Jan. 27, 1953 F. S. ONORATO 2,626,723

APPARATUS FOR NONREFILLABLE BOTTLES

Filed Dec. 18, 1950

Fig. 3.

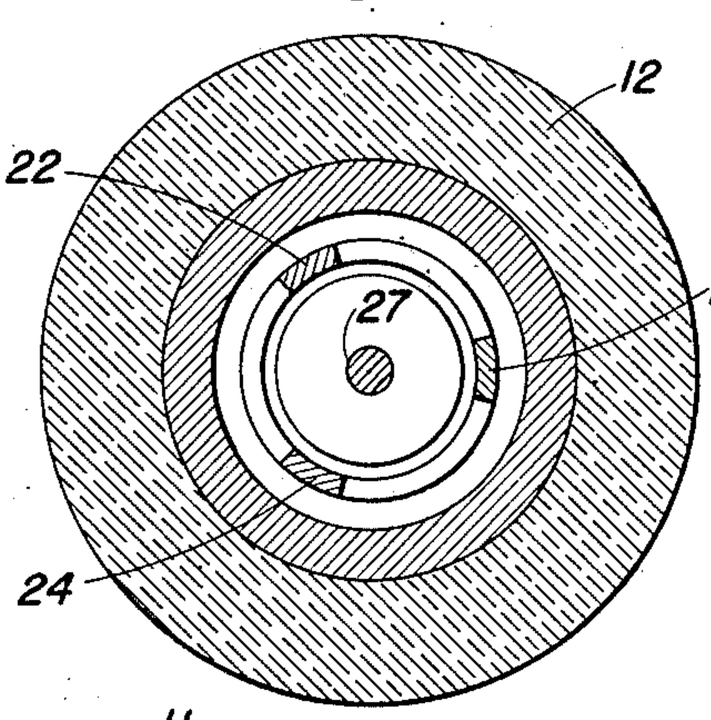
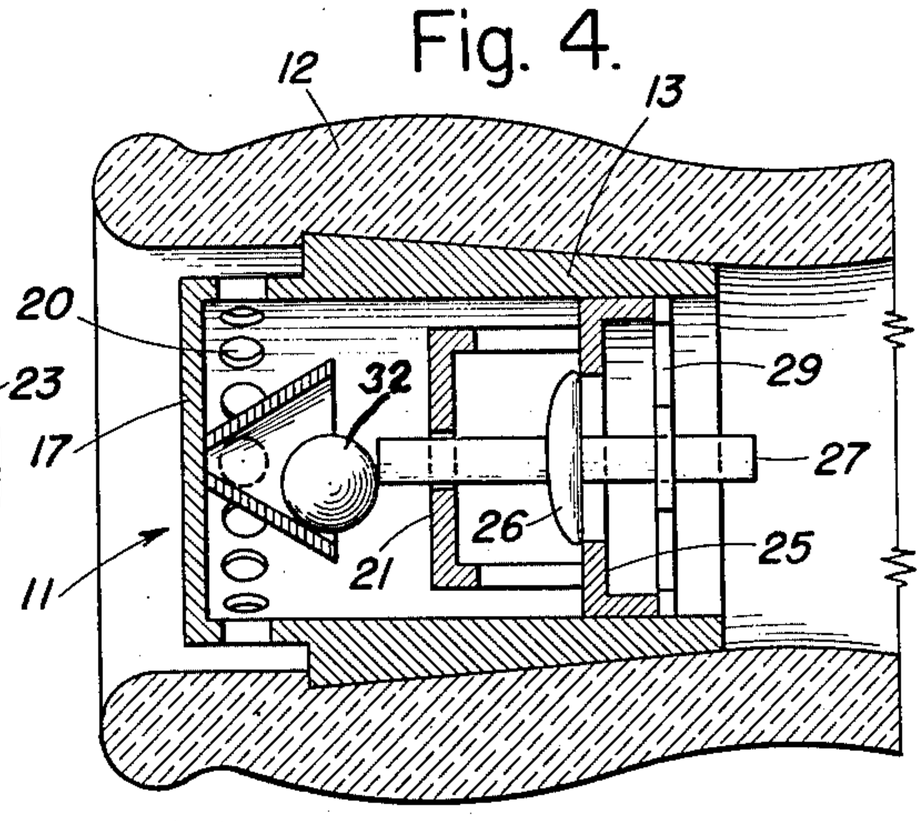


Fig. 4.



