May 7, 1940. A. T. SIMMONS 2,200,228

DISPENSING APPARATUS

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FIG. 1.

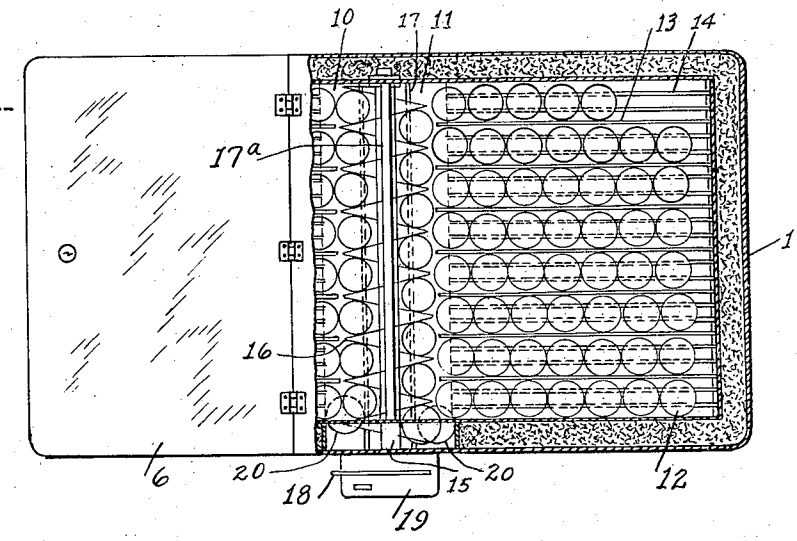
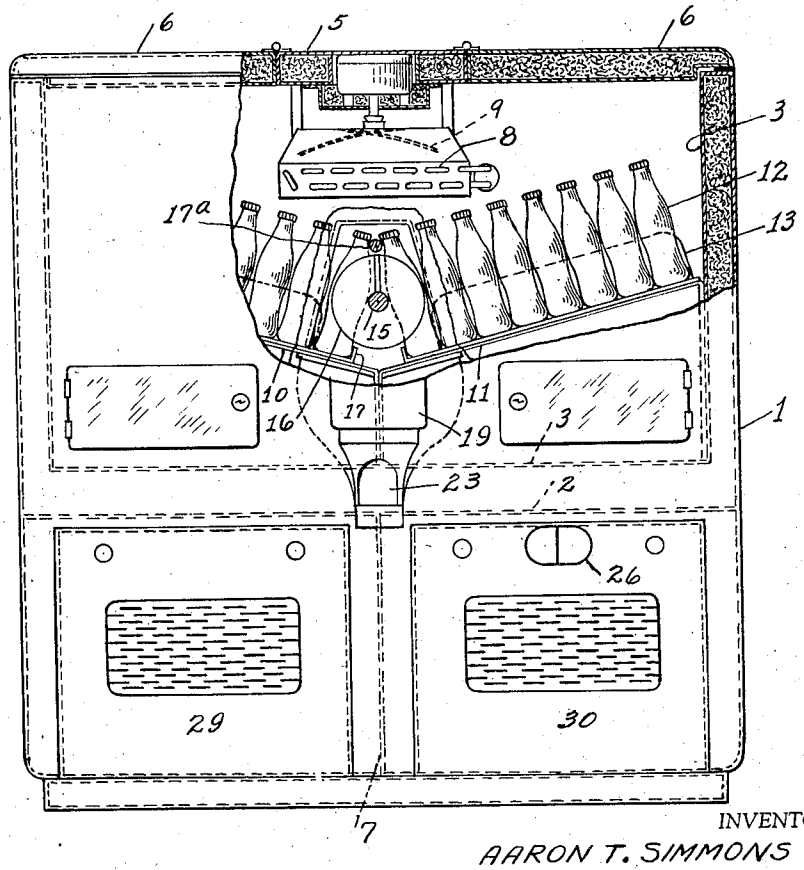


FIG. 2.



INVENTOR.
AARON T. SIMMONS
BY Langdon Moore
ATTORNEY.

May 7, 1940. A. T. SIMMONS 2,200,228

DISPENSING APPARATUS

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FIG. 3.

