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MEASURING DEVICE FOR LIQUID CONTAINERS

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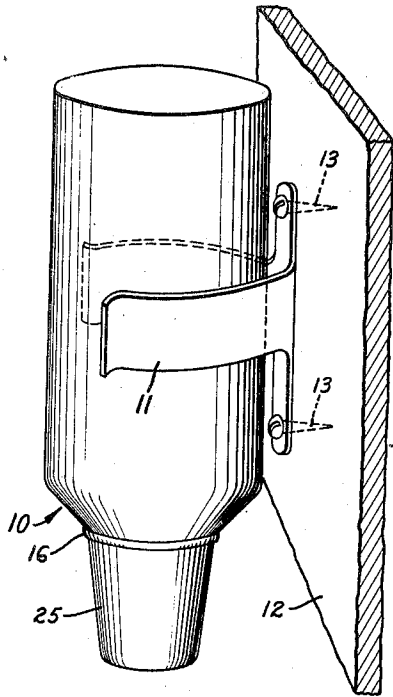


Fig. 1

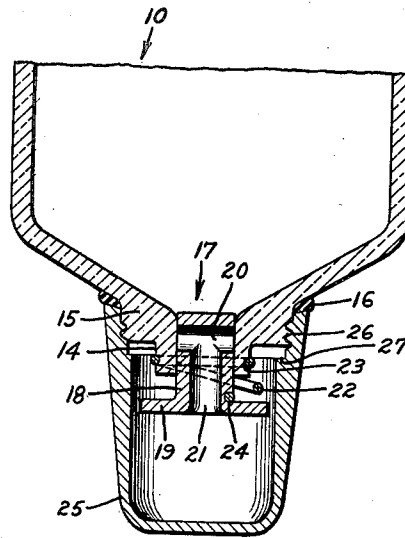


Fig. 2

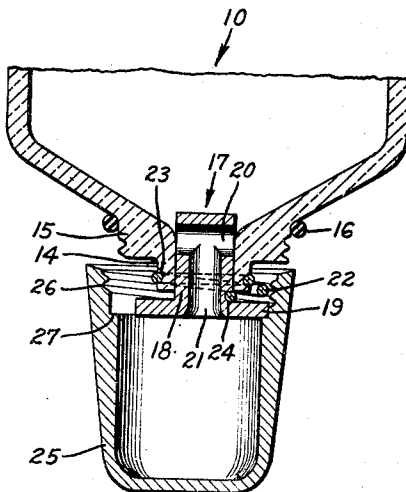


Fig. 3

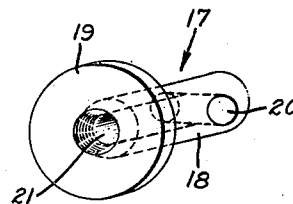


Fig. 4

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MEASURING DEVICE FOR LIQUID CONTAINERS

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11 Claims. (Cl. 222-115)

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This invention relates to new and useful improvements in measuring or dispensing devices for liquid containers and has particular relation to a device for dispensing a measured amount of the contents of a container.

An object of the invention is to provide a convenient and inexpensive device for use in dispensing measured doses or quantities from an inverted bottle or container.

Another object is to provide a liquid dispenser comprising an inverted container, a combined valve and stop in the neck of the container, a cap adapted to be used to cover said valve and to be used as a measuring cup and including a portion adapted to engage and unseat the valve and which portion is below the open end of the cap whereby on the filling of the cap to the location of said portion the liquid within the cap will seal off the discharge end of the valve, preventing the entrance of air to the receptacle and thereby stopping the flow from the latter.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawing:

Fig. 1 is a perspective view showing the dispenser of the invention fully closed and mounted as on a wall or the like;

Fig. 2 is a vertical sectional view through the lower end portion of the dispenser as viewed in Fig. 1;

Fig. 3 is a view similar to Fig. 2 but illustrating the manner of use; and

Fig. 4 is a perspective view of the valve employed.

