May 22, 1945. A. GERLICH 2,376,682

BOTTLE DISPENSING APPARATUS

Filed Jan. 26, 1942

Fig. 1

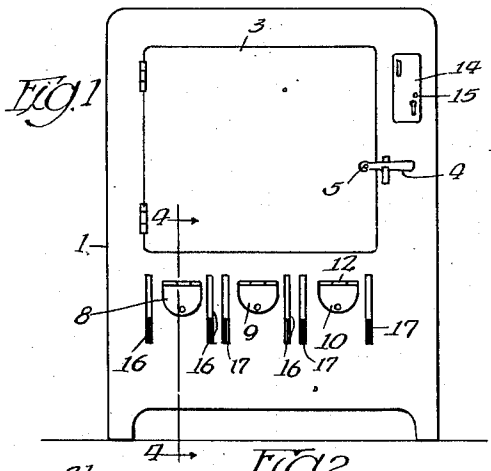


Fig. 4

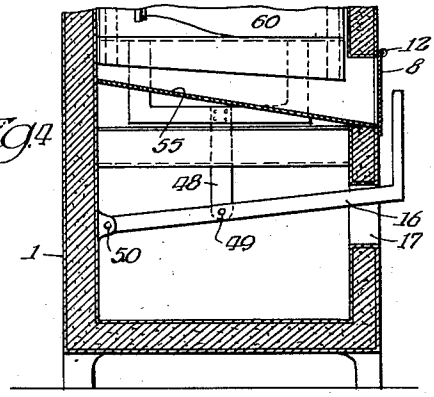


Fig. 2

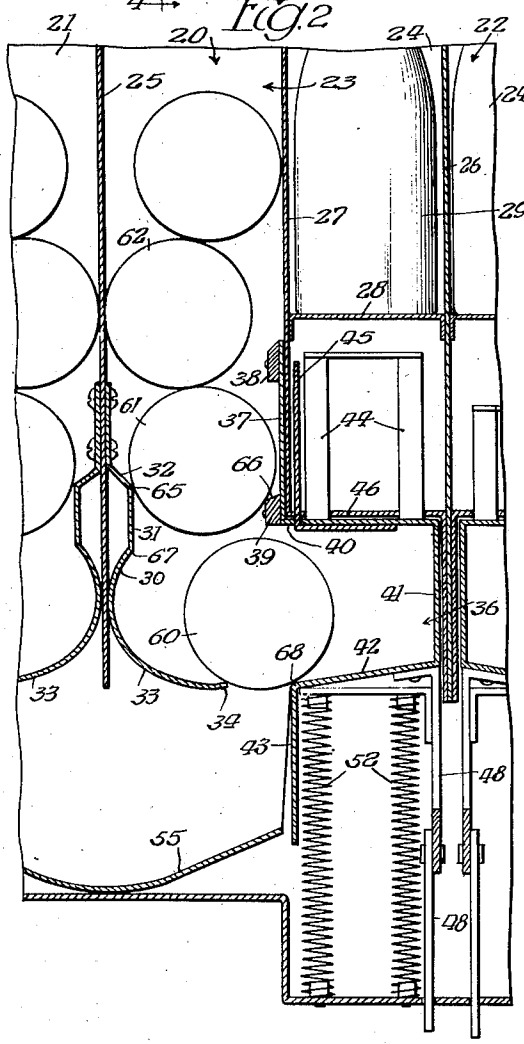
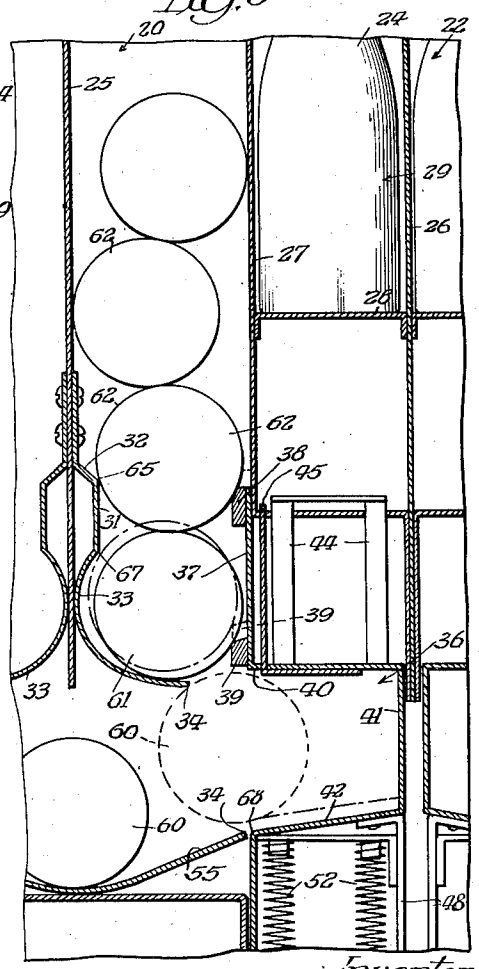