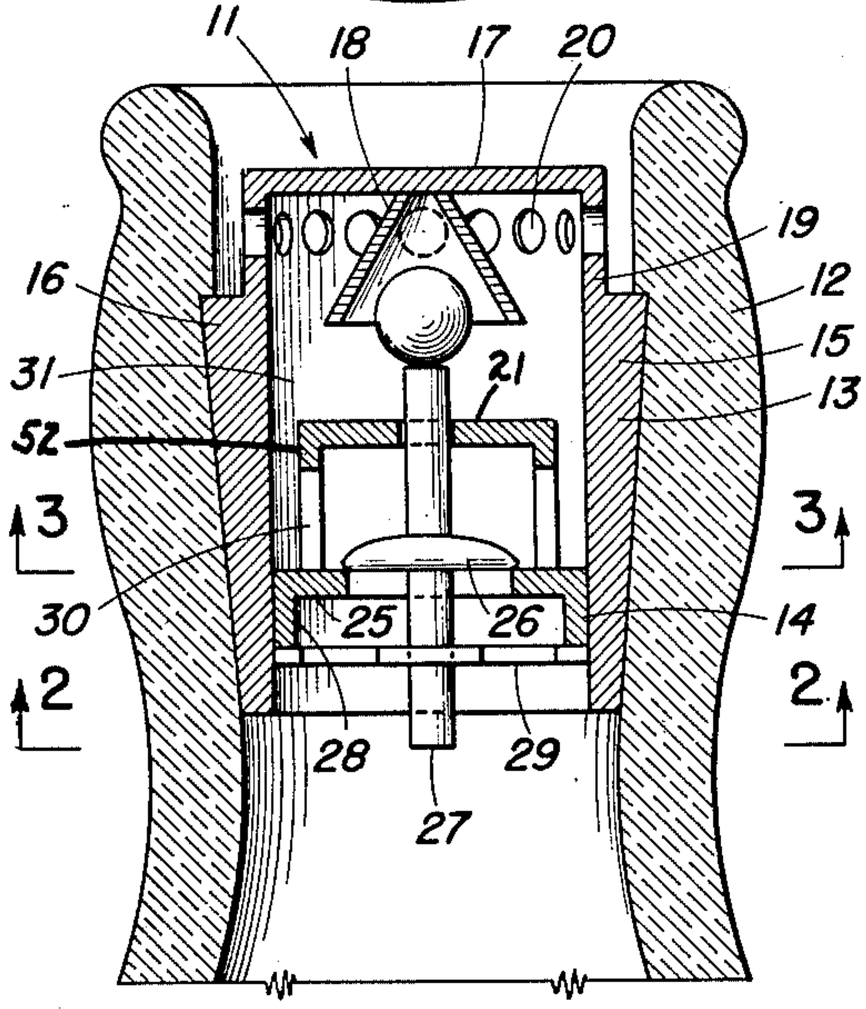


Fig. 1.

