May 13, 1941. M. J. DUFFY 2,241,394

NONREFILLABLE BOTTLE

Filed Aug. 3, 1938

Fig. 1

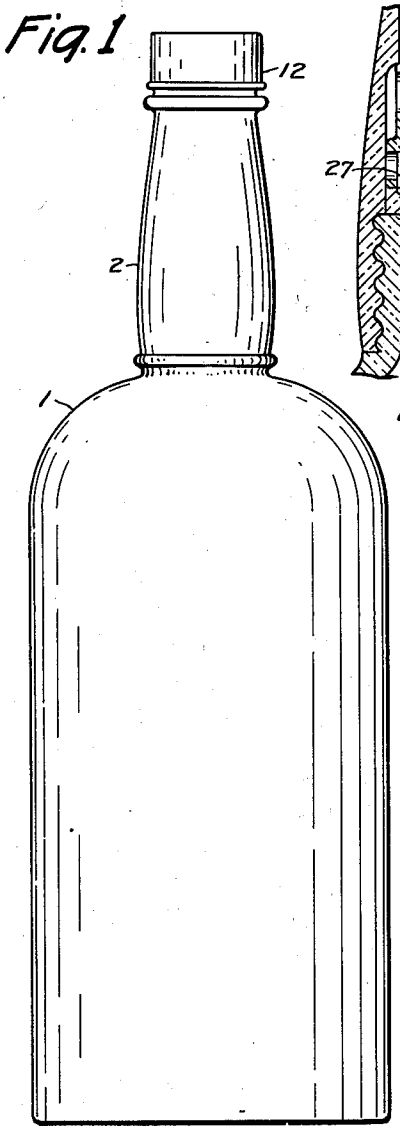


Fig. 11

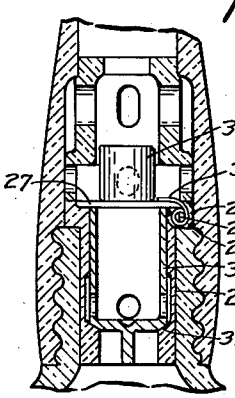


Fig. 2

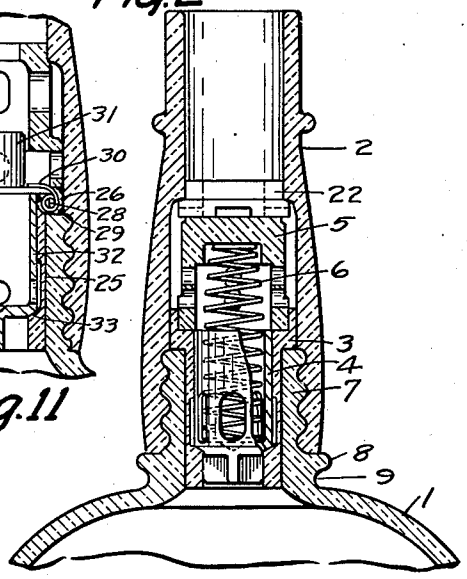


Fig. 3

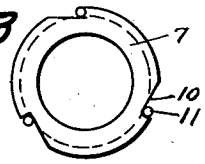


Fig. 4

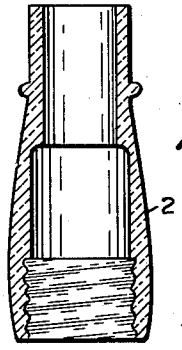


Fig. 5



Fig. 6

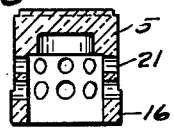


Fig. 7

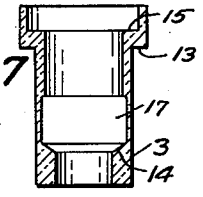


Fig. 8

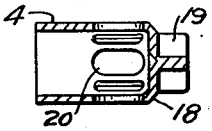


Fig. 9



Fig. 10



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Patented May 13, 1941

2,241,394

UNITED STATES PATENT OFFICE

2,241,394

NONREFILLABLE BOTTLE

Michael J. Duffy, Brooklyn, N. Y.

Application August 3, 1938, Serial No. 222,751

8 Claims. (Cl. 215—19)

The purpose of this invention is to provide improvements in nonrefillable bottles of the double neck type, in which a valve is provided in the neck of a bottle without enlarging the size thereof, and the valve is resiliently held in closed position by a relatively flexible resilient member adapted to permit the flow of a fluid from the bottle, but of sufficient strength to close the valve to prevent the flow of a fluid backward into the bottle.