Fig. 3



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Patented May 22, 1945

2,376,682

UNITED STATES PATENT OFFICE

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BOTTLE DISPENSING APPARATUS

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Application January 26, 1942, Serial No. 428,176

5 Claims. (Cl. 312—48)

This invention relates to apparatus for dispensing bottles, cans, or the like, particularly round beverage bottles or cans. It is one of the objects of the present invention to provide a bottle dispensing apparatus which may be placed into a box or cabinet, such as a refrigerator, and which will dispense the bottles safely and without any reasonable likelihood of breakage. It is a further object of the present invention to provide such an apparatus wherein the bottle being dispensed, as well as the remaining bottles in the apparatus, will be subject to substantially no jarring. This is of importance in dealing with carbonated beverages.

It is a still further object of the present invention to provide a dispensing apparatus of the above mentioned character which is simple of construction and has a minimum number of movable parts.

Another object of the present invention is the provision of a dispensing unit which can easily and simply be changed to accommodate different sizes of bottles, from very small bottles to comparatively large bottles, without involving expensive, complicated or difficult operations to make adjustments. Still another object of the present invention is the provision of a manually operated dispensing unit which will always dispense one, and only one bottle each time it is operated while there are bottles in the unit.

In accordance with the preferred embodiment of the present invention the bottles are stacked one above another in a vertical row, each bottle resting on and being supported by the bottle below it. The lowermost bottle is supported by a shuttle mechanism which is vertically movable and preferably arranged to support also the second lowermost bottle. Upon movement of the shuttle in one direction the lowermost bottle is discharged while the next lowermost bottle is supported and gently lowered to the position occupied by the previously lowermost bottle. All of the remaining bottles in the row then move gently downward an amount equal to the diameter of the bottle discharged. In the preferred construction the bottle to be discharged is held in the shuttle mechanism and preferably out of contact with the remaining bottles of the row. Upon downward movement of the dispensing unit or shuttle mechanism the bottle in the shuttle mechanism is discharged and the lowermost bottle of the row is permitted to move by gravity to a position where it is ready to enter the shuttle mechanism upon subsequent return of the shuttle mechanism to its normal position. As the shuttle mechanism is being lowered by manual operation of the dispensing unit the bottle gradually rolls towards a discharge chute. When the shuttle mechanism approximately reaches its lowermost position there is just enough clearance for the bottle to roll from the shuttle mechanism to the discharge chute. This avoids any substantial agitation of the contents of the bottle.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a front view of a coin controlled refrigerator in which the dispensing unit of the present invention may be mounted;

Figure 2 is an enlarged fragmentary sectional view through one of the dispensing units of the present invention;

Figure 3 is a view similar to Figure 2 and showing the dispensing unit in an alternate position; and

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 2 and looking in the direction of the arrows.

Reference may now be had more particularly to Figure 1. A refrigerator, indicated at 1, is of the electric or other well known type and may contain the usual electric motor driven compressor at the lower part thereof, and contains the usual cooling coils which may be located at the back of the box or at the top of the box, as is desired. The refrigerator is provided with the usual hinged door 3 for permitting access thereinto and a latch 4 for holding the door closed. The latch is locked and controlled by a key lock 5 to prevent unauthorized opening of the door. A number of delivery chutes, closed by hinged doors 8, 9 and 10, open at the lower part of the refrigerator. Each of the doors is pivoted at 12 and normally extends downwardly and is held there by gravity or by a light spring to maintain the outlet of the delivery chute closed against the escape of cold air from the refrigerator. The front of the refrigerator also has a coin controlled mechanism 14 having a push button 15 for returning a coin before the coin has been collected, as may be necessary in the event that the selected merchandise compartment is empty.

