Aug. 2, 1966 H. HAGEN 3,263,849

NONREFILLABLE CLOSURE FOR CONTAINERS

Filed April 30, 1965

Fig. 1

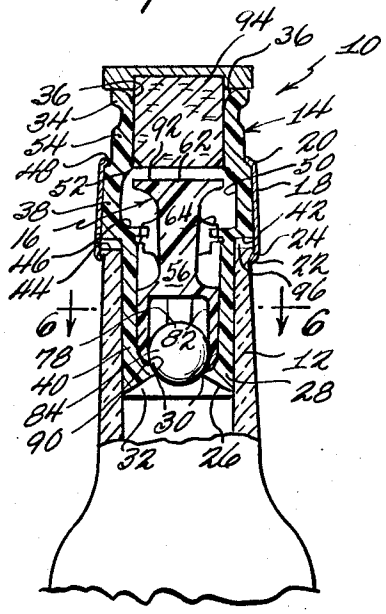


Fig. 2

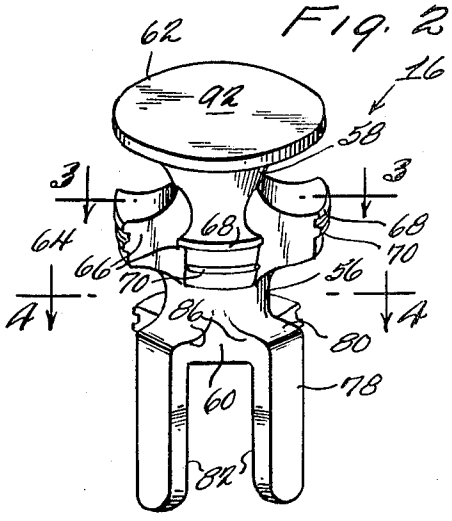


Fig. 3

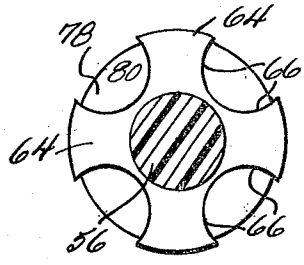
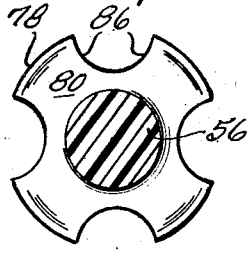


Fig. 4



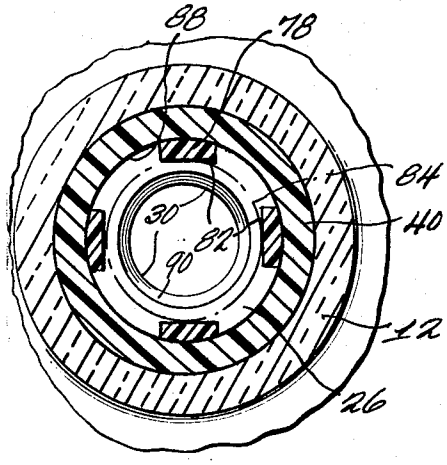
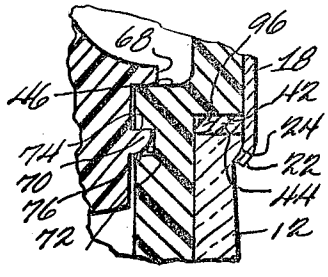


Fig. 6

Fig. 5



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NONREFILLABLE CLOSURE FOR CONTAINERS

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19 Claims. (Cl. 215—22)

This invention relates to a closure for containers and bottles and more particularly to a nonrefillable closure which makes the refilling of a container or bottle impossible, or at least most difficult.

The unauthorized refilling of low quality liquor into bottles marked with a trademark usually associated with high quality liquor is a problem which has plagued the liquor industry for a long time.

Broadly, therefore, it is an object of this invention to provide a practical closure for bottles which will prevent the unauthorized refilling of such bottles. There have been many attempts to provide such closures, but for one reason or another these closures have not been utilized. This invention overcomes a great many of these problems and provides a closure which is both simple and practical to use.