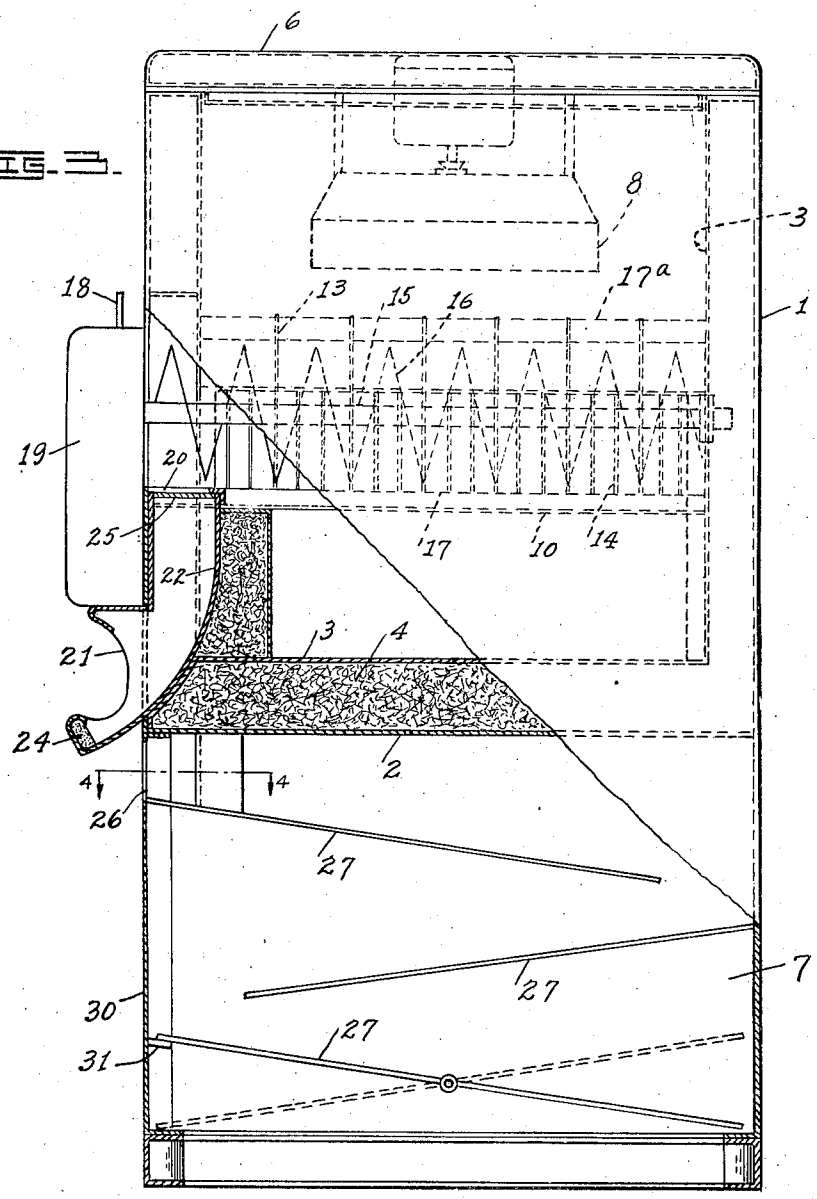
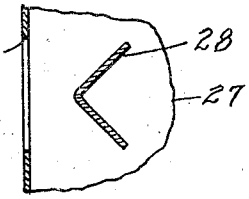


FIG. 4.



INVENTOR.
AARON T. SIMMONS
BY Langdon Moon
ATTORNEY.

May 7, 1940. A. T. SIMMONS 2,200,228

DISPENSING APPARATUS

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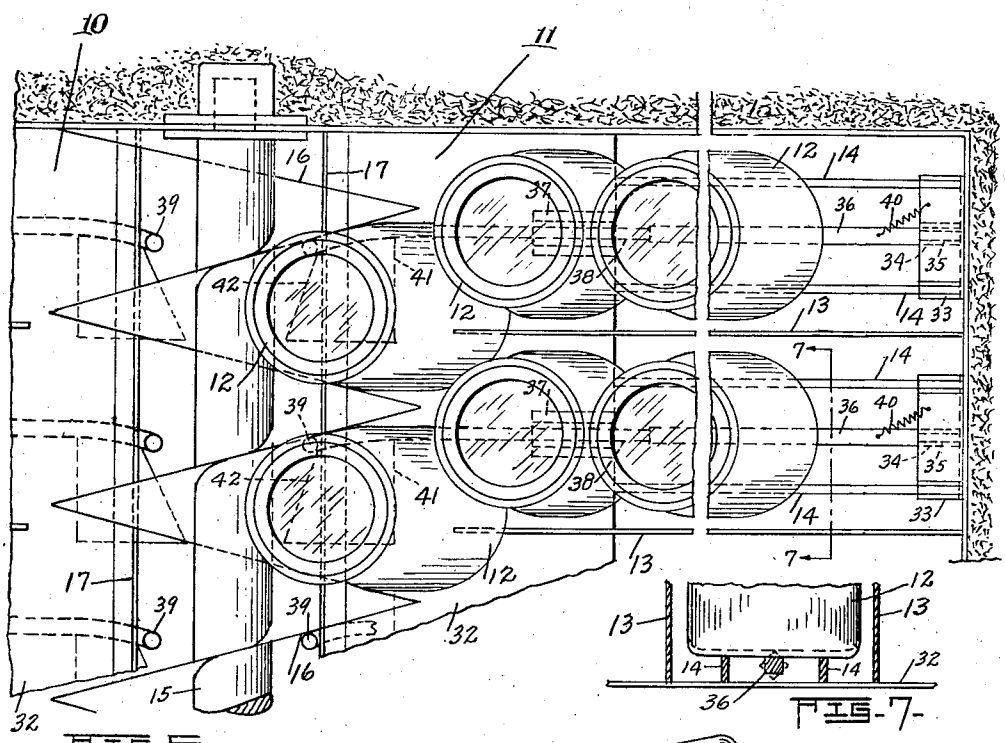

FIG. 5.

