Jan. 24, 1967 L. J. WOOD 3,300,086

VENDING MACHINE WITH COORDINATED PACKAGE HOLDERS

Filed Nov. 5, 1964

FIG. 1.

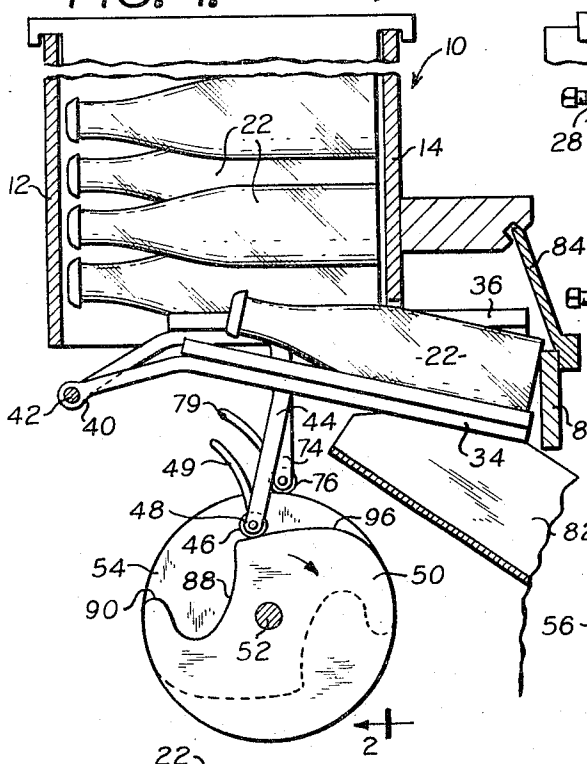
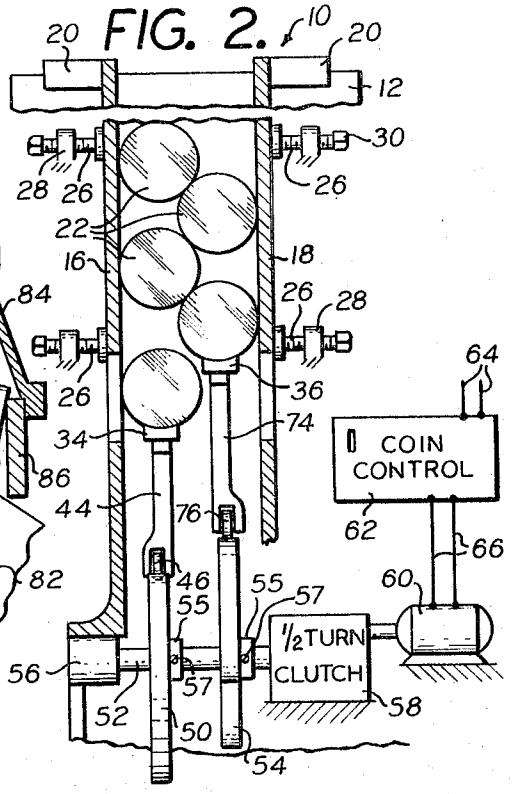


FIG. 2.



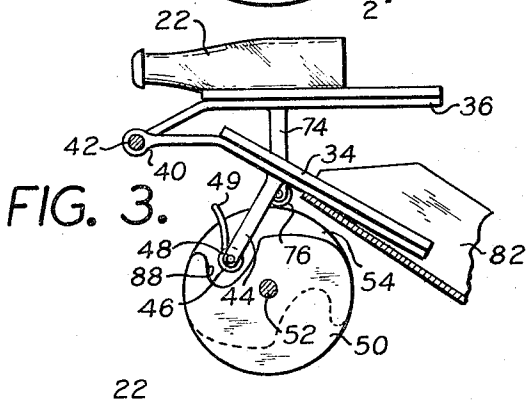


FIG. 3.

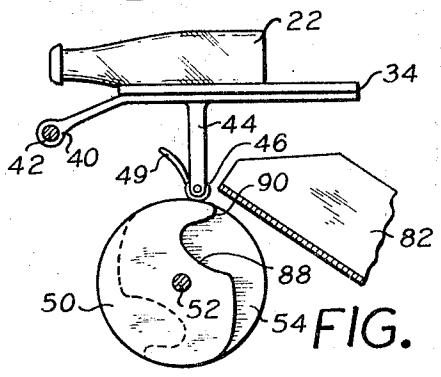


FIG. 4.

