Feb. 15, 1966 R. W. COUFFER, JR 3,235,141

MANUAL ICE CUBE TRAY FILLER

Filed Jan. 15, 1964

FIG. 1

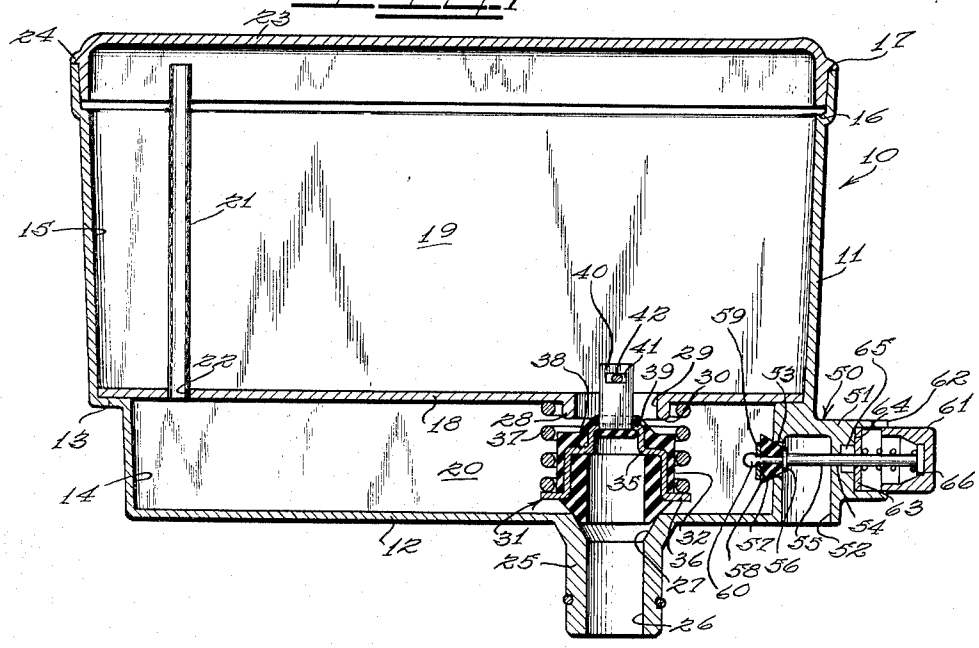


FIG. 2

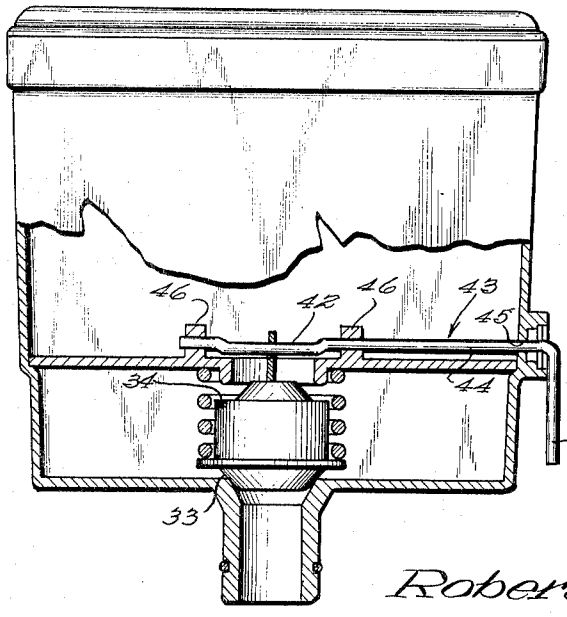
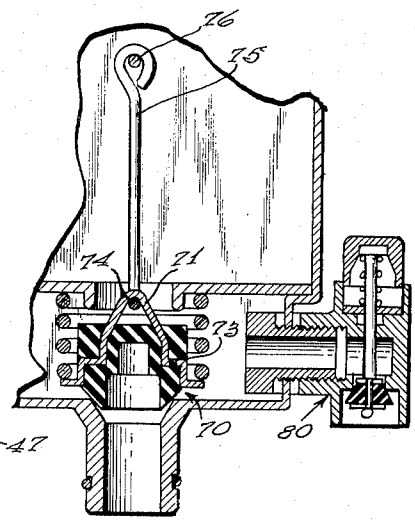


FIG. 3



INVENTOR.