FIG. 7.

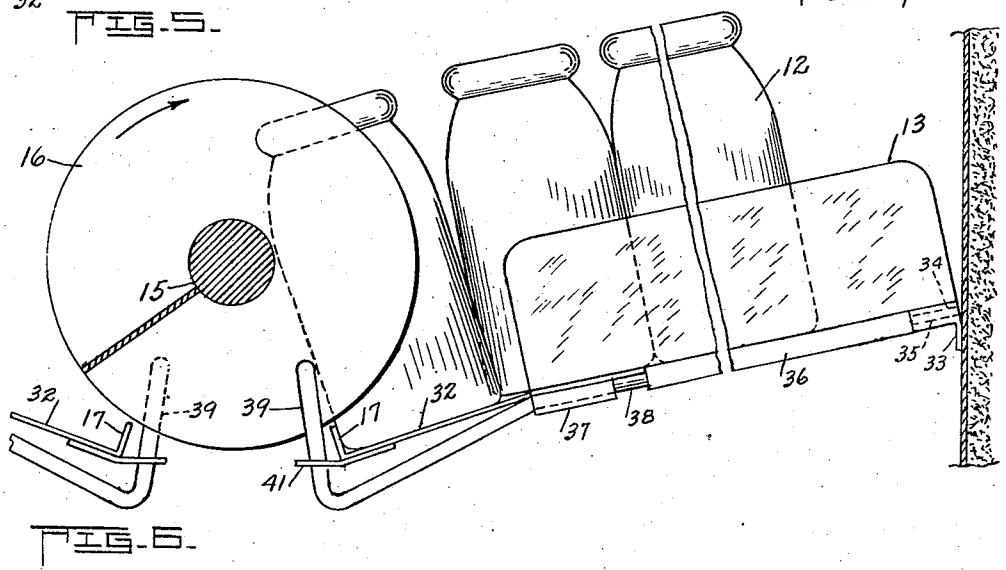

FIG. 6.

INVENTOR.
AARON T. SIMMONS
BY Langdon Moon
ATTORNEY.

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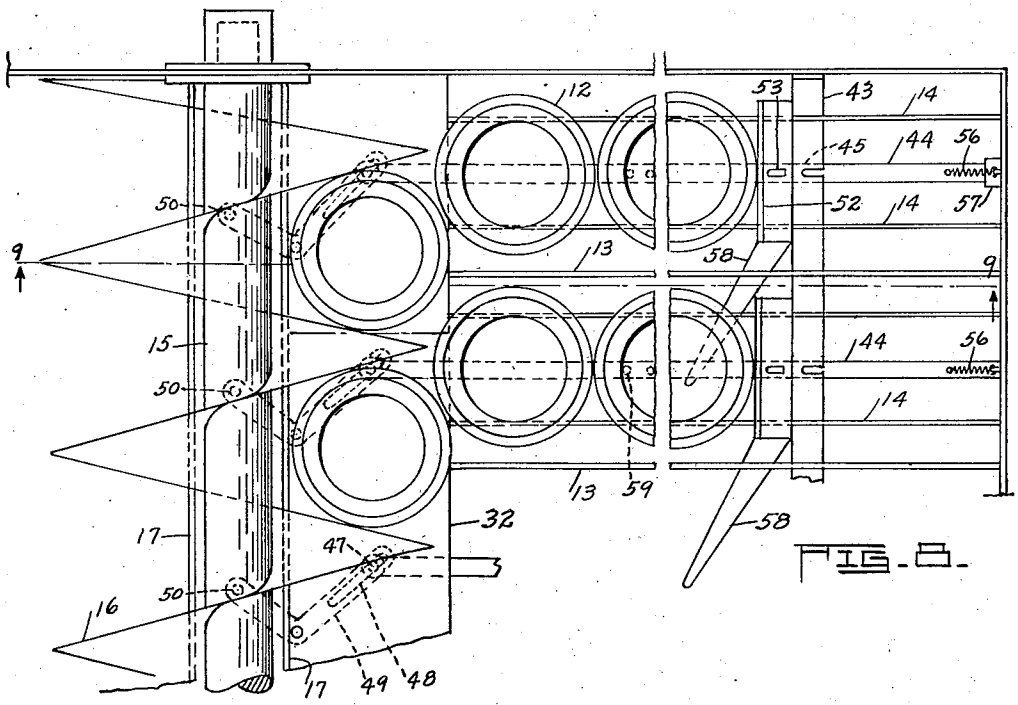

FIG. 8.