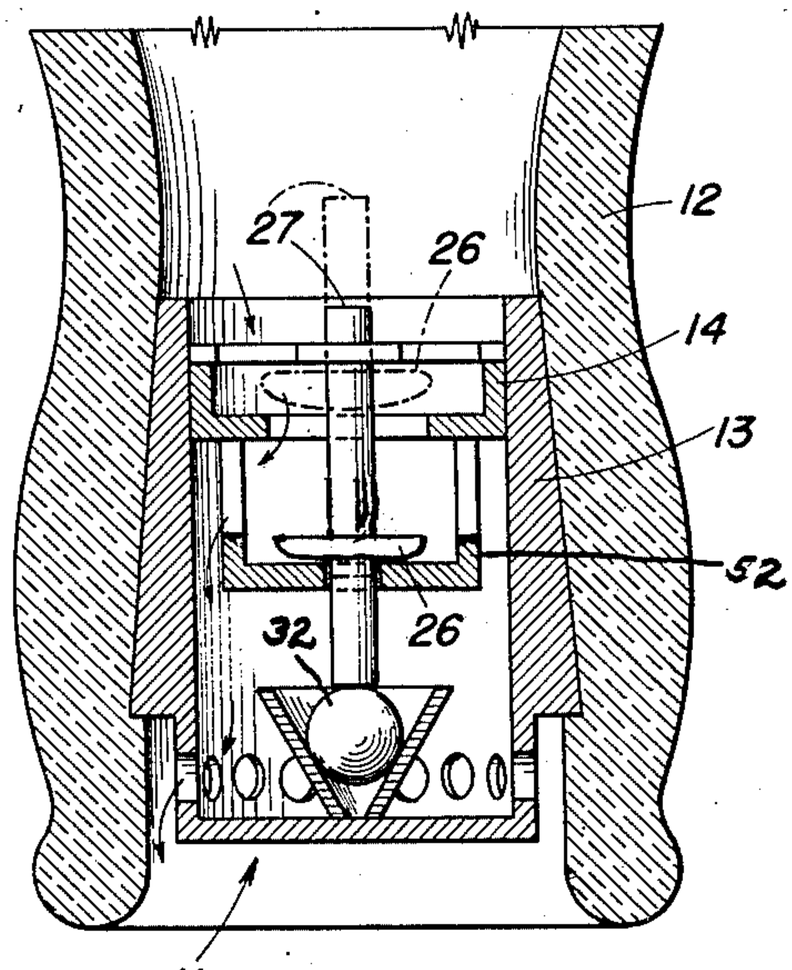


Fig. 5.

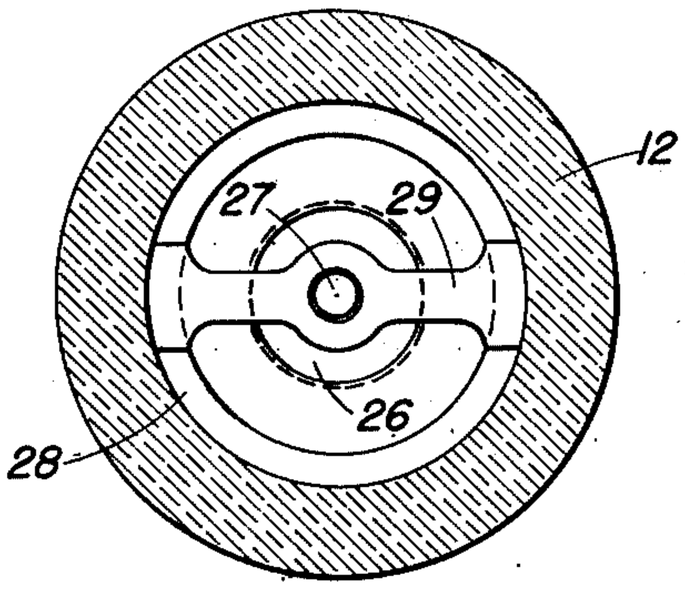


Fig. 2.

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APPARATUS FOR NONREFILLABLE BOTTLES

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2 Claims. (Cl. 215—20)

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This invention relates to bottle closing apparatus for preventing the reuse of bottles and for preventing the substitution or replacement of liquid in a bottle when the liquid is once withdrawn.

In certain industries, especially the alcoholic beverage industry, it is well known that the public is being defrauded of millions of dollars annually by having inferior products being sold in the bottles of well-known brands. Unscrupulous bartenders continue to use and to serve inferior liquors from bottles bearing well-known brands. State alcoholic beverage commissions conduct surveys several times a year to determine whether bottles have been tampered with. Devices have been developed to prevent this substitution but thus far none has been used or placed on the market because of their failure to be absolutely tamper-proof or because of their cost.

This invention then has as its primary object an apparatus which will be useful in preventing the reuse of bottles. Another object is an apparatus which will prevent the filling of bottles under pressure. A further object is to develop a closure which will prevent refilling irrespective of the angle of the bottle in which it is placed. A still further object is to develop a closure which will be tamper proof. These and other objects will appear as this specification proceeds.

In summary, these objects are attained by utilizing a small shell which is insertable in the neck of a bottle. Inside the shell is a cage which carries a floatable valve. This floatable valve has two positions inside the cage, that is, two valve seats are provided. The first valve seat is provided as the normal resting place of the valve when liquid is being put in the bottle by gravity. The second valve seat is provided as the resting place for the valve when the liquid is forced into the bottle under pressure. Under these conditions, the pressure of the liquid forces the valve to snap from the first position to the second. In this second position, the valve will permit the filling of the bottle, but will thereafter prevent the liquid from coming out of the bottle. Thus in either case, whether the liquid is supplied by gravity or under pressure, the device will render the bottle unusable.

A further feature is the use of a ball located in contact with the floatable flexible valve and free to move with respect thereto. The ball rides in an inverted cone attached to the shell. When the bottle is turned on its side, the ball rolls out

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of the cone, presses on the valve rod and forces the valve shut against its seat.

Reference is now made to the drawings for a specific embodiment of this invention, but is intended to be illustrative only, and is not to be deemed limiting. The limits of this invention should be determined by the limits of the claims and their equivalents.

Figure 1 is a cross-section of the bottle closure in place in the bottle in an upright position.