Robert W. Couffer Jr.

BY

Hill, Sherman, Meroni, Gross & Simpson

ATTORNEYS

United States Patent Office 3,235,141 Patented Feb. 15, 1966

3,235,141

MANUAL ICE CUBE TRAY FILLER

Robert W. Couffer, Jr., Deerfield, Ill., assignor to The Dole Valve Company, Morton Grove, Ill., a corporation of Illinois

Filed Jan. 15, 1964, Ser. No. 337,919
8 Claims. (Cl. 222—442)

The present invention relates to liquid dispensers and more partiularly relates to a dispenser having means for dispensing a measured slug of liquid and having independent means for dispensing any selected volume of liquid from a storage container.

The illustrated embodiment of the instant invention comprises a liquid dispenser of a type which is suitable for placement in a refrigerator to provide a means for dispensing a measured slug of water to an ice tray to fill the tray with cold water when necessary. The dispenser could be mounted within the refrigerating compartment and arranged so that manual operation of an actuator would be effective to dispense a measured volume of water to an ice tray. In addition, separate discharge means are provided so that operation of a separator will unseat a valve member and discharge any given desired amount of cold water. A cold water supply and ice cube tray filler is thus provided in a single simple and inexpensive unit.

It is therefore a principal object of the present invention to provide an improved liquid dispenser having annually actuable means for dispensing a measured slug of liquid.

Another object of the invention resides in the provision of a liquid dispenser having means for dispensing a measured slug of liquid and having independent manually actuable means for discharging a selected volume of liquid.

These and other objects, advantages and features of the present invention will become apparent from time to time as the following specification proceeds and with reference to the accompanying drawings, wherein:

FIGURE 1 is a vertical sectional view through a liquid dispenser constructed in accordance with the principles of the present invention;

FIGURE 2 is a partially sectioned, partially elevational view taken transversely through the dispenser unit shown in FIGURE 1; and

FIGURE 3 is a fragmentary vertical sectional view taken in the same plane as that of FIGURE 1 but showing a modified version of the valving assembly.

The liquid dispenser 10 illustrated in FIGURE 1 comprises generally a housing 11 having a base wall 12, a stepped shoulder 13 extending entirely around the interior thereof and dividing the interior of the housing 11 into radially reduced and radially enlarged portions 14 and 15, respectively, and has another stepped shoulder 16 which is formed entirely around the interior of the housing 11 adjacent the upper lip 17 thereof.

A horizontally extending partition 18 has its periphery seated on the shoulder 13 and serves to divide the interior of the housing 11 into upper and lower chambers 19 and 20. An air tube 21 is fitted with an aperture 22 formed in the partition 18 so that the interior of the tube is communicable with the chamber 20 and this tube extends outwardly to a point just below the plane of the lip 17.

A removable cover 23 having an outturned flange 24 is fitted over the upper open end of the housing 11 with the flange 24 resting on the lip 17 and with the wall of the cover positioned somewhat above the upper end of the tube 21.

A boss 25 is formed integrally with and depends from the base wall 12 of the housing 11 and has an outlet passageway 26 formed therein which opens through a

beveled throat 27 to the lower chamber 20. The throat 27 converges from the chamber 20 toward the outlet passageway 26.

A smaller boss 28 is formed integrally with and depends from the partition 18 and serves to defiine an outlet port 29 which communicates the chambers 19 and 20 with one another. It will be observed from an observation of FIGURES 1 and 2 that the ports 27 and 29 are formed coaaxially with one another. It will also be observed that the lip of the boss 28 is rounded as at 30.

A valve member, generally designated by the numeral 31, is positioned within the lower chamber 20 and is movable between the ports 29 and 27 to close one or the other of those ports as desired. The valve member comprises generally a resilient valve head 32 having a chamfered valve seating surface 33 and, at the opposite and upper end thereof, an annular seating surface 34.

