Jan. 15, 1963 E. J. TOWNS 3,073,469

NON-REFILLABLE CLOSURE DEVICES FOR BOTTLES

Filed Dec. 7, 1959 2 Sheets-Sheet 1

Fig. 1

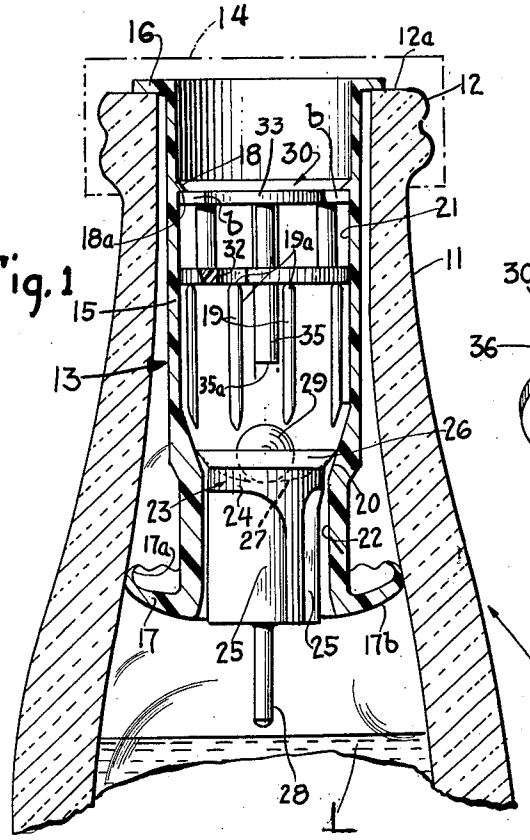
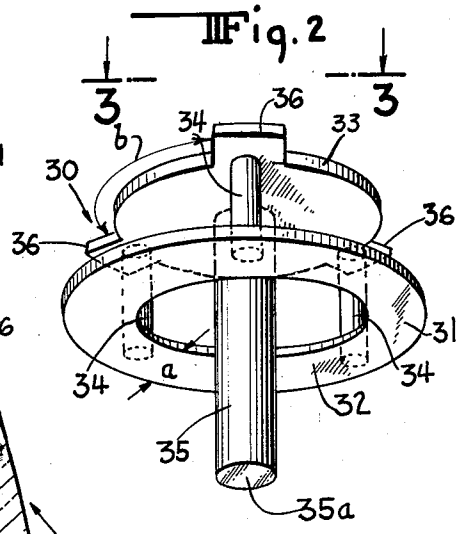


Fig. 2



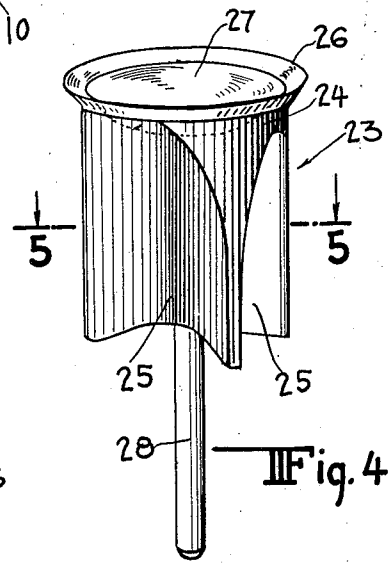


Fig. 4

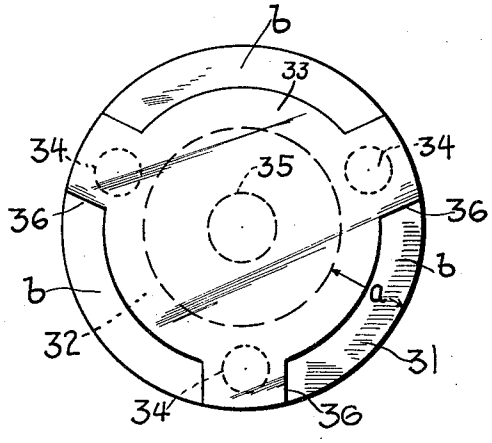


Fig. 3

INVENTOR
EDWARD J. TOWNS
BY Kenyon & Kenyon
ATTORNEYS

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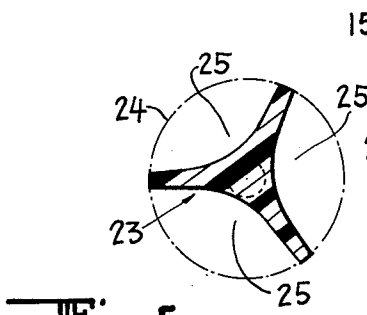


