Nov. 20, 1945. J. E. STEWART 2,389,283

MACHINE FOR VENDING BOTTLES

Filed Sept. 8, 1941 3 Sheets-Sheet 1

FIG. 1.

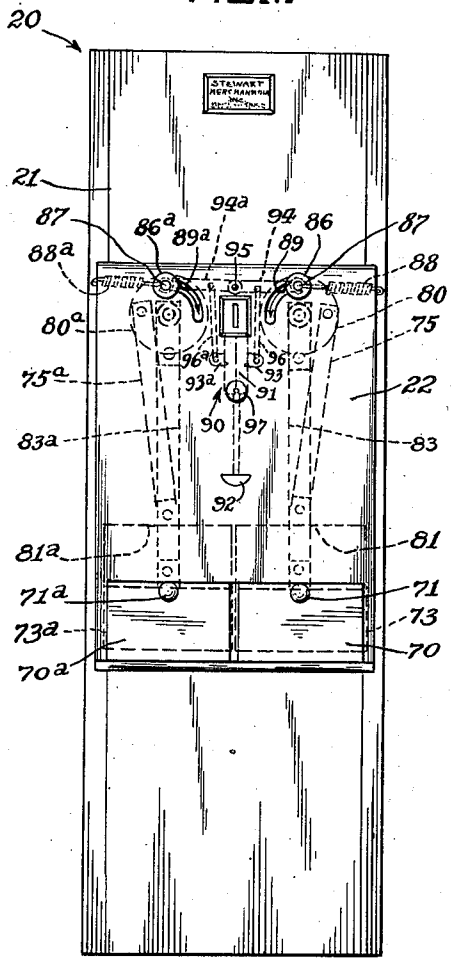
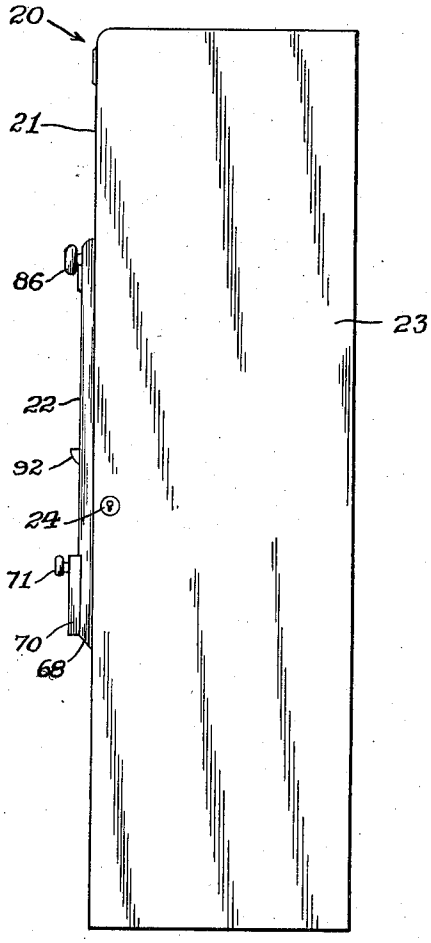


FIG. 2.



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Filed Sept. 8, 1941 3 Sheets-Sheet 2

FIG. 3.

