May 19, 1942. E. SCHWARZKOPF 2,283,652

LIQUID DISPENSING APPARATUS

Filed Sept. 11, 1941

Fig. 1.

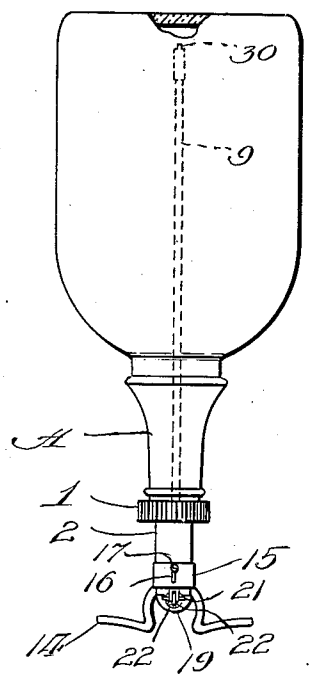


Fig. 2.

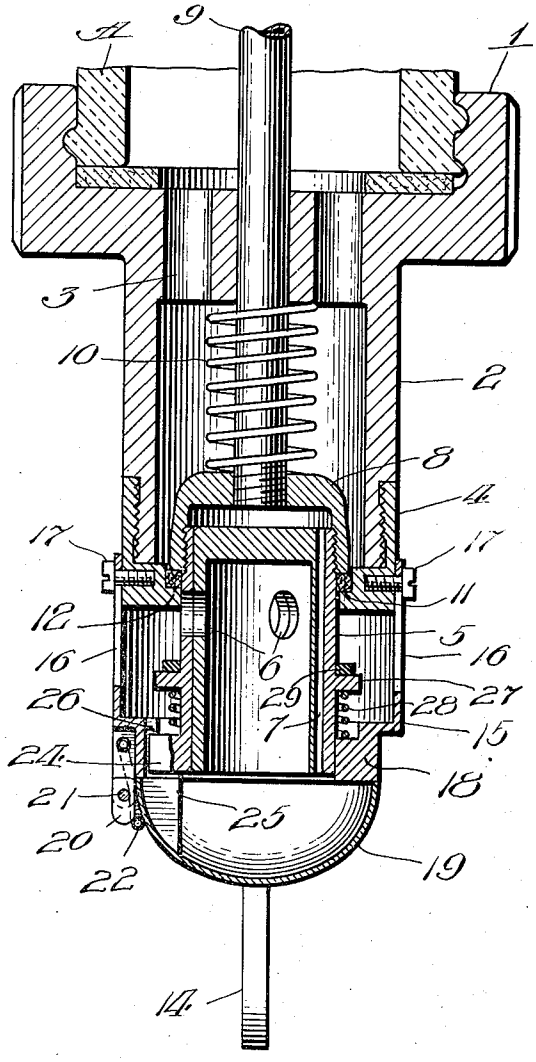
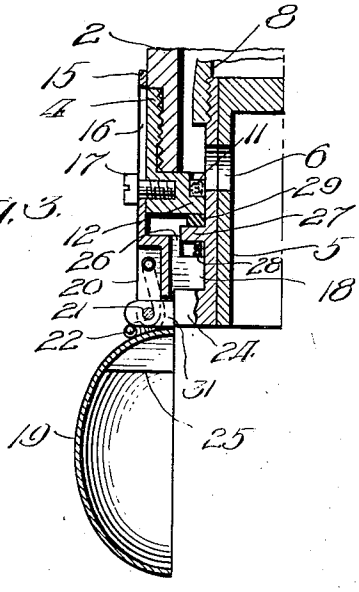


Fig. 3.



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LIQUID DISPENSING APPARATUS

Emil Schwarzkopf, Chicago, Ill.

Application September 11, 1941, Serial No. 410,467

9 Claims. (Cl. 221—67)

In my prior application, Serial No. 386,435, entitled Liquid dispensing devices, filed April 2, 1941, I have disclosed an attachment for a bottle or other container, adapted to permit liquid to be drawn from the container and air to be admitted to replace the liquid that is dispensed. The present invention relates to devices of that general type and may be said to have for its object to improve the construction and operation of the same.

