Jan. 21, 1930. J. E. SAPP 1,744,679

VENDING MACHINE

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Fig. 1.

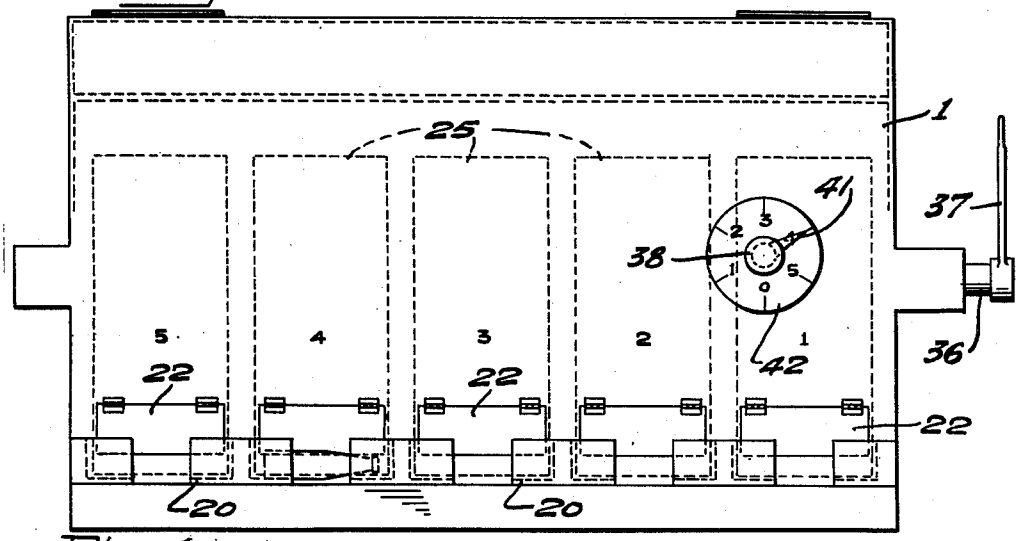


Fig. 4.

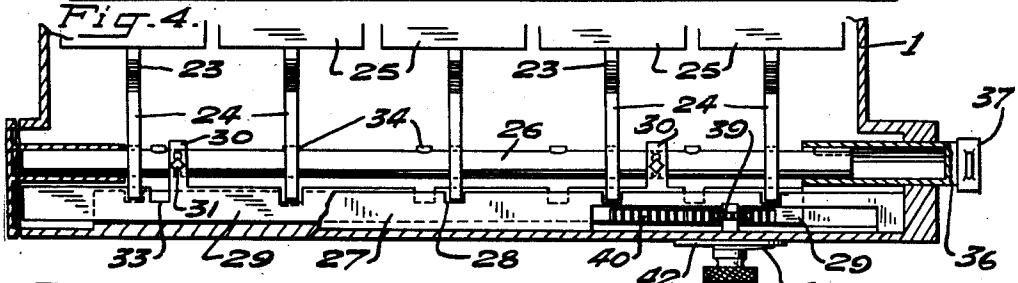


Fig. 6.

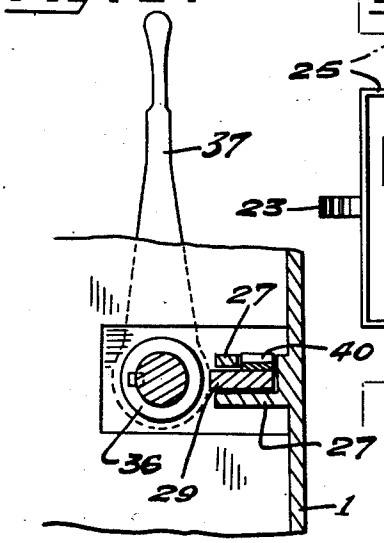
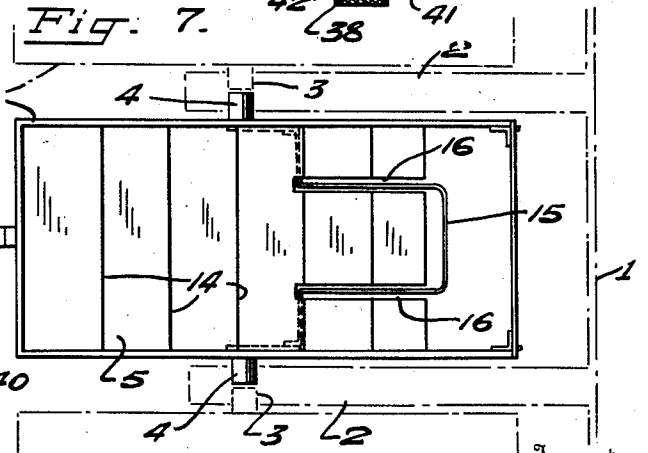


Fig. 7.