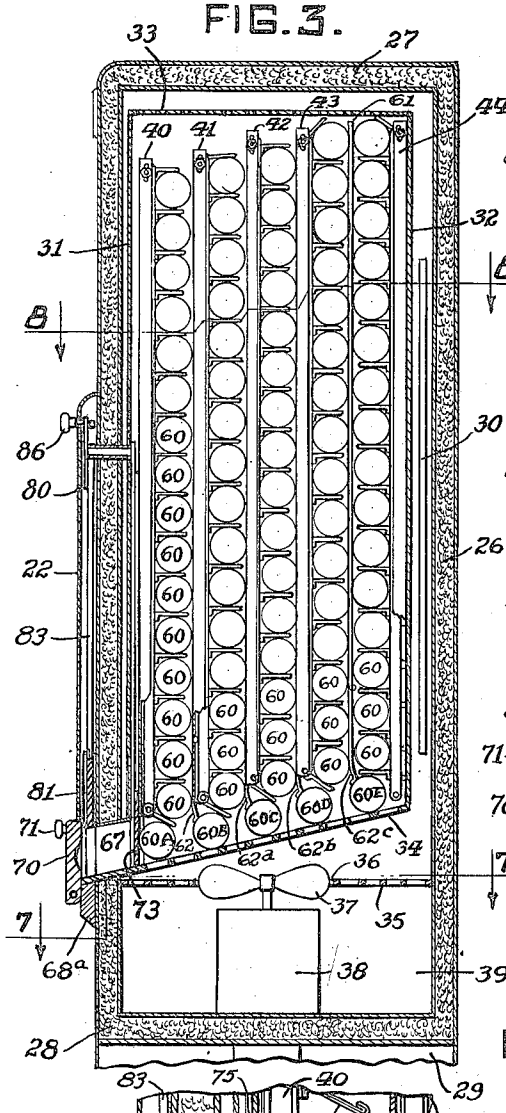


FIG. 4.

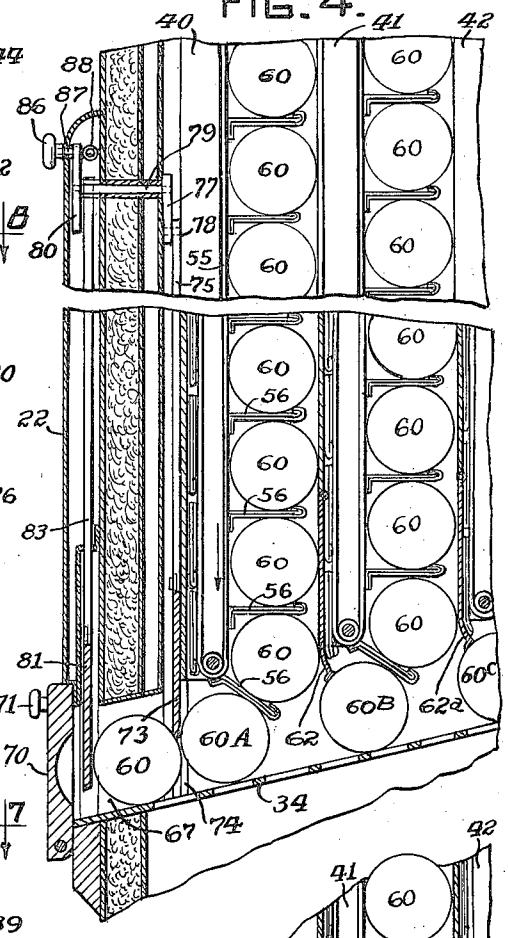


FIG. 5.

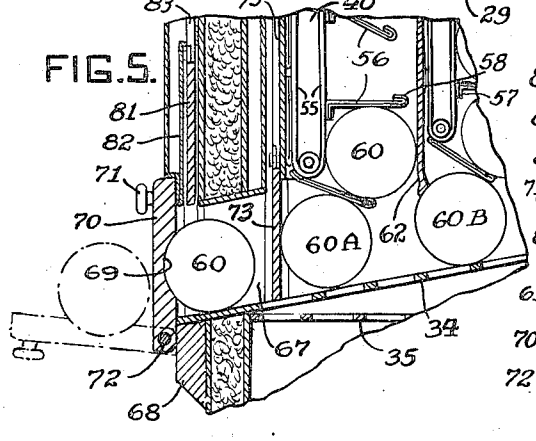
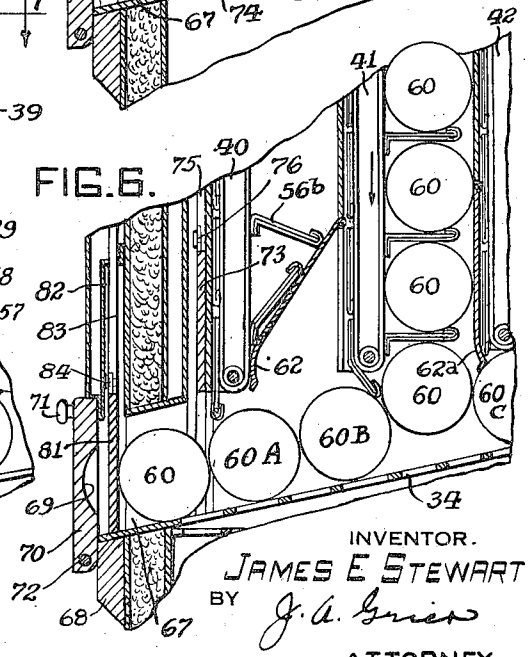


