Feb. 12, 1952 E. C. JOHNSON 2,585,012

BOTTLE DISPENSING APPARATUS

Filed Nov. 8, 1948 2 SHEETS—SHEET 1

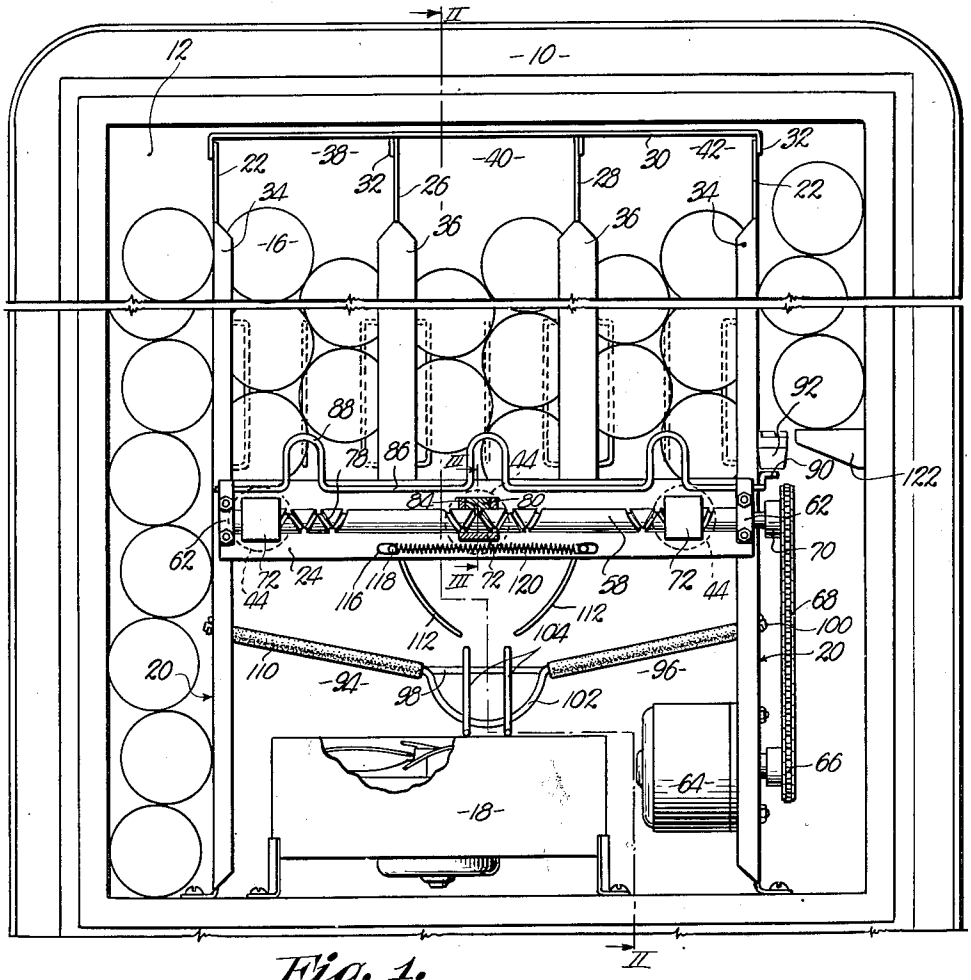


Fig. 1.

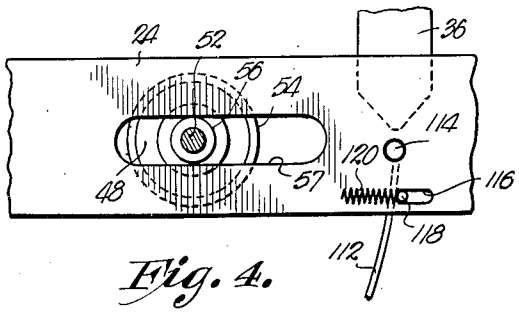


Fig. 4.