Broadly, it is an object of my invention to provide a closure comprising a hollow casing adapted to fit at least partially within the neck of a bottle, the hollow casing having an integral ball seat formed inwardly of the lower end of the casing; a valve member inserted within the casing, the valve member comprising a shaft having an upper and lower end, a disc integrally secured to the upper end of the shaft, a plurality of projections extending radially outwardly from the shaft intermediate the upper and lower ends thereof and defining first axial openings between each projection, a plurality of axially extending tines turned radially inwardly at their upper ends and integrally secured to the lower end of the shaft, the tines and radial portions thereof forming a cage, the radial portion of the tines defining second axial openings between each radial portion of the tines, each first opening being aligned with a tine so as to divert the liquid through the valve member in an irregular path and so as to prevent a wire from being inserted straight through the first and second openings; a ball member positioned within the cage and retained at least partially therein by the ball seat of the hollow casing; and means for securing the casing within the neck of the bottle.

One common feature which many of the closures in the prior art have is the fact that it is necessary to shake the bottle in order to dispense the liquid. It is an object of this invention, however, to provide a closure which allows a steady stream of liquid to be dispensed from the bottle without shaking the contents out of the bottle. The closure is designed to allow the proper amount of air to pass into the container as the liquid is being poured smoothly out of the container.

It will be appreciated that the liquid must follow an irregular path in order to prevent wires from being inserted into the bottle through the dispensing passageway. Such an irregular path often causes turbulence in pouring the liquid from the container which is undesirable. Accordingly, it is another object of this invention to provide means to minimize the turbulence of the liquid being dispensed. One such means involves the valve member being located at a position axially disposed from the end of the casing so that the liquid has an opportunity to dampen its turbulence and form a smoothly pouring stream. Furthermore, the outwardly flared lip of the case provides a practical and ideal pouring lip which minimizes the tendency of the liquid to drip.

The nonrefillable feature of the closure is primarily provided by the valve member which fits into the casing defining the dispensing passageway. The valve member

houses a ball member or valve which cooperates with a ball seat formed by the casing and prevents liquid from being poured into the bottle when it is in an upright position. The ball valve moves away from the ball seat within the cage formed by the valve member when the bottle is inverted. The cage only allows axial movement of the ball valve so that it would be impossible to dispose the ball valve laterally from its seat so that liquid could be poured directly into the bottle. Thus, it is seen that the only way in which liquid could be poured into the bottle is to lift the ball valve axially up from its seat.

However, it is an object of this invention to construct the valve member in such a manner that it is impossible to insert a wire through the valve member for engaging the ball member. Essentially, the wire is prevented from entering into the bottle by means of an irregular dispensing path formed through the valve member. Such an irregular path is defined by having two sets of openings formed by a plurality of radial projections extending from the valve member and being axially disposed from each other. The openings are so positioned that no opening is axially aligned with any other opening. Furthermore, the dispensing path is radially disposed at one position within the valve member.

It is also an object of this invention to provide locking means for holding the valve member in the casing, as well as locking means for holding the casing within the neck of the bottle.

It is a further object of this invention to provide a closure which can be easily assembled at the factory and which is inserted in the neck of the bottle from the top of the bottle so that the bottles can be filled before the closure is put in place. Inasmuch as the valve member is axially disposed from the outer end of the casing, a cork can be inserted into the outer portion of the casing to provide an attractive closure.

It is appreciated that the closure comprises only a fraction of the cost of the bottle of liquor, and, accordingly, the manufacturers thereof are not interested in increasing the cost of this relatively inexpensive item above that which would be reasonable for the type of protection that the liquor supplier is getting with a closure of this type. It is an object of this invention to provide a closure which is practicable and, accordingly, attractive to the bottling industry. The simplicity of this closure is its most attractive feature, the closure having only four parts: the casing, the valve member, the ferrule and a ball valve. By moulding the casing and valve member out of plastic, a cheap, yet attractive, closure is provided which is easy to assemble and which has only one moving part, namely the ball valve.

