. The cartons C extend upwardly along the surface of each shelf 55 in a group of parallel columns, there being as illustrated approximately 8 cartons in each column when the shelf is fully loaded. At the same time, the cartons extend fore to aft in rows which likewise extend parallel to each other with a row consisting of a single carton from each column. As illustrated, there are 6 cartons in each row, and these numbers will, of course, vary in accordance with the dimensions of the storage chamber.

Because of the inclined surface of shelves 55, the

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cartons C tend to slide toward the lower edge of the shelf under the force of gravity so that as a carton is removed from a column the remainder of the cartons in the column slide toward the lower end until the column is completely exhausted. Since the lower carton in each column is always ready to slide off of the lower end of shelf 55, there is always in effect a complete row of cartons ready to be removed. If the cartons are taken off in such rows it can also be understood that all of the columns will be exhausted at the same time, since all were initially loaded with the same number of cartons.

In order to facilitate the sliding movement of cartons C along a shelf 55, I form the latter of a built-up construction as is seen in the detail of Fig. 8. Spaced horizontal channels 60 extend fore and aft beneath the surface of the shelf and are connected to spaced parallel flat strips 61 which are arranged in pairs extending side-by-side. Between each pair of strips 61 is a vertical riser 62 placed on edge to provide a side guide rail for a column of cartons. The spacing between rails 62 is equal to the width of cartons C so that the latter are constrained for downward sliding movement. I have found that most all cartons C will slide freely down strips 61, but that because of defective construction an occasional carton will not slide. Therefore I provide spaced pairs of rollers 63 which lie along the edges of strips 61 so that the cartons C move downwardly, riding on the rollers with reduced friction. Each roller 63 is supported on an axle or shaft 64 which has its ends journaled by spaced bearing supports 65 provided on strips 61, as is best seen in Fig. 4.

The conveyor means 56 comprise individual assemblies which are mounted in the space between the lower edges of the shelves 55 and an adjacent inner side wall 70 of chamber 54, and are spaced vertically one over the other. The function of conveyor assemblies 56 is to receive cartons C from shelves 55 and carry the same forwardly to wall 34 in a step-by-step operation in response to the insertion of coins. Arriving at wall 34 the carton selected passes therethrough, as will hereinafter be described, and enters ejection means 50. In order to move cartons C forwardly the conveyor assembly 56 includes an endless belt 72 which travels forwardly in a generally horizontal path along the lower edge of shelf 55. Belt 72 is supported by a rear drive roller 73 and a front roller 74, as are best seen in Fig. 9. The upper span of belt 72 travels across a supporting plate 75 which forms a part of the main framework of the assembly.

As is best seen in Figs. 5 and 6, plate 75 is formed integrally with an upturned perpendicularly extending stop wall 76 which lies along the side thereof spaced opposite to the lower edge of shelf 55. On the other side of plate 75 is a downturned flange 77. A stop or buffer strip 78 is secured to the outside of flange 77 and projects slightly upwardly so as to lie flush with the upper surface of belt 72. On the outer side of the stop wall 76 a right-angle drive motor 80 is mounted by means of brackets 81 with the drive shaft thereof extending downwardly into a gear reduction box 82. The output shaft of gear reduction box 82 is coupled to drive roller 73 to rotate the same in a clockwise direction as viewed in Fig. 9, thus causing belt 72 to travel forwardly.

As can be appreciated, it is desired to energize drive motor 80 for step-by-step operation so that the cartons C will be traveled forwardly one at a time upon the insertion of a coin in the machine. To accomplish this end, the previously-mentioned electrical operating switch and relay panel 45 is connected to motor 80 so as to energize the same for a brief interval in response to the receipt of a coin into one of the coin actuating mechanisms 44. This form of control circuit is well known in the art and need not be described herein. The distance traveled by belt 72 upon each coin actuation of drive motor 80 is equivalent to the length of one carton C so that the leading carton moves off of the belt and each succeeding carton advances one station. In order to in-

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crease the traction of the cartons C on belt 72, I provide raised transversely extending cleats 83 spaced apart along the surface of the belt a distance equal to the length of one carton. These cleats 83 prevent slipping of cartons C along belt 72 and also serve to space the cartons slightly apart for the proper step-by-step operation.

In the detail of Fig. 4 a lower shelf 55 and associated conveyor assembly 56 are shown in a loading position while an upper conveyor and shelf are shown in operating position. The belt 72 at the lower conveyor assembly 56 is inclined at the same angle as the adjacent shelf 55 and constitutes in effect an extension thereof. This permits an entire row of cartons C to slide downwardly from shelf 55 onto the surface of belt 72, the row so loaded consisting of the leading carton from each column as is seen in Fig. 10. Downward movement of the cartons C is, of course, limited by the stop wall 76 so that they are firmly seated upon belt 72 and in a position to travel forwardly thereon upon the energization of motor 80, as previously described.