FIG. 6.



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MACHINE FOR VENDING BOTTLES

Filed Sept. 8, 1941 3 Sheets-Sheet 3

FIG. 7.

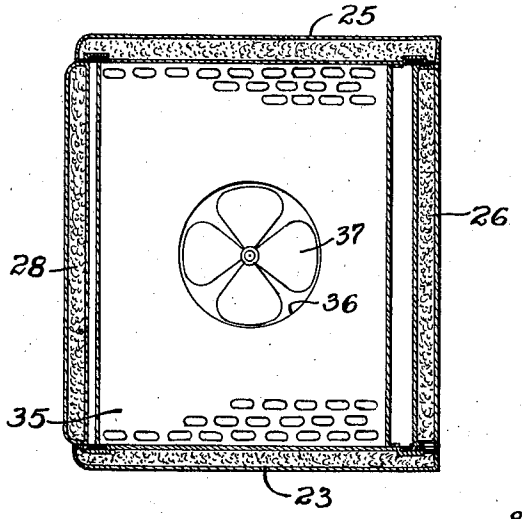


FIG. 9.

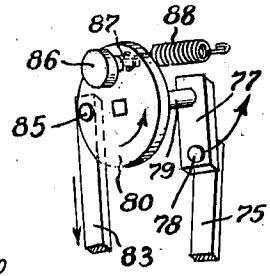


FIG. 8.

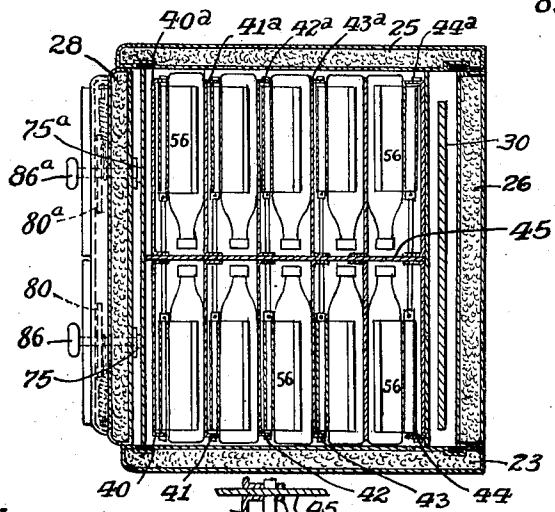


FIG. 12.

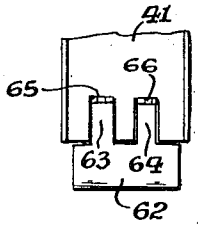


FIG. 10.

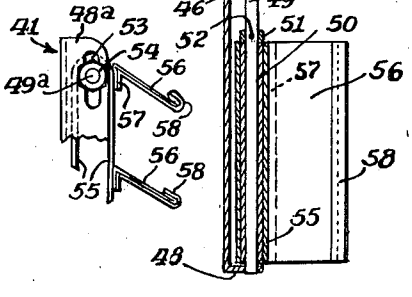


FIG. 11.