Referring in detail to the drawing, the liquid dispenser of the invention is shown as comprising a bottle or other container, generally designated 10. In Fig. 1, bottle or container 10 is shown as held in inverted position by means of a spring clip 11 which is in turn secured against a portion of the wall or the like 12 by means of screws 13. Container 10 includes a neck portion 14 immediately inwardly of which is a thickened portion 15 externally screw threaded as shown.

About the base of the thickened portion 15 is a compressible gasket or washer 16. Slidable in the neck portion 14 is a valve, generally desig-

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nated 17, and comprising a stem portion 18 and a radially extending disc-like head portion 19. A T-shaped passageway is provided through the valve 17 and such passageway includes a cross portion 20 and a longitudinal portion 21. Cross portion 20 opens through opposite sides of the stem 18 while the longitudinal passage 21 opens through the lower side of the head or flange 19.

As will later more fully appear, the stem portion 18 of the valve has a sliding fit in the neck 14 of the container. When the valve is in its lowermost position, as in Fig. 2, the ends of the passage portion 20 are closed by engagement with the interior of the container neck 14 so that the contents of the container may not enter into the valve. This is the normal position of the valve and it is urged to such position and resiliently retained in such position by a small coil spring 22. This spring is anchored in place by the partial reception of one of its coils in a groove 23 in the container neck 14 and the partial reception of a second coil in a hole or groove 24 in the stem portion of the valve 17.

Fitting over the valve and the neck portion 14 and completely enclosing these parts is a cap or cup 25. Such cap or cup is internally screw threaded at its upper or open end, as at 26, and inwardly of said threads and of its upper or open end is provided with an annular shoulder 27. When the cup 25 is in container closing position, as in Figs. 1 and 2, its threads 26 are engaged with those on the thickened portion 15 of the container and the cap is threaded home so that its free open end engages the compressible gasket 16 whereby a seal is established between the cap and the container.

When some of the contents of the container are desired, cap 25 is unscrewed from its position on the container. Then by moving the cap somewhat laterally, as suggested in Fig. 3, a portion of annular shoulder 27 of the cap is engaged with the underside of an edge portion of the annular head or flange 19. Now on the cap being shifted upwardly the valve 17 is moved inwardly with respect to the bottle neck exposing the ends of the cross passage 20 (of the T-shaped passage) to the interior of the container.

At this time the contents of the container may flow into said T-shaped passage entering through either or both ends of the cross passage and being discharged through the lower end of the longitudinal passage 21 into the cup 25. When the height of liquid in the cup 25 reaches the under or lower side of the head or flange 19 the further

entrance of air into the container 10 is prevented, a liquid seal being established.

Thus there will be no further movement of liquid from the container 10 into the cap or cup 25 and a measured amount of such contents will be in the cap 25. On removal of the cap from the position of Fig. 3 the spring 22 expands and shifts the valve downwardly, as the pressure of the cap on the valve is released, moving the valve back to the closed position of Fig. 2.

The container 10 may be of any desired material as may the valve 17 and the cap 25. Preferably the valve and cap are of a plastic material while the container would be of glass, but this is not essential and the invention is not limited to the use of such materials. With the described construction it will be clear that the cup 25 may be readily filled to a predetermined extent so that a predetermined amount of liquid will be dispensed into the cup. This will be accomplished without any visual observation, and, in fact, the measured amount of the contents of the bottle or container 10 may be obtained in the dark and without the benefit of visual observation.

The position of the shoulder 27 and its engagement with the radial head or flange portion 19 determines the extent to which the cup 25 will be filled as when the height of liquid in the cup seals off the lower end of the T-shaped passage in the valve further flow of liquid from the container does not occur. The spring 22, in addition to constantly urging the valve into the closed position of Fig. 2, actually limits movement of the valve and supports the same against falling out of the neck of the bottle.

From the above it will be seen that the dispensing device of the invention is of simple and inexpensive construction. The invention comprises essentially the combination of the detachable cap or cup 25 together with the valve 17, the use of these two parts as described involving the application of the principle that the liquid will rise in the cup only until the mouth of the valve is sealed against the further entrance of air into the container.