It is important to note that the loading of conveyor belt 72 with a row of cartons C need occur only after there have been sufficient step-by-step operations of the conveyor means so as to exhaust all of the cartons from the previously loaded row. In the interim no loading of cartons C onto belt 72 occurs, and it should also be noted that the loading of a row when it does occur takes no longer than would the loading of a single carton, since all of the cartons in the row slide simultaneously onto the surface of belt 72. Between loading times the conveyor assembly 56 is moved to an operating position as shown in the upper conveyor of Fig. 4 in which belt 72 is elevated above shelf 55. The stop member 78 is elevated above the lower edge of shelf 55 and serves to prevent any cartons C from sliding downwardly off of the shelf. Thus as can be understood, the loading and operating cycles described are positive and neither can interfere with the other.

In order to move belt 72 from the loading position to the elevated operating position, the entire conveyor assembly 56 is pivotally mounted within chamber 54. Vertical braces 84 are secured to the outer side of wall 76 near the ends thereof and support the assembly for pivotal movement. At the front of chamber 54 a bracket 85 projects outwardly from cabinet wall 70 and is connected to the front brace 84 by means of a pivot pin 86. A similar pivot pin 86 connects rear brace 84 to a back wall of chamber 54, as is seen in Fig. 10. As thus far described, it can be seen that the entire conveyor assembly 56 is freely pivotal within chamber 54.

In order to limit the movement of the assembly and control its movement between loading and operating positions, a pair of actuating arms 90 are extended outwardly from the belt framework. Arms 90 are formed as heavy channels secured firmly beneath the surface of plate 75 and projecting outwardly toward the side of chamber 54. In plan elevation (Fig. 10) arms 90 are convergent outwardly so as to form a Y-shaped frame having short outer end portions 91 extended parallel to each other and spaced slightly apart. A spring 92 is connected between the outer ends of arms 90 and cabinet wall 70 so as to urge the inner ends of the arms upwardly and move belt 72 to the elevated operating position. This is the normal position of the device as shown by the upper conveyor assembly 56 in Fig. 4.

To pivot arms 90 in a direction to depress belt 72 to the loading position, I provide a solenoid operated linkage which is connected to the outer arm portions 91. Firmly secured to cabinet wall 70 in a vertical position is a solenoid 95 having a lower plunger 96 adapted to move up and down upon the energization and deenergization of the solenoid. The lower end of plunger 96 is swingably connected to one end of a link member 97 by means of a pivot pin 98. The other end of link member 97 extends between the spaced arm portions 91 and is

journalled therein by a pivot pin 99. Normally solenoid 95 is deenergized and plunger 96 is dropped downwardly so that arms 90 are urged downwardly by spring 92 and belt 72 is elevated to the operating position. When solenoid 95 is energized, plunger 96 is pulled upwardly, carrying arms 90 upwardly and depressing belt 72 to the loading position.

The solenoid 95 should be energized and belt 72 moved to the loading position when the complete row of cartons C on the belt has been traveled forwardly so that the belt is empty. At this time it is necessary to load another row of cartons C on belt 72 and then elevate the latter to the operating position for the step-by-step vending operations. To control the energization of solenoid 95 I provide switch means which are responsive to the presence of or absence of cartons C upon belt 72. As is best seen in Figs. 5 and 6, a control flap 110 is pivotally supported at the top of stop wall 76 by an edge hinge 111 for movement toward and away from the inner side of the wall. Flap 110 extends along the entire length of wall 76 and is urged to swing away from the wall by an outwardly projecting arm 112 which carries a counterweight 113 at the outer end. Arm 112 is formed integrally with flap 110 and is positioned near the rear end thereof.

As can be understood, when flap 110 is moved away from wall 76 as is seen in Fig. 6, it overlies the surface of belt 72 and is in the path of the row of cartons C which is to be loaded thereon. As the row of cartons C slides onto the surface of belt 72 the weight of the cartons pressing against flap 110 forces the flap outwardly so that it lies flush against the surface of wall 76. The two positions of flap 110 are illustrated by the flaps of the upper and lower conveyor assemblies 56 in Fig. 4. The weight 113 carried by arm 112 is selected so that it supplies only a small moment tending to urge flap 110 away from wall 76. Thus the flap is pressed against wall 76 by the pressure of even a single carton positioned on belt 72, and it will not swing away from the wall until the belt is completely emptied.