Fig. 5

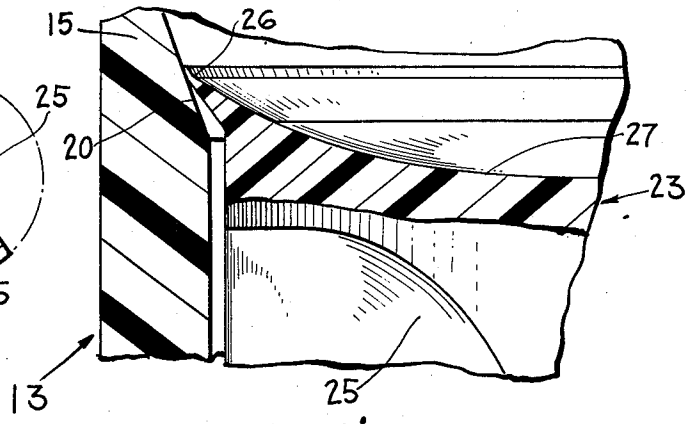


Fig. 6

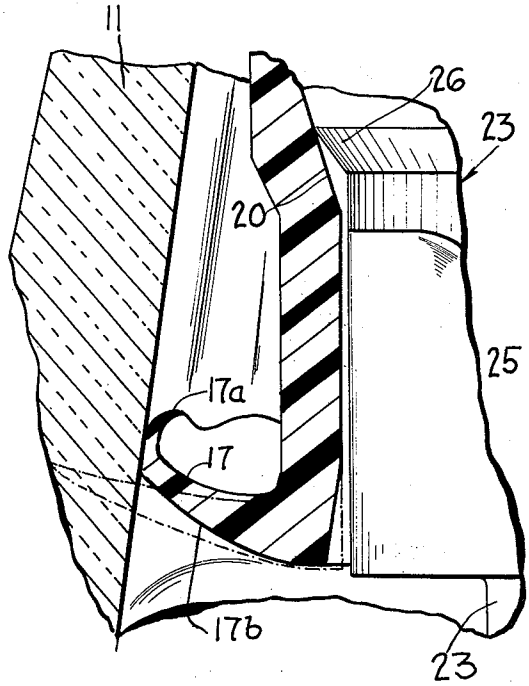


Fig. 7

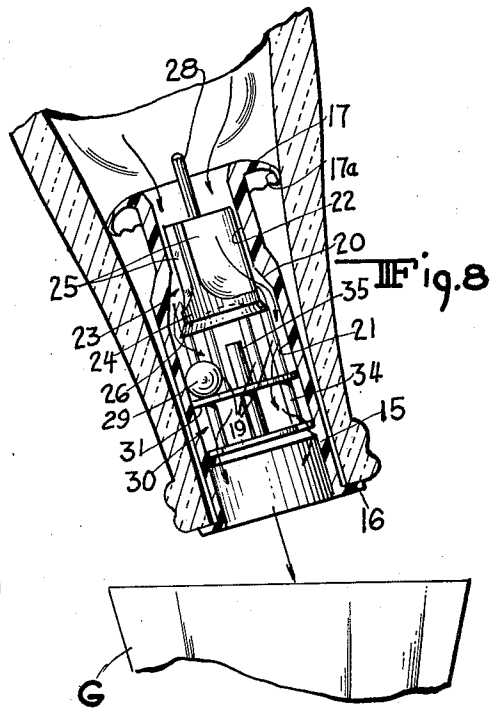


Fig. 8

INVENTOR
EDWARD J. TOWNS
BY
Kenyon & Kenyon
ATTORNEYS

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NON-REFILLABLE CLOSURE DEVICES FOR BOTTLES

Edward J. Towns, 53 Mounthaven Drive, Livingston, N.J.

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2 Claims. (Cl. 215—22)

This invention relates to non-refillable bottle closure constructions and particularly to a closure device applicable to conventional bottles used as containers of liquids such as liquors to prevent refilling thereof with counterfeit products and also to prevent adulteration of original contents of an opened bottle having residual genuine content.