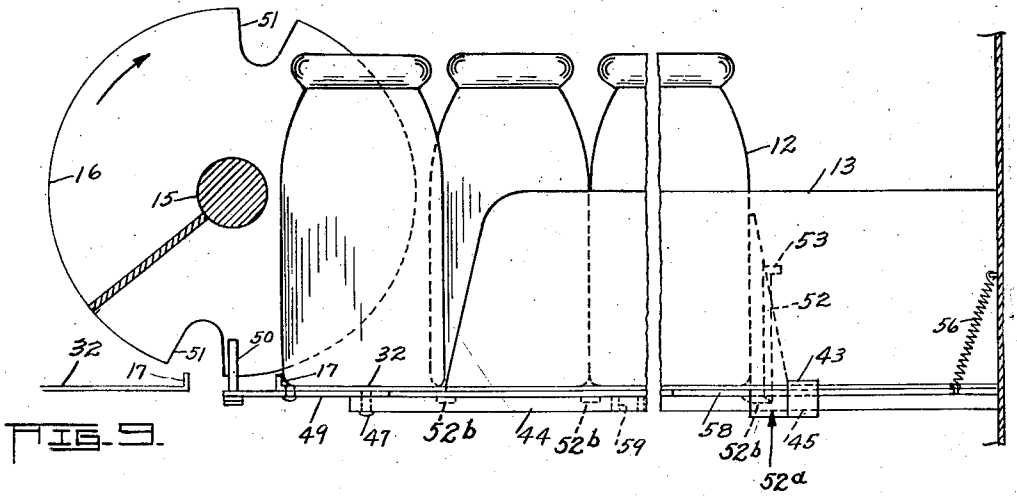

FIG. 9.

INVENTOR.
AARON T. SIMMONS
BY Langdon Moore
ATTORNEY.

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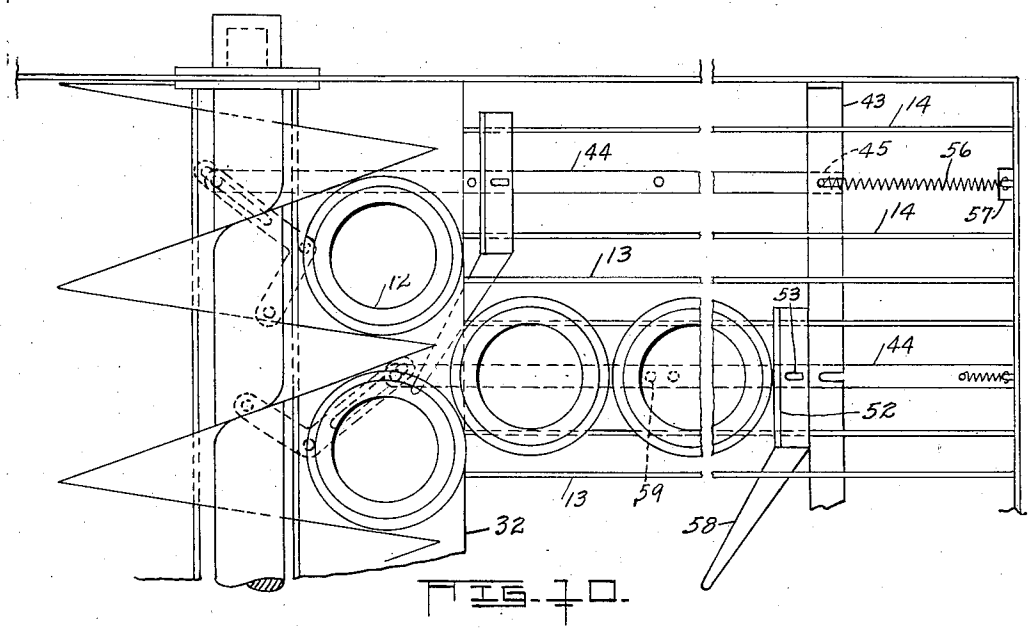

FIG. 10.

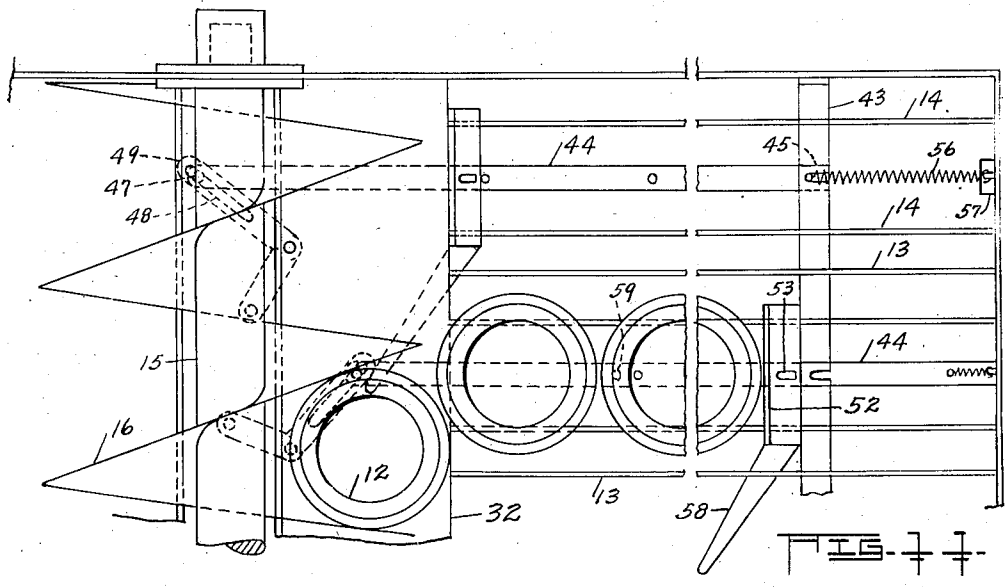

FIG. 11.