Mounted on the outside of the central portion of wall 76 is an electrical switch 115 which is supported by an enclosing bracket 116 in a position spaced slightly away from the surface of the wall. On the side of switch 115 facing wall 76 is a projecting switch operating plunger 117 which is adapted to move in and out of the switch to close and open internal electrical contacts. Switch 115 is connected into the circuit of solenoid 95 by a conductor 118 so as to control the energization and deenergization of the solenoid. With plunger 117 extended outwardly from switch 115, the electrical contacts of the latter are closed and solenoid 95 is energized. When plunger 117 is pressed inwardly toward switch 115 the electrical contacts therein are opened and solenoid 95 is deenergized.

Directly in front of plunger 117 is a control lever 120 pivotally supported on hinge 111 for free swinging movement. Near the lower end of lever 120 is mounted a coil spring 121 which projects through an opening 122 cut in wall 76 and lies in the path of flap 110. When flap 110 is pressed downwardly against wall 76 it engages the end of spring 121 and forces lever 120 against operating plunger 117, driving the latter into switch 115 and to the left as seen in Fig. 6. This opens the electrical contacts within switch 115 and deenergizes solenoid 95. The use of flexible spring 121 as a connection between flap 110 and lever 120 permits the travel of the lever to be less than that of the flap while insuring that the lever exerts sufficient pressure on plunger 117 to cause operating movement thereof.

Initially, belt 72 is unloaded and flap 110 is swung away from wall 76 under the action of weight 113. This permits switch plunger 117 to be extended from switch 115 so that the electrical contacts therein are closed. Solenoid 95 is energized, pulling plunger 96 upwardly so that belt 72 is depressed into the loading position. The first row of cartons C from shelf 55 then slides onto belt

72, completely filling the same. The pressure exerted by the inclined cartons C upon flap 110 causes the flap to be moved downwardly against wall 76, driving lever 120 against plunger 117 and opening the contacts of switch 115. Solenoid 95 is then deenergized, allowing plunger 96 to drop downwardly under the urging of spring 92. This elevates belt 72 to the operating position and places stop member 78 in a position to block any movement of cartons C off of the end of shelf 55.

The machine is now ready to vend cartons C by traveling them forwardly in steps in response to the insertion of coins. As each carton reaches the forward end of belt 72, it leaves the belt and enters dispensing means 50. After the complete row of cartons is emptied from belt 72, flap 110 swings away from wall 76 releasing switch plunger 117 so that solenoid 95 is energized and belt 72 again drops down to the loading position to receive another row of cartons thereon. As can be understood, these loading cycles are repeated as necessary until the entire supply of cartons on shelf 55 has been exhausted. At this time flap 110 again swings outwardly from wall 76, but it is not desired to energize solenoid 95 and drop belt 72 to the loading position, since there are no more cartons to be loaded.

To prevent the energization of solenoid 95 after all of the cartons have been removed from shelf 55, I provide a pendulum-operated switch means that breaks the circuit to solenoid 95. As is best seen in Figs. 4 and 7, a weighted pendulum 125 is rotatably supported on vertical brace 59 by means of a shaft 126. The lower end of pendulum 125 extends downwardly into the path of the leading carton C in the front column and is swung upwardly from the vertical by engagement with the top of the carton. So long as any cartons remain on shelf 55 there will always be a carton in contact with pendulum 125 holding the same upwardly. However, when the last row has been removed from shelf 55 the force of gravity causes pendulum 125 to drop into a vertical hanging position. An arm 127 extends laterally from the lower end of pendulum 125 and is connected by means of a spring 128 to the operating lever 129 of a microswitch 130 secured to frame 59. When pendulum 125 is swung upwardly from the vertical, sufficient force is exerted on switch lever 129 through spring 128 to hold the electrical contacts of switch 130 in a closed position. After the last carton has passed under pendulum 125, the latter drops to a vertical position and the electrical contacts of switch 130 are opened. This breaks the circuit to solenoid 95 and prevents further energization thereof.

It will be remembered that as cartons C move forwardly from belt 72, they enter one of the dispensing chutes 51. In order to allow the cartons C to enter a chute 51, the inner cabinet door 34 is provided with a plurality of vertically spaced openings 132 as is seen in Fig. 9. Each of the openings 132 is shaped to allow the forward end of belt 72 to extend a short distance therein. As a carton C reaches the front end of belt 72, it drops off of the belt and onto a bottom wall 133 of chute 51. At this point it should be noted that cartons C have been maintained in an upright position both on shelf 55 and on belt 72. This is particularly important in the case of milk cartons to avoid leakage through their top closures. It is also necessary to hold cartons C in a generally upright position as they slide along dispensing chute 51 for the aforementioned reason.