The seating surface 33 is cooperable with the edge of the housing base wall 12 defining the port 27 to control the flow of fluid therebetween. The seating surface 34 is cooperable with the rounded lip 30 of the boss 28 to control the flow of liquid through the passageway 29. It will be observed that the seating surfaces 34 and 33 are spaced apart a distance somewhat less than the distance between the rounded lip 30 and the edge of the housing base wall 12 defining the port 27 so that when the valve member 31 is seated in port closing relation to one of the ports, the other port will be open.

In order to lend some rigidity to the main body of the valve member 31 and for other reasons which will hereafter become apparent, a stepped metallic support 35 is molded within the valve member 31 in the manner clearly illustrated in the drawings and has an outturned annular flange 36 protruding from the main body of the valve head 32. The outturned annular flange 36 serves as a seat for one end of a coiled compression spring 37 which has its opposite end seated against the under surface of the partition 18 surrounding the depending boss 28. The spring 37 serves then to bias the valve member 31 into seated relation with respect to the port 27.

The stepped supporting structure 38 extends upwardly within the valve head 32 to a point just below the annular seating surface 34 and then is stepped inwardly as at 38 and terminates then in a center section 39. An ear 40 is bent upwardly from center section 39 and has an aperture 41 formed therein which receives an eccentric portion 42 of a valve actuator 43 as is best viewed in FIGURE 2.

The valve actuator 43 comprises generally a straight rod 44 which is journaled within an aperture 45 in the side wall of the housing 11 and within a pair of upstanding ears 46 which are spaced apart on opposite sides of the port 29 and which are formed integrally with the partition 18. The eccentric portion 42 of the actuator 43 is bent away somewhat from the axis of the rod 44 between the ears 46 so that rotation of the rod 44 will act through the eccentric 42 and the cooperating tab 40 of the valve member 31 to unseat the valve member 31 from the position shown in FIGURE 1 and raise it to a point where the annular surface 34 is seated on the lip 30 to shut off liquid flow through the port 29. The outer end of the rod 44 is bent at right angles to the main axis of the rod as at 47 and serves as a means by which the rod can be gripped and rotated to effect movement of the valve member 31.

Thus, when the assembly is in the position shown in FIGURE 1, water contained within the upper chamber 19 will flow into and fill the lower chamber 20 and any air previously contained therein will be vented through the vent sack or tube 21. The lower chamber 20 is preferably designed to have a capacity equal to

or somewhat less than an ice tray so that when the operator desires to fill such a tray the tray can be placed beneath the outlet 26 and the bent portion 47 of the rod 44 can then be gripped and turned to rotate the rod 43. Upon rotation of the actuator rod the valve member 31 will be moved into engagement with the annular lip 30 and if the actuator is held in this position all of the water contained within the lower chamber 20 will be expelled through the outlet passageway 26. When the actuator rod 43 is released the bias of spring 37 will serve to return the valve member 31 to the position shown in FIGURE 1 wherein the chamfered surface thereof is positioned in engagement with the edge of the base wall 12 of housing 11 defining the outlet port 27.

Independent liquid discharge means are also provided so that the operator can, by actuation of a separate member, draw off any desired amount of cold water from the lower chamber 20.

To this end, independent discharge means 50 are provided at one end of the housing 11. An outwardly protruding boss 51 is formed integrally with the housing 11 adjacent the lower chamber 20 and this boss has a bore 52 formed therein which opens from the bottom thereof. Radially enlarged and radially reduced apertures 53 and 54 are formed within the housing wall on opposite sides of the bore 52; the aperture 53 serving as a discharge port, and the aperture 54 serving as a guide for valve shaft 55. Valve shaft 55 extends through the aperture 54 and has a flange 56 adjacent the inner free end thereof upon which is seated the outwardly converging frusto-conical resilient valve member 58. An outer washer 59 and the bulbous outer end portion 60 of shaft 55 serves to maintain the valve member 58 in its proper position on the shaft 55.

