

April 15, 1958

W. R. SPARKS  
VENDING APPARATUS

2,830,626

Filed March 30, 1955

2 Sheets-Sheet 1

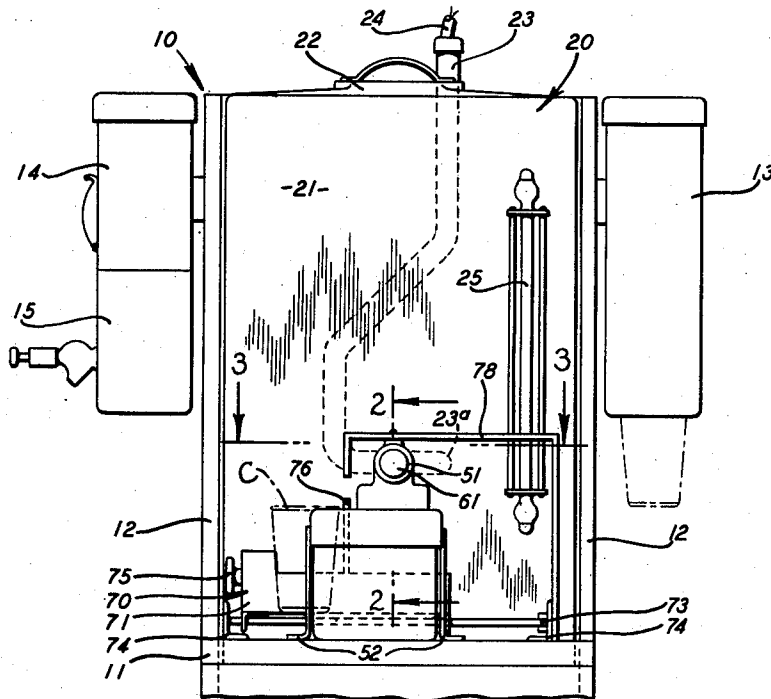


Fig-1

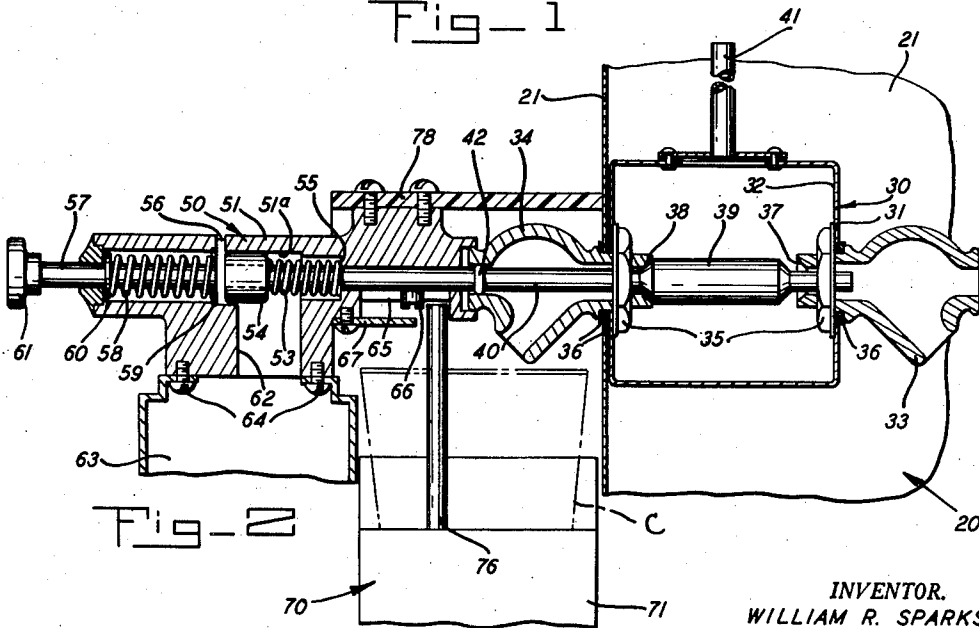


Fig-2

INVENTOR.  
WILLIAM R. SPARKS

BY

*Paul B. Fike*

PATENT AGENT