To this end a lever 134 is pivotally mounted within opening 132 to hang downwardly in the path of the top portion of the carton passing through the opening into chute 51. The contact of lever 134 against carton C momentarily retards the progress of the top of the carton and insures that it will fall bottom-first onto chute bottom 133. Chute 51 is also provided with a closed forward wall 135 and top wall 136 formed integrally with bottom wall 133 as a sheet metal structure so that forward progress of the carton is stopped and it is constrained

to make a right-angle turn and slide down the inclined surface of chute bottom 133.

Returning to Fig. 2, it will be seen that all of the chutes 51 are formed similarly with bottom walls 133 which extend along wall 34 in a steeply inclined and slightly curved path terminating at the bottom in such a position as to drop the cartons into the common receiving tray 31. To close chutes 51 from the interior compartment 54 each chute is provided with an upwardly hinged door 138 which extends completely across the chute. The forward chute wall 135 is terminated a short distance from the top of chute 51 and forms a stop frame against which door 138 seats. In order to hold door 138 in the normally closed position a weight 139 is mounted thereon so as to swing the door downwardly into a closing position in which the door is slightly inclined from the vertical.

In addition to closing off the interior cabinet chamber 54 from the space ahead of door 34, the chute doors 138 also serve an important purpose in maintaining cartons C in an upright position. Because of weight 139 the door 138 exerts a considerable retarding influence upon the top of carton C and in effect tips the carton back on its side so that it continues down chute bottom 133, sliding on its side as is indicated by the carton in phantom outline in Fig. 2. Thus when the carton reaches the open end of chute 51 it is in a position to fall bottom-first into the perpendicularly disposed tray 31. The purchaser then withdraws the carton from tray 31 through gate 30 and the operation of the machine is completed.

While I have described a preferred embodiment of the invention in considerable detail, it can be understood that modifications of design and construction will be apparent to those skilled in the art. Therefore, I do not wish to be restricted except as defined in the appended claims.

I claim:

1. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; conveyor means having belt means extending along the lower edge of each of said shelves and driving means operable to advance said belt means step by step for advancing said containers to the forward end thereof, said conveyor means including a blocking member movable from a loading position permitting a row of containers, consisting of one container from each of said columns, to be loaded on said conveyor means, to an operating position blocking the feed of containers from said shelf; and means for moving said blocking member from said operating position to said loading position when a complete row of containers has been advanced to the front of said conveyor means and returning said blocking member to the operating position when a subsequent row has been loaded on said conveyor means.

2. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; conveyor means having belt means extending along the lower edge of each of said shelves and driving means operable to advance said belt means step by step for advancing said containers to the forward end thereof, said conveyor means being movable from a loading position for receiving from said shelf, a row of containers consisting of one container from each of said columns, to an operating position blocking the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subse-

quent row has been loaded; and ejecting means including ejection chutes disposed to receive said containers from said conveyor means one at a time upon the step advance thereof and carry said containers to a position adjacent a common access opening.

3. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; conveyor means having belt means extending along the lower edge of each of said shelves and driving means operable to advance said belt means step by step for advancing said containers to the forward end thereof, said conveyor means being pivotally movable from a depressed loading position for receiving from said shelf a row of containers, consisting of one container from each of said columns, to an operating position blocking the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subsequent row has been loaded; and ejecting means including ejection chutes disposed to receive said containers from said conveyor means one at a time upon the step advance thereof and carry said containers to a position adjacent a common access opening.

4. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; a conveyor assembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subsequent row has been loaded; and ejecting means including ejection chutes disposed to receive said containers from said conveyor means one at a time upon the step advance thereof and carry said containers to a position adjacent a common access opening.

5. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; a conveyor assembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; means including a solenoid-operated linkage connected to said conveyor frame and energized for moving said frame to loading position when a complete row

of containers has been advanced to the front thereof, said last-mentioned means being deenergized to return said frame to operating position when a subsequent row has been loaded on said conveyor belt; and ejecting means including ejection chutes disposed to receive said containers from said conveyor means one at a time upon the step advance thereof and carry said containers to a position adjacent a common access opening.

6. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; a conveyor assembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subsequent row has been loaded; and ejecting means including a plurality of ejection chutes located one at the front of each of said conveyor assemblies to receive said containers one at a time upon the step advance thereof and carry said containers downwardly, together with a common access tray disposed to receive said containers from said chute and having an outer unlocked access gate.

