



US 20220097929A1

(19) **United States**

(12) **Patent Application Publication**
LALIER

(10) **Pub. No.: US 2022/0097929 A1**

(43) **Pub. Date: Mar. 31, 2022**

(54) **PLUG CLOSURE**

(52) **U.S. Cl.**

(71) Applicant: **Conopco, Inc., d/b/a UNILEVER**,
Englewood Cliffs, NJ (US)

CPC **B65D 47/0838** (2013.01); **B65D 2547/063**
(2013.01)

(72) Inventor: **Gregory LALIER**, Brookfield, CT
(US)

(57) **ABSTRACT**

(73) Assignee: **Conopco, Inc., d/b/a UNILEVER**,
Englewood Cliffs, NJ (US)

A closure (10), especially useful for e-commerce. The closure comprises a lid (16) and a cap base (12) which can be releasably fastened to a container, the cap base including an opening (24). The lid has a depending plug (26) extending therefrom which is received within the opening in the cap base when the lid is in the closed position. The opening is formed within a cylindrical opening wall (88). When the lid is in its open position, extending outwardly from the depending plug at its end distal from the lid are one or more barb flaps (82). As the lid is moved to its closed position with the depending plug within the cylindrical opening wall, the barbs are pushed up against the walls of the plug and are received within a recess in the cylindrical opening wall. Within the recess, the bar flaps abut an upper wall of the recess (40) such that extra force is required to open the lid, e.g., during shipping. When the consumer wishes to open the lid, he or she exerts the extra force needed to force the lid open, which causes the barb flaps to assume their original positions extending outwardly from the cylindrical plug.

(21) Appl. No.: **17/428,489**

(22) PCT Filed: **Jan. 7, 2020**

(86) PCT No.: **PCT/EP2020/050230**

§ 371 (c)(1),

(2) Date: **Aug. 4, 2021**

(30) **Foreign Application Priority Data**

Feb. 5, 2019 (EP) 19155612.5

Publication Classification

(51) **Int. Cl.**

B65D 47/08 (2006.01)

