March 8, 1955 F. M. IANNELLI 2,703,666

MEASURING AND DISPENSING VALVE MECHANISM

Filed Sept. 13, 1952

2 Sheets-Sheet 1

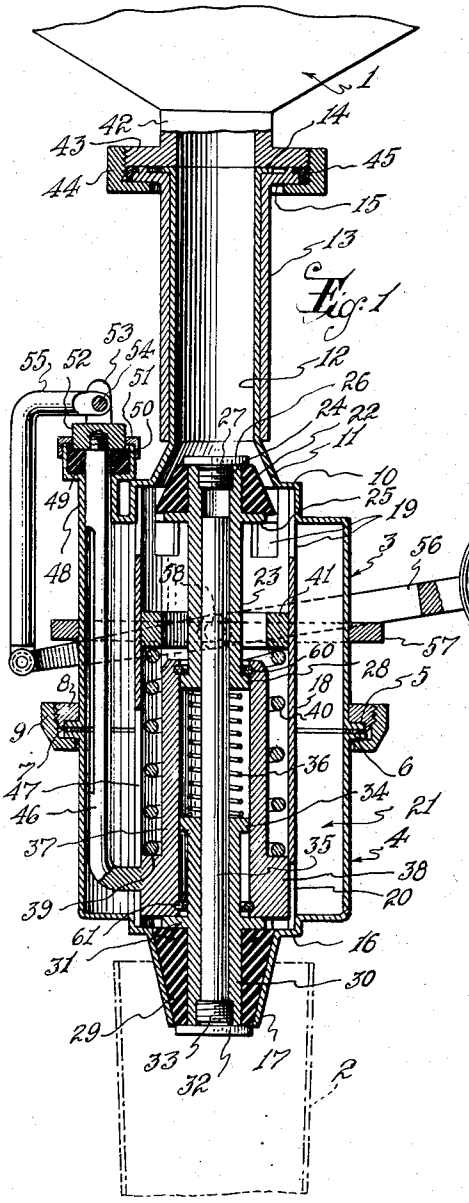

Fig. 1

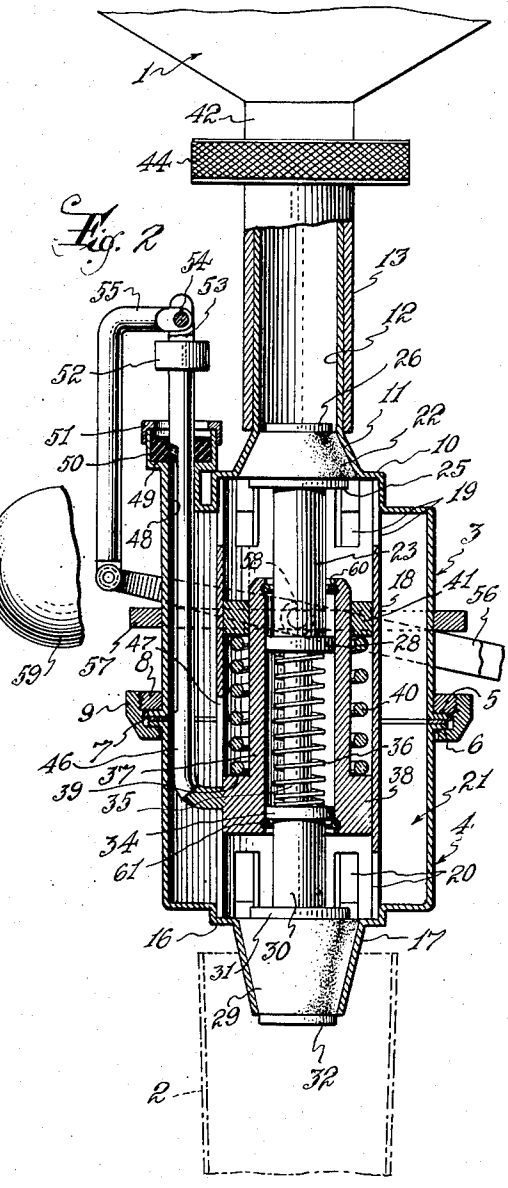

Fig. 2

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Fig. 3

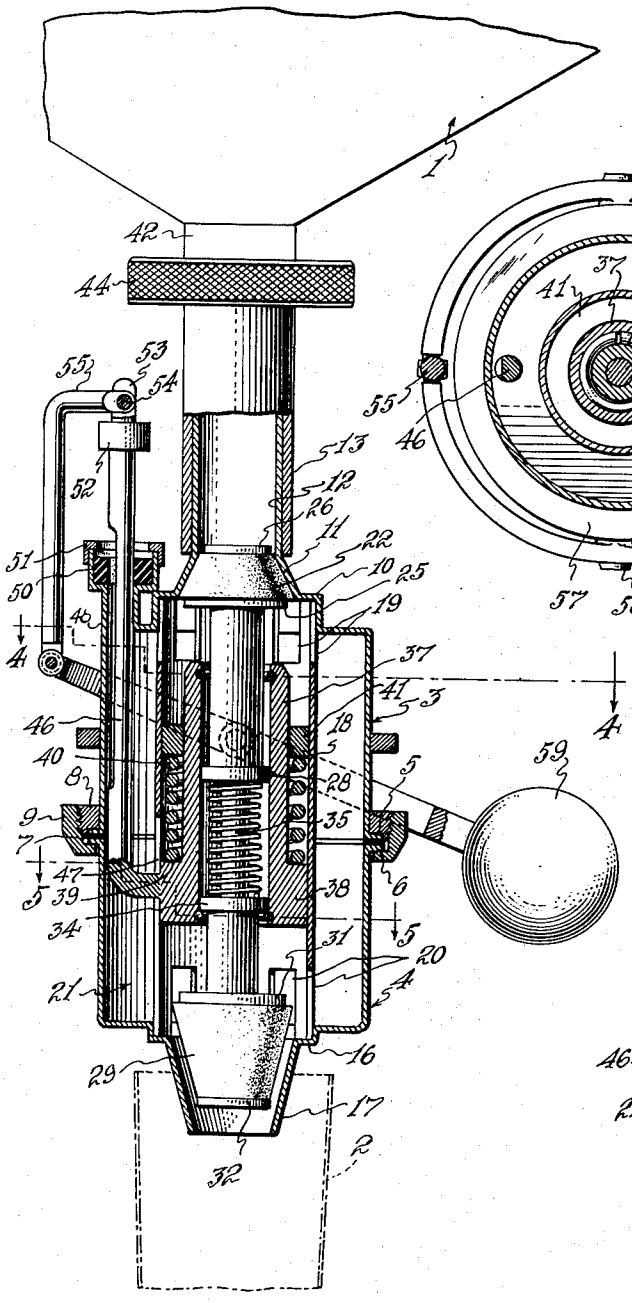


Fig. 4

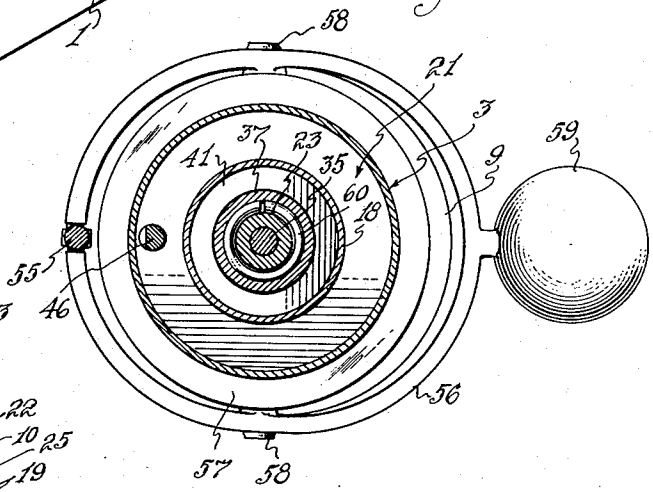
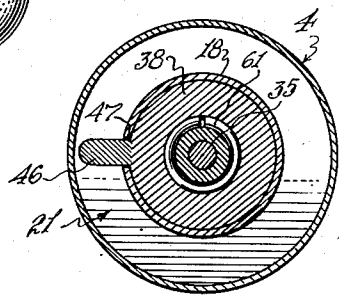


Fig. 5



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MEASURING AND DISPENSING VALVE MECHANISM

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4 Claims. (Cl. 222—447)

This invention relates to measuring and dispensing valve mechanism of the type including two valves one of which controls the flow of liquid from a supply tank into a measuring chamber while the other controls the supply of liquid from the measuring chamber through an outlet or discharge passage; and a prime object of the invention is to provide a valve of this character which shall embody a novel and improved, simple, durable, sanitary and relatively inexpensive construction which shall be reliable and efficient in operation.