INVENTOR.
AARON T. SIMMONS

BY Langham Moore

ATTORNEY

Patented May 7, 1940

2,200,228

UNITED STATES PATENT OFFICE

2,200,228

DISPENSING APPARATUS

Aaron T. Simmons, Bloomington, Ill., assignor to Williams Oil-O-Matic Heating Corporation Bloomington, Ill., a corporation of Illinois

Application April 7, 1938, Serial No. 201,797

6 Claims. (Cl. 312—36)

This invention relates to improvements in dispensing apparatus and more particularly to a device of this character in which bottled beverages or other goods contained in cylindrical packages may be supported in substantially upright position and advanced from their original positions and dispensed without upsetting the same.

It is an object of this invention to provide a device of this character which will allow the cylindrical packages to be advanced in a substantially upright position to a delivery means which will advance them in a direction at an angle to the first movement and discharge them one at a time through an opening in the walls of the casing.

With these and other objects in view, reference is made to the accompanying sheets of drawings which illustrate an embodiment of this invention with the understanding that detail changes may be made without departing from the scope thereof.

In the drawings:

Figure 1 is a top plan view of an embodiment of this invention with a portion of the top removed and the side walls shown in section.

Figure 2 is a view in front elevation of Figure 1 with the upper portion of the front removed, illustrating the parts therebehind partly in section and partly in elevation.

Figure 3 is a view in end elevation with the lower portion of the end broken away illustrating the parts therebehind partly in section and partly in elevation.

Figure 4 is a view in section taken on the line 4—4 of Figure 3 looking in the direction of the arrows.

Figure 5 is an enlarged fragmentary plan view, with parts broken away, of a modification illustrating the application of means for imparting movement to the containers to cause them to travel over the supports 10 and 11, with the conveyor blades diagrammatically indicated.

Figure 6 is a fragmentary view, with parts broken away, in elevation of the construction shown in Figure 5.

Figure 7 is a detail view in section taken on the line 7—7, Figure 5, looking in the direction of the arrows.

Figure 8 is an enlarged, fragmentary plan view, with parts broken away, illustrating a positive means for advancing the containers over the container supports when the supports are arranged in a horizontal plane and when the casing is filled with containers, with the conveyor blades diagrammatically indicated.

Figure 9 is a view in section taken on the line 9—9 of Figure 8, looking in the direction of the arrows.

Figure 10 is a view similar to Figure 8, in which the conveyor is removing the last bottle from the last row at the back of the cabinet.

Figure 11 is a view similar to Figure 10, illustrating the position of the moving parts as the conveyor has removed the last bottle from the last row and moved it half way across the next to the last row.

In the embodiment of this invention illustrated, a rectangular casing 1 is provided, preferably divided into upper and lower compartments by the division plate 2. The upper compartment is provided with spaced-apart side and bottom walls 3 with the space therebetween filled with insulation 4. The top of the casing is provided with a cover 5 similarly insulated and arranged to form an airtight closure with the side walls of the casing. The top is preferably provided with two hinged doors 6 on each side of the center to provide access to the interior thereof. The upper compartment is designed to form a cooling compartment. The lower compartment is preferably divided by a central division plate 7 and a refrigerating apparatus of any preferred commercial design may be installed on one side of the division plate in the lower compartment. The cooling coil in the form of a cooling unit 8 is preferably supported below the central section of the top cover 5, as shown in Figure 2. If desired, a motor-operated fan 9 may be provided to circulate the air over and through the cooling unit 8 within the compartment.

In the form shown in Figures 1 to 4, inclusive, the upper compartment is provided with two oppositely inclined container supports 10 and 11 resting upon brackets supported at the opposite ends against the inner side walls 3 which brackets meet in the transverse center line of the casing and are extended beyond their meeting point in a vertical direction to rest upon the bottom inner wall 3 of the casing. The angles of these supports are such that bottles or other cylindrical containers 12 supported upon their ends will travel by gravity from the side of the casing toward the center. It is preferable to provide a plurality of parallel vertical guides 13 on each support 10 and 11 to separate the containers into rows so that they will advance one behind the other. If desired, the supports 10 and 11 may be provided with spaced-apart parallel ribs 14 between the spaced-apart parallel vertical guides 13 so that the containers may slide readily down the incline. If desired, the body of the supporting

plates may be cut away between the ribs 14 to allow the circulation of the cooling air.