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BOTTLE DISPENSING APPARATUS

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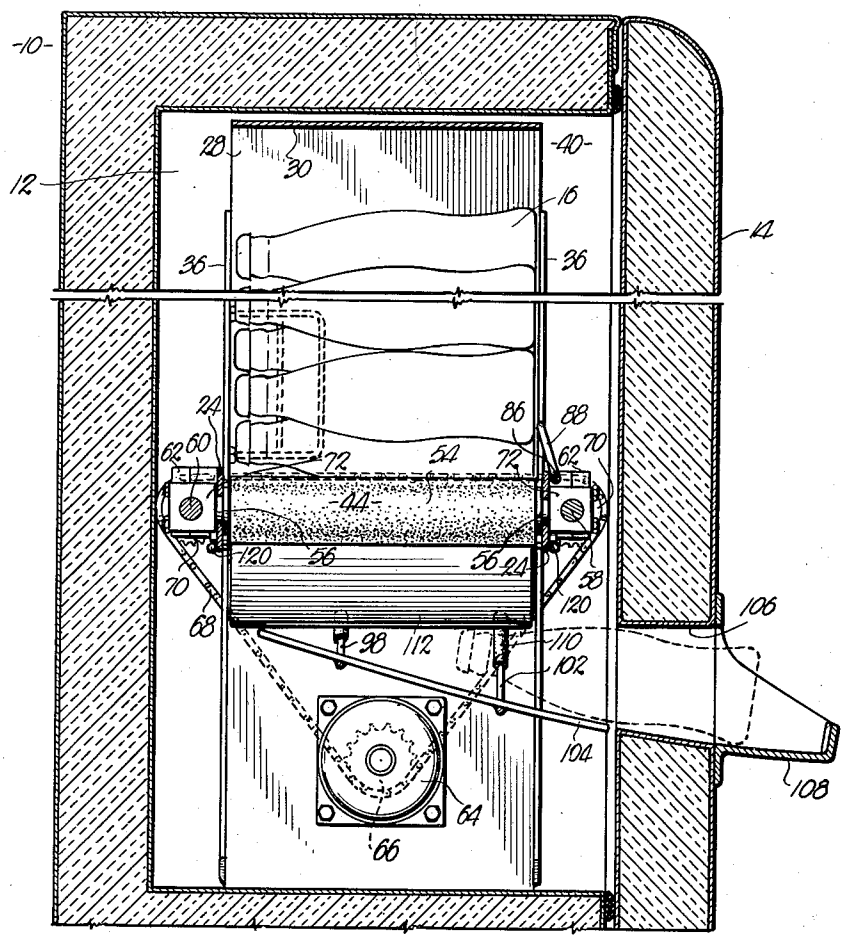


Fig. 2.

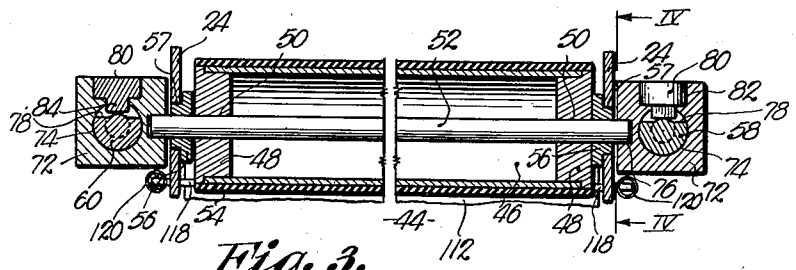


Fig. 3.

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UNITED STATES PATENT OFFICE

2,585,012

BOTTLE DISPENSING APPARATUS

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Application November 8, 1948, Serial No. 58,866

2 Claims. (Cl. 312—48)

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This invention relates to automatic vending machines of the kind particularly adapted to dispense common varieties of beverage bottles, one at a time as the machine is placed in operation and upon insertion of a coin or like medium, the primary object being to provide a vending machine requiring minimum effort on the part of the prospective purchaser to place the same in operation, and also capable of storing a large number of bottles ready for vending in a relatively small space.

In my co-pending application, filed on even date herewith, there is disclosed an automatic vending machine of much the same character as forms the subject matter hereof and while such machine has many advantages, there is present therein one disadvantage in that a relatively large area of wasted space is present. Accordingly, it is one of the most important objects of this invention to provide an automatic vending machine wherein such wasted space is entirely eliminated.

As in my aforesaid co-pending application, this invention embodies a bottle vending machine wherein the bottles themselves are horizontally arranged in a pair of stacks disposed in staggered relationship so that retention of one of the stacks against downward movement will also hold the other stack against gravitational movement, the vending structure for the stacks constituting a reciprocable, freely rotating roller underlying the stacks and shiftable from one to the other whereby the bottles are vended singly.