These and other objects of this invention are more clearly depicted in the following detailed description having specific reference to the attached drawings in which the embodiments of the invention are shown, not to limit the scope of the invention in any respect, but so that the principles thereof might be more clearly demonstrated.

In the drawings:

FIGURE 1 is a sectional side elevational view showing the closure inserted in the bottle neck;

FIGURE 2 is a perspective view of the valve member;

FIGURE 3 is a plan view taken substantially along the lines 3—3 of FIGURE 2;

FIGURE 4 is a plan view taken substantially along the lines 4—4 of FIGURE 2;

FIGURE 5 is an enlarged fragmentary side elevational view of the securing or locking means between the valve member and casing; and

FIGURE 6 is a plan view taken substantially along the lines 6—6 of FIGURE 1 with the ball member shown

in phantom lines and showing the bottle and closure in its entirety.

FIGURE 1 shows the nonrefillable bottle closure **10** inserted in the neck **12** of a bottle. Basically, the closure **10** comprises a hollow annular casing **14** and a valve member **16** inserted within the hollow casing. The hollow casing is secured within the neck of the bottle by means such as an annular ferrule **18** having an upper end **20** which engages the casing and a lower end **22** which engages the outer surface **24** of the bottle neck **12** so as to lock the casing at least partially within the bottle neck.

The hollow casing **14** has an annular projection **26** formed at its lower end **28** which extends radially inwardly thereof and defines a valve seat having an opening **30** extending axially therethrough. The lower peripheral edge **32** of the casing and hence the annular projection is preferably inwardly recessed to aid in directing the contents of the bottle into the hollow casing. The upper end **34** of the casing terminates in an upper peripheral edge **36** preferably outwardly flared to form a smooth pouring lip.

Intermediate its upper end **34** and lower end **28**, the casing has an intermediate or outwardly disposed portion **38** which is outwardly disposed with respect to the lower portion **40** of the casing. The lower annular surface **42** of the outwardly disposed portion is preferably substantially flat to form a downwardly facing ledge adapted to sit on the upper end **44** of the bottle neck **12** with the lower portion **40** extending into the neck of the bottle. It will be seen that the lower portion has an outer diameter substantially equal to the inner diameter of the neck of the bottle. Furthermore, the lower portion **40** has an upper annular surface **46** which is preferably substantially flat and forms an upwardly facing ledge. The intermediate or outwardly disposed portion **38** has an upper annular surface **48** which is engaged by the upper end **20** of the ferrule **18** in the preferable embodiment of the invention. The inner surface **50** of the intermediate portion is upwardly and inwardly flared at its upper end **52** to merge integrally with the upper portion **54** of the casing. The gradual flaring of the upper end **52** of the inner surface **50** minimizes the turbulence of the liquid as it is poured from the bottle.

As illustrated in FIGURES 1 through 6, the valve member **16** comprises a shaft **56** having an upper end **58** and a lower end **60**. A disc or button **62** is integrally secured to the upper end **58** of the shaft. Preferably, the shaft is outwardly flared at its upper end to engage the disc so as to minimize the turbulence of the liquid as it is poured from the bottle. At a position intermediate the upper and lower ends of the shaft a plurality of preferably symmetrical projections **64** extend radially outwardly from the shaft and define first axially openings **66** therebetween.

Each projection **64** preferably has a lug **68** projecting outwardly therefrom, preferably at the upper end of the projection **64**. The lug is adapted to be seated on the upwardly facing surface or ledge **46** of the lower portion **40** of the casing so as to support the valve member within the casing and prevent axially inward movement thereof. In order to prevent axially outward movement of the valve member, a plurality of snap-ring segments **70** are integrally formed with the projections **64** and extend radially outwardly therefrom. The snap-ring segments **70** are received in a snap-ring groove **72** formed internally of the casing adjacent the upper end of the lower portion **40** of the casing. As illustrated in enlarged detail in FIGURE 5, the snap-ring segments have a substantially flat upper surface **74** and a tapered lower surface **76**. The tapered lower surface **76** of the snap-ring segments enable the segments to be snapped into the snap-ring groove, while the flat upper surface prevents the segments from being removed from the corresponding groove without being broken. In one operative