The construction illustrated in the aforesaid application is such that there is a considerable length of spout or nozzle between the discharge outlet and the valve inlet to the same from within the container. Accordingly, after the valve is closed and all of the liquid has apparently been drained from the spout or nozzle, there may still remain in the interior of the latter a small quantity of liquid which subsequently results in dripping. Such dripping, even if it be only a drop or two, may be objectionable if it falls upon a counter or other support for a container from which the liquid is being dispensed. Also, where the liquid that is being dispensed consists of wine, for example, sufficient residue may remain in the nozzle or spout, at the outlet from the latter, to attract flies, which may place the device in an unsanitary condition.

The present invention may be said to have for its object to overcome the unsatisfactory characteristics of the dispensing device, just described.

In carrying out my invention, I make the effective length of the spout or nozzle very short, thereby reducing to a minimum the quantity of liquid that may be so slow in being discharged that the ordinary user fails to wait until the last drop has left the spout or nozzle. Furthermore, I provide a little drip pan which automatically closes with the shutting off of the flow of liquid to the spout or nozzle, and which automatically opens in time to be out of the way of liquid flowing down through the spout or nozzle, at the beginning of a dispensing operation.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is an elevational view of a bottle having one of my improved dispensers applied thereto; Fig. 2 is a longitudinal section through the neck end of the bottle and the dispenser, on a much larger scale, taken on a plane at right angles to the plane of Fig. 1; and Fig. 3 is a view similar to Fig. 2, showing only a fragment of the lower end of the dispenser with the parts in dispensing positions, whereas in Fig. 2 the parts are in bottle-sealing positions.

Referring to the drawing, 1 represents a cap adapted to be screwed upon or otherwise fastened to the neck A of a bottle, or the like. The cap has a long sleeve-like central projection 2. The wall of the cap at the inner end of the sleeve 2 is provided with a series of holes or passages 3 through which liquid may flow from the bottle when the latter is inverted. Screwed upon the free end of the sleeve is a cap 4 the end wall of which is in the form of an annular part or ring which only partially closes the end of the sleeve. Extending through and slidable in the ring-like wall of the cap 4 is what may be termed a long, cup-shaped cylindrical shell 5 open at its lower end and closed at its upper end. This shell is provided with a series of holes or ports 6 through the cylindrical wall thereof and with any desired number of air passages 7 extending lengthwise through the same in the interior of the annular wall. Screwed upon the upper end of the shell is a cup-shaped element 8 which forms with the top of the shell a little closed chamber that communicates with the outside atmosphere through the passage or passages 7. An air pipe 9 is screwed into the center of the member 8, and extends up through the top wall of the cap 1 in such a manner as to have a sliding fit therein, and thence into the vicinity of the bottom wall of the bottle, as in my aforesaid application. There is a spring 10 surrounding the air pipe within the sleeve 2, the lower end of the spring resting on the member 8 and the upper end engaging with the body portion of the cap 1. This spring is under an initial compression so that it tends constantly to force the unit, comprising the parts 5, 8 and 9, down until the edge around the open end of the inverted cup-shaped member 8 rests on a packing ring 11 overlying the annular flange portion 12 of the member 4. The parts are so proportioned that when the slidable unit is in its lowermost position, as in Fig. 2, the ports 6 lie below the upper surface of the flange 12, so that the packing ring 11 and the member 8 serve as a valve which completely cut off communication between the interior of the sleeve 2 and the ports 6.

The slidable unit is adapted to be moved in-

wardly or upwardly by means of a receptacle pressed upwardly against a pair of suitable cross arms 14 forming part of or rigidly attached to a cylindrical slide 15 surrounding the lower or outer end of the sleeve 2 and its cap 4. The member 15 has therein a plurality of elongated vertical slots 16. Screws 17 extend loosely through these slots and into the thickened lower or ring-like end or head portion of the member 4. The part 15 has at its lower or outer end a partial head comprising a thickened ring-like section 18 that has a slidable fit on the lower end of the shell 5. When the member 15 is moved up from the position shown in Fig. 2, it lifts the slidable dispensing unit that is normally held down by a spring 10.

Underlying the lower end of the ring-like part 18 of the slidable actuator 15 is a drip pan 19 which is connected to ears 20, depending from the part 18, by a horizontal hinge pin 21; the parts being so proportioned that when the drip pan is swung through an angle of ninety degrees from its closed position, it lies well to one side of the mouth or outlet opening from the shell-like spout or nozzle 5, thereby avoiding any contact with liquid that is flowing out of the latter. A suitable spring 22, carried by the device, acts constantly to hold the drip pan firmly in its raised, working position, in contact with the under face of the part 18 on the slide 15.