Another important object of this invention is to provide a vending machine as above set forth having a pair of rotatable shafts for mounting the above mentioned roller, the shafts being provided with criss-cross grooves and a follower block slidable on the shafts and in the grooves for reciprocation as the shafts rotate whereby the roller is alternately moved from beneath one of the stacks to a position beneath the other stack.

A further object of the present invention is to provide in a bottle vending machine having the aforesaid vending mechanism as a part thereof, a plurality of side-by-side chambers, each having a pair of bottle stacks therein, the rotatable shafts being common to all chambers and each chamber being provided with a rectilinearly reciprocable roller operated by the shafts, all to the end that through proper synchronization, the bottles are delivered singly from the machine and successively from one of the chambers and then the remaining chambers each time the machine is placed in operation.

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Many more minor objects, including novel details of construction, will be made clear or become apparent as the following specification progresses, reference being had to the accompanying drawings, wherein:

Fig. 1 is a fragmentary, front elevational view of a machine for vending refrigerated bottled goods or the like from staggered stacks, the cabinet door being entirely removed to reveal details of construction.

Fig. 2 is a fragmentary, vertical cross-sectional view taken on irregular line II—II of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a detailed, cross-sectional view taken on line III—III of Fig. 1; and

Fig. 4 is a fragmentary, detailed cross-sectional view taken on line IV—IV of Fig. 3.

The particular form of the cabinet for housing the operating mechanism and storing the bottled goods to be vended thereby, is of no importance to the present invention and there has been shown for illustrative purposes only, a cabinet that is broadly designated by the numeral 10, and having double-walled sides, ends and bottoms to present a hollow compartment 12 that is closed by a suitable swingable door 14.

All of the walls forming the cabinet 12, as well as the door 14, are suitably insulated inasmuch as the bottles 16 to be vended are to be kept cool by refrigerating means 18 preferably disposed at the bottom of the compartment 12.

Structure for holding the bottles 16 within the compartment 12 in a position for vending, as well as the assembly for vending the same, constitutes a composite unit mounted within the compartment 12 and including upright frame members 20. These frame members 20 support a pair of spaced apart end walls 22 that are interconnected intermediate the ends thereof by a pair of spaced cross panels 24. A pair of spaced apart partitions 26 and 28 are equally spaced between the end walls 22 and rise upwardly from the cross panels 24. The uppermost ends of the walls 22 and partitions 26 and 28 are held in place by means of a cover plate 30 provided with a plurality of down-turned flanges 32 that may be secured in any suitable manner to the walls 22, partition 26 and the partition 28. Each of the end walls 22 is provided with a pair of inturned flanges 34 along the vertical edges thereof and strips 36 are secured to each of the vertical edges of both partitions 26 and 28, said strips 36 overlapping proximal chambers formed by the walls 22 and partitions 26 and 28. Accordingly, three bottle-receiving chambers, designated by

the numerals 38, 40 and 42, are presented for receiving the bottles 16.

The height of each of these chambers may be chosen to suit the desires of the manufacturer but the lengths thereof should be approximately the same as the height of the bottles 16, as illustrated in Fig. 2 of the drawing. The width of each of these chambers 38, 40 and 42 is less than the combined diameters of two of the bottles 16 but greater than the diameter of one of such bottles 16. Accordingly, when bottles 16 are disposed with their longitudinal axes in a horizontal position within the chambers 38, 40 and 42, a pair of stacks thereof is presented, the bottles of one stack being in staggered relationship to the bottles of the other stack and all bottles being in engaging relationship to the bottles next adjacent thereto.

It is obvious that through such construction of the chambers 38, 40 and 42, retention of one of the stacks of bottles 16 against downward movement in the respective chamber will hold the other stack in place. Such means for retaining the stacks in place within their respective chambers 38, 40 and 42 includes a roller, broadly designated by the numeral 44 disposed adjacent the open bottom of each chamber respectively. These three rollers 44 of identical character, constitute a cylindrical member 46 having plugs 48 closing the ends thereof, said plugs each being axially perforated as at 50 for receiving an elongated shaft 52.