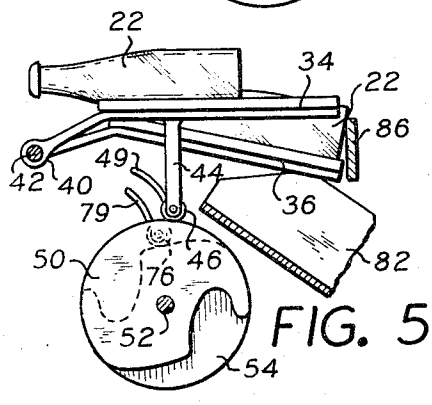


FIG. 5.

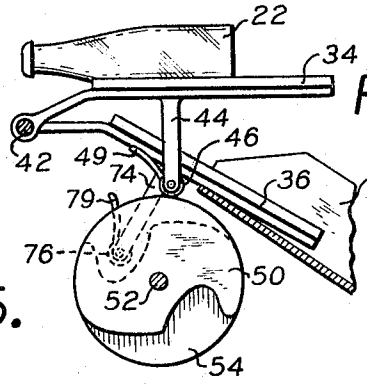


FIG. 6.

INVENTOR
Leonard J. Wood
BY Emery W. Whittemore
Sandel & Graham.
ATTORNEYS.

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VENDING MACHINE WITH COORDINATED PACKAGE HOLDERS

Leonard J. Wood, 135 Patricia Place, Clifton, N.J. 07012

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This invention relates to vending machines for dispensing bottles, cans or similar packages.

It is an object of the invention to provide an improved vending machine of the staggered stock gravity feed column type. One improvement of this invention is the provision of package-handling means that move the lower-most package into an "escrow" position separated from the rest of the stock and in a position where it can be viewed by a prospective customer.

Another object is to provide a simple vending machine where the packages are close to the discharge chute and the chute is of substantial cross-section, but the machine is "pilfer proof" as a result of cam operated mechanism that prevents unauthorized movement of the package holding parts.

Other objects, features and advantages of the invention will appear or be pointed out as the specification proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views;

FIGURE 1 is a diagrammatic sectional view of a vending machine made in accordance with this invention;

FIGURE 2 is a sectional view taken on the line 2—2 of FIG. 1; and

FIGS. 3–6 are diagrammatic views showing the way in which the cams shown in FIG. 1 move into different positions to operate the feed mechanism in a predetermined sequence.

The vending machine includes a feed column **10** having end walls **12** and **14**, and side walls **16** and **18**. The end walls **12** and **14** are preferably fixed, but each of the side walls **16** and **18** hangs from the upper ends of the end walls **12** and **14** with brackets **20** connected to side walls and slideable along the upper edges of the end walls.

The feed column **10** contains packages which are shown in the drawing as bottles **22**. The distance between the side walls **16** and **18** is greater than the width of any one of the bottles **22** but less than the width of the two bottles. Thus the packages or bottles **22** occupy a staggered relation to one another in the feed column, as is clearly shown in FIG. 2 where every other bottle **22** rests against an opposite side wall of the feed column **10**. When the packages are rectangular, they are loaded in the chute with their diagonal substantially vertical.

In order to adjust the width of the feed column; that is, the distance between the walls **16** and **18** to obtain the desired staggered relation of the bottles **22**, or to accommodate bottles of different diameter, there are screws **26** located on opopsite sides of the feed column. These screws **26** thread through fixed blocks **28** on both sides of the feed chute and contact with the wall **16** and **18** for holding the walls **16** and **18** at any desired distance from one another. The screws **26** have heads **30** shaped to receive a wrench or other tool by which the screws are adjusted to change the width of the feed column.

At the lower end of the feed column **10**, there is a feed mechanism which includes two cradles or holders **34** and **36**. The holder **34** is located in substantial alignment with the centers of the bottles **22** which rest against the sidewall **16**, and the holder **36** is in a similar position under the bottles **22** which rests against the sidewall **18**. The uppper surface of each of the holders **34** and **36** is made concave or otherwise shaped to receive the circular

outside surface of one of the bottles and to hold the bottle centered on the cradle or holder **34** or **36**.

The holders **34** and **36** have their upper ends connected with bearings **40** which are located on supporting shaft **42** which serves as a fulcrum about which each of the holders **34** and **36** can move with angular movement.