Figure 2 is a cross-sectional view of the bottle closure taken through section 2—2 of Figure 1.

Figure 3 is a cross-sectional view of the bottle closure taken through section 3—3 of Figure 1.

Figure 4 is a cross-sectional view of the bottle closure in place in the bottle in a tipped position with the ball holding the valve closed.

Figure 5 is a cross-sectional view of the bottle closure in place in the bottle when the bottle is held in an inverted position. This view also shows the valve in the snapped-through position.

More specifically in the figures, the bottle closure 11 is shown in place in bottle 12 in the neck thereof. Bottle closure 11 comprises two sections, namely, shell 13 and cage 14. Shell 13 comprises side walls 15 and 16, top section 17 and inverted cone 18. The lower end of shell 13 is open so that cage 14 may be inserted therein when assembling the unit. The upper end of shell 13 is indented slightly to form side walls 19 in which the pouring apertures 20 are located. The liquid leaves the bottle closure through these pouring apertures, into the neck of the bottle and thence flows therefrom. The shell 13 is arranged so that it snugly fits and is held in bottle 12 by any one of several means. It can either be a machined fit of such exactness that it must be pressed into place or there may be a slight ridge molded in the glass bottle and the shell pressed into the bottle until it passes the ridge and snaps into place. Any other suitable means of holding the shell 11 firmly in the bottle will be adequate.

Inside the shell the cage 14 is adapted to fit snugly so that normally it will not be capable of being forced therefrom. The cage 14 comprises an upper plate 21 supported on three upstanding legs 22, 23 and 24, respectively. These legs terminate at first seat 25 on which valve 26 rests. Valve 26 may be made of any thin floatable, flexible material, such as cork or wood. Any other material which would float and which would be flexible enough to snap past the valve seat of ledge 25 will be adequate. To hold valve 26 in an upright guided position, there is provided valve stem 27 on which valve 26 is fixedly mounted. Shelf

25 is connected to side walls 28 of the cage 14. The bottom of the cage 14 is completed by bottom member 29 attached to side walls 28.

There are thus defined in the cage two zones, namely, the first zone located above shelf 25 and the second zone located below shelf 25. Liquid enters the cage 14 through the space left in the bottom of the cage by the bottom member 29, passes into the second zone past the shelf 25 and into the first zone. From this zone, it passes from the cage by the ports 30 existing between the upstanding legs 22, 23 and 24. After leaving the cage, it passes through the hollow zone 31 of the shell 11 and leaves through the ports 20 into the neck of the bottle. This is shown by arrows in Figure 5.

Also located within the shell is the cone 18, which is adapted to contain a small metal ball 32. This ball serves to provide a positive closing action to the valve. As shown in Figure 1, when the bottle is upright, the ball 32 rests on valve stem 27, keeps the valve 26 firmly against its first seat on ledge 25 and thus keeps the bottle closed when in this position. Thus if anyone tries to fill the bottle when in an upright position, the ball 32 keeps the valve closed and no liquid can be put into the bottle.

Figure 4 shows the bottle on its side in a tipped position. In this view, the ball 32 has rolled down the cone 18 and is pressing on the valve stem 27, thus closing the valve and preventing anyone from putting liquid into the bottle.

Figure 5 shows the bottle in an inverted position. When the bottle is first used, it is tipped upright in order to pour the initial contents. The valve leaves its seat on ledge 25 and moves down to the position shown in Figure 5 wherein it rests on upper plate 21. The original liquid can now pour past the valve through ports 30 and into the shell. As the liquid comes out, there must of necessity be an inrush of air to replace it, and this inrush of air sometimes catches the valve 26 and forces it against shelf 25, thus closing the bottle and preventing the liquid from coming out. To prevent this, there is provided a recess formed by the side walls 52. The valve 26 goes into this recess when the bottle is inverted and the inrushing air cannot then catch it and the danger of premature closure is prevented.

With the bottle in this inverted position, it would be conceivable that someone would try to force liquid into the bottle by using pressure and holding the bottle in this upside down position. If this is done, and moderate pressure is used, the liquid will force the valve 26 to float as the liquid comes by. The valve will then go up and seat itself against shelf 25 and no further liquid can enter the bottle.

There is thus disclosed a method of preventing the filling of the bottle either in an upright, tilted or inverted position.