example, the snap-ring segments extended radially outwardly approximately .003 inch and are received in a snap-ring groove approximately .005 inch deep. While the snap-ring segments and the snap-ring groove represent the preferable locking means, it is readily apparent that other common locking means could be used. Inasmuch as the valve member and casing are formed separately in the preferred embodiment of the invention, the locking means should enable the valve member to be inserted and locked within the casing without being removed in a manner other than that which would cause breakage of the closure.

A plurality of preferably symmetrical, axially extending tines **78** turned radially inwardly at their upper ends **80** to form radial portions are integrally secured through the radial portions **80** to the lower end **60** of the shaft. The radial portions **80** of the tines **78** are connected at their inner ends to the lower end of the shaft and form outwardly extending radial projections with the major portion of the tines forming axial projections extending axially away from the upper end of the shaft. The tines and radial portions thereof form a cage **82** which houses a ball member **84**. The radial portions **80** of the tines **78** define second axial openings **86** extending therebetween.

As seen more specifically in FIGURES 3 and 4, the first axial openings **66** defined by the radial projections **64** and the second axial openings **86** defined by the radial portions **80** of the tines **78** have a definite angular relationship to each other. The first and second openings, **66** and **86**, are axially misaligned so that the liquid passing through the valve member will have to follow an irregular path. Accordingly, the first opening **66** is axially aligned with the tines **78** and radial portions **80** thereof, and the second openings **86** are axially aligned with the radial projections **64**. The misalignment of the first and second openings will prevent a wire from being inserted straight through the valve member to engage the ball member.

As seen in FIGURE 6, there are preferably four symmetrically spaced tines which are contiguous with the inner surface **88** of the lower portion **40** of the casing when the valve member **16** is inserted in the casing **14**. The inner diameter of the tines **78** and hence the diameter of the cage **82** is approximately equal to the diameter of the ball member **84** so that the ball member cannot be pushed to one side or another. Furthermore, it will be seen that the opening **30** formed by the annular projection **26**, and defined more particularly by the radially inner edge **90** of the annular projection which is configured to engage the curved surface of the ball, has a diameter smaller than the diameter of the ball so as to maintain the ball at least partially within the cage. Thus the ball member sits upon the seat defined by the inner edge **90** and prevents liquids from being poured into the bottle. Likewise, it will be seen that the tines **78** and hence the cage **82** have a length greater than the diameter of the ball so as to permit axial movement of the ball within the cage and away from its seat formed by the inner edge **90** of the annular projection **26**. When the bottle and closure are inverted so that the ball will move axially away from the seat, liquid will flow through the opening **30** and valve member so as to be dispensed from the closure. The ball is preferably made of metal so that it will be heavy enough to be retained in its seated position unless the bottle is tipped into an inverted position.

The outer radial extensions of the disc **62**, radial projections **64**, and the tines **78** or radial portions **80** thereof are approximately coextensive so that their radially outer ends are axially aligned. Naturally if the radial projections and tines are contiguous with the inner surface of the casing and the casing has a constant cross-sectional area, the liquid would be unable to pass through the valve member because the disc has no holes. While it might be entirely possible to form holes in the disc, it is preferable to have a casing which is radially outwardly dis-

posed at at least one portion thereof. As illustrated, the intermediate portion **38** is outwardly disposed, and accordingly the valve member is secured within the casing so that the disc is axially aligned with the outwardly disposed portion to enable liquid to pass around the disc.