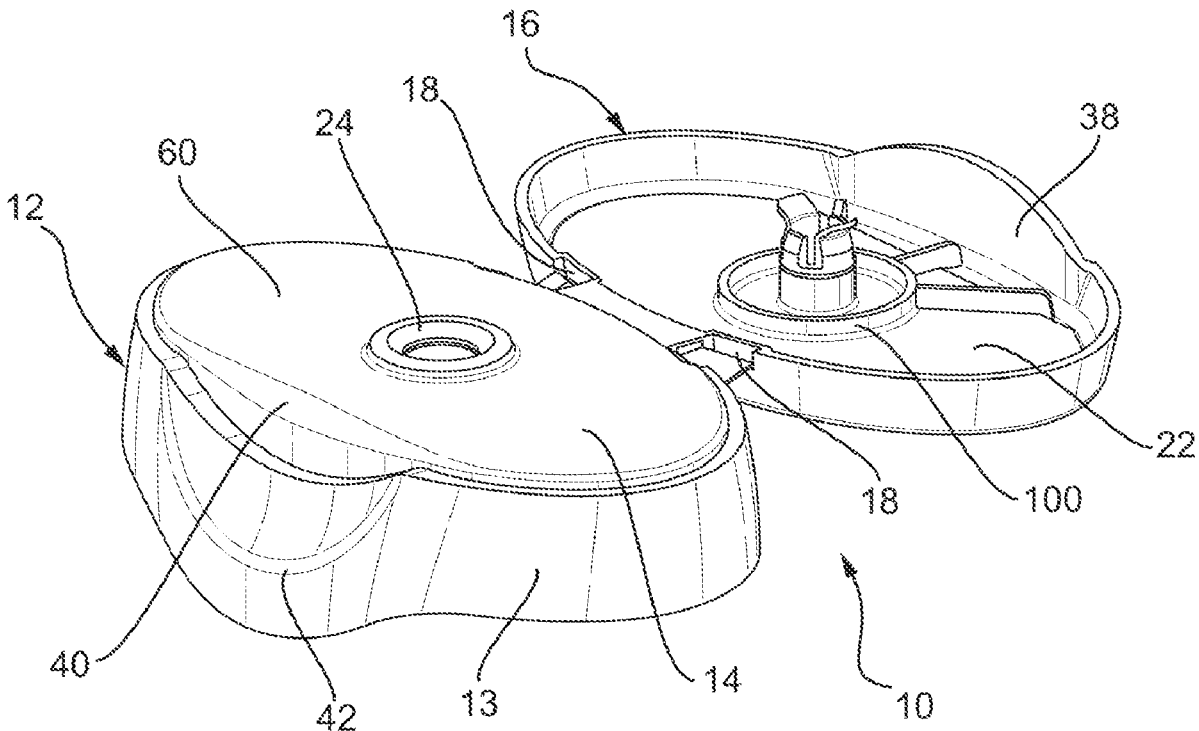


Fig. 1

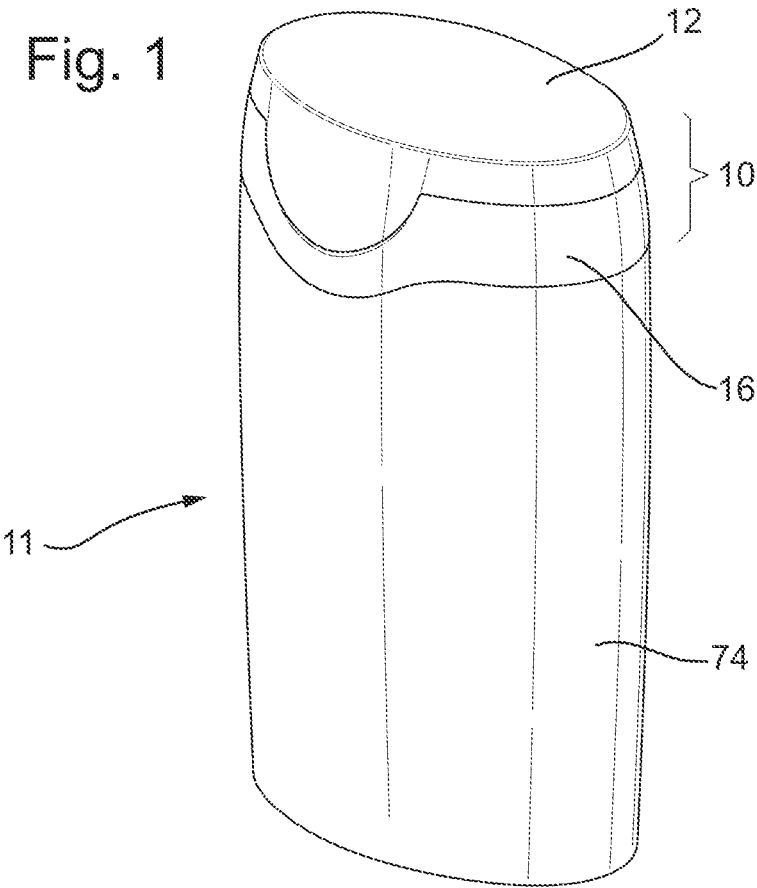


Fig. 2

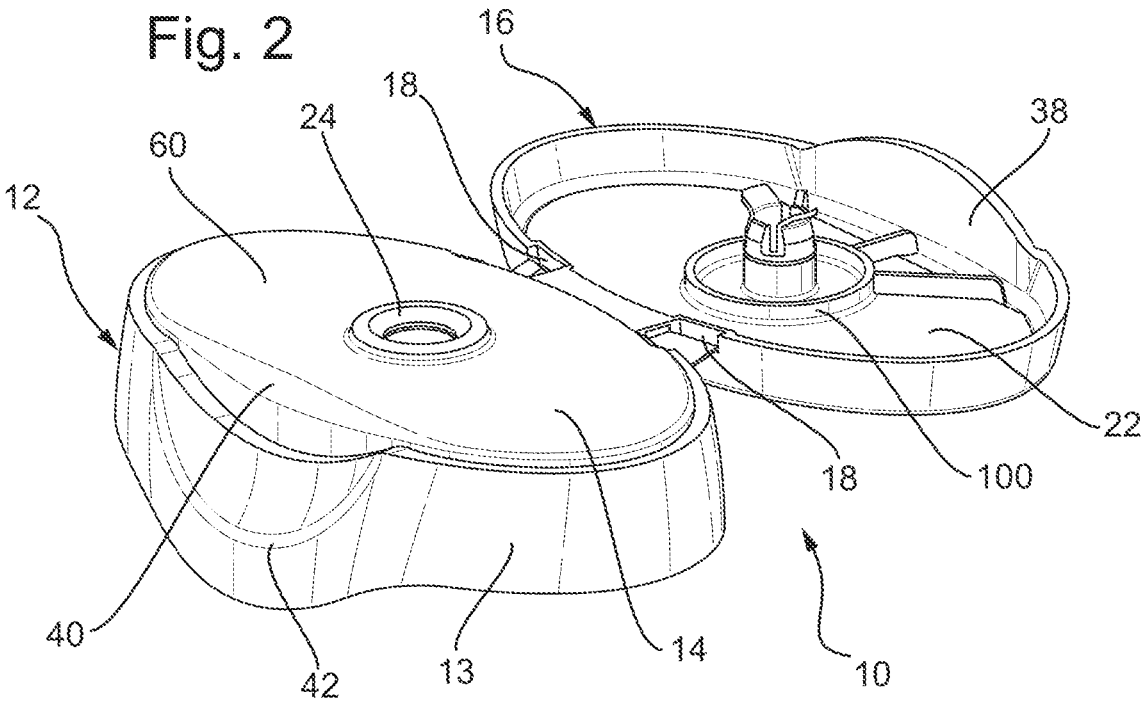


Fig. 3

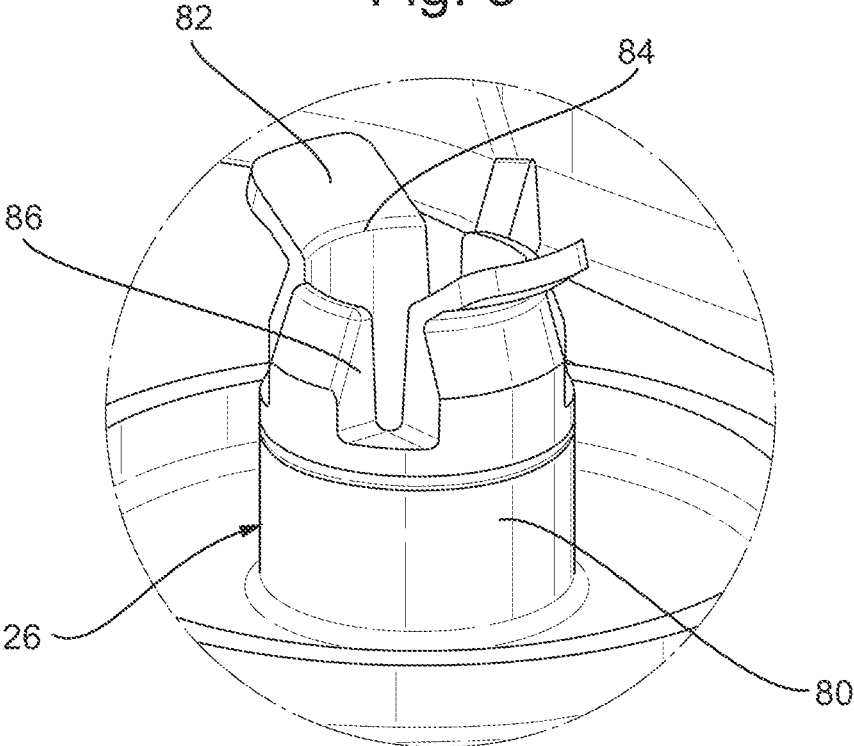


Fig. 4

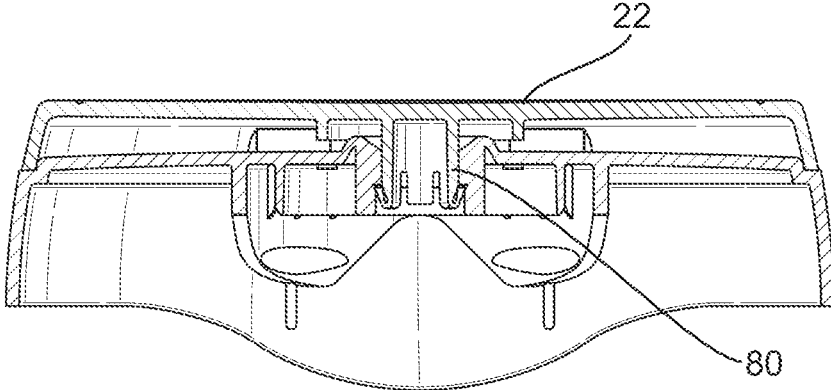


Fig. 5

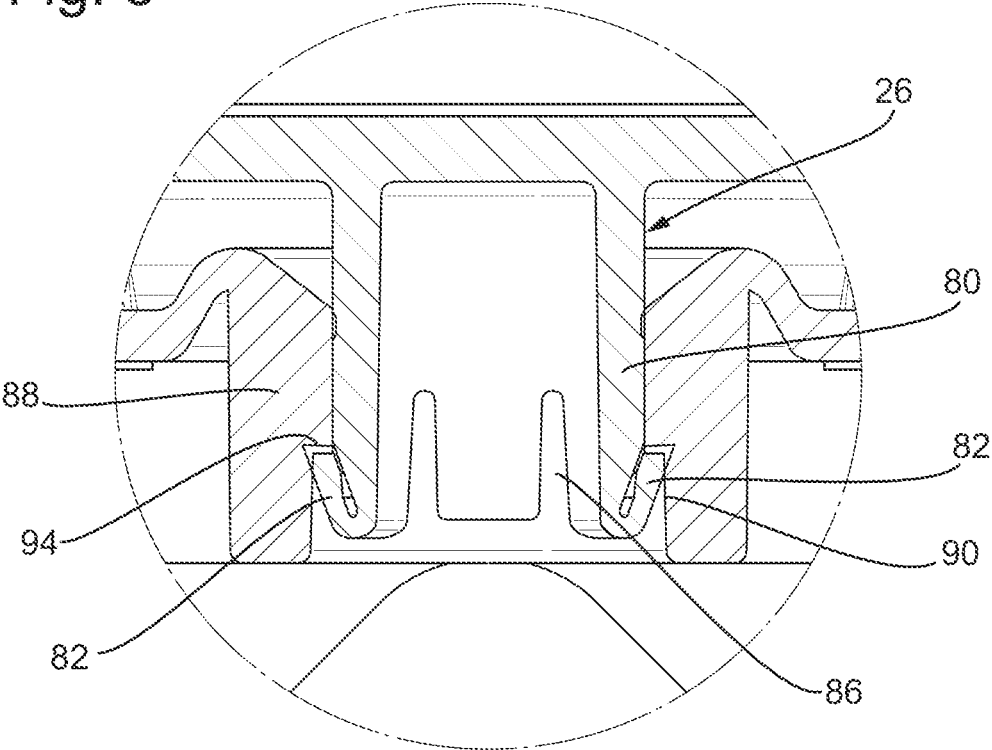


Fig. 6

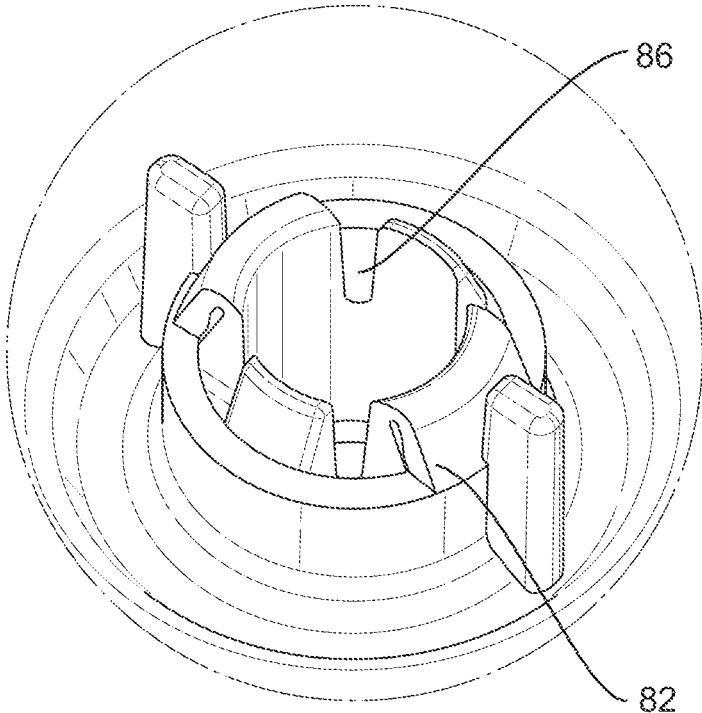
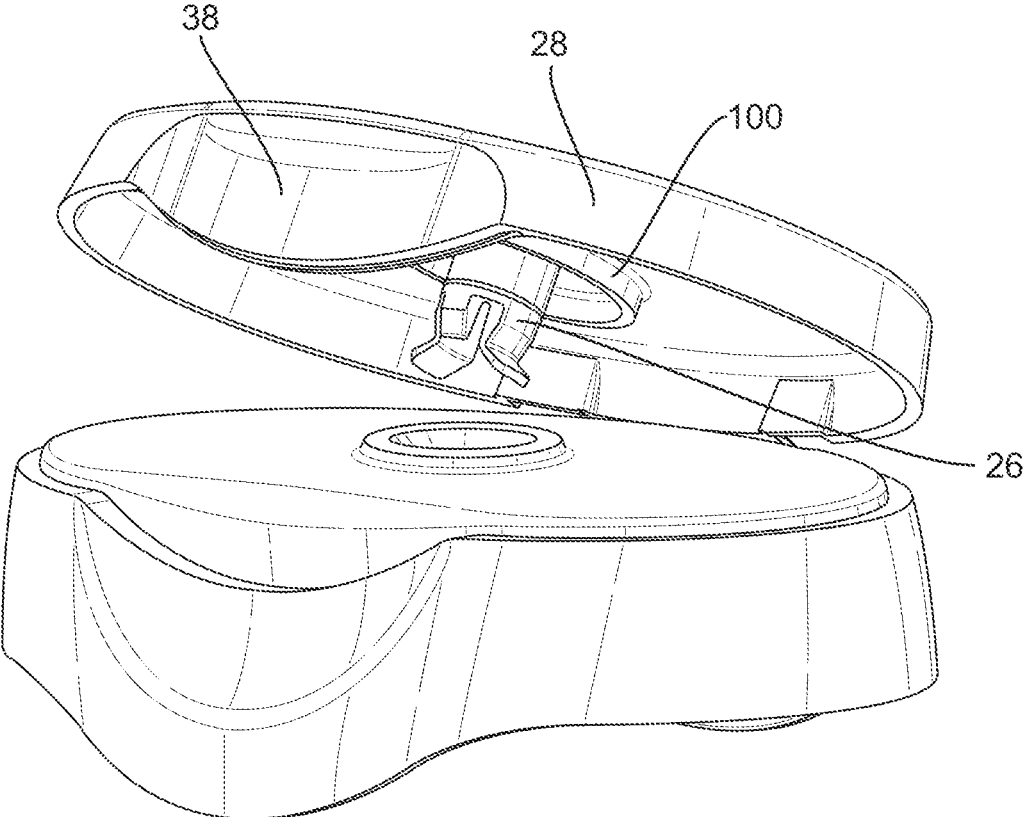


Fig. 7



PLUG CLOSURE

BACKGROUND OF THE INVENTION

[0001] Leakage of product during shipping of consumer goods can be a costly problem. The problem is particularly acute in the realm of e-commerce where individual bottles may be shipped directly to consumers. It is somewhat