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UNITED STATES PATENT OFFICE

2,389,283

MACHINE FOR VENDING BOTTLES

James E. Stewart, Rye, N. Y.

Application September 8, 1941, Serial No. 409,939

10 Claims. (Cl. 312—36)

This invention relates to improvements in machines for vending bottles, and has for an object the provision of an insulated cabinet having a plurality of columns of bottles therein, means in said columns for isolating said bottles from physically contacting each other, means to keep said bottles cold, and means to vend said bottles therefrom.

Another object of the invention is the provision in a vending machine, of a plurality of columns having the bottles therein horizontally disposed, and means in each column for physically separating the bottles from contact with each other.

A further object of the invention is the provision in a bottle vending machine, of a vertical column for said bottles, a continuous band or belt of flexible material supported for rotation at points near the top and the bottom of the column, said belt having tabs secured thereto in spaced relation of the order of the diameters of the bottles, said tabs extending crosswise in the column, and each tab extending between and separating two adjacent bottles.

Yet another object of the invention is the formation of the belts and the tabs of fabrics of extreme flexibility and suitable for long wear and continuous service.

In the embodiment herein shown and described to illustrate the invention, the cabinet is provided with a number of vertical columns. Each column has a belt therein formed of canvas or any other suitable material, and pulleys at the tops and bottoms of each column rotatably support said belts. Each belt has stitched or otherwise secured thereto a plurality of tabs which lie between and prevent the bottles from actually contacting each other.

As the bottles are vended, the belt moves downwardly due to the weight of the bottles, and the tabs may have their outer edges hemmed or otherwise thickened to prevent the tabs from pulling out from between adjacent bottles.

The columns are arranged to be vended from the columns successively as will hereinafter be described. A suitable refrigerating system is provided for cooling the cabinet, and a motor driven fan in the bottom of the bottle compartment is provided for circulating the cold air.

Referring to the drawings:

Figure 1 is a front elevation of my new bottle vending machine;

Figure 2 is a right side elevation of the machine;

Figure 3 is a sectional elevation showing the general arrangement of the columns, their belts, the gates between the columns, the discharge device etc.;

Figure 4 is an enlarged fragmentary view of a portion of Figure 3;

Figures 5 and 6 are fragmentary views illustrating the action of the machine in vending bottles;

Figure 7 is a cross-sectional view as seen along the line 7—7 of Figure 3;

Figure 8 is a cross-sectional view as seen along the line 8—8 of Figure 3;

Figure 9 is a detail view of the bottle discharge mechanism;

Figure 10 is a fragmentary end view of an upper pulley support, showing its adjustment;

Figure 11 is a view, partly in section, showing one arrangement of pulley support and belt; and

Figure 12 is a view showing the arrangement of hinged doors between the columns.

An insulated cabinet 20 has a fixed front 21, supporting a panel 22 carrying the coin mechanism and bottle releasing means to be presently described.

The side 23 of the cabinet 20 is hinged at the back and has a lock 24 engaging the front, whereby access to the bottle columns in the right half of the machine may be had. Likewise the opposite side of the cabinet is provided with a locked door through which access to the bottle columns in the left half of the machine may be had.

Referring now to Figure 3, it will be seen that in addition to the insulated doors 23 and 25, the stationary part of the cabinet includes a rear insulated wall 26, the front insulated wall above referred to and the top and bottom walls 27 and 28 respectively.

Beneath the bottom insulated wall 28 is an uninsulated compartment 29 for the high side of the refrigerating system. The low side or cooling unit 30 is mounted in the cabinet, for example, adjacent to the rear wall 26.

Within the insulated compartment is a framework including a front member 31 and a rear member 32, joined by a top member 33 which may be perforated, and joined by a bottom member 34. The member 34 is also perforated and slants downwardly toward the delivery openings which will presently be described.