Inventor

James E. Sapp

By

Attorney

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Fig. 2.

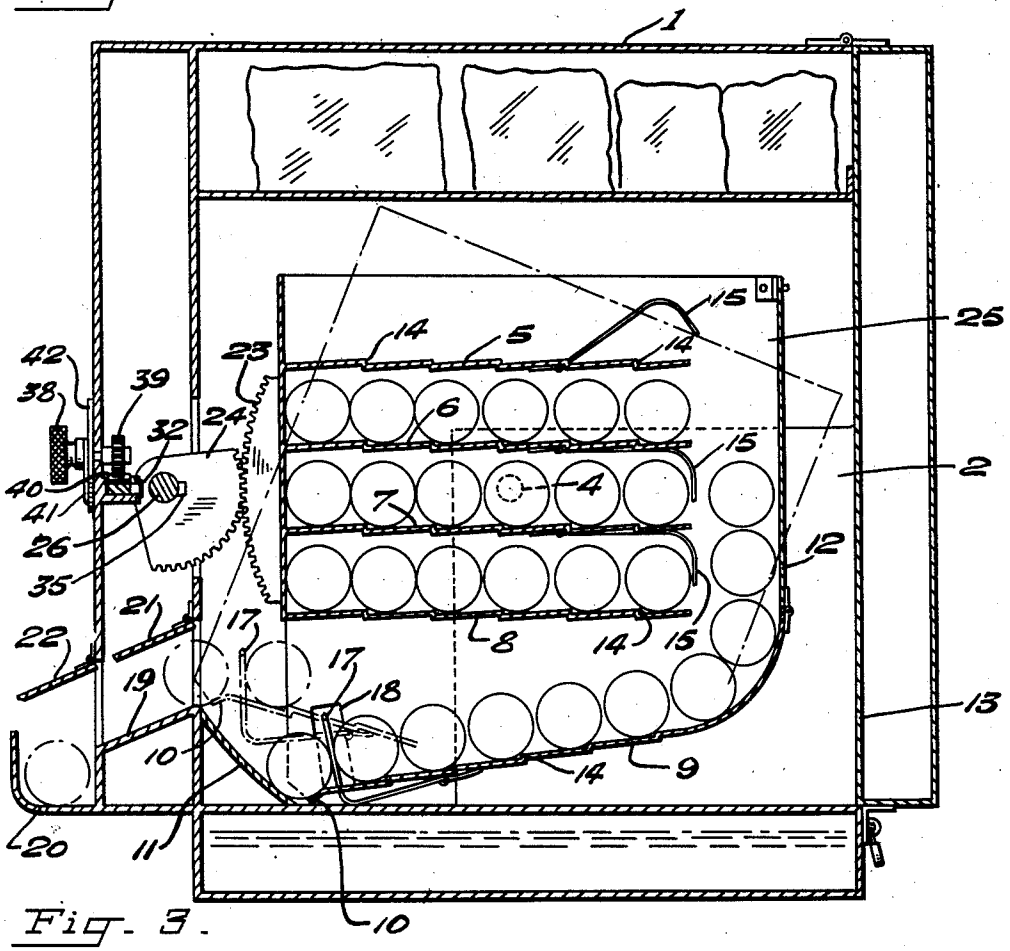


Fig. 3.

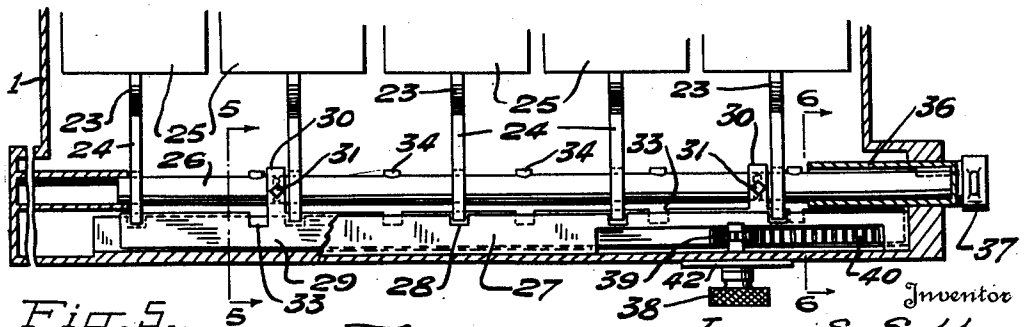
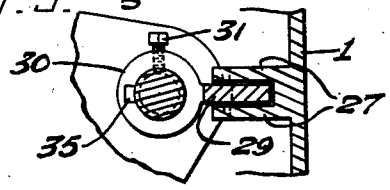


Fig. 5.