A screw conveyor carried on a shaft 15 is mounted in bearings upon the front and back wall of the casing and arranged with its axis in the center line of the casing above the meeting edges of the brackets positioning supports 10 and 11. The pitch of the spiral blade 16 of the conveyor is such as to receive a container between the contiguous edges and advance it at right angles to the guides 13. The guides 13 are terminated a sufficient distance from the edges of the supports 10 and 11 to allow a container to be advanced by the screw conveyor over the supports 10 and 11. The supports 10 and 11 are provided with parallel spaced-apart guides 17 arranged parallel with the conveyer shaft 15 to be engaged by the bottom of a container when moved by the conveyor in a direction at right angles to the guides 13. It is preferable to also provide a guide to be engaged by the top of the containers to secure steadiness while advancing with their bottoms in engagement with the guides 17. For this purpose, a guide 17a is provided in the form of a rod parallel to the shaft 15 extending from the front to the back of the casing and at a sufficient height above shaft 15 to be engaged by the tops of the containers, such as the necks of the bottles shown in Figure 2.

One end of the shaft 15 of the conveyor passes through the front wall of the casing 1, the free end of which is provided with an operating handle 18 to impart a rotation to the conveyor shaft. If desired, any commercial coin-controlled mechanism may be mounted in the casing 19 through which the shaft 15 passes, so constructed as to allow a sufficient rotation of the conveyor shaft upon depositing of a coin to advance one container at a time to the front end of its path of travel and thereafter be discharged from the casing.

As shown in Figure 3, the supports 10 and 11 above the guides 17, or an extension thereof, are each provided with an aperture 20 of sufficient size when a container 12 has been advanced by the conveyor to engage the front side of the casing to allow the container to pass therethrough. A chute 21 is arranged under each opening 20 to receive the container passing therethrough, which chute is preferably provided with a curved rear portion 22 to be engaged by the bottom of the container descending through the opening 20 to guide the same through an opening 23 provided therefor in the front wall of the casing. The bottom of the rear wall 22 is continued through the opening 23 and is provided with a stop 24 to be engaged by the bottom of the container so as to support the container in an inclined position, whereby it may be grasped by the hand and removed through the opening 23. In order to retain the cooled air within the cooling compartment, it is preferable to provide each opening 20 with a spring pressed pivoted closure 25 arranged to be opened by the weight of the container when brought by the conveyor in register with the opening 20 to allow it to pass therethrough, and which will immediately close thereafter.

It is seen from the above construction that each row between the guides 13 upon the supports 10 and 11 may be filled with containers through the hinged doors 6 and upon rotation of the screw conveyor, the containers from the rear row next to the back of the casing, will first be received within the spiral blade of the conveyor and upon rotation will be advanced from the back to the front of the casing, and when the conveyor is filled, the containers being transported thereby will act as a stop to retain the other containers in their respective rows between the guides 13. After the containers in the last row have become exhausted, then the containers in next to the last row will be transported and dispensed and so on, until the compartment is emptied.

This invention also contemplates the utilization of the lower compartment on the side opposite the refrigeration apparatus for the storage of empty containers, and for that purpose an opening 26 is provided in the front wall of sufficient size to allow the insertion of an empty container. The interior of this section is provided with transverse angular supports 27 over which the empty containers may roll by gravity with the alternate ends of the supports terminated a sufficient distance from the adjacent wall of the casing to allow the containers to travel in a zigzag path from the top to the bottom.

It is preferable to provide the upper support 27 with an angular abutment 28 adjacent the opening 26 which will be engaged by an end of the container inserted through the opening 26 to direct the container on either side of the abutment so that its axis will be parallel to the front of the casing to be in a position to roll by gravity down the support 27. It is preferable to pivot the lowermost support 27, as shown in Figure 3. The front of the casing is provided with doors 29 and 30 giving access to both sides of the lower compartment, the door 29 allowing the insertion and removal of the refrigeration apparatus and the door 30 for the removal of the empty containers inserted through the opening 26. The pivoted lower support 27 is normally held in parallel relation to the alternate support thereabove by the closed door 30, as by stop 31 thereon, so that the containers will travel in a zigzag path until the lowermost container engages the back of the casing 1. Upon the opening of the door 30, the pivoted support may be rotated about its pivot to readily discharge the empty containers contained thereon while the containers resting upon the supports thereabove will roll by gravity out of the door 30.

While the containers will ordinarily travel by gravity down the incline supports 10 and 11, shown in Figure 2, if the bottoms of the containers are smooth, but this is not always the case, and to insure that the containers in each row advance uniformly down the incline supports to the conveyor, it is desirable to provide some means for producing this action.

