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LIQUID DISPENSING DEVICE

Filed May 26, 1930

2 Sheets-Sheet 1



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Fig. A.

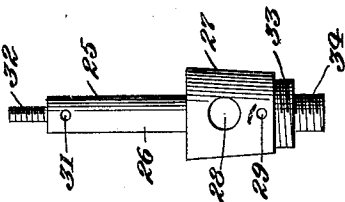


Fig. 3.

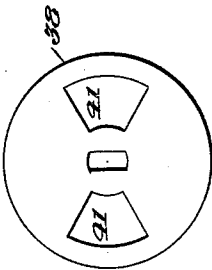


Fig. 5.

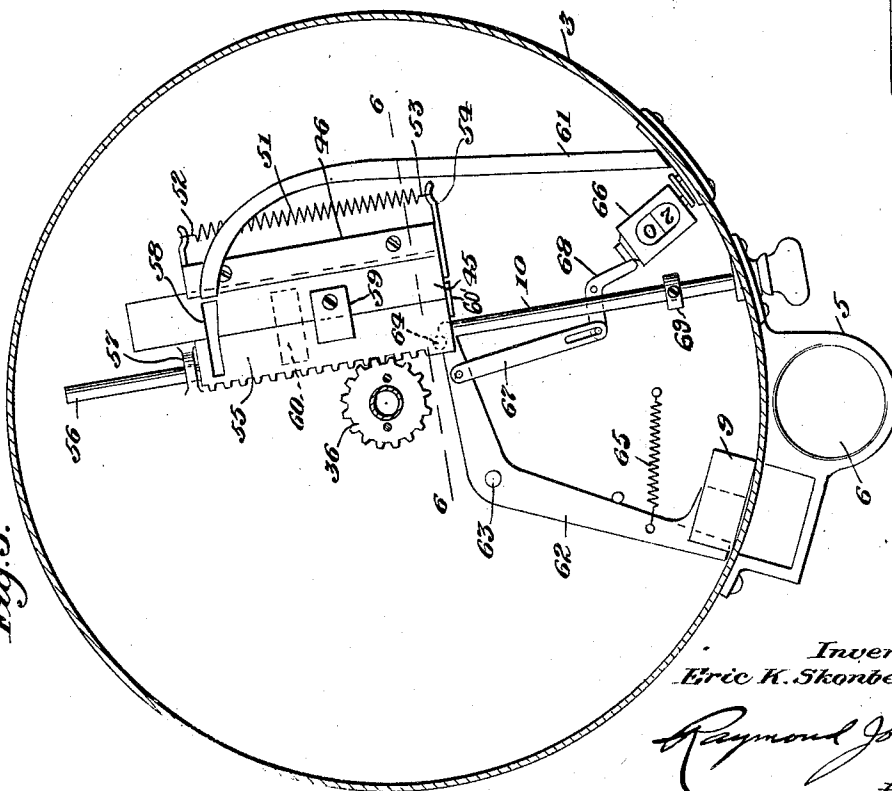
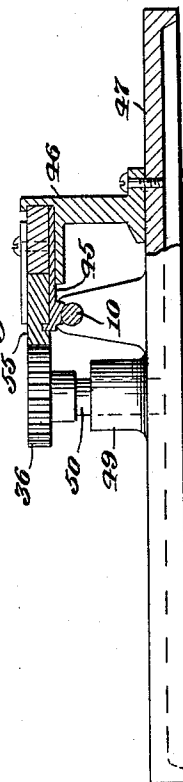


Fig. 6.



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UNITED STATES PATENT OFFICE

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LIQUID-DISPENSING DEVICE

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My invention relates to an apparatus for dispensing liquids and, more particularly, to a coin-controlled dispensing device, although certain features of the invention are applicable to vending machines for other purposes.

In apparatus of the class described, the prior art devices are of a complicated nature comprising an undue multiplicity of parts and from a manufacturing standpoint, are not only expensive to construct, but also expensive to maintain.

It is an object of my invention, therefore, to provide a liquid dispenser which comprises a minimum number of parts and which is economical to manufacture and install, as well as to maintain at a relatively low cost.

Another object is to provide in a liquid dispenser a novel combination of valves and air vents whereby measured quantities of a liquid may be delivered in a short time from a main reservoir.

A further object of my invention is to provide a simple and novel coin control for a dispenser.

Other objects will appear from the detailed description which follows.