From the drawing it will be clear that the shoulder 27 is so located within the cup or cap that the liquid may rise in the latter to cover the actual end of the bottle neck and yet there will be no overflow. This would be of importance with a different construction of valve and so the invention comprehends the location of shoulder 27 in such relation to the open end of the cup or cap that, without overflowing, the latter may be filled to a point where its contents seal off the discharge end of the container neck. In effect such is the case in the embodiment shown as the tubular valve portion 18 is an extension of the container neck.

Having thus set forth the nature of my invention, what I claim is:

1. In a liquid dispenser, a container including a neck portion having an internal valve closing surface, a valve comprising a stem slidable in said neck portion and a radially extending portion at the outer end of said stem having a lateral outer end surface, said valve having a passage therethrough and movable therewith including a lateral passage portion toward its inner end closed with respect to said valve closing surface in an outwardly moved position of said valve and open with respect to said valve closing surface in an inwardly moved position and a longitudinal portion opening through said outer end surface, a spring supporting said valve against disengage-

ment from said container and normally urging the valve outwardly to have said neck portion of the container close the lateral opening of the valve, a cup, means whereby said cup may be mounted on and removed from the container and when on the container encloses the valve and container neck, and a shoulder in said cup inwardly of the open end thereof for engagement with the flange of said valve when the cup is removed from the container for unseating the valve against the action of said spring whereby a portion of the contents of the container may flow into said cup.

2. In a dispensing apparatus, a container having a neck, a valve mounted for vertical sliding movement in said neck between a closed extended position and an open inwardly disposed position and having a discharge passage movable therewith and opening through the lower end thereof, a spring normally maintaining said valve in closed position, a cup having an open upper end and an internal annular shoulder, said open upper end of the cup of greater diameter than the lower end of said valve whereby said cup may be positioned to have said shoulder engage the lower end of said valve for manipulation of the cup to shift the valve upwardly against the action of said spring to open position whereby a portion of the contents of the container may flow into the cup, and said shoulder located inwardly of the open upper end of the cup whereby on filling of the cup to said shoulder the liquid in the cup will seal the discharge opening through the lower end of the valve.

3. In a dispensing apparatus, a container having a neck, an elongated valve slidable in said neck, said valve having a T-shaped passage therethrough with the lateral portions of said passage toward the inner end of the valve and the stem of the passage opening through the lower end of the valve, a spring about said neck and valve and supporting said valve against disengagement from said container and normally maintaining said valve in closed position with said lateral portions of the passage within said neck and closed by the side wall thereof, and a cup disposed over said valve, neck and spring and removably attached to said container.

4. In a dispensing device, a container having a neck, a valve mounted in said neck for vertical movement inwardly and outwardly with respect thereto to open and closed position, respectively, and having a discharge passage movable therewith and opening through the lower end thereof, said container having external screw threads on its portion inwardly of said neck, a spring normally retaining said valve in closed position, a cup having an internally screw threaded open end to be threaded to the external threads on said body whereby said cup is in a position enclosing said neck and said valve with the latter in closed position, a shoulder in said cup adapted on manual manipulation of the latter when unscrewed from said container to be engaged with the lower end of said valve to unseat the same against the action of said spring, and said shoulder of the cup located inwardly of the open upper end of the latter whereby as the level of liquid from the container to the cup reaches the discharge opening through the lower end of the valve a seal is provided preventing further movement of the liquid from the container to the cup and only a measured quantity of liquid is in the cup.

5. In a dispensing apparatus, a container hav-

ing a neck, a valve in said neck and shiftable to and from open position and having a discharge passage movable therewith, said passage including an entrance closed by the wall of the container neck when the valve is in closed position, a spring supporting said valve against disengagement from said container and normally maintaining the valve in closed position, said container having a portion radially of said neck, a cap threaded to said portion and enclosing the neck, valve and spring, and a compressible gasket between said container and the open end of said cup whereby as the cup is threaded home said gasket is compressed and a seal established and as said cup is unthreaded and moved from the container said spring continues to support said valve.

