Aug. 23, 1932. J. DUPONTI 1,873,830

NONREFILLABLE BOTTLE

Filed Oct. 9, 1930

Fig. 1.

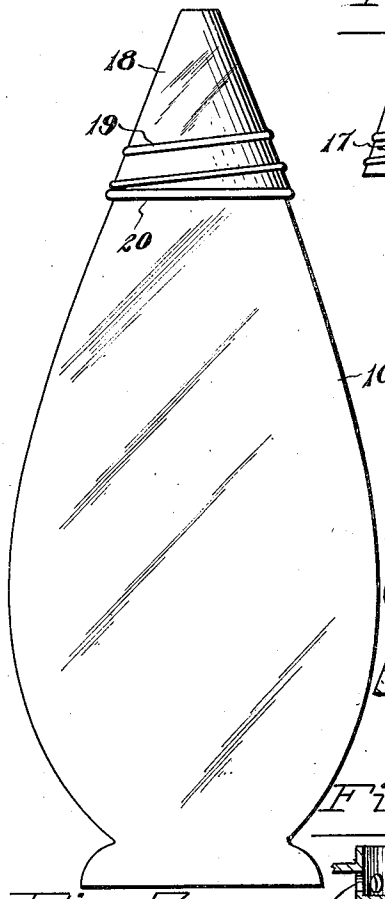


Fig. 2.

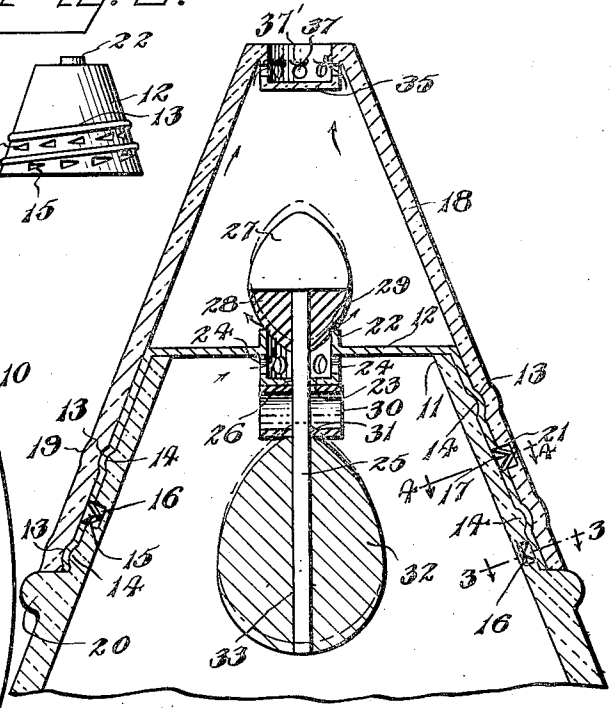


Fig. 5.

Fig. 6.

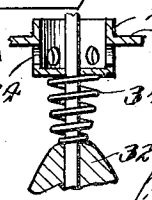


Fig. 4.

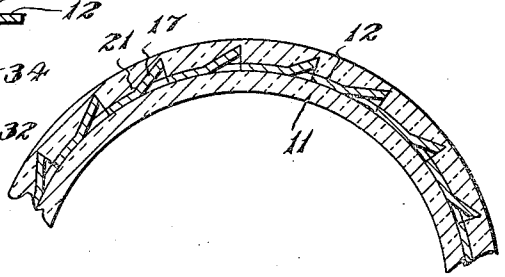
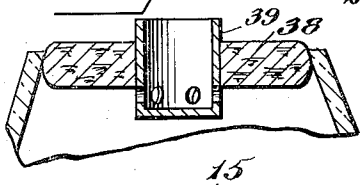


Fig. 7.



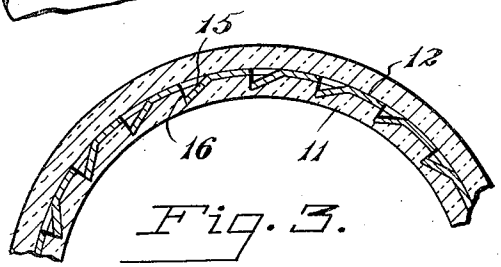


Fig. 3.

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UNITED STATES PATENT OFFICE

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NONREFILLABLE BOTTLE

Application filed October 9, 1930. Serial No. 487,574.

This invention relates to non-refillable bottles.

The primary object of this invention is to provide a bottle so constructed that it is non-refillable, any attempt to refill the bottle resulting in its breakage.

A further object is to provide a bottle which cannot be refilled in any position, vertical, oblique, horizontal, or any other angular position, and cannot be refilled by pressure, seepage, or other methods.

A still further object is to provide a non-refillable bottle having a novel valve structure which may be formed of a few simple, strong and durable parts which will not easily get out of order.

