Feb. 24, 1942. G. C. HARBISON 2,274,409

LIQUID DISPENSING APPARATUS

Filed Feb. 11, 1941

Fig.1.

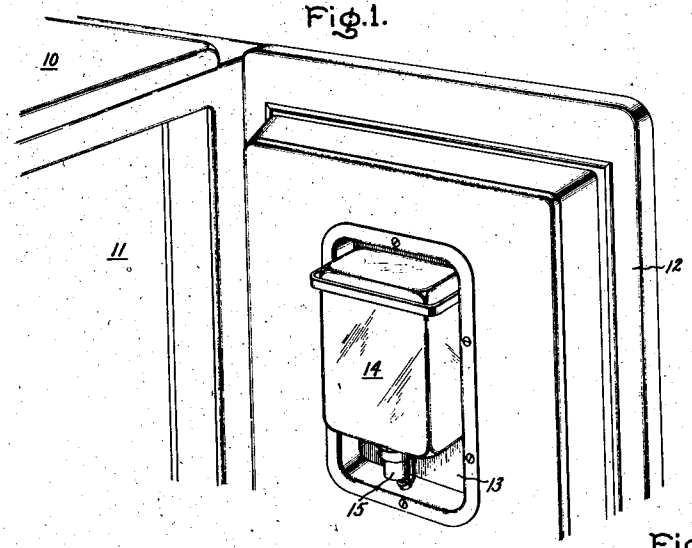


Fig.2.

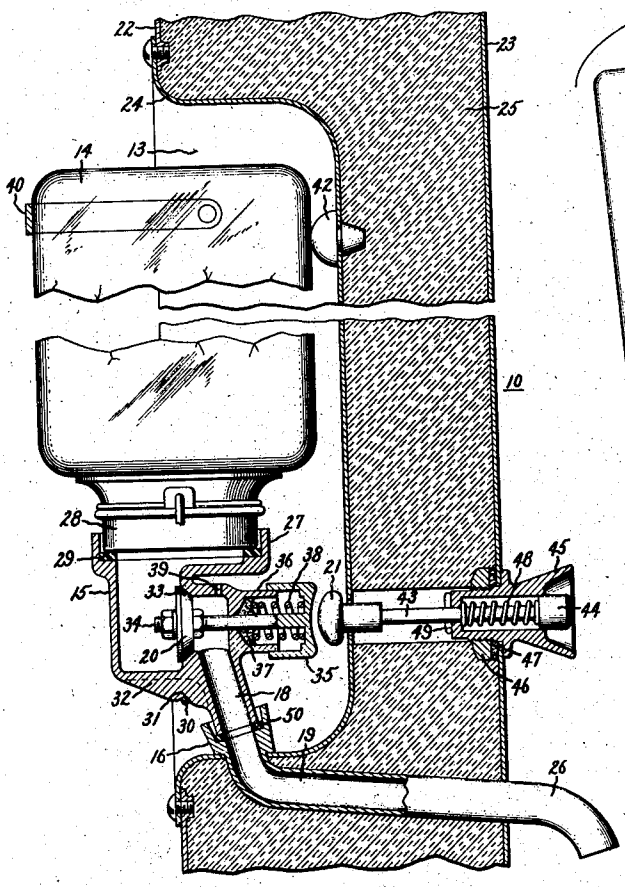
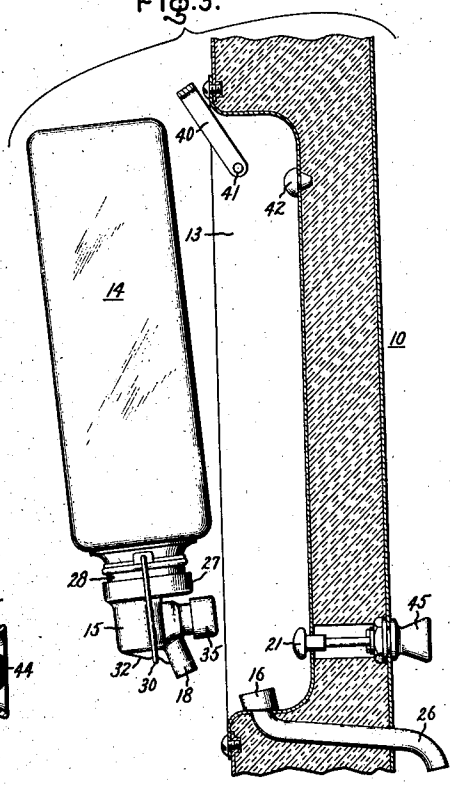


Fig.3.