The invention is a bottle in which the neck is formed of a separate piece of material and adapted to be mounted upon the bottle by non-removable means, and, before permanently mounting the neck upon the bottle, a valve seat, a valve, a cage, and a resilient member are inserted in the end of the bottle and covered by the neck, and these parts are arranged in such a manner that a fluid may be poured from the bottle while, at the same time, the valve will automatically close to prevent a fluid passing backward into the bottle after the neck and interior parts thereof are in place.

This invention is an improvement over the device of my prior patent application, with the Serial Number 143,141, in that the balls forming the valve members are omitted, and a relatively light spring is provided for holding the valve against a seat, thereby insuring positive closing of the valve when an attempt is made to refill the bottle.

The object of this invention is, therefore, to provide improvements in bottles of the nonrefillable type by the addition of positive means for closing the valve member.

Another object is to provide automatic closing means in the neck of a nonrefillable bottle which prevents the bottle being filled under vacuum.

A further object is to provide a floating valve member in the neck of a nonrefillable bottle, and means urging said valve member against a seat when the bottle is empty which, at the same time, permits a fluid to be poured from the bottle when a fluid is contained therein.

And a still further object is to provide improvements in nonrefillable bottles which make it possible to provide a bottle of this type of a simple and economical construction.

With these ends in view the invention embodies a bottle having an integral threaded nipple extending from the end thereof, and a neck adapted to be screwed on said nipple with a valve seat positioned in the nipple, a valve in the said seat, a cage, a relatively light spring between the valve and cage, and a spacing or outlet member.

Other features and advantages of the invention will appear from the following description taken in connection with the drawing, wherein:

Figure 1 is a view showing a side elevation of the bottle, showing a bottle of the type having a threaded cap.

Figure 2 is a cross section through the neck of a bottle, showing an alternate design in which a straight neck is provided for holding a cork, and the interior parts are shown in section with the exception of the valve, and this is shown with part broken away.

Figure 3 is a plan view of the neck of the bottle, showing the notches and pins for permanently locking the neck on the bottle.

Figure 4 is a detail showing the neck of the bottle.

Figure 5 is a detail showing the spacing washer.

Figure 6 is a detail showing the cage.

Figure 7 is a detail showing the valve seat.

Figure 8 is a detail showing the valve.

Figure 9 is an end view of the valve.

Figure 10 is a view showing the spring, and also showing a modification in which a floating member is incorporated in the lower end thereof.

Figure 11 is a view showing another modification in which a hinged plate is used above the valve.

In the drawing the bottle is shown as it may be made, wherein numeral 1 indicates the body of the bottle, numeral 2, the neck as shown in Figure 2, numeral 3, the valve seat, numeral 4, the valve, numeral 5, the cage, and numeral 6, the spring.

In the design shown, the bottle is of an elongated shape resembling a wine bottle, and this is provided with a threaded nipple 7 having a bead 8 at the lower end, with a recess 9 providing means for attaching a tag or other device by a cord. It will be understood, however, that the bead 8 and groove 9 may be omitted, and the intersection of the nipple and upper end of the bottle may be made of any shape or design.

It will also be understood that any means may be provided for permanently locking the neck on the bottle or on the nipple, however, in Figure 3 typical locking means is provided wherein the surface of the nipple is formed with notches 10 having pins 11 therein, and it will be noted that the shape and position of these notches makes it possible to screw the neck on the nipple but prevents removal thereof. The upper end of the neck 2 may be made as shown in Figure 2, however, it will also be understood that this may be formed as shown in Figure 1 in which a

threaded cap 12 may be screwed thereon similar to many types of wine bottles now in use.

The valve seat 3 is placed inside of the nipple 7, with a shoulder 13 resting upon the upper end of the nipple, and with the valve seat 14 extending downward inside of the nipple. The upper end is provided with a recess 15 to receive the lower end 16 of the cage 5, and a circumferential recess 17 is provided around the interior just above the seat 14. The valve member 4 is provided with a surface 18 corresponding to the surface 14, and below this surface are web guides 19 extending downward into the lower end of the valve seat 3, and above the surface 18 is a cylindrical casing or apron as indicated by the numeral 4. This upper part 4 is provided with openings 20 extending through the wall thereof, and these openings communicate with the recess 17 so that, as the valve moves away from the seat, a fluid may pass into the recess 17 and then backward into the interior of the valve through the openings 20. The valve cage 5 is also provided with openings 21 which permit the fluid to pass back out of the valve member and into the interior of the neck 2. In the design shown, the device is provided with a spacing washer 22 having slots 23 forming escape openings permitting the fluid to pass around the upper end of the cage 5 and out of the end of the neck of the bottle. It will be understood, however, that the member 22 may be omitted and the grooves 23 formed in the end of the cage 5, or escape openings may be provided in any manner.