One form of this advancing means is illustrated in Figures 5, 6, and 7 of the drawings. The embodiment shown in these figures includes the container supports 10 and 11 terminating adjacent the conveyor 15 in a continuous flat plate 32 over which the containers move when traveling in contact with the conveyor. The guides 13 are supported on the top of this plate 32 and the ribs 14 flush with the plate 32 are spaced apart between the division guides 13 with the ends adjacent the sides of the casing mounted in angular brackets 33 and with the other ends secured upon the under side of the adjacent edge of the plates 32. Each angular bracket is formed to mount an intermediate bearing 34 to support a shouldered cylindrical end 35 of a square rod 36 for both longitudinal and rotary movement. The square rod 36 is again shouldered and provided with a cylindrical axial continuation 38

thereof which is mounted for both longitudinal and rotary movement in a bearing 37 therefor mounted upon the under side of the plate 32 intermediate the ribs 14. The brackets 33 and bearings 37 are arranged normally to support the rod 36 with the flat surface of the squared portion in line with the tops of the ribs 14 on each side thereof. The reduced cylindrical portion 38 of the rod 36 is continued through the bearing 37 and then its free end 39 is bent upward to enter between the spiral blades 16 of the conveyor 15 whereby, as the conveyor is rotated, the front of the blade will engage the rear of the free end 39 of the rod 36, and as it advances, will rotate the rod 36 so that the edge of the squared portion will engage the bottom of the container supported upon the ribs 14 and lift the container free of contact with the said ribs, freeing any engagement that may retard the passage of the container in its travel by gravity toward the conveyor. Continuation of the rotation of the conveyor will tilt the end 39 in rotating the rod 36 until the conveyor edge passes thereover and the rod is returned to its normal position with its squared surface in line with the tops of ribs 14 by a spring 40 attached at one end to the bracket 33 or to the side wall of the casing 1 at one side of bearing 33 and at the other end to the normally vertical side of the square rod 36.

If desired, a longitudinal movement may be imparted to the square rod in the direction of the conveyor as the blade of the conveyor imparts a rotary movement to the rod 36 by providing upon the under side of the plate 32 a plate 41 extending in the path of the rotating end 39 of the rod 36 which plate is provided with an angular surface 42 to be wiped over by the end 39 and thereby impart a longitudinal movement to the rod 36 through the bearings 34 and 37 as the rod lifts the bottom of the container from engagement with the ribs 14. The weight of the container upon the rod during this operation will be sufficient to advance the container positively as its bottom is freed from contact with the ribs 14.

Figures 8 to 11, inclusive, illustrate a modified form providing a positive means for advancing the containers when the supports 10 and 11 are arranged in a horizontal plane. In this form a flat strip 32 with guide 17, similar to that shown in Figure 5, is supported horizontally within the casing 1 with the upper surfaces of the spaced-apart ribs 14 between the guides 13 extending in the same plane as the strip 32. The ends of the guides 13 and ribs 14 are preferably mounted upon a bracket 43 adjacent the inner side wall 3 of the casing 1. In order to advance the containers continuously in each row toward the conveyor, a reciprocating rod 44 is mounted in bearings 45 upon the brackets 43. One end of the rod 44 is provided with a pivot pin 47 having a sliding connection in the slot 48 in the long arm of the ball crank lever 49 pivoted at its apex upon the under side of the strip 32 adjacent the guide 17 with the short arm extending below the path of the blades 16 of the spiral conveyor 15. The free end of the short arm of the bell crank lever is provided with an upstanding post 50 extending upward between the blades of the conveyor whereby, as the conveyor is rotated, the forward edge of the blade will engage the rear edge of the post 50 and rotate the bell crank lever upon its pivot, imparting a longitudinal movement to the rod 44. It is preferable to provide each spiral blade with oppositely disposed cut-out notches 51 so positioned and of such dimensions that each time the spiral blade has engaged the post 50 to rotate the bell crank lever 49 to the end of the movement of the rod 44 in that direction, said notch will free the blade from the post 50 and allow the opposite side or rear side of the spiral of the conveyor to engage the front side of the post and rotate the bell crank lever 49 to reciprocate the rod 40 to the opposite end of its movement and then, upon continued rotation of the conveyor, the other notch will again free the post 50 to be engaged by the front side of the conveyor.

Each rod 44 is provided with a follower block 52 mounted to travel over the spaced-apart ribs 14 with a depending portion 52^a embracing the rod 44. To impart a step-by-step movement to the follower block 52 to advance the containers as the rod 44 is reciprocated, the upper surface 54 of the rod is serrated or notched as at 52^b (see Fig. 9) and the follower block 52 is provided with a spring or pawl 53 adapted to engage the rod as the rod is moved in the direction of the conveyor to advance the follower block 52 with it during its movement in that direction and then free the rod to be reciprocated in the opposite direction without engaging with the follower block. The rods 44 are returned by springs 56 secured to their free ends and to the guides 13 or ribs 14 adjacent the inner side wall 3 of the casing 1 or to the inner side wall itself. The construction of the bell crank lever 49 is such that at each reciprocation of the rod, the follower block 52 will advance the container it is in contact with, the width of a container.

When a casing is to be filled with containers in each of the forms hereinbefore described, the conveyor is so manipulated that a container may be placed on each support 10 and 11 between each blade of the conveyor and then each row between the guides 13 is filled with the containers in contact with each other and with the container received between the blades of the spiral conveyor. Therefore, when the conveyor is operated to deliver one container at a time, the containers between the blades are first advanced and delivered, and as the container opposite the last row at the back of the casing is advanced, the containers in that row are fed into the conveyor and exhausted and then the next adjacent row is fed into the conveyor and so on until the cabinet is empty.