Below the bottom member 34 is a plate 35 which is preferably level, and is also perforated. A circular opening 36 is formed in the plate 35, and within the opening 36 is mounted a fan 37, carried on the shaft of a motor 38. The motor 38 is positioned below the plate 35, in a compartment 39 formed between the plate 35 and the

bottom insulated wall 28, which compartment may also be used to store extra bottled drinks in.

The motor is connected across the terminals of the refrigerating motor of the high side so that while the high side is running, the motor 38 runs and circulates the cold air throughout the insulated compartment.

Within the framework 31, 32, 33, 34 is mounted a plurality of vertical members 40, 41, 42, 43, and 44, which define vertical columns for the bottles to be vended. A vertical plate 45 divides the interior of the frame work in half, and the vertical members 40, 41, 42, 43, and 44 just referred to are positioned in one of said halves. Likewise vertical members 40*a*, 41*a*, 42*a*, 43*a* and 44*a* are mounted in the other half, as may be seen in Figure 8.

All of the vertical members are in the form of channels, and these channels are identical except in length and half of them are "rights," and the other half are "lefts." A description of one of them should therefore suffice for all of them. Referring to Figure 11, the sectional view therein may be considered as taken through one of the members, for example 41. The member includes a channel having a flat portion 46 with angular portions 47 and 48 formed integral therewith. The angular portions 47 and 48 have aligned holes formed therein, supporting a shaft 49 which in turn, pivotally supports a tube or sleeve 50. The tube 50 may have its interior lubricated so that it may freely rotate on the shaft 49. A collar 51 is secured on the shaft 49 by means of a pin 52 extending therethrough, and this collar prevents the tube from moving endwise on the shaft.

It will be understood that in each channel there is a shaft and tube arrangement, such as above described, at the top of the channel and a second tube and shaft arrangement at the bottom, cooperating in a manner to be presently described.

It may be desirable to have one shaft in each column adjustable with respect to its mate. In Figure 10, slots 53 are provided at the tops of the columns instead of aligned holes.

The ends of the shafts 49*a* are threaded and provided with nuts 54 for locking the shafts in adjusted positions. A belt 55 spans the tubes or rollers 50 (which form pulleys) and as this belt is moved, in a manner to be presently described, it rotates the rollers 50 on the shafts 49. The belts are preferably of a width substantially equal to the lengths of the rollers, which are in turn about equal to the lengths of the straight portions of the bottles. This leaves a substantially wide open area through which the cold air may be circulated for cooling the bottles.

Each belt is provided with a plurality of tabs 56 which may be formed of a web of fabric, leather, or other material. Each of the tabs has one end 57 pointing downwardly and stitched or otherwise secured to the belt, and the outer end 58 folded back on itself and hemmed. Between each two bottles is a tab 56, and the hemmed end 58 obviates any tendency for the tab to pull out from between the bottles.

Figure 3 shows the cabinet as viewed from the left side, with the door 23 open, after the same has been completely loaded with bottles. It will be noted that the channels 40, 41, 42, and 43 face the right, as viewed in Figure 3, and that the channel 44 faces the left. A vertical plate 61 is mounted between the channels 43 and 44 and serves as a guide for keeping the bottles in the column formed therebetween substantially in alignment. This prevents any of the bottles from jamming therein.

At the bottom of the channel 41 is a gate 62, having vertical arms 63 and 64 positioned in slots formed in the channel, and hinged thereto at 65 and 66, Figure 12. The lower end of this gate is adapted to engage the bottom bottle in the column associated with the channel 41. The presence of bottles in the column associated with the channel 40 prevents the gate from opening. The channels 42 and 43 also have similar gates hinged thereto and designated respectively by the numerals 62*a* and 62*b*. The gate 62*c* for the column of channel 44 is hingedly mounted on the vertical plate 61 in the same manner. It is also understood that the columns in the other half of the compartment have similar gates which function in the same manner.