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LIQUID DISPENSING APPARATUS

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Application February 11, 1941, Serial No. 378,396

2 Claims. (Cl. 62—141)

My invention relates to liquid dispensing apparatus which is particularly applicable to liquid coolers for use in refrigerators.

It is an object of my invention to provide a new and improved liquid cooling and dispensing apparatus so constructed that the danger of spilling liquid therefrom during the act of placing the liquid holding device in the dispensing position is minimized.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention, reference may be had to the drawing in which Fig. 1 is a partial view in perspective of a refrigerator provided with liquid dispensing means embodying the principles of my invention; Fig. 2 is a side view, partially in section, of the refrigerator door shown in Fig. 1 illustrating the details of my invention; and Fig. 3 is a view similar to Fig. 2 showing the liquid containing device removed from the dispensing position.

In the drawing I have shown a refrigerator cabinet 10 of the domestic type having a food storage compartment 11 therein, the food compartment being closed by a door 12. A recess 13 is arranged in the inner wall of the door to receive a water bottle or liquid container 14. The container is supported in the inverted position on a cup or receptacle 15 which in turn is supported on a cup-shaped fitting or recessed member 16 secured in the lower portion of the recess 13, the member 15 serving as a closure for the opening in the container. Cooled liquid, as water for example, from the bottle 14 and receptacle or cup 15 is disposed through an outlet passage or opening 18 in the receptacle 15 and a conduit 19 extending through the door from the fitting 16.

I have found that when a liquid container, such as disclosed in the drawing is up-ended into a receptacle without a closure member covering the liquid discharge opening thereof, frequently water is spilled out of the opening therein and often the inertia of the water or other liquid causes the liquid to rush into the cup, filling it too rapidly and running over. In order to overcome this difficulty, I have provided a valve 20 for normally closing the outlet 18 and a valve operating mechanism including a valve operating member 21 operable from the exterior of the cabinet, the operating means being separate from the receptacle. The receptacle 15 with the valve 20 is so constructed and arranged that the receptacle may be secured to the bottle with the latter in its upright position. Thereafter, when the bottle is up-ended, no liquid will be spilled.

Describing my invention in greater detail, I have shown a refrigerator door comprising inner and outer liners 22 and 23, respectively. A recessed pan 24 is suitably secured, as by means of threaded members extending into suitably threaded bosses, in an opening in the inner liner 22 thereby providing a recess for the bottle or container 14. With this arrangement, the liquid container occupies a minimum of food storage volume. The space between the inner and outer liners is filled with a suitable thermal insulating material 25.

The upwardly opening cup-shaped member or fitting 16 is suitably secured to the pan 24 in the lower portion thereof, as in the bottom wall, in any suitable manner. The conduit 19 extends from the fitting through the door and terminates in a faucet 26 exteriorly of the door. These parts may be integral, as shown, or separable, if desired.

The receptacle 15 is generally-cup shaped and is provided at one end thereof with a laterally and then upwardly extending flange 27 for encirclement of the neck 28 of the container 14. The neck of the container rests on the laterally extending portion of the flange or shoulder 27 and I have provided a gasket 29 for sealing the space between the bottle and the shoulder. The outlet 18 is bored or otherwise formed in a boss extending downwardly from the bottom portion of the cup and communicates with the interior of the receptacle 15. In order to maintain the receptacle in sealing engagement with the container 14, I have provided a bail 30 on the container 14 arranged to engage a groove 31 suitably formed in the edge of the web 32 disposed on the bottom wall of the cup. The above described arrangement for maintaining the container and receptacle in assembled relationship is illustrative only and any other suitable means may be employed.

The valve 20 has been provided for selectively opening or closing the outlet 18 to the flow of liquid in the receptacle 15. A side wall of the receptacle is constructed to provide a valve seat 33 for the valve 20, the latter being suitably secured to a valve stem 34 in any suitable manner. The valve stem extends outwardly through a suitable opening in the wall of the receptacle and terminates in a generally cup-shaped member 35 constructed and arranged for sliding engagement with a lat-

erally extending portion 36 of the side wall of the receptacle 15. Suitable packing material 37 has been provided for preventing leakage of liquid along the stem 34. In order to bias the valve 20 to its closed position I have provided a spring 38 disposed between the inner surface of the member 35 and the packing material 37.