The handles of a number of levers 16 extend forward of the refrigerator through narrow slots 17. The handles of the levers are manually movable under the control of the coin box mechanism 14 and are interlocked so that only one handle

may be moved at a time in response to the deposit of a coin in the coin box mechanism. Below each handle may be placed a label for indicating the beverage in the compartment or section controlled by that particular handle. Thus bottles of various different types of beverages may be placed in the different compartments of the dispensing unit, to be hereafter described, which compartments are controlled by the different levers 16 so that a customer may select a beverage by selecting and operating the corresponding lever 16.

To receive merchandise the customer deposits a coin into the slot of the coin box 14 and thereafter depresses any one of the selected levers 16. If the compartment containing merchandise controlled by the particular selected lever is empty then the lever is automatically locked against operation. The customer may then choose to operate a different lever or may press the button 15 for the return of the coin. The particular means for locking the lever against operation when the compartment containing merchandise controlled thereby is empty forms no part of the present invention, hence no description thereof is here necessary. For a description of one suitable operation locking mechanism reference may be had to the pending application of Milton L. Smith and Robert Schwalb, Serial No. 424,466.

The dispensing unit of the present invention is placed in the refrigerator in much the same manner as is the dispensing unit of the refrigerator of the application of Milton L. Smith and Robert Schwalb above referred to. The dispensing unit comprises a plurality of similar sections of which one is shown at 20 in Figure 2, a similar section to the left of it is indicated at 21 and a third similar section to the right of it is indicated at 22. Each section, such as the section 20, includes a bottle stacking compartment 23 in which the bottles to be dispensed are placed one above the other, each bottle resting on the preceding bottle for subsequent delivery from the unit, and a precooling compartment 24 to hold bottles for precooling to be subsequently placed into the bottle stacking compartment. A stationary plate or wall 25 separates the sections 20 and 21, and a similar stationary plate 26 separates the sections 20 and 22. A stationary plate 27 divides the section 20 into the two compartments 23 and 24. The plates 25, 26 and 27 lie in vertical planes extending from adjacent the front of the refrigerator to adjacent the rear of the refrigerator. The space between the plates 26—27 is provided with a plurality of horizontal shelves such as the shelf 28, extending between the plates and spaced apart vertically an amount slightly in excess of the height of the bottles 29 to be placed on each shelf. Since each bottle is about three times as tall as its diameter and the shelf is equal to the length of a bottle approximately three bottles can be placed on each horizontal shelf 28, one in front of another. If the dispensing unit is of a height to receive approximately seventeen bottles in each dispensing or bottle stacking compartment 23, then there will be approximately five shelves 28, one above the other, each shelf receiving approximately three bottles. Thus each section will hold almost as many bottles in the precooling compartment as in its dispensing compartment.

A bottle guide 30 is removably secured to the plate 25 adjacent the bottom thereof in any desired manner, as by bolts or screws. The bottle guide includes a projection ledge 31 which projects towards the plate 27 and preferably extends the full width of the plate 25 from the front towards the rear of the refrigerator and includes an upper tapered portion 32 and a lower circular or cylindrical guiding portion 33 terminating at an edge 34.

A shuttle mechanism 36 is mounted for vertical movement adjacent the bottom of the section 20. This mechanism includes a vertical plate or bracket 37 carrying an upper bottle stop 38 and a lower bottle stop 39, a horizontal plate 40 integral with the plate 37, a second vertical plate 41 integral with the plate 40, an inclined guide plate 42, and a vertical guide plate 43 all constituting one integral structure. The plates 40, 41 and 42 thus constitute a trough for receiving bottles, one at a time, from the stacking compartment. The stops 38—39 constitute projections from the surface of the plate 37 in a direction towards the adjacent plate 25, and the plate 42 constitutes a projection from the surface of the plate 43 in a direction away from the adjacent plate 25. The shuttle is movable downwardly from the position illustrated in Figure 2 to that illustrated in Figure 3, in a manner to be more fully set forth as this description proceeds, for discharging a bottle from the trough of the shuttle to a discharge chute 55. Metal guide straps or bars 44 and 45 are an integral part of the shuttle and fit snugly through slots in a bottom stationary plate 46 for guiding the shuttle in its up and down movement. The shuttle has a strap 48 secured thereto and depending therefrom, which strap is adapted to be secured to the operating lever 16 as by a pin 49. The operating lever is pivoted to a stationary part of the refrigerator or of the dispensing unit, as indicated by a pin 50. Compression springs 52 are provided for urging the shuttle mechanism to its uppermost position illustrated in Figure 2. When the shuttle mechanism is lowered, as by manual operation thereof in a manner to be presently more fully set forth, the springs are compressed so that upon release of the force tending to lower the shuttle mechanism it is returned to its position illustrated in Figure 2 by the compression of the springs.

