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NON-REFILLABLE BOTTLE CLOSURE

Filed March 1, 1961

FIG. 1

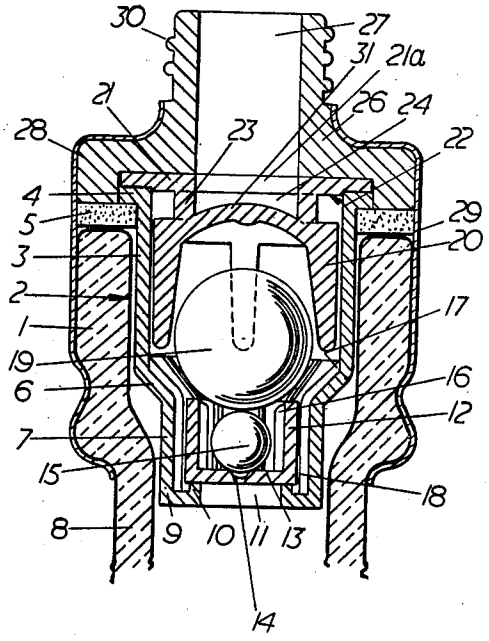


FIG. 2.

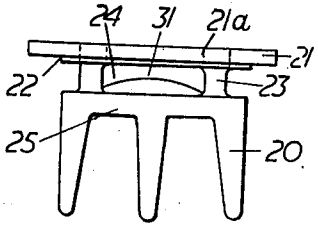
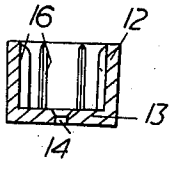


FIG. 3.



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NON-REFILLABLE BOTTLE CLOSURE

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This invention is concerned with the provision of an improved and still more efficient construction of non-refillable bottle closure than those heretofore available.

It is usual to apply non-refillable bottle closures to bottles containing whisky and other spirituous liquids at an average room temperature in the region of 60° Fahrenheit (15.5 degrees centigrade), but as the bottles in the course of transit or storage may be subjected to temperatures of 45° F. (7° C.) or even less, a vacuum may be formed between the liquid and the bottle stopper. This frequently causes the movable parts of the non-refillable bottle closure to adhere firmly together so that difficulty is experienced when it is desired to commence pouring out the liquid. Before pouring can commence, it is necessary to be able to break the vacuum by first admitting air into the bottle through the bottle stopper. It is one of the primary objects of the present invention to provide a bottle closure which will not only ensure against fraudulent refilling of the bottles and against contamination of the liquid by contact with cork, rubber or other substances which would affect the flavour, taste or aroma of the liquid, but also to provide a bottle closure which will permit the contents of the bottle to be poured even when a vacuum has been created in the bottle by the different temperatures to which the bottle and its contents have been subjected during transit and storage. This is of paramount importance where whisky and like spirituous beverages have to be shipped from temperature zones to hotter or colder climates.

A non-refillable bottle closure according to the present invention comprises a cup-shaped valve member having a bottom wall closing a main outlet aperture in the inner end of a valve casing inserted in the bottle neck, said bottom wall having a small central air inlet aperture, which is preferably countersunk to provide a seat for a small spherical valve, which may be a small glass ball, the said valve or ball being movably contained in the cup-shaped valve member so as to close said air inlet aperture, and a superposed weight, of substantially larger diameter than the small spherical glass ball or valve, is movably contained in the said valve casing and normally rests on and loads the small spherical glass ball or valve and also loads the cup-shaped valve member in the closed position. The weight is preferably spherical and also made of glass and may have a diameter equal to at least twice the diameter of the small spherical ball or valve.

According to a further feature of the invention, the weight or larger glass ball is movably contained between the prongs of a pronged member which is located in the upper end of the valve casing and is held in position by a nozzle member which forms a pouring spout, having an axial passage communicating through lateral openings in the upper part of the pronged member with the space around the weight or larger glass ball.

The pronged member may comprise a solid disc from the periphery of which the prongs project downwards in the valve casing, the disc being supported from a supporting flange by a tubular portion between the disc and flange and lateral openings being provided in the tubular portion to connect the interior of the valve casing with a central aperture in the said supporting flange, said aperture being coaxial with the axial passage through the

nozzle member. A shouldered portion of the nozzle member holds the flange in position on the rim of the bottle neck against a flange on the outer end of the valve casing, the nozzle member being secured in position in known manner by a thin sheet metal seal pressed around the shouldered portion of the nozzle member and around the bottle neck.

With the exception of the small spherical valve and the larger spherical weight, which are preferably made of glass, all the parts are preferably made of a transparent or translucent synthetic resin which is non-injurious to the flavour, taste and aroma of the spirituous beverage in the bottle.

Other features of the improved bottle closure are hereinafter described with reference to the accompanying drawings showing the preferred construction.