It will be seen because of the special construction of this valve member that the flow of liquid from the bottle not only assumes two different axial paths because of the misalignment of the first and second openings but it also assumes a radially disposed path in order to pass around the disc. Accordingly, such an irregular path makes it extremely difficult to force a wire through the valve member in order to tamper with the ball member. Because it is necessary for the disc to be axially aligned with the outwardly disposed portion **38** of the casing, it is seen that the upper surface **92** of the disc **62** is axially inwardly disposed from the upper end **34** of the casing since the outwardly disposed portion is positioned intermediately between the upper and lower ends of the casing. The axial disposition of the upper surface of the disc from the upper end of the casing also has another significant purpose in that it allows the turbulence of the liquid to be dampened or minimized before being poured from the bottle closure. It is preferable to have the disc axially inwardly disposed by at least one inch from the upper end of the casing.

The inwardly disposed position of the disc also enables a cork **94** to be placed within the upper end of the casing. Furthermore, the fact that the upper end **34** of the casing terminates in the preferable embodiment of the invention in an outwardly flared upper peripheral edge enables the cork to be securely positioned within the upper portion of the casing. The cork shown is the usual type of liquor-bottle cork although it will be appreciated that the cork could be slightly tapered. Furthermore, while the use of a cork is shown in the preferable embodiment of the invention, it is also within the scope of the invention to use any kind of cap means which would be detachably secured in some manner to the casing. It is also within the scope of the invention to position an annular washer **96** between the upper end **44** of the bottle neck **12** and the lower surface **42** of the outwardly disposed portion **38** of the casing. The washer provides an effective sealing means between the casing and the upper end of the bottle neck.

The casing and valve member are preferably made of plastic so that the major part of the closure can be inexpensively molded with the result that an economically feasible closure is provided.

While a preferred form of the invention has been illustrated in the drawings and discussed above, it should be adequately clear that considerable modification may be made thereto without departing from the principles of the invention. Therefore, the foregoing should be considered in an illustrative sense rather than a limiting sense, and accordingly the extent of this invention should be limited only by the spirit and scope of the claims appended hereto.

I claim:

1. A nonrefillable bottle closure comprising:

a hollow casing adapted to fit at least partially within the neck of a bottle, the hollow casing having an integral ball seat formed inwardly of the lower end of the casing;

a valve member inserted within the casing, the valve member comprising a shaft having an upper and lower end, a disc integrally secured to the upper end of the shaft, a plurality of projections extending radially outwardly from the shaft intermediate the upper and lower ends thereof and defining first axial openings between each projection, a plurality of axially extending tines turned radially inwardly at their upper ends and integrally secured to the lower end of the shaft, the tines and radial portions thereof forming a cage, the radial portion of the tines defining second axial openings between each radial portion of the tines, each first opening being aligned with a tine so as to divert the liquid through the valve member in an irregular path and so as to prevent a wire from being inserted straight through the first and second openings;

a ball member positioned within the cage and retained at least partially therein by the ball seat of the hollow casing; and

means for securing the casing within the neck of the bottle.

2. The nonrefillable bottle closure defined in claim **1** wherein the upper peripheral edge of the casing is outwardly flared to form a smooth pouring lip.

3. The nonrefillable bottle closure defined in claim **1** wherein the upper surface of the disc is axially inwardly disposed from the upper end of the casing.

4. The nonrefillable bottle closure defined in claim **3** wherein the upper surface of the disc is axially inwardly disposed by at least one inch from the upper end of the casing.

5. The nonrefillable bottle closure defined in claim **1** wherein the lower peripheral surface of the casing is inwardly recessed to aid in directing liquid into the hollow casing.

6. The nonrefillable bottle closure defined in claim **1** wherein the ball seat comprises an annular projection extending radially inwardly and defining an opening axially therethrough, the opening having a smaller diameter than the ball member so as to be closed by the ball member.

7. The nonrefillable bottle closure defined in claim **1** wherein the casing, intermediate its two ends, has an outwardly disposed portion with respect to its lower portion, the lower surface of the outwardly disposed portion being substantially flat to form a downwardly facing ledge and being adapted to sit upon the upper end of the bottle, the lower portion extending into the neck of the bottle.

8. The nonrefillable bottle closure defined in claim **7** additionally comprising an annular washer positioned between the upper end of the bottle and the downwardly facing ledge of the casing.