The bottle stops 38 and 39 are in the form of bars extending horizontally transversely of the refrigerator, preferably for the full depth of a bottle in the compartment 20.

A chute 55, located below the bottle stacking compartment 23, receives the bottles from the shuttle mechanism 36 when the shuttle mechanism is in its lowermost position. At that time the lower edge of the ledge 42 is approximately at the level of the edge of the chute 55, as illustrated in Figure 3, so that a bottle can roll gently from the shuttle mechanism to the chute, along which it then slides downwardly to be discharged on the outside of the refrigerator.

The entire dispensing unit for the refrigerator cabinet here illustrated consists of six sections such as the section 20, a single chute 55 being provided for each two adjacent sections. As may be seen from Figures 2 and 3, adjacent sections are so located that the bottle dispensing compartments 23 of the sections 20 and 21 are adjacent one another whereas the bottle storage or precooling compartments 24 of the sections 20 and 22 are adjacent one another. Thus the shuttle mechanisms of the sections 20 and 22 are adjacent one another. The movable part of each section, constituting the shuttle of the section, is thus adjacent the movable part of the adjacent section whereas the stationary part of each sec-

tion, which is the side thereof where the ledge 31 is mounted, is adjacent the corresponding side of its adjacent section. This is in the same manner as in the Smith and Schwalb application above referred to, to which further reference may be made.

The distance between the stationary ledge 31 and the movable bottle stops 38—39 is of importance in determining the amount of agitation of the bottles as the apparatus is operated. In one preferred construction the distance between the upper surfaces of the stops 38—39 was two inches, the ledge 31 was ⅜ inch from the wall 25, and the walls 25—27 were 3¼ inches apart. The ledge 38 extended $\frac{3}{16}$ inch from the wall 27 whereas the ledge 39 extended ¼ inch from the wall 27. This was a suitable arrangement for bottles of 2¾ inches diameter. If this structure is to be used with bottles of different diameters the stops 38—39 are replaced by larger or smaller stops as may be necessary, and the ledge 31 is also replaced by one that extends a greater or lesser distance from the wall 25.

An explanation will now be given of the manner of operation of the mechanism of Figure 2. The bottles are placed in the machine, as indicated at 60, 61, 62, etc., there being as many bottles above the bottle 62 as there is room for in the bottle stacking compartment 23. A selected lever 16 is manually depressed. This may be done after a coin has been deposited in the coin box or, if the apparatus is not to be coin controlled, then no interlock is provided between the levers 16 so that any lever may be operated at any time. Downward movement of the lever 16 causes the strap 48 to pull the shuttle mechanism downwardly. This causes the bottle 60 to move downwardly, said bottle continuing to rest on the inclined guide plate 42 and the edge 34 of the guide portion 33. At the same time the bottle 61 which rests between the upper left hand corner of the bottle stop 39 and a corner 65 of the ledge 31 moves downwardly. The clearance between the ledge 31 and the stop 39 is insufficient to permit the bottle 61 to move immediately into the guiding portion 33. As the downward movement of the shuttle continues the bottle 61 and all of the bottles above it move downwardly. This motion continues until the stop 39 reaches the position indicated in dotted lines in Figure 3. In this position the distance from the corner 66 of the stop 39 and the corner 67 of the ledge 31 is just sufficient to permit the bottle 61 to roll into the lower circular guide portion 33. At this time the guide plate 42 of the shuttle is in the dotted line position illustrated in Figure 3 and the distance between the edge 68 of the shuttle and the edge 34 of the ledge 31 is also equal to the diameter of a bottle. Therefore the bottle 60 rolls from the position illustrated in dotted lines in Figure 3 into the chute 55, as illustrated in full lines in Figure 3, from which it then slides down the chute through the trap door 8 to be delivered to the customer. It is to be noted that at this time the inclined guide plate 42 of the shuttle mechanism is almost in line with the chute 55 so that there is no substantial drop in the bottle. There is a slight drop due to the fact that allowance is made for the use of larger bottles in the machine. If a somewhat larger bottle is used then that larger bottle does not clear the edge 34 until the guide plate 42 is in line with the chute 55, hence no drop of the bottle takes place as the bottle rolls from the shuttle to the chute. If still larger bottles are used then the stops 38—39 and the ledge 31 are replaced so as to allow the larger bottles to pass through the mechanism.