In order to provide a steady flow of liquid through the faucet 26 when the valve is in its open position, I provide an air vent 39 as shown in Fig. 2.

In order to maintain the container 14 in the inverted or liquid dispensing position, I have provided a retainer in the form of a bail 40 which may be pivotally secured to the pan 24 by any suitable means as indicated by the numeral 41. When it is desired to remove the container, the bail is rotated upwardly until the container may be moved outwardly out of engagement with the bail. A stop 42 is suitably secured to the pan 24 for assisting in maintaining the container in the vertical position and to prevent rattling thereof.

I have provided a suitable gasket 50 for preventing leakage between the end of outlet 18 and fitting 16. If desired, positive means for holding the outlet within this fitting may be employed.

In order to cause the valve 20 to be moved to a position which will permit the withdrawal of liquid through the faucet 26, I have provided a valve operator 21 arranged to engage the member 35. The operator 21 may be suitably secured to a stem or push rod 43 extending through the door and terminating in an operating knob or push button 44. In order to guide the push rod 43 and knob 44, I have provided a fitting 45 suitably secured to the outer liner 23 by means of a nut 46. In order to prevent the passage of air and moisture through the door, I have provided a suitable sealing washer 47. In order to bias the push button 44 and therefore the operator 21 to a position which will permit the valve 20 to close, I have provided a spring 48 in a recess in the fitting 45, the spring encircling the push rod and engaging the push button at one end thereof and the inner end of the fitting 45 at the other end thereof. In order to limit the outward movement of the operator or push rod, I have provided a pin 49 extending through the push rod 43 for engagement with the fitting 45.

With the above described arrangement, it will be seen that normally the valve 20 will be in its closed position and no flow of liquid will be had but, if the push button 44 is pressed inwardly, the movement of the operator 21 against the member 35 will cause the valve to open. As soon as the force against the button 44 is released, the operator will be withdrawn and the valve 20 will return to its normally closed position, cutting off the flow of liquid. With this arrangement, the container may be readily inserted or removed from the dispensing position without loss of liquid.

While I have shown a particular embodiment of my invention, I do not desire my invention to be limited to the particular construction shown and described and I intend in the appended claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a refrigerator cabinet having inner and outer walls defining a food storage compartment, a member having an upwardly opening recess, said recessed member being supported in said compartment on said inner wall, an inverted liquid container supported in said recessed member, said container having an opening for the passage of liquid therefrom, a cup-shaped closure member carried by said container for closing said container opening, the bottom wall of said closure member having a portion extending into and supported by said recessed member, said portion having an opening for the passage of liquid from said closure member to said recessed member, valve means for normally closing said opening in said closure member, valve operating means extending through a side wall of said closure member for operating said valve, additional means extending through a wall of the cabinet and having a portion for engaging said valve operating means to cause said valve operating means to open said valve when said additional means is actuated from outside the cabinet, said valve operating means and said additional means being separate but so constructed and arranged that in the assembled position of the container said valve is opened only when said additional means is actuated, and means for conducting liquid from said recessed member to the exterior of said cabinet.

2. In a refrigerator cabinet having walls defining a food storage compartment, one of said walls having a recess on the inner side thereof, a recessed member supported in the lower portion of said recess, an inverted liquid container in said recess, said container having an opening for the passage of liquid therefrom, an intermediate member disposed between said opening in said container and said recessed member, said intermediate member having a passage for conducting liquid from said container to said recessed member, flow controlling means associated with said intermediate member for normally preventing the flow of liquid through said passage, means extending exteriorly of said intermediate member for operating said flow controlling means to permit the flow of fluid through said passage, additional means extending through a wall of said refrigerator and having a portion for engagement with said flow controlling means when actuated from outside the cabinet, said extending means and said additional means being separate but constructed and arranged so that in the assembled position of said container, the flow controlling means is moved to the liquid flow permitting position only when said additional means is actuated, and means for conducting liquid from said recessed member to the exterior of said cabinet.

GEORGE C. HARBISON.