easier to ensure intact shipment of large numbers of bottles together from a manufacturer to a distributor and/or retailer than it is to secure the product from leakage during shipment of individual bottles to consumers. Likewise, transport of a container by a consumer after it has been opened can be an issue and result in product leakage.

[0002] One type of closure for consumer goods such as shampoos, body washes, skin creams, etc. is the flip top closure which typically comprises two pieces, a base piece which is attached directly to the container, and a cap which is hinged attached to the base and which rotates between an open and a closed position. While it is important that the consumer can remove the cap from the base without use of Herculean strength, it is also important that the cap not open due to forces generally encountered in shipping.

[0003] Various types of closures are described in the literature.

[0004] Delli Venneri US 2007/075030 discloses a closure having a hinged lid connected to a base. The closure includes a latching mechanism which includes a pin having a bead which is said to engage in the manner of a barb behind an edge in the dispensing opening.

[0005] Suffa US 2006/231518 is directed to a closure cap having a lower part and an upper part connected by a hinge. A stopper is located on an underside of the closure cap. The stopper may include an annular collar which interacts with a corresponding annular groove in a connection piece. Or it may include longitudinal ribs which in the closed position of the closure cap come in contact with a top side of a holding part and act as retention means.

[0006] Kunz, WO 03/086891 discloses a snap action hinged closure. A sealing cylinder includes a sealing bead 43.

SUMMARY OF THE INVENTION

[0007] The invention is directed to a closure, especially useful for e-commerce and to the closure combined with a bottle or other container. Indeed, the base of the closing can be integral with the container.