6. In a dispensing apparatus, a container having a neck, a valve in said neck and vertically adjustable to and from open position and having a discharge passage movable therewith and opening through its lower end, said passage including an entrance closed by the wall of the container neck when the valve is in closed position, a spring attached to said container and valve and supporting said valve against disengagement from said container and normally maintaining the valve in closed position, said container having a portion radially of said neck, a cap threaded to said portion and enclosing the neck, valve and spring, a compressible gasket between said container and the open end of said cup whereby as the cup is threaded home said gasket is compressed and a seal established, a shoulder in said cup to be engaged with the lower end of said valve and moved to unseat the same against the action of said spring, and said shoulder of the cup located inwardly of the open upper end of the latter whereby as the level of liquid from the container to the cup reaches the discharge opening through the lower end of the valve a seal is provided preventing further movement of the liquid from the container to the cup and only a measured quantity of liquid is in the cup.

7. In a dispensing device, a container having a neck, a valve mounted in said neck for vertical movement inwardly and outwardly with respect thereto to open and closed position, respectively, and having a discharge passage movable therewith and opening through the lower end thereof, means normally retaining said valve in closed position, a cup adapted to be threaded to said body in a position enclosing said valve and neck, a shoulder in said cup to be engaged with the lower end of said valve to unseat the same, and said shoulder of the cup located inwardly the open upper end of the latter whereby as the level of liquid from the container to the cup reaches the discharge opening of the valve a seal is provided preventing further movement of the liquid from the container to the cup and only a measured quantity of liquid is in the cup.

8. In a dispensing apparatus, a container having a neck, a valve in said neck and shiftable to and from open position and having a discharge passage movable therewith and opening through the lower end thereof, means normally maintaining the valve in closed position, said container having a portion radially of said neck, a cap threaded to said portion and enclosing the neck, valve and means, a compressible gasket between said container and the open end of said cap whereby as the cap is threaded home said gasket is compressed and a seal established, a

shoulder in said cap below the open upper end thereof to be engaged with the lower end of said valve to unseat the same, and said shoulder of the cup located inwardly the open upper end of the latter whereby as the level of liquid from the container to the cup reaches the discharge opening through the lower end of the valve a seal is provided preventing further movement of the liquid from the container to the cup and only a measured quantity of liquid is in the cup.

9. In a dispensing apparatus, a container having a neck, a valve mounted for sliding movement in said neck between a closed extended position and an open inwardly disposed position and having a discharge passage movable therewith and opening through the lower end thereof, a spring normally maintaining said valve in closed position, a cup, said cup having abutment means adapted to engage the lower end of said valve for manipulation of the cup to shift the valve to open position, said abutment means being so located with respect to the discharge opening and the open end of said cup whereby, on filling of the cup to a predetermined level, the liquid in the cup will seal the discharge opening through the lower end of the valve.

10. In a liquid dispenser, a container including a neck portion having an internal valve closing surface, a valve comprising a stem slidable in said neck portion, said valve having a passage therethrough and movable therewith including a lateral passage portion toward its inner end and a longitudinal portion opening through its outer end, means normally maintaining said valve in closed position with its lateral passage portion closed by the internal valve closing surface of said neck, a cup, said cup having an internal abutment, said cup adapted to be manually manipulated to engage said abutment with the outer end of said valve and to then be manipulated to move said valve against the action of said means whereby to expose the lateral portion of the valve inwardly of the neck of the container for the movement of the contents of the container through the passage through the valve and into said cup, and said abutment located inwardly of the open end of the cup whereby on liquid in the cup reaching the abutment the liquid seals the outer end of said discharge opening and further discharge of liquid from the container through the valve is prevented.

11. In a liquid dispenser, a container including a neck, a valve including a stem slidably movable in said neck, said valve including said stem having a passage therethrough opening through the lower end of said stem, said passage including an entrance closed by the wall of the container neck when the valve is in closed position, means normally maintaining said valve in closed relation with the contents of said container, said means including a spring about said container neck and valve stem and anchored at its respective ends to said container neck and valve stem whereby disengagement of the valve from the container is prevented, a cup, means for attaching said cup to said container in a position enclosing said means, container neck and valve stem, and a compressible gasket between said container and the open end of said cup whereby to form a seal therewith when said cup is in the last mentioned position.

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