When the shuttle is in its lowermost position, illustrated in Figure 3, so that the bottle 60 is discharged, and the bottle 61 enters the lower circular guide portion 33, the bottle 62 is supported by the stop 38 and the ledge 31. The customer then raises the lever 16 or releases the lever so that the springs 52 raise it, thus causing the shuttle mechanism to move upwardly. As the shuttle moves upwardly the stop 39 pushes the bottle 61 to the left from the position illustrated in Figure 3, and the stop continues its upward movement until it passes above that bottle. As the stop 39 continues to rise the bottle then moves to the right until it encounters the guide plate 42 which prevents the bottle 61 from being discharged. That bottle is then in the same position as that of the bottle 60 of Figure 2. During the same upward movement of the shuttle from the position illustrated in Figure 3 the stop 38 forces the bottle 62 to roll upon the ledge 32 until the stop 38 rises above the center of the bottle 62. Continued upward movement of the shuttle causes the bottle 62 to roll down the inclined portion 32 under control of the stop 38 until the bottle abuts against the vertical plate 37. At this time the stop 39 engages the bottle 62 of Figure 3, which is now in the position previously occupied by the bottle 61 of Figure 2. Thus there is a minimum amount of movement and agitation of the bottles.

It is to be noted that when the shuttle mechanism moves downwardly from the position illustrated in Figure 2 the bottle 61 tends to roll in a clockwise direction down the vertical wall of the ledge 31. Clockwise rotation of the bottle 61 tends to induce a counter-clockwise rotation of the bottle 62 above it. The bottle 62 is in contact with the wall 25. The downward sliding of the bottle 62 in contact with the wall 25 tends to resist the clockwise rotation of the bottle 62 thus resisting rotation of the bottle 61. This retards the downward movement and also inhibits or even prevents the rotation or rolling that may tend to take place, thus reducing the amount of agitation of the bottles.

When the mechanism is coin controlled the dispensing unit is provided with a locking mechanism which normally locks the shuttle against downward movement when the particular selected row, such as 20, is empty, thus advising the customer to operate a different lever 16 which controls the shuttle mechanism of an adjacent row, such as the row 21. The locking mechanism is released by the weight of a bottle at 60 in Figure 2, in the manner illustrated in the application of Milton L. Smith and Robert Schwalb above referred to, to which reference may be had. Likewise the movable shuttle mechanism is provided with a full stroke mechanism, as shown in the Smith and Schwalb application, so arranged that upon initiation of movement of the shuttle in either direction the full stroke mechanism prevents reverse movement until the shuttle has been moved its full stroke, at which time reverse movement is again permitted. Since this is no part of the present invention a description and illustration thereof is not deemed necessary, but reference to the application of Milton L. Smith and Robert Schwalb may be had for these features.

In the description thus far given I have spoken of the springs 52 as being compression springs