A still further object is to provide a non-refillable bottle which, when viewed from the exterior, will present an all glass appearance with the single exception of a metal guard which is molded into the glass at the mouth of the bottle to prevent insertion of a tool to damage the valve structure, tampering with the metal cap resulting in fracture of the glass with resultant destruction of the bottle.

With the above and other objects in view the invention consists in certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification,

Figure 1 is a side elevation of my improved non-refillable bottle,

Fig. 2 is an enlarged fragmentary sectional view through the top of the bottle showing the valve structure with the valve closed and with the valve dotted in open position,

Fig. 3 is a fragmentary sectional view taken on the line 3—3 of Fig. 2,

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2,

Fig. 5 is a side elevation of the valve cap, and

Fig. 6 is a detail sectional view of a modified form of valve spring, and

Fig. 7 is a detail section of a modified form of valve cap.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates a bottle which, in the present embodiment, is shown as being approximately oval in vertical cross section and tapering gently toward the top to provide a wide neck 11, as best shown in Fig. 2. The bottle is preferably formed of glass and may be formed of other shape than the particular shape shown, it being essential, however, that the neck of the bottle be comparatively wide and substantially frusto-conical in outline to receive the valve cap about to be described.

The valve cap 12 is substantially frusto-conical in contour, as best shown in Fig. 5, and is preferably formed of light, strong metal. The cap is provided with threads 13 which are struck from the inclined side wall of the cap. These threads engage complementary threads 14 molded in the bottle neck, as best shown in Fig. 2.

A spiral series of spurs 15 are stamped in the inclined wall of the cap with their protruding ends pointing counter-clockwise and inclined inwardly toward the interior of the cap. These spurs lodge in a spiral series of openings 16, as shown in Figs. 2 and 3, when the cap is applied to the bottle neck and prevent the cap being unscrewed from the bottle once it is applied.

The cap is furthermore provided with an upper series of spurs 17 stamped from the inclined wall and arranged with their protruding ends extending clockwise, as shown in Figs. 2 and 4, and directed outwardly beyond the exterior of the cap. The purpose of this row of spurs is to permanently retain a glass cap or top for the bottle, which will now be described.

The glass top 18 of the bottle is preferably formed substantially frusto-conical in contour and is preferably matched with or made to harmonize with the body of the bottle. The frusto-conical glass cap is provided with threads 19, best shown in Fig. 2, which en-

gage the threads 13 of the metal valve cap and permit of the glass top being screwed onto the bottle neck until it abuts an annular shoulder 20 formed integral with the bottle neck. In this position of the parts, the above mentioned spurs 17 will have come to rest in a spiral series of openings 21 formed in the inner face of the glass cap, as best shown in Fig. 2, and will positively prevent unscrewing of the glass cap from the bottle.

The glass cap 18 houses the valve structure which will now be described.

The top wall of the metal cap 12 is provided centrally with a hollow cylindrical valve seat 22, best shown in Fig. 2. The valve seat is closed at the bottom, as shown at 23, and is provided in the side wall below the top of the cap with an annular series of openings 24 through which the contents of the bottle may escape through the cylindrical valve seat, as indicated by arrow-heads, when the bottle is reversed. The valve stem 25 is slidably mounted in a central opening 26 formed in the bottom of the valve seat. The outer end of the stem terminates in a bullet-shaped head 27. The stem and head are preferably formed of light strong metal.

A substantially hemispherical valve 28 is fitted snugly on the stem below the head and abuts the head snugly. An annular groove 29 is formed in the valve to receive the upper or outer edge of the cylindrical valve seat 22 and thereby seal the valve seat. The valve 28 is preferably formed of rubber, although other material may be employed if desired.

A resilient member 30, preferably formed of a short length of rubber tubing, is disposed transversely on the valve stem, there being alined openings 31 in the wall of the tubing to snugly receive the stem.

A retainer 32, preferably egg-shaped in contour, is provided axially with an opening 33 to frictionally receive the stem 25. The retainer bears against the resilient member 30 and forces the same against the bottom wall 23 of the valve seat. The retainer, in addition to retaining the valve stem, the valve and the resilient member 30 in permanent assembly, performs the additional function of a balance or counter-weight for the valve structure.

While a resilient member 30 is illustrated in Fig. 2, it is not intended to confine the member to being formed of rubber tubing as, for instance, a light metal spring 34, such as is shown in Fig. 6, may be employed in lieu of the rubber tubing to hold the valve 28 normally seated to seal the valve seat.