Inventor
James E. Sapp
By
Attorney

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Fig. 9.

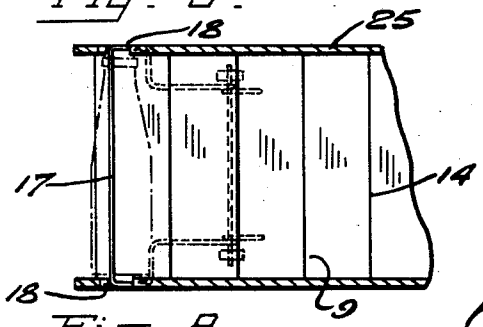


Fig. 8.

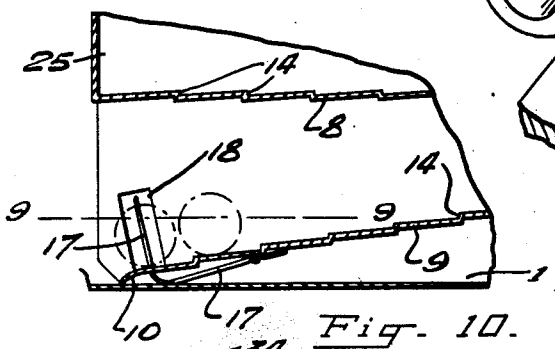


Fig. 12.

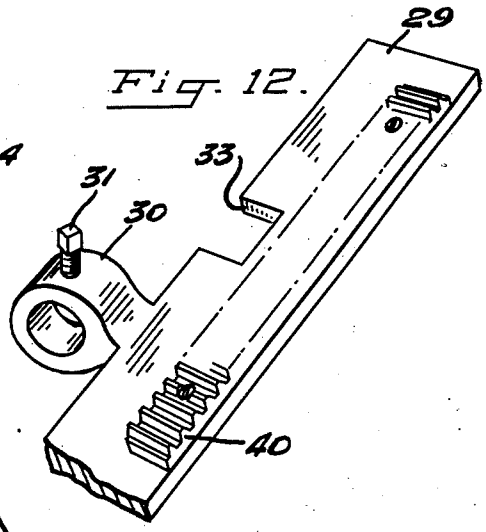


Fig. 10.



Fig. 11.

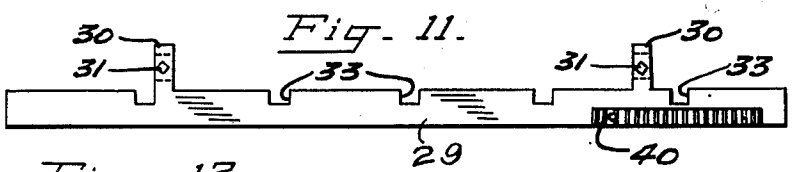
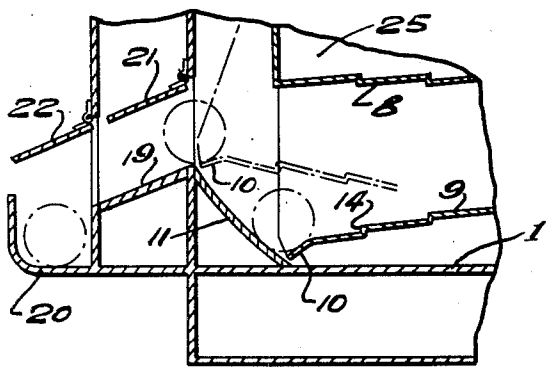


Fig. 13.



Inventor
James E. Sapp

By

Attorney

Patented Jan. 21, 1930 1,744,679

UNITED STATES PATENT OFFICE

JAMES E. SAPP, OF BAINBRIDGE, GEORGIA

VENDING MACHINE

Application filed July 21, 1927. Serial No. 207,521.