In the drawings:

Figure 1 shows a front elevation of a liquid dispensing device to which my invention is applied;

Fig. 2 is a fragmentary cross sectional view on an enlarged scale showing the measuring device and related parts;

Figures 3 and 4 show, respectively, an inlet valve and an outlet valve forming a part of my invention;

Figure 5 is a top plan view of the coin-controlled mechanism; and

Figure 6 is a cross sectional view on section 6—6 of Figure 5.

Referring to the drawing in detail, my improved dispensing device comprises a casing 1, which includes an upper portion 2, a lower portion 3, and a base 4. A shelf 5 is arranged to support a cup 6 in position below a fluid delivery spout 7. The shelf is extended to a point adjacent the delivery orifice 8 of a chute 9 whereby to receive a lump of sugar delivered from the chute at each operation of the device. An operating rod 10 and a coin slot

11 are arranged in convenient positions adjacent the spout 7.

A transverse partition 12 serves to support a fluid reservoir 13 within the casing portion 2 in position above a coin-controlled dispensing mechanism located within the lower casing portion 3. I prefer to employ a reservoir of the thermos type formed by the usual inner and outer shells 14, 15. The reservoir is supported in an inverted position with its neck or cap portion 16 extending through an opening 17 provided in the partition.

A ring 18 having a flange 19 and a threaded extension 20 is adapted to screw upon the threaded portion of the neck 16. A plate or base 21 is supported in position upon the flange 19, which plate in turn supports a liquid measuring container 22. A gasket 23 is arranged in position between the end of the neck 16 and a flange 24 formed on the container 22. This arrangement permits the container 22, gasket 23, and plate 21 to be forced against the end of the neck 16 by rotation of the ring 18 and extension 20 upon the neck.

A combined valve and valve operating tube 25 is rotatably mounted centrally within the container 22. This tube is shown in detail in Figure 4 and comprises essentially a tubular portion 26 and a valve portion 27. The portion 27 has the shape of an inverted truncated cone and is provided with a fluid outlet port 28 and an air inlet port 29, and, as shown in Figure 2, seats within a similarly shaped extension 30 formed on the plate 21. An air outlet port 31 is provided at the extreme upper end of the tube 25 and the tube is provided at its opposite ends with threaded extensions 32, 33 and 34, the purpose of which will be described later.

Referring to Figure 2, the upper end of the tube 25 is rotatably mounted in an opening formed centrally in the top of the container. A nut 35 engages the threaded portion 33 and serves to maintain the valve portion 27 within the extension 30. A valve operating pinion 36 is threaded upon the extension 34 and locked thereto by the pins 37. A valve 38 is rotatably mounted on the con-

tainer 22 and is locked in position on the tube 25 by means of a washer 39 and a nut 40 which engage the extension 32. The valve 38 is provided with fluid inlet ports 41 which register in an open position of the valve with ports 42 formed in the container 22. An outlet port 43 for fluid and an air inlet port 44 are formed in the extension to the plate 21. It will be noted from Figure 2 that the parts are in position to permit the delivery of the fluid. The valve 38 has closed the inlet ports 42, while the outlet ports 28 and 43 are in registry, as are the air inlet ports 29 and 44. In this position of these parts, the contents of the container 22 will flow through the spout 7.

A rotation of the pinion 36 through 90° will rotate the tube 25, thereby opening ports 42 and closing ports 43 and 44, and the container 22 will be immediately filled with liquid from the reservoir 13. It will be noted when port 43 is open that air inlet port 44 is open to permit air to flow through ports 44, 29 and 31 in succession to vent air into the container 22, whereas when ports 43 and 44 are closed, the air in the container 22 will be vented through the ports 42 into the reservoir 13, thereby permitting liquid to flow from the reservoir to the container 22. This arrangement of valves and ports provides a very simple, compact and efficient arrangement whereby to insure a quick passage of liquid to and from the measuring container and a simultaneous venting of air from and to the container and reservoir.

The operating mechanism and coin control for the dispenser will now be described. As shown in detail in Figure 5, the operating rod 10 is connected to a slide bar 45, which in turn is mounted to slide in a support or guide 46. The guide 46 is carried by a support 47 suitably mounted on the bottom plate 4 by means of posts 48. The support 47 is provided with a bearing 49 which receives a thrust bearing 50 that engages the lower end of the tube 25. A spring 51 is fixed at one end 52 to the guide 46 and at its other end 53 to a lug 54 formed on the bar 45. A rack bar 55 is mounted on the slide bar 45 and engages the pinion 36. An extension 56 on one end of the rack bar 55 slidably engages a bearing 57. A coin slot 58 is formed partly in rack 55 and partly in bar 45, whereby the presence of a coin in this slot will lock the rack and bar together to cause them to slide as a unit. A lug 60' extends laterally from bar 45.