Other objects of the invention are to provide such a valve mechanism which shall include a casing having an inlet at one end and an outlet at the opposite end, an inlet valve and an outlet valve relatively slidable on a common rod and normally yieldingly pressed in opposite directions, means for yieldingly pressing the outlet valve into closed position and the inlet valve into open position, and mechanism for controlling actuation of the last-named means to move said inlet valve and said outlet valve in succession into closed position and into open position respectively; and to obtain other advantages and results that will appear more fully hereinafter.

The invention will be better understood from the description thereof to follow taken in connection with the accompanying drawings in which—

Figure 1 is a vertical sectional view of valve mechanism for measuring and dispensing liquid embodying my invention showing the inlet valve head in open position and the outlet valve head in closed position.

Figure 2 is a similar view but showing both the inlet valve head and the outlet valve head in closed position.

Figure 3 is a similar view but showing the outlet valve head in open position and the inlet valve head in closed position.

Figure 4 is a cross sectional view taken on the plane of the line 4—4 of Figure 3.

Figure 5 is a cross sectional view taken on the plane of the line 5—5 of Figure 3.

Referring to the drawings, it will be seen that the improved valve mechanism is illustrated as connected to a tank 1 for a supply of liquid to be dispensed in measured quantities into a receptacle, such as a container 2 shown in dotted lines.

The valve mechanism comprises a main sectional valve casing having an upper section 3 and a lower section 4, the adjacent ends of which sections have aligned and overlapping flanges 5 and 6, respectively. A gasket 7 of rubber or other suitable material is interposed between the flanges for forming an effective air tight seal at this point. The sections are secured together and compressed in sealed relationship by a coupling consisting of an inner externally screw-threaded washer 8 seated on the flange 5 of upper section 3 and an outer internally screw-threaded flanged clamping ring 9 in threaded engagement with the washer.

The top end of upper section 3 has a reduced portion forming a horizontally disposed shoulder 10 and extending upwardly therefrom is an integral tapered portion forming a combined inlet nozzle and valve seat 11. Extending upwardly from the member 11 and formed integrally therewith is an elongated tubular inlet neck member 12 and positioned over said elongated neck member is a sleeve 13. The upper end of neck member 12 has a flange 14 seated on a flange 15 formed on the upper end of sleeve 13.

The bottom end of lower section 4 is also formed with a reduced portion providing a horizontally disposed shoulder 16 and extending downwardly from said shouldered portion is an integral outlet nozzle and valve seat 17 which is longer than the inlet nozzle and valve seat 11.

An upright tubular valve casing 18 is mounted inside the main casing and axially thereof, with its top end seated against the shouldered portion 10 of upper section 3 and its bottom end seated on the shoulder 16 of the lower section 4 and is held fast when the sections 3 and 4 are clamped together by the ring 9. The top end of the tubular casing 18 is formed with spaced slots or openings 19 and its bottom end with similar slots or openings 20 whereby the interior of the casing 18 communicates with the interior of the outer main casing. The interior of the main casing and the interior of the tubular casing 18 together form a measuring compartment 21 of predetermined capacity for trapping a definite quantity of liquid for delivery through the discharge nozzle 17.

A separate valve device controls the flow of liquid from tank 1 through the inlet nozzle 11 and a separate valve device controls the flow of such liquid out of the measuring compartment 21 through the outlet nozzle 17. The inlet valve device comprises a conical valve head 22 formed of rubber or other suitable material and having a central opening, and a tubular shank 23 having its upper end internally screw threaded as indicated at 24. The valve head 22 is seated on a flange 25 formed on the shank adjacent its upper end as viewed in Figure 1 and is disposed around the upper end of the shank. The inlet valve head is secured on the shank and flange by a cap 26 having a threaded shank 27 secured to the threaded upper end 24 of the shank 23 and overhanging the upper end of the valve head. The bottom end of the shank 23 terminates in a flange 28.