[0008] The closure comprises a cap base which can be releasably fastened to a container, the cap base including an opening. A cap is movably attached to the cap base and is suitable, when it is in a closed position, for preventing egress of a liquid from the container through the cap base opening. Portions of the cap base constitute a barrier which together with the cap are suitable for preventing egress of the liquid from the container.

[0009] The cap has a depending plug extending therefrom which is received within an opening in the cap base when the cap is in the closed position. The opening is formed within a cylindrical opening wall. When the cap is in its open position, extending outwardly from the depending plug at its end distal from the cap are one or more barb flaps. As the cap is moved to its closed position with the depending plug within the cylindrical opening wall, the barbs are pushed up against the wall of the plug and are received within a recess

in the cylindrical opening wall. The barb flaps abut an upper wall of the recess such that extra force is required to open the cap, e.g., during shipping.

[0010] When the consumer wishes to open the cap, he or she exerts the extra force needed to force the cap open which causes the barb flaps to dislodge from their position abutting the upper access wall and eventually to assume their original positions extending outwardly from the cylindrical plug.

[0011] When the cap is closed it is further secured by a locking flap on the cap which snaps into and is received within a recess on the cap base.

[0012] The cap is preferably attached to the cap base using a living hinge. Likewise, the barb flaps are preferably attached to the plug cylinder wall using living hinges.

[0013] For a more complete understanding of the above and other features and advantages of the invention, reference should be made to the following detailed description of preferred embodiments and to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is perspective view of a bottle having the closure of the invention.

[0015] FIG. 2 is a perspective view of the closure of the invention removed from a container and having the cap in the open position.

[0016] FIG. 3 is a perspective, magnified view of the depending plug of the invention seen in FIG. 2.

[0017] FIG. 4 is a cross section of the closure.

[0018] FIG. 5 is a cross section according to FIG. 4 with the depending plug and adjacent structure in the closure base magnified.

[0019] FIG. 6 is a perspective view of the depending plug in the closed position with portions of the closure base cut away.

[0020] FIG. 7 is a perspective view of the closure of the invention with the cap partly open.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Closure 10 comprises cap base 12 and cap 16. Cap base 12 includes top surface 14 and cylindrical skirt 13 depending from the top surface. Skirt 13 includes semicircular recess 40, which is shaped to receive a locking flange on the cap, as will be explained hereinafter. Below recess 40 and is finger access recess 42 which permits the consumer readily to unlock cap 16.

[0022] Cap 16 is movable and pivotably attached to cap base 12 by living hinges 18. Placing cap 16 in the open position reveals opening 24 in top wall 60 of cap base 12. It will be apparent that top wall 60 will constitute a barrier to egress of liquid from a package to which closure 12 has been fastened. Cap 16 includes platform 22. Platform 22 includes depending cylindrical plug 26. Cap cylindrical sidewall 28 depends from platform 22.

[0023] Plug 26 includes cylindrical wall 80 depending from the underside of lid 16. At the end of wall 80 opposite that at which it is attached to cap 16 are two barb flaps 82. Although the invention is illustrated herein as having two barb flaps those of ordinary skill could readily determine whether other numbers would be preferred in a particular application, e.g., one, three, four, etc. Barb flaps 82 are connected to cylindrical wall 80 by thin plastic hinges 84 which permit the flaps to move relative to cylinder wall 80.

Preferably, when in the cap-open position, barb flaps **82** are disposed at an angle to the cylindrical wall, e.g., of about 45-90 degrees to the longitudinal axis of the plug for the right hand flap seen in FIG. 3., especially from 65 to 80 degrees.

[0024] Cylindrical wall **80** includes longitudinal slits **86** which permit the diameter of the wall to decrease as needed to fit snugly within opening **24** and wall **88**. Cylindrical plug **26** is surrounded by sealing ring **100**.

[0025] At the opposite end to that at which it is attached with living hinges **18**, cap sidewall **28** includes a recessed locking flange **38**. When cap **16** is closed, locking flange **38** snaps into and is received within recess **40** to help lock the lid **16** closed.

[0026] Opening **24** in base **14** is defined by cylindrical wall **88**. Cylindrical wall **88** includes at its end distal to the opening a recess **90**.