The holder **34** has a depending element **44** which extends downwardly to a cam follower **46** which is preferably a roller and which is so shown in the drawing. The roller **46** rotates about an axis **48** connected to the depending element **44**. The cam follower also includes a bracket **49** secured to the depending element **44** and forming a unitary part thereof. Most of the time the roller **46** is in contact with a cam **50** located immediately below the holder **34**; but part of the time the arm **49** of the cam follower is in contact with the cam **50** as will be explained in connection with FIGS. 3–6. The cam **50** is secured to a shaft **52**. There is another cam **54** secured to this same shaft **52** so that the shaft **52** serves as a common operating element for both of the cams.

Each of the cams **50** and **54** has a hub **55** which can be adjusted axially for packages of different diameter; and the hubs **55** are secured to the shaft **52** by set screws **57**.

One end of the shaft **52** is supported in a bearing **56**, and the other end by a bearing in a housing of a clutch mechanism **58** which is connected with the shaft **50** and which turns the shaft **52** through a one-half turn each time the clutch **58** is operated. The clutch then disengages. Half-turn clutches of this type are well understood in the mechanism art and no further description of the clutch is necessary for a complete understanding of this invention. The clutch **58** is actuated by a motor **60**, in the preferred embodiment of the invention, but may be operated by other means if desired. Operation of the motor **60** is responsive to a coin controlled switch mechanism **62** connected with a power line **64** and connected with the motor **60** by electrical conductors **66**. This mechanism is merely representative of means for causing the cams **50** and **54** to turn one-half revolution in response to the placing of a coin in the vending machine.

The cam **54** is located under the holder **36** which has a depending element **74** with a roller cam follower **76** at its lower end and an arm cam follower **79** extending from its lower end, the construction being similar to that of the parts **44**, **46** and **49** already described in connection with the cradle or holder **34**.

When the cam **50** is in the position shown in FIG. 1, the bottle **22** on the holder **34** is removed from the other bottles in the feed column **10** and is in a mid-position between its storage position in the feed column and the position in which it is discharged from a delivery chute **82**. This mid-position is referred to herein as the "escrow" position. One feature of the invention is the provision of a window **84** in a front wall **86** of the machine housing and through which a respective purchaser can view a bottle or other package which is located in the escrow position.

With the bottle **22** in the escrow position, it is prevented from moving forward and into the chute **82** by the lower part of the wall of **86**. Although a person can reach up the chute **82** under the wall **86** and touch the holder **34** and the bottle on the holder, it is not possible to tilt the holder **34** downward to discharge the bottle because the depending element **44** and the cam follower **46** are supported from the cam **50** and prevent any downward movement of the holder **34** until the cam **50** has rotated far enough to permit the cam follower to move down nearer to the shaft **52**.

The cams **50** and **54** are constructed so that approximately half of the circumference of each cam is the active portion of the cam which causes movement of the holder and the other half is a holding portion of the cam

for preventing operation of one of the holders of the feed mechanism while the other holder is in operation. The cams **50** and **54** are positioned on the shaft **52** at opposite phase angles so that at any given time the opposite portion of the cam **50** is in contact with its cam follower as compared with the portion of the cam **54** which is in contact with its cam follower.

As a result of this correlation of the cams **50** and **52**, the cam **50** swings the holder **34** into position to discharge a bottle **22** into the delivery chute **82** when the cam **50** moves from the position shown in FIG. 1 to that shown in FIG. 3. In FIG. 3 the holder **34** has moved into contact with the bottom of the delivery chute **82** and the cam follower **46–49** is over a depressed sector **88** of the cam **50** and is not in contact with the cam **50**. The other cam **54** has its circumferential "inactive" section in contact with the follower roller **76** and holds the bottle **22**, which is on the holder **36**, in its initial horizontal position in which it supports all of the other bottles in the chute **10**.

As the cams move from the position shown in FIG. 3 to that shown in FIG. 4 a rise **90** on the cam **50** contacts with the arm **49** of the cam follower, and continued rotation of the cam **50** lifts the holder **34** back into horizontal position as shown in FIG. 5.

As the holder **34** is thus restored to its horizontal position, the cam **54** lowers the holder **36** part way toward the delivery chute and stops with the bottle on the holder **36** in the escrow position. This lowering of the holder **36** permits the bottles in the feed column **10** to move downward until the next bottle rests on the horizontally extending holder **34**. FIG. 5 shows the holder **36** with its bottle **22** in the escrow position. The machine stops with the parts in this position and remains so until actuated again by the insertion of another coin into the coin controlled mechanism.