As shown by dotted lines in Fig. 2, when the bottle is inverted, the resilient member 30 will be distorted against its own tension with resultant unseating of the valve 28 whereby, as shown by the dotted arrowheads, the contents of the bottle may flow through the openings 24 in the valve seat and out into the bottle cap 18 between the valve seat and the valve, and from the cap may obviously escape without obstruction. Should, however, an attempt be made to surreptitiously refill the bottle by pressure, seepage or other methods, failure will result since the resiliency of the member 30 automatically seats the valve 28 when pressure of the contents of the bottle on the combined retainer and balancing member 32 has been removed. The resiliency of said member will hold the valve seated, regardless of whatever angular position the bottle may be manipulated to assume, when an attempt is surreptitiously made to refill the bottle.

To positively prevent tampering with the valve structure, a cap 35 is provided with an open top and closed bottom, as best shown in Fig. 2, and is furthermore provided at the top with an outstanding flange 36 which is molded into the inner face of the glass cap 18. The metal cylindrical cap 35 is provided in the side wall with openings 37 through which the contents of the bottle may escape. The closed bottom of the cap prevents insertion of a tool to damage the valve structure and, obviously, should a hooked tool be inserted through the openings to remove the metal cap 35, the glass cap 18 will be fractured and broken and destruction of the bottle will result.

To prevent a tool being inserted in the openings 37, a burr 37′ is arranged above the openings so that no tools may be inserted at any angle.

It will be stated that when the top 18 is formed of glass, then the cap 35 will be formed of glass also and in one piece therewith. When the top 18 is formed of metal then the cap 35 will be formed of metal and in one piece therewith.

While the retainer 32 is shown as egg-shaped, it is not intended to limit the construction of the retainer to the form illustrated since, obviously, a small metal washer may be used in lieu thereof to confine the valve parts on the valve stem.

To reduce the cost of manufacture in some instances, when the top 18 is made of metal, then instead of the valve cap 12 being constructed as illustrated in Fig. 2, a simpler construction may be utilized, as shown in Fig. 7. In Fig. 7, a stopper 38 may be used in lieu of the valve cap to hold the valve seat 39, as illustrated.

Having thus described the invention, I claim:

1. A non-refillable bottle comprising a bottle having a substantially frusto-conical neck, a substantially frusto-conical glass cap for the bottle overlapping said neck, a valve cap closing said neck and having a frusto-conical wall inserted between and interlocking with said neck and said glass cap, a valve seat in said valve cap, a valve closing said seat and

having a stem extending axially therethrough into the bottle, a resilient member on said stem, a retainer on said stem holding said valve and said member assembled in position to normally hold said valve closed, said resilient member being distortable when the bottle is inverted to permit said valve to unseat, and a perforated cap carried by said glass cap for preventing access to the valve while permitting escape of the contents of the bottle when the valve is open.

2. A non-refillable bottle comprising a bottle having a wide neck, a substantially frusto-conical glass cap overlapping said neck, a substantially frusto-conical metal valve cap closing said neck and having the frusto-conical wall provided with threads which interfit with corresponding threads on said glass cap and said bottle neck, a series of spurs struck from said frusto-conical wall interlockingly engaging said glass cap, a series of spurs struck from said frusto-conical wall interlockingly engaging said bottle neck, said spurs preventing unscrewing of said glass cap and said valve cap from said bottle neck, a valve carried by said valve cap opening when said bottle is inverted to permit escape of the contents of the bottle, a resilient member coacting with said valve to normally hold said valve closed, and a perforated cap closing the open end of said glass cap and preventing access to said valve.

3. A non-refillable bottle comprising a bottle having a wide neck, a substantially frusto-conical metal valve cap closing said neck and extending downwardly along the exterior thereof, a substantially frusto-conical glass cap disposed on said valve cap and overlapping said frusto-conical metal cap, a screw thread connection between said neck, said valve cap and said glass cap, interlocking spurs between said valve cap, said neck and said glass cap preventing surreptitious separation of the valve cap, the bottle and the glass cap, a perforated cylindrical valve seat formed on said valve cap and having a closed bottom, a valve stem slidably extending through said seat, a valve on one end of said stem, a retaining member on the opposite end of said stem, a resilient length of tubing disposed transversely on said stem and confined against the closed bottom of said valve seat by said retaining member and normally holding said valve seated, and a closure cap closing the open end of said glass cap and preventing access to said valve, said cap having a marginal flange molded in said glass cap to assure breakage of the glass cap when the closure cap is tampered with.

4. A non-refillable bottle comprising a bottle having a wide neck, a valve cap closing said neck, a glass cap overlapping said valve cap, a plurality of spiral series of spurs formed on the cap, the spurs of each series being turned oppositely to the spurs in the next adjacent series, said spurs interlockingly associating the bottle neck, the valve cap and the glass cap together as a permanent unitary assembly, a valve, carried by said valve cap adapted to open only when said bottle is shaken obliquely, invertedly or angularly, and means carried by said glass cap for preventing insertion of a tool to tamper with said valve.

In testimony whereof I affix my signature.

JOHN DUPONTI. [L. S.]