In the past, numerous proposals to eliminate counterfeiting refill or the adulteration of the original liquid contents of bottles have been proposed. Few, if any, of these proposals have been adopted or utilized and the liquor and restaurant industries in particular have long sought an effective solution to a very vexing problem. The problem is of particular importance in bars, restaurants or other locations where liquors are dispensed from opened bottles. Substitution by dishonest bartenders of counterfeit liquors by refilling into bottles bearing reputable labels, dilution, or else adulteration of original liquor contents of such bottles is a commonplace occurrence in many bars even of restaurants of high repute. The purchasing public in such places has been misled as to the genuineness and the quality of liquors dispensed from reputably labeled bottles and sellers themselves have been victimized by dishonest bartenders regardless of their intent to dispense only genuine and unadulterated liquors from labeled bottles.

An appropriate solution for this problem requires application of tamper proof closures to bottles at the initial site of bottle filling by the original distillers or bottlers which are relatively inexpensive so as to eliminate material increases in bottling and distributing costs. In addition, such closures must be simple to construct and to apply. They should be easy to use for dispensing purposes and cheap enough to be discardable when the original bottle contents have been completely poured therefrom. Furthermore such closures must in all their components be of such materials that will not contaminate the contents of the bottles to which they are applied nor alter the taste, odor or quality of the initial liquid contents with which the bottle has been filled. An additional important requirement is that such closures must prevent completely any illicit attempts to replace or adulterate initial bottle contents by the dishonest bartender or other like person. To this end such closures must be so constructed that their sealing parts are inaccessible for tampering that might permit illicit filling or adulterating operations.

Moreover, it is important and desirable in such closures to provide automatic re-sealing means for opened bottles which will operate between dispensations of the genuine contents of the bottle to prevent evaporation. Such automatic re-sealing means however must also be of such construction because of its inaccessible tamper-proof location and that it will not become jammed in sealed position by changes in room temperature and relative changes between internal bottle pressures and environmental atmospheric pressure and thus prevent emptying or successive dispensation of desired quantities of genuine liquor from bottles bearing such closures.

Principal objects and features of the instant invention are the provision of tamper proof bottle closure devices meeting all of the foregoing requirements and which are safe, cheap to produce, easy to use and substantially tamper-proof against illicit refilling or adulterating operations.

Other objects and features of the invention will become apparent from the following specification and the accompanying drawings, wherein:

FIGURE 1 is a fragmentary vertical section of a filled bottle bearing the novel non-refillable closure device of this invention;

FIGURE 2 is a perspective view on an enlarged scale relative to FIGURE 1 of the valve limit stop member utilized in the structure of this invention;

FIGURE 3 is a plan view also on an enlarged scale relative to FIGURE 1 of the stop member seen from the plane of line 3—3 of FIGURE 2;

FIGURE 4 is a perspective view also on an enlarged scale relative to FIGURE 1 of the movable valve element of this invention;

FIGURE 5 is a transverse section taken along the plane of line 5—5 of FIGURE 4 and viewed in the direction of the arrows;

FIGURE 6 is a fragmentary section on an enlarged scale illustrating the seating position of the valve body with reference to a valve seat provided on the bottle insert of the closure embodying the invention;

FIGURE 7 is a further fragmentary vertical section of the bottle insert in relationship to the bottle neck illustrating the manner of non-removable retention of said insert within said bottle neck; and

FIGURE 8 is a vertical section of the assembled closure within the bottle neck illustrating the positions of parts during pouring of liquid contents from the bottle.

Referring to the drawings and first to FIGURE 1, the reference character **10** represents a bottle filled with genuine liquid content L into whose neck **11**, via its mouth **12**, a tamper-proof, non-refillable closure device **13** embodying this invention has been inserted after filling of said bottle with its initial genuine liquid content. The neck mouth **12** is equipped with conventional external threading to receive a conventional screw cap **14** or other type of conventional cover or cap.