7. In a beverage machine the combination of: an insulated refrigerated cabinet; a plurality of vertically spaced inclined storage shelves extending across said cabinet from an upper end at one side thereof to a lower end spaced from the opposite side wall, said shelves being formed to support a group of individual containers arranged in a series of parallel and rearwardly spaced columns extending downwardly on the surface of said shelf for slidable gravity feed therefrom; a conveyor assembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated to block the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subsequent row has been loaded; ejecting means including ejection chutes disposed to receive said containers from said conveyor means one at a time upon the step advance thereof and carry said containers to a position adjacent a common access opening.

8. In a beverage vending machine the combination of: an insulated refrigerated cabinet; a plurality of vertically spaced inclined storage shelves extending across said cabinet from an upper end at one side thereof to a lower end spaced from the opposite side wall, said shelves being formed to support a group of individual containers arranged in a series of parallel and rearwardly spaced columns extending downwardly on the surface of said shelf for slidable gravity feed therefrom; a conveyor as-

sembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof, and returning said conveyor means to the operating position when a subsequent row has been loaded; an inner door on said cabinet; an outer door on said cabinet spaced from said inner door; and ejecting means including a plurality of ejection chutes mounted on the outside of said inner door and extending in generally parallel relationship towards the bottom of said cabinet, the upper ends of said chutes being disposed adjacent openings formed in said inner door at the front end of each of said conveyor belts to receive containers therefrom, said ejecting means having a common access tray mounted to the inside of said outer door at the bottom thereof to receive said containers from said chutes and formed with an unlocked access gate through said outer door for removal of said containers.

9. In a beverage vending machine the combination of: an insulated refrigerated cabinet; a plurality of vertically spaced inclined storage shelves extending across said cabinet from an upper end at one side thereof to a lower end spaced from the opposite side wall, said shelves being formed to support a group of individual containers arranged in a series of parallel and rearwardly spaced columns extending downwardly on the surface of said shelf for slidable gravity feed therefrom; a conveyor assembly having a movable belt extending along and adjacent to the lower edge of each of said shelves and driving means operable to advance said belt step by step for advancing said containers to the forward end thereof one by one, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said lower shelf edge from a depressed loading position in which said belt is located to receive a row of containers from said shelf, consisting of one container from each of said columns, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; means normally holding said conveyor frame in the operating position; means including a solenoid-operated linkage connected to said conveyor frame and adapted to be energized for moving said frame to loading position when a complete row of containers has been advanced to the front thereof, said last-mentioned means being deenergized to return said frame to operating position when a subsequent row has been loaded on said conveyor belt; an inner door on said cabinet; an outer door on said cabinet spaced from said inner door; and ejecting means including a plurality of ejection chutes mounted on the outside of said inner door and extending in inclined generally parallel relationship towards the bottom of said cabinet, the upper ends of said chutes being disposed adjacent openings formed in said inner door at the front end of each of said conveyor belts to receive containers therefrom, said ejecting means having a common access tray mounted to the inside of said outer door at the bottom thereof to receive said containers from said chutes and formed with an unlocked access gate through said outer door for removal of said containers.

10. A conveyor assembly for a vending machine of the class having vertically spaced inclined storage shelves, which comprises, a frame pivotally mounted for limited movement about an axis parallel to the lower edge of

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one of the inclined storage shelves, belt means supported on said frame for movement along said lower shelf edge, driving means operable to advance said belt means step by step, said frame being movable from a depressed loading position in which said belt means are located to receive a row of containers from said shelf to an operating position in which said belt means are elevated and the belt thereof is inclined laterally while said frame blocks the feed of containers from said shelf, a stop member mounted on said frame and extending along the side of said belt means opposite to said shelf and adapted to limit the lateral movement of said row of containers, actuating means connected to said frame and operable for moving said frame from the operating to the loading position, and control means mounted on said stop member and responsive to the lateral pressure of said container row for controlling said actuating means, said control means normally holding said actuating means inoperable and causing said actuating means to operate to move said belt means to loading position when a complete row of containers has been advanced from said belt means.

11. A conveyor assembly for a vending machine of the class having vertically spaced inclined storage shelves, which includes, a frame pivotally mounted for limited movement about an axis parallel to the lower edge of one of the inclined storage shelves, belt means supported on said frame for movement along said lower shelf edge, driving means operable to advance said belt means step by step, said frame being movable from a depressed loading position in which said belt means are located to receive a row of containers from said shelf to an operating position in which said belt means are elevated and the belt thereof is inclined laterally while said frame blocks the feed of containers from said shelf, a wall mounted on said frame and extending perpendicular to said belt along the side thereof opposite to said shelf and adapted to limit the lateral movement of said row of containers, actuating means connected to said frame and operable for moving said frame from the operating to the loading position, and control means including a flap pivotally mounted on said wall and urged outwardly into the path of said row of containers, said flap being held against said wall by said containers to cause said actuating means to be held inoperable, and releasing when all of the containers have been advanced from said belt to cause said actuating means to operate and depress said frame to the loading position.