The outlet valve device also comprises a conical valve head 29 of material similar to valve head 22 with a central opening and a tubular shank 30 formed with internal threads on its lower end. The valve head 29 is longer than the inlet valve head 22 and is sleeved over the lower end of the shank and bears against an integral flange 31 on the shank formed midway its ends. The valve head 29 is secured to the shank and flange 31 by a cap 32 having a screw threaded shank portion 33 secured to the threaded end of the valve shank 30, said cap overlying the lower end of the outlet valve head. The upper end of the shank 30 is formed with a flange 34.

The shanks of both the inlet and outlet valve devices are sleeved over an elongated guide rod 35 and are slidable therealong. The inner flanged ends of said shanks are normally spaced apart along said guide rod by a light compression spring 36 which encircles the guide rod and has its ends bearing against the spaced flanges 28 and 34 of the shanks. These shanks are guided in their sliding movement on the rod 35 by an elongated sleeve member 37 which is slidable vertically in the tubular casing 18 and which encloses the spring 36 and the adjacent flanged ends of said shanks.

Sleeve member 37 is formed with an enlarged bottom end 38 having an upper shoulder 39. The bottom end 38 engages the inner surface of the casing 18 and guides the sleeve member in its vertical movement. A heavy compression spring 40 encircles the sleeve member 37 and has its bottom end seated on the shoulder 39 and its upper end bears against a washer member 41 secured to the inner surface of the casing 18 at a point above its longitudinal center. Spring 40 normally urges the sleeve member 37 downwardly with its bottom end seated on the flange 31 of the shank 30 of the outlet valve device so as to force the outlet valve head 29 against its seat thereby closing off the outlet or discharge nozzle 17 as shown in Figure 1.

The supply tank 1 has a neck portion 42 with an externally threaded flange 43 seated on the flange 14 of the inlet valve neck 12 and on the flange 15 of the sleeve 13. These parts are coupled together by an internally screw threaded clamping ring 44 and sealed by a gasket 45 interposed between said flanges and the clamping ring. When the parts are thus clamped, the interior of the supply tank is in communication with the interior of the valve neck 12 and the liquid in the tank is adapted to flow by gravity into the neck 12.

The valve operating mechanism comprises an elon-

gated rod 46 extending along the interior of the main valve casing with its lower end bent through an elongated slot 47 in the inner tubular casing 18 and secured to the bottom enlarged portion 38 of the valve sleeve member 37. The upper end of the rod extends through and above a tubular extension 48 formed on the upper end of the upper section 3 of the main casing. The extension is cupped at its upper end to form a seat 49 for a sealing gasket 50. The upper edge of the seat extends above the gasket and seated on said upper edge is a cap 51 which assists in sealing the space between the rod 46 and extension 48. The upper end of rod 46 is screw threaded to a cap member 52 having two upstanding spaced lugs 53, 53 for supporting a pivot pin 54 therebetween. A link 55 extending along the outside of the main casing has its upper end bent over the extension 48 and connected to the pin 54. The lower end of the lever 55 is pivotally connected to a ring member 56 which encircles the outside of the main casing and which is tiltably connected to a ring member 57 fixed to the upper section 3 of the main casing by opposed pivot pins 58, 58. A ball-shaped handle 59 is connected to the tiltable ring member 56 directly opposite the link 55 for tilting said ring member manually.

In operation, the bottom of the spring loaded valve sleeve member 37 normally engages the flange 31 of the shank 30 of the outlet valve device and forces the valve head 29 into closed position as shown in Figure 1. At the same time, a ring 60 secured to the upper end of the sleeve member 37 and projecting into the fore thereof engages the flange 28 of the valve shank 23 of the inlet valve device and holds the shank down with the valve head 22 off of its seat 11 against the action of spring 36. When the valve parts are in such positions, a quantity of liquid is adapted to flow by gravity from the supply tank 1 through the valve neck 12 into the tubular casing 18 and out through the slots 19 and 20 into the main casing thereby filling the measuring compartment 21 comprising the interiors of said tubular and main casings.