In the drawings:

FIG. 1 is a vertical sectional view through the bottle neck and closure device.

FIG. 2 is a side elevation of the pronged member.

FIG. 3 is a vertical sectional view of the cup-shaped valve member.

The drawing shows the neck 1 of a bottle which is internally formed with a cylindrical surface 2 to receive the outer cylindrical surface of a hollow cylindrically formed valve casing 3, which is a close fit in the bottle neck 1. The casing 3 has an upper external flange 4 which rests on a sealing ring 5 on the rim of the bottle mouth. The sealing ring 5 is preferably made of cork. The casing 3 is formed with an inwardly tapered wall 6 which is integral with a cylindrical extension 7 which projects into a narrower portion 8 of the bottle neck. The extension 7 forms a lower valve chamber and has a transverse bottom wall 9 with an upwardly turned inner lip 10 around a central opening 11. The lip 10 forms a valve seat for a movable cup-shaped valve member 12 (shown separately in FIG. 3) which has a flat bottom wall 13 in the centre of which is a small countersunk valve aperture 14. A small spherical glass ball valve 15 contained in the cup-shaped member 12 is adapted to seat in the countersunk end of the valve aperture 14. The inner cylindrical part of the cup-shaped member 12 is formed with a plurality of spaced inwardly projecting vertical ribs 16 whih act as guides for the small ball valve 15.

The tapered wall 6 of the valve casing 3 also has spaced inwardly projecting ribs 17 which are continued vertically downwards at 18 along the inside of the extension 7. The ribs 18 serve as spaced guides for the vertical outside wall of the cup-shaped member 12. A larger glass ball or weight 19 rests on the smaller ball valve 15 and on the ribs 17. When the bottle is tilted, the ball or weight 19 is received between prongs 20 projecting downwards from a pronged member which is shown separately in FIG. 2. This member comprises a flange 21 having a thickened part which forms a circular ridge or shoulder 22 and a tubular part 23 which has diametrically opposite lateral openings or slots 24 formed through it. The tubular part 23 ends below in a solid disc 25 from which the prongs 20 project, so that the ball or weight 19 is free to move between the lower ends of the prongs. A central opening 21*a* extends through the flange 21 and its thickened part 22. The flange 21 rests on the flange 4 of the valve casing 3 with the thickened part 22 engaging in the top of the valve casing 3.

A nozzle member 26 has a central axial passage 27 which registers with the opening 21*a* in the flange 21, so that the nozzle member forms a pouring spout for decanting the liquid from the bottle. The nozzle member 26 has a shouldered flange 28 which embraces both the flange 21 and the flange 4 which rests on the sealing ring 5.

When the parts are assembled as shown in FIG. 1, the bottle closure thereby formed is secured to the bottle neck in known manner by pressing a thin sheet metal shell **29** around the flange **28** and bottle neck so that the nozzle member **26** cannot be removed without breaking the seal formed by the thin metal shell **29**.

The nozzle member **26** is screw-threaded at its outer end at **30** to receive a screw-cap for sealing the bottle contents.

The solid disc **25** of the pronged member is preferably formed with a convex upper surface **31** to deflect a wire or other tool if inserted through the pouring spout with any fraudulent intention.

The spaced ribs **16** form channels between them through which air or the liquid contents of the bottle can flow when the small ball valve **15** moves away from the aperture **14**. Similarly, the spaced ribs **18** form channels between them through which air or the liquid contents of the bottle can flow when the bottom wall **13** of the cup-shaped valve member **12** is free to move away from the lip **10** of the aperture **11**, which can take place only when the small ball valve **15** is released from the pressure of the weight **19** by tilting the bottle.

The bottle is normally filled and stoppered at a temperature of about 60° F. (15.5° C.). When it is desired to decant the contents and a vacuum has formed, it is first necessary to tilt the bottle so that the weight **19** falls away from the small ball valve **15**. Air then enters through passage **27** and slots **24** into the space between the prongs **20** around the weight **19** and passes around the small ball valve **15**, the air entering the bottle through the small valve orifice **14**. As soon as the vacuum is broken, the air pressure balance allows the base **13** of the cup-shaped member **12** to lift away from the lip **10** so that, when the bottle is again tilted, the liquid pressure lifts the cup-shaped member **12** and allows the liquid to flow out through the aperture **11** into the spaces between the ribs **18** and into the space between the prongs **20** and from thence out through the slots **24** and outlet passage **27**.

The whole of the parts, with the exception of the cork ring **5** and glass balls **15** and **19**, may be made of artificial resin, such as polythene, polystyrene or other resinous product which will not have any adverse effect on the flavour, taste or aroma of the liquid.