The closure device **13** comprises a generally tubular insert body **15** of relatively flexible material that is unaffected by the liquid contents L of the bottle **10**. In a preferred embodiment this material is polyethylene or other synthetic plastic material having like properties of flexibility and nontaste imparting qualities as well as resistance to the liquid contents L of the bottle. This body at its uppermost or outermost end is provided with an annular integral lip **16** intended to rest on the upper outer end **12***a* of the bottle mouth **12**. The opposite or innermost end of the insert body **15** is provided with a flexible integral annular flange **17** having a tapering transverse section so that it diminishes in thickness radially outwardly towards its peripheral edge **17***a*. The diameter of insert **13** is admeasured to be less than the internal diameter of the mouth and neck portions **12** and **11** of said bottle so that it can be inserted into the bottle via its mouth like a cork, to the limit permitted by engagement of flange **16** with the bottle mouth end **12***a*. The innermost flange **17***a* is of substantially larger diameter than that of the mouth **12** of said bottle and is deformed during insertion of said insert so that its peripheral edge **17***a* curls and engages snugly against the inner walls of bottle neck **11** providing a substantially leak-proof seal in such engagement.

A tapered, inwardly extending annular, integral shoulder or ridge **18** is provided internally of the tubular insert **15** for purposes presently described. A plurality of longitudinally disposed, inwardly extending integral ribs **19** are provided on the inner surface of said insert. The uppermost ends **19***a* of these ribs all lie at the same level and these ends serve an abutment function presently to be described. The opposite ends **19***b* of these ribs terminate in an inwardly tapering annular wall portion **20** of the insert which defines and functions as a valve seat as will be presently described. This tapered wall or valve seat portion **20** joins the bore portion **21** of the

insert with a second bore portion 22 of reduced diameter which terminates at the lower or innermost end of said insert adjacent the annular flange 17. The outermost face of flange 17 is rounded or beveled at 17*b* to facilitate insertion of the insert via the mouth 12 of the bottle.

A valve body 23 which is movably retained within the insert 15 is provided. This body 23 is preferably of the same material as said insert and includes a generally cylindrical portion 24 of somewhat smaller overall diameter than that of the bore portion 22 of said insert. Longitudinally extending grooves or flutes 25 are provided in the surface of said cylindrical portion for weight reducing purposes. A flexible annular valve lip 26 integral with said cylindrical portion 24 flares upwardly and outwardly from the upper end thereof. This lip 26 is admeasured to rest upon the tapered valve seat 20 of the insert, the relative tapers of said lip and seat differing however to prevent locking of the lip 26 and valve seat 20 even when said lip is forced against said seat 20 by a differential of pressures internally and externally of said bottle. The upper surface 27 of valve body 23 is preferably spherically concave while a longitudinally extending axially positioned stem 28 projects outwardly of the lower or opposite end of valve body 23.

A seating weight 29 preferably in the shape of a sphere or ball and of a material unaffected by the liquid contents L of the bottle is positioned to lie loosely on the concave surface 27 of valve body 23. It is essential that this weight 29 be of non-magnetic material and preferably it is in the shape of a ball so that it cannot be shifted relative to the valve body 23 by a dishonest bartender or other operator either by the use of magnets applied externally of the bottle neck 11 or by manipulating pins, wires or the like inserted through the mouth 12 and upper bore portion 21 of the insert 15. In a preferred embodiment the weight 29 is a ball or bead of glass whose diameter is small enough to permit free pouring of liquid from the bottle when the latter is tilted to the inverted position of FIGURE 8. The specific gravity of the material of this ball always is greater than that of water, alcohol or other liquid a bartender might attempt to introduce surreptitiously into the bottle to refill it or to adulterate its original fluid content. Thus it will not float in such liquids.