A plate 59 affixed to the bar 45 serves to maintain the rack 55 in position on the bar 45. A slot 60 is formed in the bar 45 at a suitable location for the purpose of permitting the coin to drop from and below the slot 58 to unlock the rack from the bar at the proper point of their joint travel.

A coin chute 61 extends from the coin slot

11 to a position adjacent the slot 58. A bell crank pusher lever 62 is pivoted at 63 to a fixed support. The free end of the pusher is adapted to engage the lowermost lump of sugar in the chute 9. A pin 64 projecting from rack 55 is adapted to engage lever 62 to rotate the latter clockwise while a spring 65 functions to restore the lever 62. A register 66 is operably associated by means of link 67 and lever 68 with the lever 62 to totalize the operations of the device.

In the operation of my apparatus, a coin inserted in the slot 11 will roll by gravity along the chute 61 and lodge itself in the slot 58. A forward pull on the rod 10 will cause the slide 45 and rack bar 55 to move as a unit since these two members are locked together by the coin. The pinion 36 being in mesh with the rack bar 55 will be rotated together with the valve tube 26 whereby to close the outlet port 43 and open the inlet ports 42, and the container 22 will be quickly filled with liquid from the reservoir 13.

The forward movement of the bar 55 will cause the pin 64 to strike the lever 62, thereby rotating the latter clockwise and causing a lump of sugar to discharge from the chute 9. Rotation of the lever 62 will operate the link 67 and crank 68 to move the register 66 one step. The forward movement of the rod 10 is limited by a stop 69 adjustably mounted on the rod. When the rod 10 has reached its extreme forward position, the coin in slot 58 will fall by gravity through the slot 60. The operator is required to return the rod 10 in order to receive a measured quantity of liquid.

When the rod 10 is pushed back, the lug 60' on the slide 45 will engage the rack 55 and return the latter to its original position, thereby rotating the pinion 36 and tube 26 in the counter-clockwise direction, whereupon the outlet port 43 is opened and the inlet ports 42 are closed. At the same time, the inlet air port 44 is opened to permit air to flow upwardly through the tube 26 and out through air port 31 into the container 22, whereby the contents of the container will be permitted to flow through the spout 7 into the cup 6.

I claim as my invention:—

1. In a liquid dispensing device, a main liquid reservoir, a measuring container located within said reservoir, one end of said container having a liquid inlet opening, a valve associated with said container end for controlling said opening, a hollow tubular member extending through said container and engaging said valve, said tubular member provided with an air outlet at one end opening into said container at a point adjacent said container end and a liquid outlet associated with the opposite end of said container.

2. In a liquid dispensing device, a main

liquid reservoir, a measuring container located within said reservoir, one end of said container having a liquid inlet opening, a valve associated with said container end for controlling said opening, a tubular member
5 extending through said container and engaging said valve, said tubular member provided with an air outlet at one end opening into said container at a point adjacent said
10 container end, and an air inlet associated with the opposite end of said tubular member and a liquid outlet associated with the opposite end of said container.

3. In a liquid dispensing device, a main
15 liquid reservoir, a closure plate for said reservoir, a measuring container supported on said plate, one end of said container being provided with a liquid inlet valve, a tubular member extending through said container
20 and operably associated with said valve, said plate being provided with a liquid outlet, a valve on said member for controlling said liquid outlet, said tubular member being provided with an air outlet at one end opening
25 directly into said container, said plate having an air inlet therethrough and communicating with the interior of said tubular member.

4. In a liquid dispensing device, a main
30 liquid reservoir, a closure member therefor, a measuring container supported on said member, a liquid inlet valve on one end of said container, a liquid outlet valve on said closure member, a tubular rod connecting
35 said valves interiorly of said container, a part associated with said outlet valve, for venting air through said closure member into said tubular rod, and means for venting air directly from said tubular rod into said container at a point adjacent the upper end
40 thereof.

5. In a liquid dispensing device, a main liquid reservoir, a measuring container within said reservoir, an inner wall of said container being provided with a liquid inlet
45 valve, a closure member for said container, a liquid outlet associated with said closure member, said closure member being provided with an air inlet, a single valve member for simultaneously opening said outlet
50 and said air inlet, a valve operating tube within said container and operably connected to said valves, and an air outlet port formed in said tube and opening into the upper end of said container.
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In testimony whereof I affix my signature.
ERIC K. SKONBERG.