12. A conveyor assembly for a vending machine of the class having vertically spaced inclined storage shelves, which comprises, a frame pivotally mounted for limited movement about an axis parallel to the lower edge of one of the inclined storage shelves, a belt rotatably supported on said frame for movement along said lower shelf edge, driving means operable to advance said belt step by step, said frame being movable from a depressed loading position in which said belt is substantially flush with the edge of said shelf to slidably receive a row of containers therefrom to an operating position in which said belt is pivotally elevated and a stop member on said frame blocks the feed of containers from said shelf, a wall mounted on said frame and extending perpendicular to said belt along the side thereof opposite to said shelf and adapted to limit the lateral movement of said row of containers, actuating means connected to said frame and operable for moving said frame from the operating to the loading position, and control means including a flap pivotally mounted on said wall and urged outwardly into the path of said row of containers, said flap being held against said wall by said containers to cause said actuating means to be held inoperable, and releasing when all of the containers have been advanced from said belt to cause said actuating means to operate and depress said frame to the loading position.

13. A conveyor assembly for a vending machine of

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the class having vertically spaced inclined storage shelves, which comprises, a frame pivotally mounted for limited movement about an axis parallel to the lower edge of one of the inclined storage shelves, a belt rotatably supported on said frame for movement along said lower shelf edge, driving means operable to advance said belt step by step, said frame being movable from a depressed loading position in which said belt is substantially flush with the edge of said shelf to slidably receive a row of containers therefrom to an operating position in which said belt is pivotally elevated and a stop member on said frame blocks the feed of containers from said shelf, a wall mounted on said frame and extending perpendicular to said belt along the side thereof opposite to said shelf and adapted to limit the lateral movement of said row of containers, spring means normally holding said frame in the operating position, a solenoid-operated linkage connected to said frame and adapted to be energized to move said frame to the loading position, and control means including a flap hinged along the top of said wall and counterweighted to be urged outwardly into the path of said row of containers, and a switch connected to said solenoid linkage and operable by said flap to energize said linkage when said flap is in the outward position, said flap being held against said wall by said containers to cause said linkage means to be deenergized, and being released when all of said containers have been advanced from said belt to cause said linkage means to be energized and depress said frame to the loading position.

14. A conveyor assembly for a vending machine of the class having vertically spaced inclined storage shelves, which includes, a frame pivotally mounted for limited movement about an axis parallel to the lower edge of one of the inclined storage shelves, a belt rotatably supported on said frame for movement along said lower shelf edge, driving means operable to advance said belt step by step, said frame being movable from a depressed loading position in which said belt is substantially flush with the edge of said shelf to slidably receive a row of containers therefrom to an operating position in which said belt is pivotally elevated and a stop member on said frame blocks the feed of containers from said shelf, a wall mounted on said frame and extending perpendicular to said belt along the side thereof opposite to said shelf and adapted to limit the lateral movement of said row of containers, spring means normally holding said frame in the operating position, a solenoid-operated linkage connected to said frame and adapted to be energized to move said frame to the loading position, control means including a flap hinged along the top of said wall and counterweighted to be urged outwardly into the path of said row of containers, and a switch connected to said solenoid linkage and operable by said flap to energize said linkage when said flap is in the outward position, said flap being held against said wall by said containers to cause said linkage means to be deenergized, and being released when all of said containers have been advanced from said belt to cause said linkage means to be energized and depress said frame to the loading position, and pendulum-operated switch means mounted above said shelf in a position to engage one of the containers in the lower row thereon and be held in an upward position to close the circuit to said solenoid-operated linkage, and movable downwardly when all of the containers have been exhausted from said shelf to open said circuit and render said solenoid linkage inoperable.

15. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; a plurality of frames pivotally mounted for limited movement about axes parallel to the lower edges of said inclined storage shelves; belt means supported on each of said frames for movement

along said lower shelf edge, driving means operable to advance said belt means step by step; each of said frames being movable from a depressed loading position in which said belt means are located to receive a row of containers from said shelf to an operating position in which said belt means are elevated and the belt thereof is inclined laterally while said frame blocks the feed of containers from said shelf; a wall mounted on said frame and extending along the side of said belt means opposite to said shelf and adapted to limit the lateral movement of said row of containers; actuating means connected to said frame and operable for moving said frame from the operating to the loading position; control means mounted on said stop member and responsive to the lateral pressure of said container row for controlling said actuating means, said control means normally holding said actuating means inoperable and causing said actuating means to operate when a complete row of containers has been advanced from said belt means; and ejection means including ejection chutes disposed to receive said containers from said belt means upon the step advance thereof and carry said containers to a position adjacent a common access opening.

16. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves, each of said shelves being formed to support a group of individual containers arranged in a series of parallel columns extending downwardly on the surface of said shelf for gravity feed therefrom; a plurality of frames pivotally mounted for limited movement about axes parallel to the lower edges of said inclined storage shelves; a belt rotatably supported on each of said frames for movement along a lower shelf edge; driving means operable to advance said belt step by step; each of said frames being movable from a depressed loading position in which said belt is substantially flush with the edge of the adjacent shelf to slidably receive a row of containers therefrom to an operating position in which said belt is pivotally elevated and a stop member on said frame blocks the feed of containers from said shelf; a wall mounted on said frame and extending perpendicular to said belt along the side thereof opposite to said shelf and adapted to limit the lateral movement of said row of containers; actuating means connected to said frame and operable for moving said frame from the operating to the loading position; control means including a flap pivotally mounted on said wall and counterweighted to be urged outwardly into the path of said row of containers, said flap being held against said wall by said containers to cause said actuating means to be held inoperable, and releasing when all of the containers have been advanced from said belt to cause said actuating means to operate and depress said frame to the loading position; and ejection means including a plurality of ejection chutes located one at the front of each of said conveyor assemblies to receive said containers one at a time upon the step advance thereof and carry said containers downwardly, together with a common access tray disposed to receive said containers from said chutes and having an outer unlocked access gate.

17. In a beverage vending machine the combination of: an insulated refrigerated cabinet; a plurality of vertically inclined storage shelves extending across said cabinet from an upper end at one side thereof to a lower end spaced from the opposite side wall, said shelves being formed to support a group of individual containers arranged in a series of parallel and rearwardly spaced columns extending downwardly on the surface of said shelf for slidable gravity feed therefrom; conveyor means including belt means extending along the lower edge of each of said shelves and driving means operable to advance said belt means step by step for advancing said containers to the forward end thereof, said conveyor means being movable from a loading position for receiving from said shelf a row of containers consisting of one

container from each of said columns, to an operating position blocking the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof and returning said conveyor means to the operating position when a subsequent row has been loaded; an outer door on said cabinet; an inner door on said cabinet spaced from said outer door; and ejection means including a plurality of ejection chutes mounted on the outside of said inner door and having upper ends opening through said inner door adjacent the front of said conveyor means to receive containers therefrom and having a pivotal lever depending therein to retard the movement of the top of said container and drop said container bottom-first into said chute, said chutes inclining downwardly in generally parallel relationship, and said ejection means having a common receiving tray mounted on the inside of said outer door to receive said containers from said chutes and formed with an unlocked access gate through said outer door for removal of said containers.

18. In a beverage vending machine the combination of: an insulated refrigerated cabinet; a plurality of vertically inclined storage shelves extending across said cabinet from an upper end at one side thereof to a lower end spaced from the opposite side wall, said shelves being formed to support a group of individual containers arranged in a series of parallel and rearwardly spaced columns extending downwardly on the surface of said shelf for slidable gravity feed therefrom; conveyor means including belt means extending along the lower edge of each of said shelves and driving means operable to advance said belt means step by step for advancing said containers to the forward end thereof, said conveyor means being movable from a loading position for receiving from said shelf a row of containers consisting of one container from each of said columns, to an operating position blocking the feed of containers from said shelf; means for moving said conveyor means from said operating position to said loading position when a complete row of containers has been advanced to the front thereof and returning said conveyor means to the operating position when a subsequent row has been loaded; an outer door on said cabinet; an inner door on said cabinet spaced from said outer door; and ejection means including a plurality of ejection chutes mounted on the outside of said inner door and having upper ends opening through said inner door adjacent the front of said conveyor means to receive containers therefrom and having a pivotal lever depending therein to retard the movement of the top of said container and drop said container bottom-first into said chute, each of said chutes having a normally closed hinged door extending thereacross and adapted to close off the interior of said cabinet from the space forwardly of said inner door, said chute doors being adapted to retard the tops of a container passing therethrough and turn said container on its side, said chutes inclining downwardly and terminating in vertically extending end portions, and said ejection means having a common receiving tray mounted on the inside of said outer door perpendicular to the end of said chutes to receive said containers bottom-first from said chutes and formed with an unlocked access gate through said outer door for removal of said containers.