One last possibility remains, namely, the filling of the bottle under extreme pressure. If this is attempted, no matter what the position of the bottle, the flexible valve 26 is intended to be thus flexible so that it will not break or shatter under the pressure, but will snap past the shelf 25, forming the first seat, into the second zone. In this zone, it will be retarded from passing from the cage 14 entirely, because the bottom member 29 will prevent its escape. It will then rest on bottom member 29 until the bottle is filled with the now contraband liquid. Bottom member 29 is intended to span the cage 14 in only one place so that the valve would be tilted and permit the liquid to pass. In this way, the pressure of the liquid is relieved from the valve 26 and there is no danger of breakage of the valve. However, when an attempt is made to remove this contraband liquid from the bottle, the valve will float or be forced into position by the passage of the liquid past it, and it will seat itself against the opposite side of shelf 25, and use this as its seat. The liquid will then be prevented from leaving the bottle. Thus, the use of extreme pressure causes the valve to snap through into the second zone to relieve the pressure and permits the bottle to be filled, but will prevent the liquid from leaving the bottle, rendering the bottle useless.

There are at least two other ways in which this apparatus may be used by inspectors to determine whether bottles have been tampered with, if filled with liquid. If so filled with liquid, it means that pressure was used, and the valve 26 has snapped through into the second zone. In this position, in the upright bottle, the stem 27 will be projecting downwardly a considerable distance from the shell. If the inspector sees this, he knows that the bottle has been tampered with. Or as an alternative, the fit of the cage into the shell can be adjusted so that the entire cage assembly will fall out of the shell if any pressure is used. The inspector need only shake the bottle, and if he hears the cage rattling around in the bottom of the bottle, it is a warning sign that there has been tampering.

In order to prevent further tampering, there is provided the pouring apertures 20 in the side of the shell. Immediately inside the shell is the cone 18 for holding the ball. The apertures and the cone have been so arranged as shown in the figures that if one were to insert a wire inside the shell to try to contact the valve and hold it open in some manner, the cone would force the wire to travel such a tortuous path that any control over it would be prevented.

Although the description is of a floatable valve, it is within the concept of this invention to use a non-floatable valve fixedly mounted on a floatable stem, so that the same effect is achieved, namely the closing when the liquid passes up around the unit.

The material of construction of this entire unit is preferably of light metal, but any suitable strong plastic or other material may be substituted without departing from the essential teachings of this invention.

By the use of this invention, there is also achieved a very smooth flow of liquid from the bottle, as any of the surges which occur because of the inrush of air are damped out in the shell and the liquid flows out in a placid stream which is highly desirable under most conditions.

I claim:

1. As a new article of manufacture, a non-refillable bottle comprising a bottle, a neck therein, a hollow shell snugly fitting in the neck, said shell comprising cylindrical neck-contacting walls, a top wall connected thereto having an inverted cone on its under side, a ball freely movable in the cone, pouring openings in the top wall of the shell, a valve carrying cage snugly fitting in the shell, said cage comprising side walls, a top member, a bottom member, and a shelf having an opening therein, pouring openings between the top member and the shelf, a valve rod movable within the cage between the top and bottom thereof, the upper end of the valve rod engaging the ball, a flexible floatable valve mounted on the valve rod, an inner valve seat on the shelf

adapted to be closed by the valve in sealing position when under normal pressure but permitting the valve to snap through when under increased pressure, and an outer valve seat spaced from the first valve seat a distance greater than the width of the valve, and adapted to prevent the passage of the valve through the valve cage.

2. A non-refillable bottle having a neck portion, a hollow shell snugly fitting in the neck, co-acting means in the neck and on the shell to retain the shell within the neck, the shell having an offset central portion leading to a closed top, pouring openings in the offset portion, a valve cage snugly fitted within the shell, the valve cage comprising a horizontal shelf having an opening therein for the pouring of the liquid, the upper surface of the shelf adjacent the opening forming a valve seat and a plate spaced inwardly from the shelf having a central opening therein to receive a valve stem, the plate having a downwardly extending flange with openings below the flange through which liquid may pass in pouring, a flexible floatable valve mounted on the valve stem and normally positioned between the shelf and plate and engaging the valve seat, an inverted cone on the under side of the offset portion, a weighted ball normally resting on the valve stem to maintain the valve engaged with the seat, the ball being housed within the inverted cone, a bottom member across the bottom of the cage, whereby when the bottle is inverted the weight of the liquid will force the valve open and against the under side of the plate where it will be protected by the flange against accidental closure by the air passing into the bottle to replace the liquid poured, and upon attempt to refill the bottle the valve will float on the liquid and close the opening in the shelf, but if pressure is applied to force the liquid into the bottle the valve will be forced through the opening and will engage the bottom member, however upon reinverting the bottle the weight of the liquid will force the valve against the under side of the shelf thus closing the pouring opening therein.

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