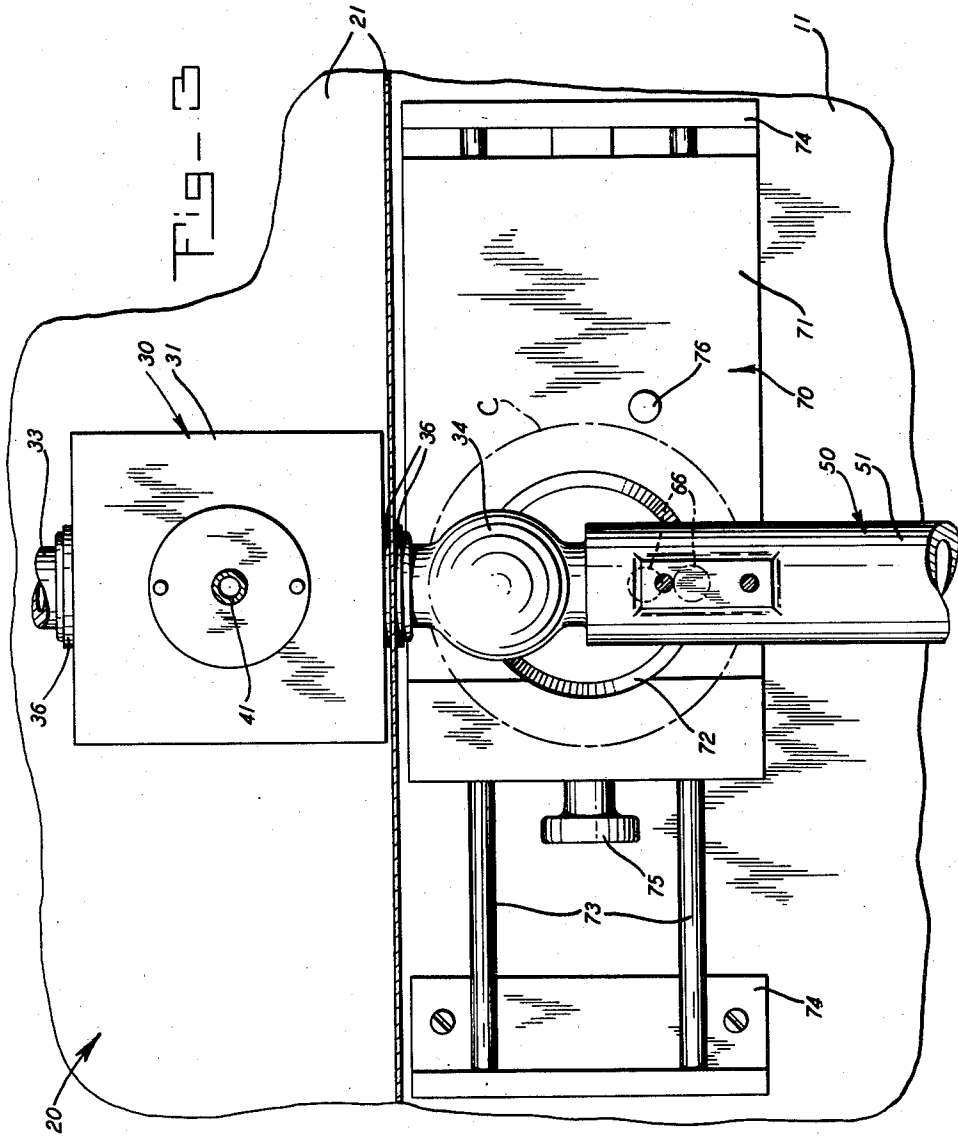
April 15, 1958

W. R. SPARKS  
VENDING APPARATUS

2,830,626

Filed March 30, 1955

2 Sheets-Sheet 2



INVENTOR.  
WILLIAM R. SPARKS

BY *Paul B. Fike*  
PATENT AGENT

1

2,830,626

VENDING APPARATUS

William R. Sparks, Cupertino, Calif.