My invention relates to vending apparatus for the dispensing of packaged articles, and particularly those of cylindrical form, such for instance, as bottled soft drinks. The invention is particularly designed as a self-service device for correlation with coin controlled mechanism, the latter, however, being no part of the present invention, and therefore having been omitted altogether from the drawings and description thereof.

This invention is an improvement upon the invention forming the subject matter of my application Serial No. 110,409, filed May 20, 1926, and has for its general object the simplification and improvement in the mechanism and an enhancement in the reliability and efficiency in the operation of the device, relative to that of the prior invention.

Among the more specific objects are the provision of means ensuring the unidirectional travel of the packages toward the outlet or delivery chute; bottle actuated means ensuring the emptying of one shelf before the packages begin to discharge from the next, automatic means controlled by the position of the hopper ensuring that one bottle only shall advance beyond the pale of retention by the hopper, for each complete actuation of the latter, improved selector means, whereby the hoppers are positively locked against rotation at all times when they are not designatedly placed in condition to permit rotation; and dialing means correlated with the selector means for conveniently and accurately indicating to the user of the device the correct setting of the selector means to obtain service from any desired one of the several hoppers.

With these and other objects in view, the invention comprises principles of construction which find a preferred, although not exclusive, embodiment in the device described in the drawings, in which

Figure 1 is a front elevation of the apparatus;

Figure 2 is a side section through one of the hoppers;

Figure 3 is a horizontal longitudinal section taken in the plane of the selector mechanism, showing the latter in operative position with regard to all of the hoppers;

Figure 4 is a similar view showing the selector mechanism active with regard to hopper No. 4;

Figure 5 is a section taken along the line 5—5 of Fig. 3;

Figure 6 is a section taken along the line 6—6 of Fig. 3;

Figure 7 is a plan view of one of the hoppers;

Figure 8 is a vertical section through the mouth of one of the hoppers;

Figure 9 is a section taken on the line 9—9 of Fig. 8;

Figures 10 and 11 are respectively, plan views of the rotary shaft and sliding bar of the selector mechanism;

Figure 12 is a perspective view of the rack end of the sliding bar;

Figure 13 is a vertical section through the apparatus adjacent a delivery chute, showing a slight modification.

Referring now in detail to the several figures, the numeral 1 represents a casing or cabinet which, as shown, is double walled to obtain the effect of heat insulation, and which is shown with an ice compartment above and a drainage water compartment below, which may be connected by a suitable drain pipe, not shown.

The cabinet is provided with a series of vertical partitions 2 affording supports for bearings 3 within which trunnions 4 are journalled, the latter affording pivotal axes for the hoppers 25. The latter are several in number according to the variety of packages to be dispensed.

Each hopper is of the same general shape, as is indicated in Figs. 2 and 7, being rectangular in plan, having say, four normally horizontal shelves 5, 6, 7, and 8, and having the lower floor or wall inclined downwardly toward the front to form a ramp 9, the extreme end 10 of which bends downwardly, forming with an upwardly inclined wall 11 of the cabinet a bottle trough in which a single bottle or cylindrical package rests, the one that has been automatically excluded from return to the hopper, by means presently to be described. Each hopper is replenished with packages, through a door 12 in the back, ac-

cess to which is had by means of a door 13 in the back of the cabinet. The upper ends of the hoppers are preferably left open, to obtain full effect of the refrigeration.

The bottles are arranged transversely upon the shelves 5 to 8 and roll progressively forwardly as the hopper is tilted, forming a continuous series on the ramp, from which one bottle is discharged each time the hopper is tilted. The shelves and ramp are formed with stepped surfaces having abrupt shoulders 14, facing the direction of normal travel of the bottles and preventing them rolling backward and clashing against one another when the hopper is oppositely tilted.

To ensure that the shelves shall discharge their packages successively, beginning with the top shelf, every shelf but the top one is provided with a gate 15 obstructing its outlet, which is maintained in closed position by the weight of bottles on the shelf above. This gate, in the form shown is formed of a bent resilient rod having the plan shape as shown in Fig. 7 and the elevation shape shown in Fig. 2. It is pivoted substantially in the plane of the shelf overlying the tier of bottles which it is to control and is normally biased upwardly through its resiliency, slots 16, Fig. 7, being provided so that it may pass through the plane of the shelf to which it is affixed. When bottles are on the overlying shelf, the gate 15 is depressed so as to be in obstructing position relative to the bottles on the shelf below, and it is only when the last bottle has been discharged from the overlying shelf that the gate springs upwardly so as to release the bottles on the shelf next below.