A tubular sleeve 54 of rubber or other suitable resilient material, completely covers the cylinder 46 and the plugs 48 thereof. The longitudinal axes of the rollers 44 are in substantial parallelism with the axes of the bottles 16 and are mounted within the cross panels 24 through the medium of a pair of opposed rollers 56 that are threaded upon the ends of the shaft 52 extending outwardly beyond the plugs 48. These rollers 56 are rotatably mounted within elongated slots 57 formed in the panels 24 for free rotation longitudinally therealong.

It is thus seen that a roller assembly 44 is provided for each of the chambers 38, 40 and 42, all three rollers being disposed between the spaced cross panels 24 and mounted for rectilinear reciprocation within the elongated slots 57 from beneath one of the stacks of bottles 16 to a position beneath another of the stacks thereof. Because of the free rotation of the rollers 44 and their frictional engagement with the lowermost of the bottles 16 in the respective chamber, such reciprocable movement thereof will release the bottles singly from the open bottoms of the respective chambers. As the rollers 44 so reciprocate, they will roll upon the surfaces of the bottles which come into engagement therewith and a gradual release of the bottle will take place. Before any one bottle is released by a roller 44, the latter will actually come into contact with the lowermost bottle of the next stack thereof and at no time will there be a sudden drop of any of the stacks. Because of the free rotative movement of the roller 44, the bottles 16 themselves will not roll as they move downwardly but will gradually squeeze by the roller 44 as the same is reciprocated to a position for releasing such bottle.

The structure for imparting rectilinear reciprocation to the three rollers 44, includes a pair of spaced-apart substantially parallel rotatable shafts 58 and 60. The shafts are of identical character and are mounted upon the outermost faces of the proximal cross panels 24 by means of spaced-apart bearings 62 secured directly to the panels 24. It is thus seen that the longitudinal axes of the horizontal shafts 58 and 60 are disposed in substantially perpendicular relationship to the longitudinal axes of the horizontally positioned bottle 16 within chambers 38, 40 and 42. Simultaneous rotation of the two shafts 58 and 60 is caused by energization of an electric motor or other prime mover 64 mounted upon one of the end walls 22 below the chamber 42, said motor 64 having a sprocket 66 secured to its drive shaft for receiving an endless chain 68 that in turn passes over sprockets 70 on one end of the shafts 58 and 60.

Each of the shafts 58 and 60 is provided with three follower blocks of identical character designated by the numeral 72, these blocks 72 having a bore 74 formed therein of substantially the same diameter as the corresponding shaft 58 or 60 to the end that the blocks 72 are freely slidable longitudinal of the shafts 58 and 60.

A cavity 76 extends inwardly into one face of the followers 72 in perpendicular relationship to the bore 74 for receiving the ends of the shafts 52 in the manner illustrated in Fig. 3 of the drawing. Shafts 58 and 60 are provided with criss-cross grooves 78 adjacent each of the chambers 38, 40 and 42. A plug 80 freely rotatable within an opening 82 formed in the uppermost face of followers 72, is provided with an ear 84 on the innermost end thereof that extends into the criss-cross grooves 78. The three sets of grooves 78 are formed circumferentially about the shafts 58 and 60 and the ears 84 of plugs 80 are polygonal in cross section for free sliding movement within the grooves 78.

It is apparent that as the shafts 58 rotate, the ears 84 of plugs 80 will follow the grooves 78 and as such ears 84 reach the ends of grooves 78, rotation of the plugs 80 will take place within the openings 82 and the direction of movement of the blocks 72 on the respective shafts 58 and 60 will be reversed. Such reciprocation of the three followers 72 on each of the shafts 58 and 60 will in turn impart rectilinear reciprocation to the rollers 44 within the elongated slots 57. Through proper pitch of the criss-cross grooves 78 and initial correct relative disposition of the three followers on their respective shafts 58 and 60, rotation of the shafts will vend the bottles 16 consecutively from the chambers 38, 40 and 42. In other words, a single bottle 16 will be delivered either from the compartment 38, compartment 40 or the compartment 42, since only one of the three rollers 44 will move to a position for releasing a bottle 16 during each full cycle of machine operation.

It is contemplated of course, that coin control means be associated with the machine for controlling energization of the motor 64 and further, that suitable cam switches be provided on either the drive shaft for motor 64 or upon one of the shafts 58 or 60 for controlling the cycle of operation of motor 64.