In order to dispense the liquid contained in the measuring compartment, the handle member 59 is moved downwardly as viewed in Figure 1 thereby tilting the forward part of ring 56, or the part adjacent the handle, downwardly, and its rear part upwardly carrying the lever 55 therealong which in turn lifts the rod 46 with its attached sleeve member 37 upwardly against the action of the compression spring 40. Simultaneously with the lifting of the sleeve member 37, the ring member 60 is moved along with it and pressure on the flange 28 of the shank 23 of the inlet valve device is thus released whereupon the compression spring 36 immediately acts upon the shank 23 and moves it upwardly forcing the inlet valve head 22 on to its seat as shown in Figure 2 thereby sealing the inlet nozzle 11 and preventing further flow of liquid into the measuring compartment. After the sealing of the inlet nozzle 11, the sleeve member 37 will have traveled upwardly a sufficient distance to permit a ring 61, secured to its lower end and projecting into the bore thereof, to engage the flange 34 of the outlet valve device and further upward movement of the sleeve member 37 moves the outlet shank 30 and outlet valve head 29 upwardly thereby moving said valve head off of its seat and opening the discharge nozzle 17 as shown in Figure 3 to permit the discharge of the liquid in the measuring compartment downwardly through the outlet nozzle 17 and into the container 2 therebelow. The advance sealing of the inlet nozzle 11 is permitted because the distance the inlet valve head 22 has to travel to its seat is shorter than the distance the ring 61 has to travel to engage the flange 34 of the outlet valve shank.

Subsequent movement of the handle member 59 upwardly will permit the spring 40 to restore the parts to the normal position of Figure 1.

The ring member 57 may be positioned adjacent the clamping ring 9 if desired.

In view of the foregoing it will be seen that the present invention provides a combined measuring and dispensing valve well suited for the rapid and accurate dispensing of measured quantities of fluid, and one of its principal uses resides in dispensing carbonated and similar beverages in which a flavoring syrup is used.

Changes in details of construction might be made without departing from the principle or spirit of the invention.

What I claim is:

1. Liquid measuring and dispensing valve mechanism comprising a hollow casing having a measuring compartment therein, said casing having an inlet neck at one end communicating with said compartment and having an outlet nozzle at the opposite end communicating with the compartment, a guide rod extending between said neck and said nozzle centrally of the casing, an inlet valve including a valve head and a tubular shank slidable on the inlet end of said guide rod, a separate outlet valve including a valve head and a tubular shank slidable on the outlet end of said guide rod, a compression spring encircling said guide rod for separating said shanks and for urging the inlet valve head to closed position in the inlet neck, a sleeve member slidable over said guide rod, a compression spring urging said sleeve member against the shank of the outlet valve for normally closing the outlet nozzle, said sleeve member normally engaging the shank of the inlet valve for holding the inlet valve head in open position, and manually operated means for moving the sleeve member out of engagement with the shank of the inlet valve whereby the first named compression spring presses the inlet valve head into the inlet neck for closing the latter and whereby said sliding sleeve member subsequently moves the outlet valve head to open position.

2. Liquid measuring and dispensing valve mechanism as set forth in claim 1 in which the manually operated means includes a rod connected to the slidable sleeve member, a tiltable ring secured to the outside of the casing and a handle for tilting said ring.

3. Liquid measuring and dispensing valve mechanism as set forth in claim 1 in which the manually operated means includes a rod disposed inside the casing and connected at one end to the slidable sleeve member, the other end of said rod extending outside of the casing, a link pivotally connected to the outer end of the rod, a ring member encircling said casing and pivotally connected thereto and to said link and a handle for moving said ring member.

4. Liquid measuring and dispensing valve mechanism comprising an outer hollow casing, an inner tubular casing extending from end to end of the outer casing, said inner tubular casing having slotted portions communicating with the interior of the outer casing, the interiors of said outer and inner casing forming a measuring compartment for liquid, said outer casing having an inlet neck communicating with one end of said inner casing and having an outlet nozzle communicating with the other end of said inner casing, an inlet valve in one end of said inner casing for closing said inlet neck, an outlet valve slidable in the other end of said tubular casing for closing the outlet nozzle, spring means for normally urging said inlet and outlet valves apart and for pressing said inlet valve to closed position, a sleeve member reciprocably slidable in and guided by said inner casing relatively to both said inlet valve and said outlet valve, spring means normally urging said sleeve member in one direction, said sleeve member when moved in said direction normally engaging said outlet valve to close the outlet nozzle and normally engaging said inlet valve to hold the latter in open position, said sleeve member when moved in the opposite direction disengaging said inlet valve to permit said inlet valve to close said inlet neck, and said sleeve member thereafter engaging said outlet valve to open the outlet nozzle.

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