In order to be able to get the drip pan away before liquid begins to flow from the spout or nozzle, I provide a lost motion between the actuator 15 and the spout or nozzle, during which the drip pan is shifted into its idle position. The immediate means for shifting the drip pan against the resistance of its spring comprises a lug 24 projecting radially from the lower end of the shell 5 and an internal lug 25 on the drip pan immediately underlying the lug 24 at times when the drip pan is serving as a closure for the mouth of the spout. These lugs are arranged in a radial plane at right angles to and intersecting the hinge pin 21. In order that the lug 24 will always be properly located, it is caused to project into a vertical groove 26 in the ring-like part 18; this groove serving both as a locating device and as a guide during the relative vertical sliding movements between the members 5 and 15.

Therefore, when the slide 15 is moved up, the shell 5 being still held in its down position by the spring 10, the lug 25 strikes the lug 24 and, the latter being stationary, the lug 25, and therefore the drip pan, must yield; the drip pan swinging around its hinge pin as the latter is carried up with the actuator.

Not only must there be a lost motion between the actuator 15 and the shell 5, but the actuator is preferably yieldingly held in its down position except during the act of dispensing. In the arrangement shown, the shell 5 is provided with an external annular flange 27 that lies at some distance above the ring-like head of the cylindrical actuating member 15. Between this flange and the part 18 is a light coil spring 28 which surrounds the shell; this spring being considerably weaker than the spring 10 so that it must first be closed to bring its coils in contact with each other when the actuator is moved up, before the spring 10 can be caused to yield and permit the slidable dispensing unit to be raised bodily. The parts are preferably so proportioned that when the slidable dispensing unit is moved up to admit liquid to flow out through the same, such movement is arrested at the proper point through the engagement of a cushioning ring 29, lying upon the flange 27, with the under side of the stationary flange 12.

As previously stated, the air pipe 9 extends into the vicinity of the bottom of the bottle, where it is provided with a check valve 30 that is opened through engagement with the bottom wall of the bottle when the elements are in their dispensing positions.

It will be seen that if the bottle, with one of my improved apparatuses attached thereto, is held in an inverted position, the check valve in the air pipe is closed because it stands clear of the bottom wall of the bottle. Also, the valve for controlling the flow of liquid is closed, as indicated in Fig. 2, and the drip pan is up. The distance between the ports 6 in the shell 5 and the discharge end of the shell is very short, so that after the flow of liquid has been shut off, following an operation of the dispensing device to deliver liquid into an extraneous receptacle, the spout or nozzle quickly drains itself. However, should a very small quantity of liquid remain after the receptacle is removed, this is prevented from leaving the dispenser as it will be caught by the drip pan. Thus, the surface on which the container for the liquid is supported is protected against drippings. Not only that, but the end of the spout or nozzle, including both the air inlets and the liquid outlet, is effectively covered and shielded against contact with insects or dirt, thereby avoiding condemnation of liquid, subsequently dispensed.

It will be seen that normally the bottle or other container is sealed and communication with the outside atmosphere is prevented, whether the bottle be in an upright or any other position. With the container inverted, as shown, a glass may be filled with wine, for example, by simply placing it underneath the cross arms and pushing it up. It will be seen that the cross arms are L-shaped, so that their horizontal elements lie at a considerable distance below the outlet end of the spout. This distance is great enough to permit the cover or drip catcher to swing open without coming in contact with the glass. At the end of this preliminary movement, the hinge ear 31 which is an integral part of or rigidly fixed to the drip pan or catcher lies in engagement with the end edge face of the lug 24; thus causing the drip pan or catcher to be locked in its idle position. As the actuator 15 continues its upward movement, it and the slidable dispensing unit move together until the ports 6 rise above the valve seat on the flange 12 as in Fig. 3; thus permitting wine to flow through the port 6 and out of the spout into the glass. As is the case with the device disclosed in my prior application, the check valve 30 in the air pipe is opened through engagement of the stem thereof with the bottom of the bottle so that air may enter above the liquid in the bottle rapidly enough to permit a free, full flow of liquid from the spout or nozzle. When the glass is again lowered, the parts are restored to the positions illustrated in Fig. 2 through movements that are the reverse of those previously made in bringing about a flow of liquid. Since the drip pan is as large in diameter as is the lower end of the sliding actuator 15, it does not actually come into contact with the spout which is much smaller in diameter. Consequently, nothing except the liquid that is being dispensed and air need ever touch the outlet end of the spout. It will of course be un-

derstood that although there is very little likelihood of liquid entering the air passage, any liquid which should happen to do so would be caught by the drip pan in the same way as any drippings from the spout proper.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. The combination with a liquid dispensing device having a movable spout, a valve that is opened and closed by the spout, and an actuator for the spout adapted to be engaged and moved by a receptacle which is to receive liquid from the spout: of a drip catcher for the outlet end of the spout, and means for causing said actuator to shift said drip catcher into an idle position when the actuator is moved as aforesaid.