19. In a beverage vending machine cabinet having inner and outer doors spaced apart, ejection means including a plurality of ejection chutes mounted on the outside of said inner door and having upper ends opening through said inner door to receive containers delivered forwardly from the interior of said cabinet and having a pivotal lever depending therein to retard the movement of the top of said container and drop said container bottom-first into said chute, each of said chutes having a normally closed hinged door extending thereacross and adapted to close off the interior of said cabinet from the space forwardly of said inner door, said chute doors being

adapted to retard the top of a container passing there-through and turn said container on its side, said chutes inclining downwardly and terminating in vertically extending end portions, and said ejection means having a common receiving tray mounted on the inside of said outer door perpendicular to the end of said chutes to receive said containers bottom-first from said chutes and formed with an unlocked access gate through said outer door for removal of said containers.

20. In a beverage vending machine the combination of: an inclined storage shelf arranged for gravity feed of containers therefrom; conveyor means mounted at the lower edge of said shelf and including a blocking member movable from a loading position permitting gravity feed of containers from said shelf to said conveyor means to an operating position blocking the feed of containers to said conveyor means; means for moving said blocking member from said operating position to said loading position when said conveyor means are unloaded and returning said blocking member to the operating position when said conveyor means has been reloaded; and means on said shelf interconnected with said last mentioned means to render said last mentioned means inactive to return said blocking member to said loading position when said shelf is empty.

21. In a beverage vending machine the combination of: an inclined storage shelf arranged for gravity feed of containers therefrom; conveyor means mounted at the lower edge of said shelf; a blocking member associated with said shelf and said conveyor means and movable from a loading position permitting gravity feed of containers from said shelf to said conveyor means, to an operating position blocking the feed of containers to said conveyor means; and means responsive to the load condition of said conveyor means for moving said blocking member from said operating position to said loading position when said conveyor means are unloaded, and returning said blocking member to the operating position when said conveyor means has been reloaded.

22. In a beverage vending machine the combination of: an inclined storage shelf arranged for gravity feed of containers therefrom; conveyor means mounted at the lower edge of said shelf; a blocking member associated with said shelf and said conveyor means and movable from a loading position permitting gravity feed of containers from said shelf to said conveyor means, to an operating position blocking the feed of containers to said conveyor means; means responsive to the load condition of said conveyor means for moving said blocking member from said operating position to said loading position when said conveyor means are unloaded, and returning said blocking member to the operating position when said conveyor means has been reloaded; and means on said shelf interconnected with said last mentioned means to render said means inactive to return said blocking member to said load position when said shelf is empty.

23. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves arranged for gravity feed of containers therefrom; conveyor means mounted at the lower edge of each of said shelves; a blocking member associated with each of said conveyor means and movable from a loading position permitting gravity feed of containers from said shelf to said conveyor means, to an operating position blocking the feed of containers to said conveyor means; and means

responsive to the load condition of each of said conveyor means for moving said blocking members from said operating position to said loading position when said conveyor means are unloaded, and returning said blocking member to the operating position when said conveyor means has been reloaded.

24. In a beverage vending machine the combination of: a plurality of vertically spaced inclined storage shelves arranged for gravity feed of containers therefrom; conveyor means mounted at the lower edge of each of said shelves; a blocking member associated with each of said conveyor means and movable from a loading position permitting gravity feed of containers from said shelf to said conveyor means, to an operating position blocking the feed of containers to said conveyor means; means responsive to the load condition of each of said conveyor means for moving said blocking members from said operating position to said loading position when said conveyor means are unloaded, and returning said blocking member to the operating position when said conveyor means has been reloaded; and means interconnected with each of said last mentioned means to render said means inactive to return said blocking member to said loading position when said shelf is empty.

25. In a beverage vending machine the combination of: a storage shelf; a conveyor assembly having a movable belt extending along and adjacent to an edge of said shelf, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said shelf edge from a depressed loading position in which said belt is in alignment with said shelf, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; and means responsive to the load condition of said belt for moving said conveyor assembly from said operating position to said loading position when said belt is unloaded, and returning said conveyor assembly to the operating position when said belt has been reloaded.

26. In a beverage vending machine the combination of: a plurality of storage shelves; a conveyor assembly having a movable belt extending along and adjacent to an edge of each of said shelves, said assembly having a pivotally mounted frame adapted for limited movement about an axis parallel to said shelf edges from a depressed loading position in which said belt is in alignment with said shelf, to an operating position in which said belt is elevated and said frame blocks the feed of containers from said shelf; and means on each of said conveyor assemblies responsive to the load condition of said belt for moving said conveyor assembly from said operating position to said loading position when said belt is unloaded, and returning said conveyor assembly to the operating position when said belt has been reloaded.

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