Application March 30, 1955, Serial No. 498,033

1 Claim. (Cl. 141—155)

The present invention relates to vending apparatus and more particularly to coin-controlled apparatus for vending certain foods and beverages.

Commercially available machines for the automatic delivery of a solid food in response to the mere deposit of an appropriate coin are, relatively speaking, quite expensive units, and those which dispense beverages are even more so, as mechanism for the automatic delivery of a cup or other container is additionally required. Since there are certain basic elements required in an entirely automatic vending machine regardless of its food or beverage capacity, it is preferable to construct large capacity machines so that the ratio of capacity to cost is high. In addition, large machines require less frequent replenishment so that labor costs are minimized and ultimately greater profit can be realized.

Although economically desirable, as indicated, the utilization of large capacity vending apparatus presents certain problems. First a large capacity machine can only be installed where reasonably high demand for the item or items vended can be expected. Thus, for example, a large and expensive soft-drink vending machine cannot be placed in a small shop having twenty employees. Furthermore, even when placed in a relatively large factory, the machine must service a large number of employees some of whom may have to walk a considerable distance in order to obtain a drink and thereby waste minutes which all too quickly are multiplied into an appreciable number of man-hours.

A second problem is presented when a large capacity machine is utilized to dispense perishable items. The desirability of large capacity is defeated if frequent servicing is required to prevent spoilage. To preserve certain items, techniques such as refrigeration can be utilized, but this solution adds considerably to the initial cost of the machine, and cannot be employed for all perishable items. For example, it is recognized that coffee, no matter how kept, becomes stale and unpalatable after a certain period of time, particularly if left in a quiescent state.

In view of these and other problems encountered in the vending of various items and particularly those such as coffee which cannot be preserved over an extended period of time, it is a general object of the present invention to provide a semi-automatic vending apparatus whose initial cost is sufficiently low to establish economic feasibility for the production and use of relatively small as well as large capacity machines.

It is a feature of the present invention to provide a vending apparatus that is semi-automatic in operation but is arranged so that the requisite manual operations are simple and readily performed by the vendee.

Another feature relates to the arrangement of the semi-automatic vending mechanism that precludes petty tampering or misuse of the apparatus.

A further feature of the present invention also relates to the vending mechanism which, while particularly suit-

2

ed for incorporation in an apparatus for the vending of coffee and other drinks, is also adapted for use with vending machines for solid food and other items.

It is also a feature to provide an apparatus, which when employed for vending coffee, preserves the fresh quality of the coffee for an extended period of time.

Yet another feature relates to the design of the vending apparatus which renders the same simple to construct and to install.

A feature correlative to the simplicity of installation relates to the ready removal of an emptied apparatus from a given location and its immediate replacement by a second filled unit.

These and other features of the invention as well as the advantages stemming from its use will become apparent from a perusal of the following description of the accompanying drawings wherein:

Fig. 1 is a front elevational view of a coffee vending apparatus embodying the present invention in a preferred form,

Fig. 2 is a fragmentary vertical sectional view taken along line 2—2 in Fig. 1, and

Fig. 3 is a fragmentary horizontal sectional view taken along line 3—3 of Fig. 1, but showing a cup positioned to receive coffee.

As shown in Fig. 1, the coffee vending apparatus, indicated generally at 10, constitutes a portable unit that may be seated on a base 11 from which rise vertical walls 12 that encompass the unitary apparatus on three sides. The base 11 is supported rigidly on the ground or floor by suitable uprights (not shown) so that the apparatus 10 will be at a convenient height for vending operations. Conventional dispensing units 13, 14 and 15 for cups, sugar, and cream are removably attached to the side walls 12 so as to be readily available to the coffee purchaser or vendee, and easily replaceable by new units when the supply is exhausted.