Assuming that the columns 40 to 44 are all loaded with bottles as shown in Figure 3, the delivery mechanism, to be presently described, first delivers bottles from the bottom of column 40. As the bottom bottle is delivered, the others move down so that the one next to the bottom takes its place, and due to the weight of the bottles, the belt moves down one tab space for each bottle delivered until the top bottle in column 40 reaches the position 60A. When the top bottle reaches the position shown in Figure 5, it will be noted that the gate 62 cannot open yet. However when the bottle moves down one more step to the position 60A, Figure 6, the gate 62 is uncovered and opens, permitting the bottles to then be fed from column 41. When the top bottle in column 41 reaches the position 60B, the gate 62*a* is uncovered, and the bottles are fed from column 42.

It will be noted that the positions 60A and 60B above referred to are in contact with the slanting bottom plate 34, so it may be said that whenever the top bottle of any column reaches the bottom plate 34, the gate of the next succeeding column is released and the latter starts feeding bottles until its top bottle reaches the plate 34 etc.

As may be seen in Figures 4 and 5, the tabs on the upwardly moving portion of the belt lie flat between the surface of the belt and the inside surface of the channel. In reloading the machine, the operator opens the door on one side, turns the belts to positions where the tabs project across the column. Of course the tabs sag downwardly somewhat like the tab 56*b* in Figure 6. Beginning at the bottoms of the columns, the bottles are pushed endwise and neck first into the columns, making sure that a tab separates each bottle from its neighbor. The necks of the bottles form entering wedges and facilitate the job of reloading. The operator must of course make sure that the gates are closed. When one side is reloaded it has the appearance of Figure 3. The operator may then close the door on that side, open the door on the opposite side and reload it in the same manner.

In Figure 3 it will be noted that the front wall 31 has an opening 67 formed therein. This opening is due to the thickness of the wall and is therefore in fact a small compartment. It is elongated and is large enough for a bottle to pass freely therethrough. Surrounding the outer end of the opening 67 is a rectangular member 68, preferably of non-metallic material and therefore a poor conductor of heat. Hingedly mounted on the rectangular member 68 is a door 70 having an elongated depression 69 formed therein. The door 70 is provided with a knob 71 to facilitate

the opening thereof, and the hinge 72 has a spring (not shown) for urging the door towards its closed position at all times. The door 70 is never locked and may therefore be opened at any time. When a bottle is positioned in the opening 67, and the door is opened, the bottle rolls to the dot-dash position shown in Figure 5 so that it may be easily picked up. The door 70 then closes again under the urge of its spring hinge.

As to the delivery mechanism, I use inner and outer sliding panels cooperative in a see-saw arrangement. The inner panel 73 is slidably mounted in ways or guides 74, and when positioned at the bottom of its travel, isolates the opening 67, which might be termed a "unit bottle compartment," from the interior of the cabinet.

The panel 73 has one end of a connecting rod 75 joined thereto by means of a pivot pin 76, the other end of the connecting rod being joined to an arm 77 by means of a pivot pin 78. The arm 77 is keyed or otherwise fixed on a shaft 79 passing through the front wall 31. This shaft may be formed of non-metallic material to reduce heat leakage into the cabinet. On the outer end of the shaft 79 is mounted a disc 80 which is also keyed or otherwise fixed thereon. The purpose of this disc will presently be described.

The outer panel 81 is slidably mounted in a slot 68*a* formed in the rectangular member 68 and is further guided by the extension 82 on member 68. A connecting rod 83 has one end pivotally connected to panel 81 by means of pivot pin 84, and its other end pivotally connected to the disc 80 by pivot pin 85, see also Figure 9. A knob 86 is pivotally mounted on a shaft 87 carried by the disc 80.