The spring 6 rests inside of the valve 4, with the upper end extending upward into the cage 5, and this spring is made of relatively light material so that, whereas it normally holds the valve against the seat, any liquid on the interior of the bottle resting against the end of the valve will cause the spring to compress and permit the liquid to escape, however, as soon as all the liquid passes out of the bottle, the spring will close the valve.

In some instances, it may be considered that, while holding the bottle in an inclined position with the neck sloping downward, the spring, being very flexible, may permit the valve member to open slightly so that, when the bottle is immersed in a liquid, the liquid may pass backward through the slight opening of the valve, and, therefore, it may be desired to use a float, as indicated by the numeral 24, inside of the spring so that, when the bottle is immersed in an inverted or inclined position, this float will automatically raise the valve.

In the design shown in Figure 11, the valve casing 25, similar to the casing 3, is provided with a notch 26, and a cover plate 27 forming a shutter, is hingedly mounted therein on a pin 28 through a projection 29, and this is resiliently held closed by a spring 30 around the pin 28, and with one end extending over the plate 27. This spring is relatively light and permits the plate 27 to open to the position indicated by the dotted lines when the bottle is held upside down or in an inclined position with the neck extending downward. This arrangement may also be provided with a weight 31 adapted to cooperate with the spring to insure closing of the cover plate which holds the valve 32 against the seat 33 similar to the seat 14.

It will be understood that, although both designs of the bottle neck use springs to urge the valve member against the seat, the springs may be omitted as the valve member, particularly as shown in Figure 8, has a tendency to remain against the seat when the bottle is empty, being drawn toward the seat by vacuum particularly when the bottle is immersed. It is believed, therefore, that it would be impossible to fill the bottle with this device with the springs omitted, and in all experiments it has been found that the valve member 4 seats itself as soon as an attempt is made to force a fluid into the bottle, regardless of the position of the bottle. This may be explained by the fact that the empty bottle, or, rather, the bottle from which the liquid has been poured, is filled with air, and, when the bottle is immersed, the water or fluid pressure on the outside of the valve member will be greater than the air pressure on the inside.

It will be understood that other changes may be made without departing from the spirit of the invention. One of which changes may be in the use of this device in a bottle of any other type or design, another may be in the use of a resilient member of any other type or design, and still another may be in the exact design or arrangement of any of the internal parts.

The construction will be readily understood from the foregoing description. In use the bottle may be provided as shown and described, and it will be noted that, with a very flexible spring, the bottle may be used in the normal manner, and, after it is filled, the neck may be inserted and the fluid may be poured therefrom without interference of the internal parts; however, after the bottle is empty, it is believed it will be practically impossible to refill it through the neck, and, therefore, without breaking parts thereof.

All of the parts except the spring and float are preferably made of glass which would make it impossible to see through the neck, and, therefore, readily observe the internal parts thereof, however, these parts may be made of any material and may be of any color.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A nonrefillable bottle of the type having a valve member in the neck with a seat therefor in an internal sleeve in the bottle neck, characterized by a plate forming a shutter hinged to said sleeve at one side and positioned to engage the said valve member to move said member to and hold it in the closed position, and means resiliently urging said shutter toward said valve member.

2. In combination with a nonrefillable bottle as described in claim 1, a weight slidably mounted in the neck above the shutter cooperating with the said resilient means in urging the shutter toward the valve member with the bottle in the upright position.

3. In a nonrefillable bottle as described in claim 1, a cage positioned above the shutter limiting the opening movement of the shutter and having openings therein permitting passage of fluid therethrough.

4. A nonrefillable bottle as described in claim 1, in which the resilient means comprises a spring incorporated in the hinge.

5. A nonrefillable bottle as described in claim 1, further characterized in that the said internal sleeve is flanged at the outer end and the shutter is hinged in said flanged portion.

6. A nonrefillable bottle as described in claim 1, further characterized in that the outer end of said internal sleeve is flanged and the flange rests upon the end of the bottle neck and the said

bottle neck is provided with an outer section permanently attached to said neck, and providing holding means securing said internal sleeve in position.

7. In combination with a nonrefillable bottle as described in claim 1, a cage having openings through the walls thereof positioned against the end of said internal sleeve and limiting the opening movement of said shutter, and an outer section forming an extension of said bottle neck permanently attached thereto, providing holding means securing said cage and internal sleeve in position.

8. In combination with a nonrefillable bottle as described in claim 1, a cage having openings through the walls thereof positioned against the end of said internal sleeve and limiting the opening movement of said shutter, a weight slidable in said cage cooperating with the said resilient means in holding the said shutter in the closed position, and an outer section forming an extension of said bottle neck permanently attached thereto, providing holding means securing said cage and internal sleeve in position.

MICHAEL J. DUFFY.