The main body portion of the vending apparatus 10 constitutes a generally rectangular container 20 for the coffee having metallic bottom and side walls 21 and a top or cover 22 that can be removed to enable the insertion of freshly-brewed coffee. The cover 22 fits tightly in position so that the loss of coffee by evaporation and consequent impairment of flavor is precluded. A thermostatically-controlled electrical heating element 23 depends from the cover 22 into the interior of the container 20 so that the coffee therein can be kept at the desired temperature, such temperature control having been found effective in the maintenance of the fresh quality of the beverage.

The actual heating coil within the heating element 23 is located near the bottom end thereof, as indicated at 23a. The coffee heated in this vicinity tends to rise while on the other hand, coffee adjacent the metallic side walls 21 is cooled by conduction and thus tends to flow downwardly. As a consequence, the arrangement of the heating element 23 and the un-insulated side walls 21 create automatically a continuous recirculation within the container 20. This continuous recirculation has been found effective in extending considerably the period of time over which the fresh quality of the coffee can be maintained because no settling occurs and the temperature of the coffee throughout the container is more accurately controlled by the thermostat.

The electrical power for the heating element 23 is supplied from a convenient 110 volt A. C. outlet through a suitable connecting cord, indicated at 24, this electrical connection being all that is required for installation of the vending apparatus 10 as shown.

To indicate the quantity of coffee within the container 20, a glass sight tube 25 is mounted on the front-facing

3

side wall 21 and has suitable conduits (not shown) connecting its upper and lower ends to the interior of the container 20. When the container 20 is emptied, an operator need merely disconnect the heater connection and bodily remove the apparatus 10 from the base 11. Thereafter a new, full apparatus 10 is seated on the base 11, its heater connected and a fresh supply of coffee is thus made available within a matter of seconds.

The mechanism for vending a cup of coffee from the container 20 is shown best by reference to Fig. 2. The coffee is adapted to flow from the container 20 through a metering valve, indicated generally at 30, into a properly positioned cup C. Said metering valve 30 includes a generally rectangular or box-shaped body 31 defining an interior chamber 32 whose volume is slightly less than that of one of the cups C. Valve cocks 33 and 34 of like construction are secured by suitable nuts 35 in aligned openings on opposite sides of the body 31 to project outwardly therefrom. The valve body 31 is suitably secured to the interior of the side wall 21 of the container 20 so that the valve cock 34 protrudes through an opening in this side wall 21 and the other cock 33, projects into the coffee container 20. Conventional washers 36 form a liquid tight seal between the cocks 33 and 34 and the supporting body 31 and side wall 21. Valve seats 37 and 38 are provided on the cocks 33 and 34 respectively within the chamber 32 and a closure member 39 is mounted on a valve stem 40 for movement into sealing engagement with one or the other of said valve seats 37 and 38. When the closure member 39 is against valve seat 38, as illustrated in Fig. 2, coffee can flow from the container 20 through the open inlet cock 33 into the chamber 32 of the metering valve 30 and fill the same. Any air in the valve chamber 32 is vented through a small vent pipe 41 that rises from the body 31 to a point above the highest coffee level in the container 20. When the closure member 39 is shifted to the right so as to sealingly abut valve seat 37, the inlet cock 33 is closed and the coffee within the chamber 32 can flow through the now open outlet cock 34 into a properly positioned cup C and automatically fill the same with the measured amount of coffee. Air can now enter the chamber 32 through the described vent pipe 41 to preclude formation of a vacuum and the consequent cessation of flow from said chamber.