normally urging the shuttle mechanism to the position illustrated in Figure 2 and placed under compression when the shuttle mechanism is moved to the position illustrated in Figure 3. By this arrangement, as above described, a bottle is discharged when the shuttle mechanism is forced downwardly and thereafter the springs urge the shuttle mechanism to its upward position so that when the mechanism reaches its uppermost position the next succeeding bottle is brought into position for discharge upon the subsequent repetition of the cycle of operation. If desired the springs **52** may be tension springs, rather than compression springs, so that the springs normally urge the shuttle mechanism to the position illustrated in Figure 3. When this is the case the operator of the machine actuates the lever **16** upwardly, thereby tensioning the springs **52** and moving the shuttle mechanism from the position illustrated in Figure 3 to the positions illustrated in Figures 2 and 4. That causes the lowermost bottle (**61** of Fig. 3) to move into the position illustrated by the bottle **60** of Figure 2. At that time the springs **52** are under tension so that on release of the lever **16** by the operator the shuttle then returns from the position of Figure 2 to that of Figure 3, thereby discharging a bottle. Under such circumstances the initial operation of the lever **16** (upward) results in setting of the mechanism, and the release of the lever results in discharging of the bottle. This is of advantage particularly when the mechanism is used in conjunction with a full stroke mechanism which compels completion of an initiated operation of the lever **16** before the reverse operation can take place. In such an arrangement, with the springs **52** as tension springs, a customer commences the upward movement of the lever **16**. The customer cannot obtain a bottle of beverage until after the lever has been moved to its uppermost position and then moved downwardly again. The customer is therefore sure to move the lever to its uppermost position, or to continue moving the lever upwardly until such time as he can move it no further. The release of the lever then causes the springs to move the shuttle mechanism downwardly to discharge a bottle. In an arrangement such as was first described, wherein the springs **52** are compression springs so that the first movement of the shuttle is downward resulting in the discharge of the bottle, there is a possibility in the case of a coin controlled dispenser that a bottle, especially a small bottle, may be discharged before the shuttle mechanism reaches the bottom of its stroke, and the customer having received his bottle of beverage will not complete the downward movement of the shuttle, so that the full stroke mechanism might prevent the automatic upward movement of the shuttle. This is not possible in a case where the springs are tension springs and the initial shuttle movement is upwardly, as above last described.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. A bottle dispensing unit comprising means for holding a single vertical row of bottles each resting upon the subjacent bottle, and a shuttle mechanism at the bottom of the row and offset laterally from said row of bottles for controlling the discharge of bottles from the row one at a time, said shuttle mechanism including a vertically movable bottle receiving trough movable downwardly in a straight line in a direction parallel to the row of bottles held in the unit from a bottle receiving position at substantially the level of the lowermost bottle of the row to a bottle discharging position below said row.

2. Bottle dispensing apparatus comprising spaced vertically extending members opposite one another for holding a row of bottles between them with each bottle resting upon the subjacent bottle, one member having a projection extending towards the other member, a shuttle mechanism adjacent the lower end of said other member and having a projection extending towards said first mentioned projection, said shuttle mechanism having another projection above the second mentioned projection for supporting together with the first mentioned projection the second lowermost bottle, said shuttle and said one vertically extending member being so mounted that one is movable vertically relative to the other to permit the lowermost bottle to move to a discharging position.

3. Bottle dispensing apparatus comprising spaced vertically extending members opposite one another for holding a row of bottles between them with each bottle resting upon the subjacent bottle, one member having a projection extending towards the other member, a shuttle mechanism adjacent the lower end of said other member and having a projection extending towards said first mentioned projection, said shuttle mechanism having another projection above the second mentioned projection for supporting together with the first mentioned projection the second lowermost bottle, said shuttle and said first vertically extending member being so mounted that one is movable vertically relative to the other to permit the lowermost bottle to move by gravity to a discharging position, said movement bringing the third mentioned projection out of position helping to support the second lowermost bottle thereby permitting the second lowermost bottle to move by gravity into the position previously occupied by the lowermost bottle upon subsequent reverse relative movement of said one member and the shuttle with respect to one another.

4. Bottle dispensing apparatus comprising spaced vertically extending members opposite one another for holding a row of bottles between them with each bottle resting upon the subjacent bottle, one member having a projection extending towards the other member, a shuttle mechanism adjacent the lower end of said other member and having a projection extending towards said first mentioned projection for holding together with the first mentioned projection the lowermost bottle of the row, said shuttle mechanism having another projection above the second mentioned projection, said shuttle and said one vertically extending member being so mounted that one is movable vertically relative to the other to permit the lowermost bottle to move past said two first mentioned projections, said movement permitting the next lowermost bottle to move into engagement with the first mentioned projection and the third mentioned projection where it is held so that upon subsequent reverse relative movement of said one member and the shuttle with respect to one another said next lowermost bottle moves into the position previously occupied by the lowermost bottle.

5. Bottle dispensing apparatus comprising a pair of spaced vertical walls for holding bottles of beverage in a row one bottle above the other and confined as to side movement by the walls, a projection on one of the walls engaging the lowermost bottle, a vertically movable shuttle mechanism also engaging the lowermost bottle of the row for controlling the discharge thereof past said projection, said shuttle mechanism including a projection for engaging the next lowermost bottle and preventing discharge thereof as the lowermost bottle is discharged, all of the bottles above the bottle being discharged moving downwardly in contact with one another as the lowermost bottle is discharged and said bottles having relative sliding movement with respect to one another and with respect to the side walls as they tend to roll thereby retarding the tendency to roll.

ADOLPH GERLICH.