A rod 86 is swingably mounted adjacent one of the cross panels 24 above the shaft 58, the ends of the rod 86 being pivotally secured to the two bearings 62 for the shaft 58. This rod 86 has a laterally extending loop 88 for each of the chambers 38, 40 and 42 respectively, that normally rests upon the bottom of the lowermost bottle 16 of the respective chamber. One end of this rod 86 is offset as at 90 and is disposed in alignment with the actuating arm of an electric switch 92. Thus;

when all of the bottles 16 have been vended from compartments 38, 40 and 42, the portions 88 of rod 86 will swing inwardly into the chambers to impart rotative movement to rod 86 and to the offset portion 90 thereof. Such operation will actuate the normally open switch 92 to energize an electric circuit having a lamp therein that is disposed at a suitable point on the exterior of the cabinet 10 to indicate the empty condition of the machine. The bottles emanating from the compartments 38 and 42 drop downwardly upon a pair of inclined shelves 94 and 96 disposed in underlying relationship to the compartments 38 and 42. The lowermost ends of the shelves 94 and 96 terminate at a point below the compartment 40 and are formed by a pair of rods 98 and 100 that span the distance between the walls 22.

As illustrated in Figs. 1 and 2, the rod 100 has a downwardly extending loop 102 formed midway between the ends thereof for receiving a pair of cross bars 104; as illustrated in Fig. 2 of the drawing, these cross bars are inclined downwardly toward the door 14 from a point adjacent the back of chamber 40 to a point near the innermost face of the door 14.

An opening 106 formed in the door 14 registers with the lowermost ends of the cross bars 104 and a shelf 108 formed on the outermost face of the door 14 receives the bottles 16 in the manner shown in Fig. 2 of the drawing.

Rods 98 and 100 forming shelves 94 and 96 are provided with telescoping rubber or other resilient sleeves 110, to cushion the impact of bottle 16 as the same drops from the compartments 38 and 42. It is seen that such bottles will readily roll downwardly upon the shelves 94 and 96 until the same come to a position resting upon the cross bars 104, whereupon such bottle 16 will slide forwardly through opening 106 in door 14 and upon the shelf 108. Inasmuch as the bottles 16 vended from the chamber 40 drop directly downwardly, a pair of arcuate panels 112 are provided to break the fall of such bottles 16 before the same come to rest upon the cross bars 104. These arcuate panels 112 are swingably secured to cross shafts 114 spanning the distance between the panels 24 and a slot 116 formed in each panel 24 adjacent each of the arcuate members 112 slidably receives a pin 118 that is secured directly to the panel 112. The pins 118 are joined by a spring 120 to yieldably hold the two arcuate panels 112 biased toward each other in the manner shown in Fig. 1 of the drawing. As the vended bottle from chamber 40 drops and comes into contact

with the panels 112, the spring 120 will yield and permit the bottle to fall upon the cross bars 104.

If desired the cabinet 10 may be formed with the compartment 12 thereof sufficiently large to present storage spaces for additional bottles 16 along the outermost faces of the end walls 22. Inasmuch as the endless chain 68 and associated parts, occupy a portion of one of these spaces, a shelf 122 is provided for receiving such stored bottles 16.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a vending machine having supporting and guiding means for receiving two columns of articles in staggered relationship, a reciprocable roller disposed below the columns of articles and adapted to alternately engage the columns to restrain both columns from downward movement; a slotted support at each end respectively of the roller for guiding the same along a rectilinear path of travel; a rotatable, compound screw having criss-cross grooves adjacent each support respectively; and a follower block operably mounted on each screw respectively and connected to the roller for reciprocating the latter as the screws are rotated.

2. In a vending machine having supporting and guiding means for receiving two columns of articles in staggered relationship, a reciprocable roller disposed below the columns of articles and adapted to alternately engage the columns to restrain both columns from downward movement; a shaft for the roller; a slotted support at each end respectively of the roller for guiding the same along a rectilinear path of travel; a slide member in the slot of each support respectively for receiving said shaft; a rotatable, compound screw having criss-cross grooves adjacent each support respectively; and a follower block operably mounted on each screw respectively and connected to the shaft for reciprocating the shaft and the roller as the screws are rotated.

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