When the knob 86 is moved to the left as viewed in Figure 9, the disc 80, the shaft 79 and the arm 77 are all moved in a counter-clockwise direction, the connecting rod 83 is moved downwardly and therewith, the outer panel 81 moves downwardly. At the same time, the connecting rod 75 moves upwardly and therewith the inner panel 73 moves upwardly also. As a result the panels arrive at the positions shown in Figure 6. The inner panel 73 has raised, permitting a bottle to roll into the single bottle compartment 67, and the outer panel 81 has closed so that the bottle comes to rest against it within said single bottle compartment. The spring 88 tends to urge the disc 80 in a clockwise direction so that when the knob 86 has been turned and released, the inner panel moves down between the two left hand bottles Figure 4 and closes off the single bottle compartment from the interior of the cabinet, and at the same time the outer panel rises to its normal position so that when the door 70 is opened the bottle rolls from the single bottle compartment into the depression 69 for easy removal.

I employ two such delivery devices, but since they both operate in the same manner, only one need be described in detail. A panel casing 22 houses the delivery mechanism, arcuate slots 89 and 89*a* being provided to define the movements of the knobs 86, 86*a*.

Since the other delivery mechanism is identical it will not be herein described, but like parts thereof bear the same numerals with the addition of "*a*."

The coin mechanism 90 forms no part of the present invention, therefore it need not be described in detail. A coin slot 91 is provided to receive the coins, and a coin return receptacle 92 receives the returned coins after the coin return buton 97 is depressed. Interposer levers 94 and 94*a* are pivoted on a supporting shaft 95, which may be supported by the wall 21 and the front panel 22, and are normally positioned horizontally with their outer ends in line with the shafts 87 of the knobs 86, 86*a*, suitable stops (not shown) being provided for defining the lowest positions of these interposers. When in this position they have their ends in the path of travel of the stud shafts 87 supporting the knobs 86 and prevent either disc 80 from being turned. Movable members 93 and 93*a* project oppositely from the coin mechanism and they are respectively connected to the interposers 94 and 94*a* by connecting rods 96 and 96*a*.

When a coin of the proper value is dropped in the slot 91 and enters the coin mechanism, the outer ends of both of the members 93 and 93*a* are raised, thereby raising both of the interposers. This permits either the knob 86 or 86*a* to be operated. As soon as one of the knobs starts moving, both interposers are released and move down to their normal horizontal positions, but the shaft of the knob which has been moved is at that time below its interposer and the operation of that knob is not hindered.

The dropping in of a second coin before the delivery operation is completed does not interfere, and permits the release of the second knob and the delivery mechanism associated therewith; therefore one customer does not have to stand back and wait for the one before him to finish a delivery operation.

As described before, after a knob is moved as far as it will go, and then released, the bottle goes into the single bottle compartment and is available as soon as the door 70 (or 70*a*) is opened.

Although I have herein shown and described embodiment of the invention by way of example, it is obvious that many changes may be made in the arrangements shown without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In a vending machine, a casing, means defining a vertical column therein adapted to carry a stack of horizontally disposed bottles, a belt associated with said column and including at least a portion lying within said column, non-metallic tabs secured to said portion and adapted to extend between adjacent bottles, thereby preventing the latter from contacting each other, means for delivering bottles from the bottom of said column to a point external to said casing, said belt being advanced solely by the vertical weight of said bottles.

2. In a vending machine, a casing, a vertical column in said casing adapted to contain a plurality of horizontally disposed bottles, a plurality of pads each adapted to extend between each two adjacent bottles for preventing the latter from physically contacting each other, a flexible member in said column secured to said pads and movable therewith, and means for delivering bottles from the bottom of said column; any remaining bottles, said pads and said flexible member being adapted to move downwardly in said column a distance equal to at least the diameter of a bottle under the urge of the vertical weight of said bottles each time a bottle is delivered from said column.

3. In a vending machine, a casing, a column therein, a rigid support at the top of said column, a second rigid support at the bottom of said column, rotatable members on said supports, a belt carried on said rotatable members, a plurality of

spaced members carried by said belt and extending substantially across said column, said column being adapted to contain a plurality of horizontally disposed bottles with the bottles lying between said spaced members and isolated thereby, and means adapted to deliver bottles from the bottom of said column, said belt being adapted to be advanced solely under the urge of the weight of the bottles in said column.