9. The nonrefillable bottle closure defined in claim **1** wherein the shaft flares outwardly at its upper end to engage the disc for minimizing the turbulence created as the liquid follows an irregular path in being poured from the bottle.

10. The nonrefillable bottle closure defined in claim **1** additionally comprising means to secure the valve member within the casing, the securing means being secured to the plurality of radial projections.

11. The nonrefillable bottle closure defined in claim **10** wherein the casing, intermediate its two ends, has an outwardly disposed portion with respect to the lower portion of the casing, the upper surface of the lower portion being substantially flat and forming an upwardly facing ledge and additionally comprising a plurality of lugs projecting outwardly from the radial projections, the lugs being seated upon the upwardly facing ledge.

12. The nonrefillable bottle closure defined in claim **10** additionally comprising a plurality of snap-ring segments formed integrally with and projecting from the radial projections and wherein the casing has a snap-ring receiving groove formed internally thereof for receiving the snap-ring segments and locking the valve member within the casing.

13. The nonrefillable bottle closure defined in claim **1** wherein the valve member has four symmetrical radial projections and four symmetrical tines.

14. The nonrefillable bottle closure defined in claim **1** additionally comprising an annular ferrule engaging the casing at its upper end and the outer surface of the neck of the bottle at its lower end so as to lock the casing at least partially within the neck of the bottle.

15. The nonrefillable bottle closure defined in claim **1**

wherein the cage formed between the tines has an axial length greater than the diameter of the ball so as to permit axial movement of the ball away from the ball seat of the casing when the closure is inverted.

16. The nonrefillable bottle closure defined in claim **1** wherein the casing and valve member are plastic.

17. The nonrefillable bottle closure defined in claim **1** wherein the outer radial extensions of the disc, radial projections, and tines are approximately coextensive.

18. A nonrefillable bottle closure comprising:

a plastic hollow casing adapted to fit at least partially within the neck of a bottle, the casing having an annular projection at its lower end extending radially inwardly thereof and defining an opening axially therethrough, and the casing, intermediate its two ends, having an outwardly disposed portion with respect to its lower portion, the lower surface of the outwardly disposed portion being substantially flat to form a downwardly facing ledge adapted to sit upon the upper end of the bottle with the lower portion extending into the neck of the bottle and the upper surface of the lower portion being substantially flat and forming an upwardly facing ledge, the lower portion of the casing having a snap-ring receiving groove formed internally thereof adjacent the upper end of the lower portion;

a plastic valve member inserted within the casing, the valve member comprising a shaft having an upper and lower end, a disc integrally secured to the upper end of the shaft, a plurality of symmetrical projections extending radially outwardly from the shaft intermediate the upper and lower ends thereof and defining first axial openings between each projection, a lug projecting outwardly from each radial projection and being seated upon the upwardly facing ledge of the lower portion of the casing, a snap-ring segment formed integrally with and projecting from each radial projection;

the snap-ring segments being received in the snap-ring groove of the lower portion of the casing for locking the valve member within the casing at a position

in which the upper surface of the disc is axially inwardly disposed from the upper end of the casing, a plurality of symmetrical axially extending tines turned radially inwardly at their upper ends and integrally secured to the lower end of the shaft, the tines and radial portions thereof forming a cage, the radial portion of the tines defining second axial openings therebetween, each second axial opening being aligned with a radial projection so that the liquid passing through the valve member will be diverted in an irregular path and so that a wire will be prevented from being inserted straight through the first and second openings;

a ball positioned with the cage, the ball having a greater diameter than the opening defined by the annular projection at the lower end of the casing so as to be retained at least partially within the cage, and the cage having an axial length greater than the diameter of the ball so as to permit axial movement of the ball away from the annular projection forming its seat; and

an annular ferrule engaging the casing at its upper end and the outer surface of the neck of the bottle at its lower end so as to lock the casing at least partially within the neck of the bottle.

19. The nonrefillable bottle closure defined in claim **18** additionally comprising an annular washer positioned between the upper end of the bottle and the downwardly facing ledge of the casing.

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