A combined means 30 serving as a limit stop for the ball 29 and valve body 23 and as a baffle to prevent unauthorized manipulation by instruments inserted through the upper end of insert 13 is provided. This combined means 30 (see FIGURE 2) in the embodiment shown comprises an annular baffle ring 31 whose outer diameter is approximately that of the inner diameter of the bore portion 21 of insert 15 so that it can seat on the ends 19*a* of ribs 19. The inner periphery of baffle ring 31 defines a center hole 32 to permit free egress of liquid poured from bottle 10 when the latter is inverted. A disc 33 is spaced from the ring 31 and secured thereto by integral rod-like spacers 34 secured preferably both to said ring and disc so that the ring 31, disc 33 and spacers 34 preferably form a unitary body. This disc 33 is of smaller diameter than the diameter of bore portion 21 but preferably of somewhat larger diameter than center hole 32 in ring 31 so that the disc and the ring 31 will serve as baffles to any attempted insertion of an instrument of any kind past disc 33 for unauthorized manipulation either of ball 29 or valve body 23 or both. This is effected by appropriately dimensioning the radial width *a* of disc 31. A center pin 35 integral with disc 33 and centrally located therein projects downwardly thereof through hole 32 and its end 35*a* serves as a limit stop for valve body 23 when the bottle is inverted for pouring purposes. Its length is admeasured to permit an axial displacement of the ball 29 and valve body 23 sufficient to permit free flow of liquid from the bottle past valve lip 26 and valve seat 20 through hole 32, past the periphery of disc 33 in the space between the latter and said bore portion 21 of insert 15 and outwardly through the open mouth end thereof. Radially directed lugs 36 preferably at equispaced locations on the periphery of disc 33 extend radially outwardly thereof and are engageable under the lower or innermost surface 18*a* of the annular tapered shoulder 18 of insert 15. The peripheral diameter of disc 33 is less than the diameter of shoulder 18 leaving liquid egress spaces *b* as seen in FIGURES 1 and 8. The means 30 which is of integral construction is likewise of a material unaffected by the liquid content L of the bottle and non-taste imparting. It is of relatively rigid material so that it cannot be deformed or easily broken by tampering instruments inserted by a dishonest bartender or like person. In a preferred embodiment, the material of means 30, e.g. ring 31, disc 33, spacers 34, pin 35 and lugs 36 is a synthetic plastic such as general purpose styrene or other synthetic having similar non-taste imparting rigid characteristics that will not affect the liquid contents of the bottle.

In assembling the tamper-proof closure means 13 of this invention for application to a filled bottle 10, the valve body 23 is inserted via the upper open end of the insert body 15 so that its pin 28 extends downwardly and its valve lip 26 rests on the tapered wall or valve seat 20 of said insert body. Then the ball 29 is placed on the concave surface 27 of said valve body 23. Thereafter the means 30 is inserted via the upper open end of insert body 13 so that the lower surface of disc 32 rests on the upper ends 19*a* of ribs 19 and the lugs 36 ride past tapered shoulder 18 into engagement with its lower surface 18*a* thus locking means 30 permanently within said insert, the lower end 35*a* of pin 35 then lying spaced from the ball 29, to permit displacement in an axial direction of valve body 23 and ball 29 between the limits permitted by pin 35 and valve seat 20.

An assembled closure device is then inserted via the open mouth 12 of the filled bottle 10, flange 17 innermost and pressed into position such that the upper flange 16 rests on the top edge 12*a* of the bottle mouth 12. A screw cap 14 may then be mounted on the bottle 10.

When liquid from the bottle is to be dispensed, the cap 14 is removed by the bartender and the bottle inverted in usual manner for pouring purposes as illustrated in FIGURE 8. This causes ball 29 and valve body 23 to move longitudinally toward the mouth of the bottle to the limit permitted by engagement of end 35*a* of stop pin 35 with valve body 23 or ball 29. At this time the valve lip 26 is moved away from valve seat 20 and the liquid flows freely outwardly as indicated by the arrows in FIGURE 8 through hole 32, the spaces *b* and the open end of insert body 15 into the glass G. Immediately when the bottle is upended to its initial condition shown in FIGURE 1, the weight of ball 29 reseats valve lip 26 on valve seat 20. The weight of ball 29 is not sufficient to form an absolutely tight seal between said lip 26 and valve seat 20. Moreover, the different tapers of the lip 26 and valve seat 20 prevent locking of the body to the valve seat and some slight leakage is possible and desirable so that differentials of gas pressure internally and externally of the bottle between pouring periods are equalized and the valve body lip 26 always is free to move away from valve seat 20 during subsequent pourings no matter how long a period exists between successive pourings. The seating of valve lip 26 on valve seat 20 however is sufficiently snug to prevent any attempt at refilling of the bottle with water or other adulterating liquid via the open mouth of the bottle as the weight of such liquid added to the weight of the ball above the valve body 23 will simply act to seat the lip 26 more firmly in place and prevent the adulterating liquid from flowing into the bottle. It is essential in this connection that the combined weight of the ball 29 and valve body 23 be sufficient to prevent any floating tendency of the valve body and ball in the refilling or

adulterating liquid. The combined specific gravity of these two components thus should at least exceed that of alcohol and water the most common adulterating fluids a bartender might attempt to use for refilling purposes.