The ramp is provided, adjacent its discharge end, with a control gate 17, the purpose of which is to let one bottle or package at a time out of the hopper in position for delivery. This gate is formed of a resilient bent rod and is constructed as a loop, extending clear across the hopper, as in Fig. 9, the sides of said loop being accommodated in slots 18 in the sides of the hopper. The sides of the loop extend below the plane of the ramp, being bent in a direction longitudinally of the ramp and pivoted thereto. The gate is normally biased downwardly so that the cross member of the loop acts as a barrier to the exit of the bottles. This relation of parts is shown in dotted lines in Fig. 2 and prevails for all positions of the hopper except when it is in the normal full line position shown in Fig. 2, at which time the bottom of the gate abuts against the bottom of the cabinet being thereby pressed upwardly so that the cross member of the gate rises above the height of the bottles, permitting the full passage of a bottle to the trough formed by the end 10 of the hopper and the inclined wall 11, from which it is discharged when the lower end of the hopper moves upwardly, to the dotted line position, rolling by gravity down the chute 19 to the receiving shelf 20. In its gravital passage down the chute, the bottle, by its own weight opens the doors 21 and 22 in the inner and outer walls of the cabinet, which doors are provided for heat excluding purposes.

The hoppers are tilted by means of arcuate racks 23 secured to the front faces thereof, engaged by toothed sectors 24 freely supported upon a shaft 26, the same forming an element of the selector mechanism. The sectors are kept from lateral displacement, by means of a stationary bar 27 secured to the rear face of the front wall of the cabinet, having notches 28 of a width to freely receive the edges of said segments, said notches being so spaced as to keep the sectors in registration with the racks.

The selector mechanism consists of a sliding lock bar 29, slidable between a pair of guide flanges on the rear of the front face of the cabinet, of which the bar 27 is one. Said lock bar has bearings 30 receiving the shaft 26, the latter being grooved in the zones engaged by said bearings, and set screws 31 or their equivalent being provided, projecting into said grooves so that while the shaft is rotatable relative to the lock bar, it moves slidably synchronously therewith. The lock bar is of such width, except at certain indented places, that it extends within notches 32 in the sectors 24, and so maintains them in fixed position, the shaft 26 being free to rotate within said sectors so that no strain can be put upon the sectors by any one attempting to operate the device while the lock bar is in locked position. The lock bar is provided with indentations 33, one for each sector, and arranged at such distance intervals apart that only one at any time can be brought into registry with a sector by sliding the lock bar. When this occurs the particular sector with which a recess associates itself is unlocked and free to rotate, while the others remain locked in the manner afore said.

The shaft 26 is provided with protuberances or keys 34 arranged at intervals corresponding to those of the indentations 33, and the sectors are provided with recess 35 for said keys, so that at the same movement an indentation on the lock bar comes into unlocking relation to a sector, a key 34 slips into a recess 35 of the same sector temporarily securing it rotatably to the shaft, the end of the shaft 26 freely telescopes within a rotatable sleeve 36 set in one side of the cabinet and suitably fixed against longitudinal movement. The shaft 26 is splinably mounted within this sleeve 36. When the crank 37 on the end of the sleeve 36 is rotated the movement is communicated through shaft 26 to the one sector which at the time is keyed to said shaft, tilting the hopper with which

it cooperates and thereby accomplishing the delivery of a bottle or package.

Selection of the desired hopper which is to be operated is made by turning a knurled knob 38 which operates a gear 39, in mesh with a rack bar 40 fixed to the bar 29 slidable with respect to the lock bar 27, and accessible by gear 39 through a slot in bar 27 as shown. By this means slidable movement is imparted to the rack bar, the knob preferably carries an index 41 cooperating with a dial 42 on which are carried indicia identified with the variety of product dispensed by each of the several hoppers. When the user turns the knob until the index points to the desired indicia he then merely turns the crank and a package of the desired variety is deposited in the receiving shelf 20.

While I have in the above description defined a preferred and practical embodiment of the invention, it is to be understood that the specific structure described is not to be considered as a limitation in its concept of the invention, but merely by way of example, so that various changes in structure may be permissible without transcending the scope of the appended claims.