4. A vending machine according to claim 3 in which said spaced members are comprised of short lengths of fabric the outer ends of which are hemmed or otherwise thickened to prevent them from pulling out from between said bottles.

5. In a vending machine, a casing, a vertical column therein, a channel defining one side of said column, a pair of aligned holes in said channel near the top thereof, a shaft positioned in said holes and fixed therein, a tubular roller rotatably carried on said shaft, a second pair of aligned holes in said channel near the bottom thereof, a second shaft mounted in said holes and secured against rotation therein, a second tubular roller rotatably carried on said second shaft, said rollers forming pulleys, a belt spanning said pulleys and having one straight side within said column, a series of tabs secured to said belt in spaced relation to each other, said tabs adapted to project laterally from said belt between adjacent bottles, when the latter are stacked in said column and serving to prevent the bottles from contacting each other, and means adapted to deliver bottles from the bottom of said column, said belt advancing, under the urge of the vertical weight of the bottles remaining in said column, as each bottle to be delivered is removed from the bottom of said column.

6. In a vending machine, a casing, a plurality of vertical channels mounted therein in spaced relation to each other, each of said channels having a belt movably mounted therein, and each of said belts having a series of spaced flexible tabs secured thereto, said tabs extending from the belt of one channel towards the next adjacent channel, and adapted to extend between bottles when the latter are stacked in the spaces between said channels, adjacent bottles in said stacks being separated from each other by said tabs, and means for serially delivering said bottles from the bottoms of said stacks, said belts moving downwardly by gravity as said deliveries are made.

7. In a vending machine, a casing, a plurality of vertical channels mounted therein in spaced relation to each other, each of said channels having a belt movably mounted therein, and each of said belts having a series of spaced flexible tabs secured thereto, said tabs being adapted to extend from the belt of one channel towards the next adjacent channel, the spaces between said channels forming columns for containing horizontally disposed bottles and said tabs being adapted to prevent adjacent bottles from contacting each other, a delivery opening formed in said casing, a plate below said columns inclined towards said delivery opening and adapted to be contacted by the bottom bottle in each column, and means adapted to serially deliver bottles from the bottoms of said stacks via said delivery opening.

8. In a vending machine for horizontally disposed bottles, a casing, a plurality of vertical channels mounted therein in spaced relation to each other, each of said channels having a belt movably mounted therein, and each of said belts having a series of spaced flexible tabs secured thereto, said tabs being adapted to extend from the belt of one channel towards the adjacent channel, the spaces between said channels forming columns for containing bottles, said tabs being adapted to extend between adjacent bottles, a delivery opening formed in said casing, a plate below said columns inclined towards said delivery opening, and adapted to support the bottom bottle in each stack, and a series of gates pivotally mounted on said channels at the bottoms thereof, and normally adapted to prevent bottles from one column from being delivered until the exhaustion of bottles from the preceding column releases the gate of the succeeding column, and means adapted to deliver bottles from the bottoms of said columns.

9. In a vending machine for refrigerated articles, an auxiliary compartment adjacent the interior of said machine, said compartment being adapted to contain a single one of said articles at a time, a door between said compartment and said interior forming a heat barrier therebetween, a second door between said compartment and the exterior of said machine, said second door also forming a heat barrier, and linkages and see-saw means connecting said doors, whereby one of them is closing while the other is being opened.

10. In a vending machine, in combination, a cabinet for horizontally disposed bottles, an elongated unit bottle compartment communicating with the interior of said cabinet, said compartment being capable of holding a single bottle at a time, a door on the exterior of said unit bottle compartment, and means for singly delivering bottles from the interior of said cabinet to said unit bottle compartment, said last means including a member forming a barrier between said compartment and said door when a bottle is entering said compartment and a second member forming a barrier between said compartment and the interior of said compartment after the bottle is delivered to said compartment, and see-saw means linked to said barriers for causing one of them to close while the other is being opened.

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