I claim:

1. A non-refillable bottle closure comprising a tubular valve casing for insertion in a bottle neck, said casing having a main outlet aperture in its lower end, a cup-shaped valve member movable in said casing and having a bottom wall normally closing said aperture, said bottom wall having a small central air inlet orifice therein, a small spherical valve movably contained in said cup-shaped valve member and adapted to close said air inlet orifice, and a superposed weight contained in said valve casing and arranged to rest on and normally load said small spherical valve in closed position and to load also said cup-shaped valve member in closed position, tilting of the bottle closure releasing the loading of said weight on said small spherical valve and permitting said valve to open to admit air through said air inlet orifice to balance the air pressure on both sides of the bottom wall of said cup-shaped member, whereupon re-tilting of the bottle closure permits said cup-shaped member to lift to open said main outlet aperture for the escape of liquid into said valve casing from the bottle.

2. A ball closure according to claim 1 in which the weight is a spherical ball of substantially larger diameter than the small spherical valve.

3. A bottle closure according to claim 1 in which the weight is a spherical ball of substantially larger diameter than the small spherical valve and both the weight and valve are made of glass.

4. A non-refillable bottle closure comprising a tubular valve casing for insertion in a bottle neck, said casing having a main outlet aperture in its lower end, a cup-shaped valve member movable in said casing and having a bottom wall normally closing said aperture, said bottom wall having a small central air inlet orifice therein, a small spherical valve movably contained in said cup-shaped valve member and adapted to close said air inlet orifice, a pronged member located in the upper end of said valve casing and having a plurality of spaces downwardly projected prongs, a weight movably contained between said prongs and arranged to rest on and normally load said small spherical valve in closed position and to load also said cup-shaped valve member in closed position, and a nozzle member secured upon the upper end of said valve casing and holding said pronged member in position, said nozzle member having an axial passage communicating through openings in the upper part of said pronged member with the space between said prongs and around said weight so that said nozzle member forms a pouring spout.

5. A bottle closing according to claim 4 including a flange on the outer end of said valve casing for positioning on the rim of a bottle neck, the pronged member comprising a solid disc from which the prongs project, said discs being connected above by a tubular laterally-apertured neck portion to a centrally apertured annular member coaxial with the axial passage in the nozzle member, and said nozzle member having a lower shouldered portion which holds said annular member and the flange on the outer end of said valve casing in superimposed position on the rim of the bottle neck.

6. A bottle closure according to claim 1 in which the valve casing is of reduced diameter over the lower portion thereof within which the cup-shaped member is contained, said reduced lower portion of the valve casing having spaced vertical ribs between which said valve member is movably guided.

7. A bottle closure according to claim 1 including spaced vertical ribs projecting inwards from a cylindrical wall of said cup-shaped valve member, said small sperical valve being movably guided between said ribs.

8. A non-refillable bottle closure comprising a tubular valve casing having an upper end flange to rest on a sealing ring on the rim of a bottle neck and having a cylindrical body to fit closely into the bottle neck, said cylindrical body merging at its lower end into a cylindrical extension of smaller diameter than said body and said extension terminating below in a transverse annular bottom wall around a central outlet opening surrounded by an upwardly-turned inner lip which forms an annular valve seat, a movable cup-shaped valve member having a bottom wall seating on said lip and having a small central air inlet orifice therein, a small spherical valve movably contained in said cup-shaped member and adapted to seat on said orifice, a superposed weight movably retained in said cylindrical body and to press on said valve to hold it in closed position on said orifice, said weight also loading said cup-shaped member to hold the bottom wall thereof in closed position on said lip, a pronged member inserted in the outer end of said valve body and having prongs between which said weight is movably received, said prongs projecting downwards from a solid disc, a tubular connecting portion having lateral openings therein disposed between said solid disc and a centrally apertured flange, and a nozzle member having a central axial passage opening through said lateral openings into the interior space in said cylindrical body around said weight, said nozzle body having a shouldered portion which embraces both said flange and the flanged outer end of said cylindrical body, said shouldered portion resting on said sealing ring.

9. A bottle closure according to claim 8 in which the small spherical valve is made of glass.

10. A bottle closure according to claim 8 in which the small sperical valve is made of glass and the weight is a spherical ball of substantially larger diameter than the valve.

11. A bottle closure according to claim 8 in which the small spherical valve and the weight are made of glass, and the valve casing, cup-shaped valve member and the pronged member are all made of a synthetic resin having no contaminating effect on the liquid contents of the bottle.

12. A bottle closure according to claim 8 in which the small spherical valve is made of glass and the weight is a spherical glass ball of a diameter equal to at least twice the diameter of the spherical glass valve.

13. A bottle closure as specified in claim 8 including

spaced vertical ribs projecting inwards from a cylindrical wall of said cup-shaped valve member, said small spherical valve being movably guided between said ribs, and said cylindrical extension having spaced vertical ribs between which said cup-shaped valve member is movably guided, said last-mentioned ribs extending upwards and outwards in said valve casing towards said cylindrical body where they support said weight.

No references cited.