2. The combination with a liquid dispensing device having a movable spout, a valve that is opened and closed by the spout, and an actuator for the spout adapted to be engaged and moved by a receptacle which is to receive liquid from the spout: of a drip catcher for the outlet end of the spout, and means for causing said actuator first to shift said drip catcher into an idle position and then to move said spout in a direction to open the valve when the actuator is moved as aforesaid.

3. The combination with a container, a movable spout and a valve controlled by the spout for admitting liquid to the spout: of a movable closure for the outlet end of the spout, and actuating means constructed and arranged to open the closure and then to shift said spout through a valve-opening movement.

4. The combination with a dispensing device adapted to be attached to a container to receive liquid therefrom and containing a movable spout and a valve controlled by the spout and adapted to admit liquid into the latter: of a drip catcher movable between an idle position and a position below the spout, and means to shift the drip catcher into its idle position and then to operate the spout in a manner to open the valve.

5. The combination with a dispensing device for a container including a stationary part, a spout movably mounted in said part, and a valve controlled by the spout: of a closure for the outlet end of the spout, a drip catcher movable between an idle position and a working position below the spout, and means for shifting the drip catcher from the working position to the idle position and then moving the spout.

6. In combination, a cap device adapted to be attached to a container, a short spout closed at its inner end and open at its outer end slidable in said cap, said cap device and said spout device having cooperating annular valve faces transverse to the axis of the spout, a spring tending constantly to move said spout outwardly and said valve faces in contact with each other, there being a port through the side of the spout which lies outwardly from the cap device when said valve faces are engaged with each other and inwardly from the valve face on the cap when the spout is pushed in, a drip pan for the end of the spout, and means first to move the drip pan away from the spout and then to push the spout in as aforesaid.

7. In combination, a cap device adapted to be attached to a container, a short spout closed at its inner end and open at its outer end slidable in said cap, said cap device and said spout device having cooperating annular valve faces transverse to the axis of the spout, a spring tending constantly to move said spout outwardly and said valve faces in contact with each other, there being a port through the side of the spout which lies outwardly from the cap device when said valve faces are engaged with each other and inwardly from the valve face on the cap when the spout is pushed in, an actuator for the spout mounted on the cap device for movements in the direction of the length of the spout, said actuator having a limited movement relative to the spout, a spring lighter than the aforesaid spring arranged between the spout and the actuator, a spring-held drip pan hinged to the actuator to close the open end of the spout; and cooperating shoulders on the spout and on the drip pan near the hinge axis of the drip pan for engaging with each other while said actuator is moving relatively to the spout and compressing the light spring, thereby to swing the drip pan to one side of the spout before the spout begins to move.

8. The combination with a container, a movable spout having a liquid passage and an air passage opening out through the outer end of the spout, and valves controlled by the spout for admitting liquid and air to their respective passages; of a movable drip catcher over the outer end of the spout forming a closure for both of said passages, and actuating means constructed and arranged to move the drip catcher out of the way and then to shift said spout through a valve-opening movement.

9. In combination, a cap device adapted to be attached to a container and having a tubular outward extension provided with an annular internal flange at its outer end, a short spout closed at its inner end and open at its outer end slidable in said extension, said spout device having an external, annular shoulder inwardly from the aforesaid flange, a spring tending constantly to move said spout outwardly and said shoulder into contact with said flange, there being a port through the side of the spout which lies inwardly from the said flange when the spout is pushed in, a sleeve-like actuator for the spout mounted on said extension for movements in the direction of the length of the spout, a spring lighter than the aforesaid spring arranged between the spout and the actuator tending constantly to push the actuator outwardly, a spring-held drip catcher hinged to the actuator to close the open end of the spout; and cooperating shoulders on the spout and on the drip catcher near the hinge axis of the latter for engaging with each other upon each inward movement of the actuator, the light spring being compressed during the first part of each inward movement of the actuator whereby the actuator is permitted a limited movement relative to the spout to cause the lug on the spout to swing the drip catcher to one side of the spout before the spout begins to move inwardly.

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