The opopsite end of the shaft 55 has a button 61 mounted thereon in the usual manner and this button is slidable within a guide wall 62. A washer 63 extends around the shaft 55 and is seated on a shoulder 64 of the boss 51 and maintains a sealing ring 65 in position about the shaft 55. Coiled compression spring 66 encircles the shaft 55 and has one end seated against the under surface of the button 61 and its opposite end seated on the washer 63 and thereby serves to bias the shaft 55 toward the right as viewed in FIGURE 1 to thereby seat the frusto-conical surface 57 of the valve member 58 against the wall of the housing 11 defining the port 53. Upon depression of the button 61 the poppet valve 58 will be unseated from the port 53 and water will be discharged through the bore 52.

FIGURE 3 illustrates a different embodiment of each of the valving asemblies. The valve member 70 illustrated therein is similar in nature to the valve member 31, is somewhat differently configurated. A stirrup-like strap 71 extends upwardly through the resilient valve head 73 and is carried on a horizontally extending portion 74 of a carrier 75 which carrier is in turn carried by the eccentric portion 76 of an eccentric actuator which might be just like that illustrated in FIGURE 2. In this arrangement the area around the eccentric actuator is somewhat easier to clean and it may be desirable from a sanitation standpoint.

The independent liquid discharge assembly shown in FIGURE 3 and identified by the numeral 80 is very similar in nature to FIGURE 1 but differs therefrom in that the main body thereof is not integral with the housing wall and in that the valve member carrying shaft is vertically rather than horizontally oriented. In all other respects the valving arrangement is substantially identical to that shown in FIGURE 1.

It will be understood that these embodiments of the instant invention were made for illustrative purposes only and that various modifications and variations may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. A liquid dispenser comprising:
a housing having a hollow interior and having a partition extending across the interior and dividing it into storage and metering chambers,
a port formed within said partition and communicating said chambers with one another,
an outlet port opening through a wall of said housing to said metering chamber, wherein said ports are coaxial with one another and extend through parallel planes,
a single valve member positioned within said metering chamber and movable between said ports to control liquid flow through the said ports,
an actuator rod journaled within said housing along an axis perpendicular to the axis of movement of said valve member and having an eccentric portion,
means mounting said valve member on said eccentric portion of said actuator rod,
whereby rotation of said rod will act through said eccentric to move said valve member to close one and open the other of said ports,
means for rotating said actuatory rod, and
independent liquid discharge means opening from the said metering chamber.

2. A liquid dispenser comprising:
a housing having hollow interior and having a partition extending across the interior and dividing it into storage and metering chambers,
a port formed within said partition and communicating said chambers with one another,
an outlet port opening through a wall of said housing to said metering chamber, wherein said ports are coaxial with one another and extend through parallel planes,
a single valve member positionable within said metering chamber and movable between said ports to control the liquid flow through the said ports, spring means biasing said valve member into port closing position with said outlet port,
an actuator rod journaled within said housing along an axis perpendicular to the axis of movement of said valve member,
an eccentric portion formed on said actuator rod,
means mounting said valve member on said eccentric portion of said actuator rod, wherein rotation of said actuator rod will act through said eccentric portion to unseat said valve member from said outlet port and move same against the opposing bias of said spring means to a port closing position with respect to said first mentioned port,
means for rotating said actuator rod, and independent liquid discharge means opening from said metering chamber.

3. A liquid dispenser constructed in accordance with claim 2 wherein said independent liquid discharge means comprises a port opening through a wall of said housing to said metering chamber and a manually actuable poppet valve cooperable with this said port to control the flow of liquid therethrough.