Having described my invention and set forth its merits, what I claim is:—

1. A vending device for deliverable packages, including a hopper having superposed shelves on which the packages are stored and a ramp upon which they are discharged from said shelves, gates associated with said shelves and having an inherent tendency to move to open position, and means whereby the sequence in the discharge of packages from the shelves to the ramp is controlled.

2. A vending device for deliverable packages, including a hopper having superposed shelves on which the packages are stored and a ramp upon which they are discharged from said shelves, gates associated with said shelves and having an inherent tendency to move to open position, means whereby the sequence in the discharge of packages from the shelves to the ramp is controlled, and means for tilting each hopper.

3. A vending device for deliverable packages, including a hopper having shelves on which said packages are stored, and a ramp upon which they are discharged from said shelves, the latter and said ramp forming a runway from which said packages gravitate when the hopper is tilted, said runway being constructed with stepped portions forming shoulders facing the direction of discharge, and preventing back travel of said packages when said hopper is oppositely tilted.

4. A vending device for deliverable packages, including a tiltable hopper, having a ramp from which packages are discharged by gravity, and retaining means carried by said hopper and operable by contact with a fixed part of said device when said hopper is tilted in one direction, to permit the automatic advance of a determined number of packages beyond said means and when tilted in the opposite direction to exclude said packages from the pale of retention of said hopper.

5. A vending device for deliverable packages, including a cabinet and a hopper pivotally mounted therein, said hopper having a ramp from which packages are discharged by gravity when the hopper is tilted, and a spring gate normally positioning itself through its inherent resilience, behind a determined number of packages, at the advance end of the succession of packages on said ramp, to exclude them from the pale of retention of said hopper, said gate being operable through contact with a fixed part of said cabinet to the passage of packages past said gate.

6. A vending device for deliverable packages, comprising a plurality of hoppers, pivotally mounted and operable by tilting to discharge packages therefrom, tilting means, individual to each hopper, locking means and operating means cooperable with said tilting means and normally so disposed as to maintain said tilting means locked and inoperative, said locking and operating means being connected to move synchronously to a setting position and being constructed, so that when so moved a selected one only of the tilting means shall be simultaneously released from the locking means and rendered operative, said operating means having a movement independent of the setting movement for operating the selected tilting means.

7. A vending device for deliverable packages comprising a plurality of hoppers, pivotally mounted and operable by tilting to discharge packages therefrom, tilting means, individual to each hopper, locking means comprising a bar engaging a slot in each tilting means for locking said tilting means against tilting movement, said bar being provided with recesses adapted to be brought into the paths of said tilting means to release them from said bar, said recesses being so spaced that but one will register with a tilting means at a time, an operating shaft having bosses, engageable with corresponding recesses in said tilting means, said bosses being spaced corresponding to the recesses in said locking bar, said bar and shaft being synchronously movable into selective operative position with respect to a tilting means, said shaft having an operative movement independent of said setting movement, for tilting the selected one of said tilting means.

8. A vending device for deliverable packages comprising a plurality of hoppers, pivotally mounted and operable by tilting to discharge packages therefrom, tilting means, individual to each hopper, locking means comprising a bar engaging a slot in each tilting

means for locking said tilting means against tilting movement, said bar being provided with recesses adapted to be brought into the paths of said tilting means to release them from said bar, said recesses being so spaced that but one will register with a tilting means at a time, an operative shaft having bosses, engageable with corresponding recesses in said tilting means, said bosses being spaced corresponding to the recesses in said locking bar, said bar and shaft being synchronously movable into selective operative position with respect to a tilting means, said shaft being rotatable, a crank sleeve within which said shaft telescopes during setting movement of said locking bar and shaft, and means on said crank sleeve for rotating said shaft.

9. A vending device for deliverable packages comprising a plurality of hoppers, pivotally mounted and operable by tilting to discharge packages therefrom, tilting means, individual to each hopper, locking means comprising a bar engaging a slot in each tilting means for locking said tilting means against tilting movement, said bar being provided with recesses adapted to be brought into the paths of said tilting means to release them from said bar, said recesses being so spaced that but one will register with a tilting means at a time, an operative shaft having bosses, engageable with corresponding recesses in said tilting means, said bosses being spaced corresponding to the recesses in said locking bar, said bar and shaft being synchronously movable into selective operative position with respect to a tilting means, a setting handle associated with said connected locking bar and operating shaft, and a dial to which the position of said setting handle is referred, having indicia identified with indicia related to the several hoppers.

In testimony whereof I affix my signature.

JAMES E. SAPP.