Since the ball 29 is of glass and non-magnetic, the bartender cannot circumvent its biasing effect by attempting to raise or move it with a magnet. Also the baffle ring 31 in conjunction with the baffle disc 33 preclude insertion of any instruments by the bartender to raise the ball 29 or valve body 23 for unauthorized refilling or adulteration.

It is essential too that the ball 29 and valve body 23 be separate entities. Thus when the bottle is up-ended and an illicit attempt is made to blow liquid into the bottle, the valve body, being light, immediately reseats itself and prevents liquid from entering the bottle. If the ball were integral with said body its weight would prevent movement of the valve body to effect such reseating.

Although a specific embodiment of the invention has been disclosed, variations within the scope of the appended claims are possible and are contemplated. There is no intention therefore of limitation to the exact details herein described and shown.

What is claimed is:

1. In a bottle having a mouth and neck, a device for rendering said bottle non-refillable and adulteration proof as to its original liquid content comprising a tubular insert mountable into the bottle via its mouth after its original filling, said insert having a flange adjacent one end adapted to rest on the rim of the bottle mouth, a second flange projecting laterally outwardly of the insert and engageable in sealing relationship with the inner surface of the bottle neck to prevent removal of said insert from said bottle after it has been mounted therein, said insert having an internally located valve seat, a valve body within said tubular insert movable toward and away from said seat, a ball-like weight within said insert for biasing said valve body by gravity into closing engagement on said valve seat so as to preclude refilling of the bottle, said insert also having an annular internal shoulder above said valve seat and longitudinal ribs between said seat and said shoulder, keeper means mounted within said insert mounted between said shoulder and said ribs to prevent withdrawal of the valve body and ball-like weight from said insert and to preclude tampering access to either via the bottle mouth and means attached to said keeper means for limiting movement of said weight and said valve body away from said valve seat, said keeper means including a disc-like member having lugs engageable with said shoulder and a ring spaced from said disc-like member and resting on said ribs and both admeasured to permit free pouring of original fluid from said bottle, said keeper means also including a stop member projecting from said disc-like member through the hole in said ring toward said valve body with its free end engageable with the latter to limit movement of the valve body away from said valve seat when said bottle is tilted for pouring, and said stop member being dimensioned relative to the diameter of said hole to preclude passage therethrough of said ball-like weight.

2. In a bottle having a mouth and neck, a device for rendering said bottle non-refillable and adulteration proof as to its original liquid content comprising a tubular insert of flexible synthetic plastic material mountable into the bottle via its mouth after its original filling, said insert having a flange adjacent one end adapted to rest on the rim of the bottle mouth, a second flange at its other end projecting laterally outwardly of the insert and engageable in sealing relationship with the inner surface of said bottle neck to prevent removal of said insert after it has been mounted in said bottle, said insert having an internally projecting annular shoulder and also having a tapered valve seat below said shoulder and longitudinal ribs between said shoulder and said seat, a generally cylindrical valve body with longitudinal flutes and an annular valve lip movable within said body toward and away from said valve seat, said lip having a different taper than that of said valve seat to prevent binding, said valve body being of the same material as said tubular insert, a ball-like weight located within said insert to bear against a surface of said valve body and bias said lip by gravity into engagement with said valve seat to provide a seal that precludes refilling of the bottle or adulteration of its original content, and keeper means including a disc with radial lugs engageable with said annular shoulder to retain the valve body and ball-like weight permanently within said tubular insert, said keeper means including an integral stop member extending from said disc for limiting movement of said valve body within said insert and also including a ring seated on said ribs and integral spacers between said ring and said disc, said stop member projecting through the hole in said ring toward said valve body so that its free end is engageable with the valve body to limit movement thereof away from said valve seat when the bottle is tilted for pouring, and said stop member being dimensioned relative to the hole in said ring to preclude the passage through said hole of said ball-like weight, and the hole in said ring being of smaller diameter than the peripheral diameter of said disc, and said peripheral diameter being less than the internal diameter of the portion of the tubular insert within which the disc lies, said ring and said disc thereby serving as baffling elements to preclude tampering manipulation of said valve body or ball weight by any instruments introduced via said bottle mouth while permitting pouring of liquid content from said bottle.

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