[0027] The cap is seen in the open position in e.g., FIG. 2 and the cylindrical plug **26** is shown in FIG. 3 in the cap's open configuration. When the consumer wishes to close the package, he rotates the cap closed on hinges **18**. As cylindrical wall **80** approaches opening **24**, barb flaps **82** contact cylindrical wall **88** and are bent toward wall **80**. When cap **16** is fully closed, barb flaps **82** are accommodated within recess **90**, preferably at an angle of 100-180 degrees, as seen in FIG. 5, especially from 110-175 degrees, most preferably from 120-170 degrees again with respect to the longitudinal axis of the plug.

[0028] During shipment of the package, or when being transported by the consumer, e.g., during travelling, the presence of flaps **82** within recess **90** and abutting upper wall **94** of recess **90** increase the amount of force which would be needed to open cap **16** thereby minimizing the likelihood of inadvertent opening.

[0029] The consumer will receive package **11** including closure **10** and bottle **74**. To open the package, the consumer inserts his or her finger into recess **42** and lifts upwardly to pull flange **38** up out of recess **40** and open lid **16**. The consumer exerts the extra force needed to overcome the resistance caused by the abutment of flap **82** against upper wall **94**, thereby causing flaps **82** to turn downwardly away from cap platform **22** permitting cylindrical wall **80** to be moved upwardly through opening **24** as cap **16** is opened. When cap **16** has been opened and plug **26** is removed from opening **24**, flaps **82** will, due to the resiliency of the hinge line **84**, return to the angle shown in FIG. 3.

[0030] Typically, the closure **10** of the invention will be fastened to bottle **74** or other container, as is evident from FIG. 1. Fasteners (not shown) will typically be present on the underside of the closure and may include screws or snap fit mechanisms such as debossments, embossments, etc. Mating screws or other fastening structures can be present on the bottle neck.

[0031] During shipping of the bottle with the closure fastened thereto, cap **16** and locking flange **38** are in their closed, locked positions, such as may be seen in FIG. 1. In its closed position, locking flange **38** is received within recess **40** and cylindrical plug **26** is tightly and lockingly releasably received within opening **24**. The diameter of plug **26** may be slightly greater than that of opening **24** to provide

a snap fit. Plug **26** together with cap base **12** prevent egress of liquid from bottle **74** or other container.

[0032] Transport via e-commerce often entails shipping products in individual packages which may be less secure than the product pallets often used by manufacturers in transporting large numbers of products. The present closure affords an extra measure of protection against inadvertent opening of the cap in response to the additional stresses to which packages are subjected during e-commerce transport.

[0033] The adaptor and living hinge will typically be made of polypropylene or polyethylene. Post-consumer polypropylene may be included as well. The adaptor and/or living hinge may also be made from the hinge material described in Domoy et al. U.S. Pat. No. 9,637,626, namely a molded article having a hinge, the molded article being a polymer, the polymer comprising a mixture of a first high-density polyethylene (HDPE) resin and a second HDPE resin, that is different than the first HDPE,

[0034] wherein, when mixed: the first high-density polyethylene (HDPE) resin has:

[0035] a. a Melt Index ($I_{2.16}$) of about 0.5 dg/min to 10 dg/min,

[0036] b. a Density of about 0.940 g/cm³ to 0.968 g/cm³, and

[0037] c. a Melt Flow Ratio ($I_{21.6}:I_{2.16}$) greater than about 25;

[0038] and

[0039] the second HDPE resin has a Melt Flow Ratio ($I_{21.6}:I_{2.16}$) of less than about 30. The disclosure of Domoy et al. U.S. Pat. No. 9,637,626 is hereby incorporated by reference herein. The closure will generally be fabricated using injection molding.

[0040] It should be understood, of course, that the specific forms of the invention herein illustrated and described are intended to be representative only as certain changes may be made therein without departing from the clear teachings of the disclosure. Accordingly, reference should be made to the following appended claims in determining the full scope of the invention.

1. A closure (10) comprising

a) a cap (16) and a

b) a closure base (12) having an opening (24),

c) the cap having a depending plug characterized in that the depending plug has at least one flap (82) extending radially outwardly from the plug when the cap is in the open position, and in that the at least one flap (82) being deformable such that upon closing of the cap (16) the flap folds upwardly whereby the upwardly extending flap provides interference with the opening (24) of the cap.

2. The closure according to claim 1 wherein the opening (24) is defined by a cylindrical wall (88).

3. The closure according to claim 2 wherein the wall (88) includes a recess (40) which accommodates the one or more flaps (82) when the cap (16) is closed.

4. The closure according to claim 3 wherein the recess (40) includes a top wall and the one or more flaps about the top wall when the cap is closed.

* * * * *