The described movement of the closure member 39 is actuated by a coin-controlled mechanism which is generally indicated at 50. This mechanism includes a body 51 that constitutes a metal casting which is attached to the outlet cock 34 and supported on brackets 52 so that a central stepped bore 51a therein receives the valve stem 40 that projects outwardly from said outlet cock and, as will be remembered, mounts the closure member 39 at its remote inner end. An O-ring 42 seals the movable valve stem 40 to the outlet cock 34 at the point of projection therefrom.

The valve stem 40 is urged to the left as viewed in Fig. 2 by a spring 53 disposed in an enlarged portion of the bore 51a and held under compression between a tubular stub 54 attached to the outer extremity of the valve stem 40 and the shoulder 55 formed in the body 51 at the terminus of the enlarged portion of the bore 51a. When the valve closure member 39 is against the outlet valve seat 38, as illustrated in Fig. 2, the attached valve stem 40 is disposed so that the tubular stub 54 on its outer end is immediately adjacent a coin slot 56 formed in the body 51 of the coin-controlled actuating mechanism. The inner end of an actuating plunger 57, that is aligned with the valve stem 40, is normally disposed immediately adjacent the side of the coin slot 56 remote from the stub 54, being resiliently urged to this position by a coil spring 58 compressed between a ring 59 secured to the interior of the body 51 and a second ring 60 attached to the plunger 57. A knob 61 is attached to the outer end of the plunger 57 where it projects from the mechanism body 51 for manual access.

4

If the plunger 57 is shoved in when no coin has been placed in the slot 56, the inner end of the plunger merely enters the tubular stub 54 and no motion is transmitted to the valve stem 40 and the closure member 39 mounted thereon. When, however, a coin is placed in the slot 56, inward motion of the plunger 57 will be transmitted through the coin to the valve stem 40 and the closure member 39 will move to the right as viewed in Fig. 2 to open the outlet cock 34 and permit the flow of coffee therethrough.

An opening 62 is formed in the body 51 of the coin controlled actuating mechanism 50 so as to intersect the described central bore 51a at a position inwardly offset from the coin slot 56 and communicates downwardly with the interior of a coin box 63 secured to the body 51 by means of screws 64. After the actuating plunger 57 has been pushed in to permit the flow of coffee as described, its release will cause withdrawal under the action of the compressed spring 58, and such withdrawal will release the coin from its frictional support between the end of the plunger 57 and the stub 54 on the valve stem 40. The released coin will drop through the opening 62 downwardly into the coin box 63 for subsequent collection.

A second opening 65 is milled or otherwise formed in the body 51 of the actuating mechanism 50 to expose the lower side of the valve stem 40 at a position intermediate the coin opening 62 and the outlet cock 34. A small lug 66 is secured to the underside of the valve stem 40 so as to shift longitudinally in the opening 65 when the valve stem 40 is moved by the actuating plunger 57. A curved plate 67 covers a portion of the opening 65 so that the lug 66 is exposed, when viewed transversely to its direction of movement, only when the plunger 57 and valve stem 40 are moved inwardly to open the outlet cock 34. This lug 66 is adapted to cooperate with part of a cup-supporting mechanism 70 which is arranged to present cups C in filling position in a manner such that the filling of more than one cup at a time is positively precluded.

The cup-supporting mechanism 70, as best shown in Fig. 3, includes a carriage 71 having a circular recess 72 within which a cup C can be seated. The carriage 71 is supported for movement across the front of the apparatus on spaced rods 73 supported on suitable brackets 74 in parallelism with the front walls 21 of the container 20 and beneath the outlet cock 34. A handle 75 at the left end of the carriage facilitates manual actuation of carriage movement. A projection or stud 76 is rigidly mounted on the carriage 71 to extend upwardly therefrom an amount such that as the carriage is moved from the left under the outlet cock 34, the upper end of the stud 76 passes through the described opening 65 in the bottom of the body 51 of the actuating mechanism, as can best be visualized by reference to Fig. 2. This path of the upper end of the stud 76 accordingly is intersected by the previously described lug 66 on the valve stem 40 when the latter has been pushed inwardly, and under such condition, free movement of the carriage 71 is precluded. The placement of the stud 76 on the carriage 71 is to the right of the cup-receiving recess 72 so that the stud 76 is disposed to the right of the depending lug 66 when a cup has been brought into filling position beneath the outlet cock 34, as clearly shown in Fig. 3.