4. A liquid dispenser comprising:
a housing having a hollow interior and having a partition extending across the interior and dividing it into storage and metering chambers,
a port formed within said partition and communicating said chambers with one another,
an outlet port opening through a wall of said housing to said metering chamber, wherein said ports are coaxial with one another and extend through parallel planes,
a single resilient valve member positioned within said metering chamber and movable between said ports to control liquid flow through the said ports,
a valve actuator rod journaled within said housing along

an axis perpendicular to the axis of movement of said resilient valve member,
an eccentric portion formed on said actuator rod,
means mounting said resilient valve member on said eccentric portion of said actuator rod,
spring means biasing said resilient valve member into seated relation with respect to said outlet port,
means extending exteriorly of said casing for rotating said rod to unseat said valve member from said outlet port and move same in opposition to said spring bias into seated relation with respect to said first mentioned port,
a moveable cover means closing said storage chamber to permit filing thereof with water,
means venting said metering chamber to the area above the level of water within said storage chamber,
a discharge port spaced from said outlet port and opening to said metering chamber,
a poppet valve cooperable with said discharge port to control the flow of liquid therethrough, and
a depressible actuating button cooperable with said poppet valve,
whereby depression thereof will unseat said poppet valve from said discharge port to permit liquid to flow therethrough.

5. A liquid dispenser constructed in accordance with claim 4 wherein said actuator rod is positioned within said storage chamber and a carrier tab mounted on the eccentric portion of said rod extends through the first mentioned said port and comprises an extension of said valve member.

6. A liquid dispenser comprising:
a housing having a hollow interior and having a partition extending across the interior and dividing it into storage and metering chambers,
a port formed within said partition and communicating said chambers with one another,
an outlet port opening through a wall of said housing to said metering chamber,
wherein said ports are coaxial with one another and extend through parallel planes,
a single valve member positioned within said metering chamber and movable between said ports to control liquid flow through said ports,
said single valve member having oppositely disposed valve heads formed integrally therewith,
said oppositely disposed valve heads being separated by a distance less than the distance between said coaxial ports,
an actuator rod journaled within said housing along an axis perpendicular to the axis of movement of said valve member,
said actuator rod having an eccentric portion,
said single valve member being carried by said eccentric portion of said actuator rod,
said eccentric portion having a maximum deviation which is a specified function of the distance between said ports and the distance between said oppositely disposed valve heads,
means for rotating said actuator rod,

whereby rotation of said rod will act through said eccentric portion to move said valve member to close one and open the other of said ports.

7. A liquid dispenser comprising:
a housing having a hollow interior and having a partition extending across the interior and dividing it into storage and metering chambers,
a port formed within said partition and communicating said chambers with one another,
an outlet port opening through a wall of said housing to said metering chamber,
wherein said ports are coaxial with one another and extend through parallel planes,
a single valve member positioned within said metering chamber and movable between said ports to control liquid flow through said ports,
said single valve member having oppositely disposed valve heads formed integrally therewith,
said oppositely disposed valve heads being separated by a distance less than the distance between said coaxial ports,
an actuator rod journaled within said housing along an axis perpendicular to the axis of movement of said valve member,
said actuator rod having an eccentric portion,
said single valve member being carried by said eccentric portion of said actuator rod,
said actuator rod including said eccentric portion defining a single vertical plane when said valve head is seated at said port formed within said partition,
said eccentric portion having a maximum deviation which is a specified function of the distance between said ports and the distance between said oppositely disposed valve heads,
means for rotating said actuator rod,
whereby rotation of said rod will act through said eccentric portion to move said valve member to close one and open the other of said ports.

8. A liquid dispenser constructed in accordance with claim 4 wherein a stirrup is embedded within said valve member and has an outwardly extending flange in engagement with said spring and extends upwardly from said valve member,
said actuator rod extends through said storage chamber in spaced relation from said stirrup and a carrier rod mounted on said eccentric portion of said actuator rod engages said stirrup and thereby carries said valve member.

References Cited by the Examiner

UNITED STATES PATENTS

597,116	1/1898	Krause	222—509 X
1,000,150	8/1911	Byrd	222—510 X
1,064,150	6/1913	McDaniel et al.	222—442 X
1,074,369	9/1913	Lapaugh	222—453 X
1,342,173	6/1920	Joslin	222—442 X
2,842,294	7/1958	Crowder	222—510 X
2,895,652	7/1959	Rockriver	222—442

LOUIS J. DEMBO, *Primary Examiner.*