When the machine is again actuated by insertion of another coin, the shaft **52** again turns the cams **50** and **54** and the initial rotation causes the cam **54** to lower the holder **36** into contact with the delivery chute **82** so that the bottle **22** which was in escrow position is discharged down the delivery chute **82** and the cam follower **76** and arm **79** are over a depression in the cam **54**, corresponding to the situation shown in FIG. 3 for the cam **50**.

The machine does not stop in the position shown in FIG. 6 but continues the rotation of the cam until the cam **54** has lifted the holder **36** back into its horizontal position in the manner already described for the holder **34** in connection with FIGS. 4 and 5. With the holder **36** in horizontal position, the continued movement of the cams causes the cam follower **46** to come on to a portion **96** of the cam **50** and this portion **96** is of decreasing radius so that the holder **34** moves its bottle **22** downward into escrow position and the machine stops again in the position shown in FIG. 1.

The preferred embodiment of the invention has been illustrated and described, but changes and modifications can be made and some features can be used in different combinations without departing from the invention as defined in the claims.

What is claimed is:

1. In a vending machine having

(a) a feed column container wider than packages that are to be dispensed by the machine whereby the packages are in staggered relation in the column container,

(b) feed mechanism at the bottom of the column container in position to receive the lowermost package from the column,

(c) a delivery chute,

(d) the feed mechanism including two package holders, one under each of the staggered portions of the column, and each movable between a raised position for supporting the column of packages, and a lowered position that locates the lowermost package on the holder at the delivery chute,

(e) a different actuator for each of the package holders,

the improvement which comprises,

(f) each of the actuators including a displacement device that gently moves the column-supporting holder downward until the column rests on the other holder and that continues the downward movement of the lowermost package to an escrow position, and that then moves the lowermost package at a rapid rate to lowered position at the delivery chute,

(g) an abutment forward of the lower end of the feed column container for retaining a package in escrow position against movement into the delivery chute,

(h) a normal position of the machine being with one holder supporting the lowermost package in escrow position and the other holder supporting the rest of the packages,

(i) and cycling means for moving, on each operation of said cycling means, one holder from escrow position to lowered position and back to raised position while the other holder moves from raised to escrow position.

2. The vending machine described in claim **1** characterized by the column having walls on sides of the container that are spaced from one another by a width greater than the width of a package, at least one of the walls being movable toward and from the other to change to width of the column for packages of different size.

3. The vending machine described in claim **2** characterized by both of the walls being movable by equal amounts to maintain the column symmetrical with respect to the feed mechanism at the bottom of the column.

4. The vending machine described in claim **1** characterized by a housing in which the packages are located when in the feed column and when in escrow position, and a window in the housing in position to expose a package to view when the package is in escrow position.

5. The vending machine described in claim **1** characterized by the holder being movable to an intermediate escrow position at the region where it leaves all of the column except the lowermost package supported by the other holder, means for stopping the actuator with the holder in the escrow position, the package being immediately adjacent to the delivery chute when in the escrow position, and the parts of the machine including positive stops for preventing a person from dislodging a package into the delivery chute by reaching into the machine through the chute and manually shifting the feed mechanism.

6. The vending machine described in claim **1** characterized by each of the displacement devices including a cam, common operating mechanism comprising a shaft by which both of the cams are driven, the cams being similar and each having a 180° arc for actuating a package holder, and the cams being opposite phase angles on the shaft so that each one half turn of the shaft the active part of a different one of the cams is effective to operate one of the package holders, and coin controlled mechanism effective to cause one half revolution of the shaft.

7. The vending machine described in claim **6** characterized by each of the cams being set with its active arc only part way past its cam follower on each alternative movement of the cam in response to the control of the coin controlled mechanism so that one or the other of the package holders brings a package into the intermediate escrow position for each one half revolution of the shaft.

8. The vending machine described in claim **1** characterized by each of the package holders including a long cradle shaped to receive and hold a package of generally cylindrical shape, a bracket at the end of each cradle remote from the delivery chute, a pivot about which each of the brackets is independently movable to change the angular position of the cradle, a depending element extending down from the cradle, a cam follower at the lower

end of the depending element, the actuator including a different cam under each of the cam followers, and a common shaft to which both of the cams are secured, the cams being in different phase angle relation to one another whereby they produce opposite movements of their followers.

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