In the form shown in Figures 8 to 11, inclusive, Figure 8 shows a casing filled with containers, as above described, with the container opposite the last or back row received between the blades of the conveyor partially advanced from alignment with the other containers in that row. In this construction, it is necessary that the springs 56 retract for all of the rods 44 so that the posts 50 upon the short arm of the pivoted bell crank lever 49 are positioned at the rear of the blades 16 of the conveyor a sufficient distance so that they will not be engaged by the front edge of the conveyor when the notches 51 pass by the posts 50. When the casing is filled with containers, the post 50 on the pivoted bell crank lever 49 in alignment with the last row of containers at the rear or back of the casing must be adjusted manually or the free end of the reciprocated rod 44 provided with a stop 57 so that the post 50 is in position as a notch 51 in the blade 16 passes thereover to be engaged by the front of the blade to reciprocate the rod 44 to advance the containers 12 in the last row as the container received

between the blades of the conveyor is advanced out of alignment with that row.

When the last container in the last row has been received between the blades of the propeller to be advanced along the plate 32 toward the delivery opening, it is necessary that some means be provided to bring the post 50 in alignment with the next adjacent row of containers into position to be engaged by the blade of the conveyor. This invention contemplates the providing of an arm 58 extending from the follower block 52 to engage the free end of the long arm of the next adjacent pivoted bell crank lever 49 after the last container is advanced by the follower block into position between the blades of the conveyor so that the end of the arm 58 will rotate the bell crank lever, as that container passes the next row of containers, to bring its post 50 in position to be engaged by the forward side of the blade the next time the notch 51 passes over it. Figure 10 shows the last container from the last row being advanced by the conveyor and Figure 11 shows the arm 58 engaging the next adjacent bell crank lever to move it into position to be engaged by the front edge of the blade 16 to cause its follower block to move a container between the blades as the last container from the back row passes forward to free the containers in the said row. It is seen in Figure 10 that the follower block in the row of containers at the back of the casing, when the last container has been received between the blades 16 of the conveyor, is spaced apart from the edges of the blades and its arm 58 has not engaged the next adjacent bell crank lever. To cause the arm 58 to perform its function, each rod 44 is provided with an additional notch 59 between its connection with its bell crank lever and the position of the follower block 52 when it delivers its last container so that upon the next reciprocation of the rod 44, the follower block 52 will be engaged in this notch 59 and will advance it sufficiently to cause its arm 58 to move the next adjacent bell crank lever to bring its post 50 into operative relation with the blade 16 of the conveyor.

What I claim is:

1. A dispensing apparatus for cylindrical containers including a casing, an inclined container support mounted therein, means for guiding said containers to travel on end by gravity in a straight line thereover, a screw conveyer rotatably mounted within the casing at an angle to the direction of travel of the containers arranged adjacent the lower end of the container support, said conveyer arranged to receive a container between the convolutes of its spiral blade to advance the container so received upon the support toward the front of the casing, said front of the casing being provided with an opening, means to rotate the conveyer; and means to receive and discharge a container so conveyed adjacent the front of the casing through said opening provided therefor in the front of the casing, and means to vibrate the containers in traveling over the inclined support.

2. A dispensing apparatus for cylindrical containers including a casing, a pair of oppositely disposed, oppositely inclined meeting container supports mounted therein, means for guiding containers in an upright position to travel by gravity over said inclined supports toward the center of the casing, a screw conveyer rotatably mounted within the casing at right angles to the direction of the travel of the containers arranged adjacent and above the meeting ends of the container supports, said conveyer arranged to receive a container between the convolutions of its spiral blade to advance the containers so received upon the supports to the front of the casing, said front of the casing being provided with an opening, means to rotate the conveyer, and means to receive the alternate containers as they are advanced from the opposite supports adjacent the front of the casing and to discharge said containers one at a time through said opening provided therefor in the front of the casing, and means to engage the under ends to vibrate the containers during their travel between the guiding means actuated by operation of the screw conveyer.

3. The structure of claim 1, wherein the means to vibrate the containers in traveling over the inclined support is operable upon rotation of the conveyer.

4. The structure of claim 2, wherein the means provided to engage the under ends to vibrate the containers during their travel between the guiding means actuated by operation of the screw conveyer includes a rotatable square member normally engaging a flat surface with the bottoms of the containers between the guiding means.

5. The structure of claim 2, wherein the means to engage the under ends to vibrate the containers during their travel betwen the guiding means actuated by operation of the screw conveyer includes a rotatable square member normally engaging a flat surface with the bottoms of the containers between the guiding means, and means upon said members to rock said flat surface adapted to be engaged and wiped over by a blade of the conveyer.

6. The structure of claim 2, wherein the means to engage the under ends to vibrate the containers during their travel between the guiding means actuated by operation of the screw conveyer includes a rotatable square member normally engaging a flat surface with the bottoms of the containers between the guiding means, to reciprocate the square member while in engagement with the containers to advance them toward the conveyer.

AARON T. SIMMONS.