Transparent plastic sheets 78 partially encompass the vending mechanism 59 leaving only a lateral opening for the entrance and exit of the cup-supporting carriage 71 from and to the cup-receiving position at the left of the apparatus, as shown in Fig. 1. Only in this cup-receiving position can a cup C be inserted into or removed from the cup-receiving recess 72.

In operation, a purchaser, after first noting that a supply of coffee is available by glancing at the sight tube 25, draws a cup C from the cup dispenser 13 and inserts the same into the cup-receiving recess 72 in the carriage 71, the latter being disposed in its cup-receiving position

5

as illustrated in Fig. 1. The carriage 71 is then moved to the right to filling position whereby the cup C is brought under the outlet cock 34, as shown in Fig. 3. A coin is then inserted in the coin slot 56 and the actuating plunger 57 is pushed in to open the outlet cock 34 whence the measured amount of coffee from the chamber 32 is delivered into the cup C. As long as the plunger 57 is pressed in and the cock 34 is open, the carriage 71 cannot be withdrawn from the filling position because of the disposition of the lug 66 in the path of the projecting stud 76. After the plunger 57 is released, the lug 66 withdraws automatically from its operative, impeding position as shown in dotted lines in Fig. 3 to its inoperative position, as shown in phantom lines, and the carriage can be withdrawn to the cup-receiving position and the filled cup C lifted from the carriage 71. Sugar and cream can be taken from the dispensers 14 and 15, if desired, and added to the cup, and another purchaser can now repeat the described process which although only semi-automatic is so simple as to be obvious to anyone and can be quickly executed.

Various alterations and modifications will readily occur to those skilled in the art to which this invention pertains so as to fall within its spirit. Accordingly, the foregoing description of one embodiment of the invention is to be considered merely as exemplary and not in a limiting sense, the scope of the invention being indicated by the appended claims.

I claim:

A vending apparatus for beverages comprising a container for the beverage, a valve adapted to deliver the beverage from said container, a carriage adapted to sup-

6

port a cup and movable to filling position whereat a cup thereon is adapted to receive the beverage delivered from the valve, means including a stem projecting from said valve for opening said valve to deliver the beverage into a cup, a lug secured on said stem, and a projection positioned on said carriage so that upon movement of said carriage, the path of said projection intersects the position of said lug when said valve-opening means is in valve-opening position.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

441,628	Coon et al. -----	Nov. 25, 1890
896,737	Mayo et al. -----	Aug. 25, 1908
941,760	Cordley -----	Nov. 30, 1909
1,051,832	Dunn -----	Jan. 28, 1913
1,241,353	Doering -----	Sept. 25, 1917
1,342,173	Joslin -----	June 1, 1920
1,366,529	Frick -----	Jan. 25, 1921
1,407,838	Butterfield -----	Feb. 28, 1922
1,538,214	Rath -----	May 19, 1925
1,637,808	Armond et al. -----	Aug. 2, 1927
1,799,755	Loughridge -----	Apr. 7, 1931
1,831,832	Wise -----	Nov. 17, 1931
1,882,812	Gunn -----	Oct. 18, 1932
1,883,021	Silkmitter -----	Oct. 18, 1932
2,029,460	Brady -----	Feb. 4, 1936
2,433,054	Lime -----	Dec. 23, 1947
2,591,507	Brous -----	Apr. 1, 1952

##### FOREIGN PATENTS

827,240	Germany -----	Jan. 10, 1952
---------	---------------	---------------