Dec. 31, 1968 G. N. PETTERSEN 3,419,198

COVERING CAP WITH CLOSABLE OPENING FOR BOTTLE OR OTHER CONTAINER

Filed Sept. 19, 1966 Sheet 1 of 3

Fig. 1.

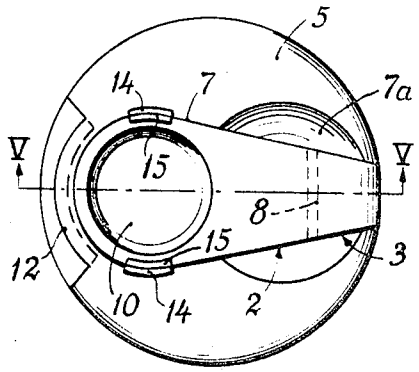

Fig. 2.

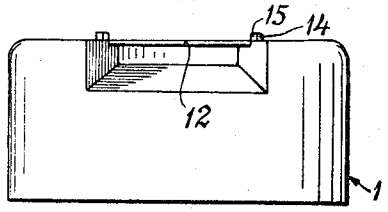

Fig. 5.

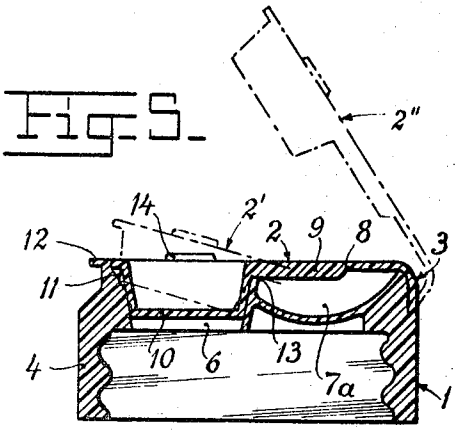

Fig. 3.

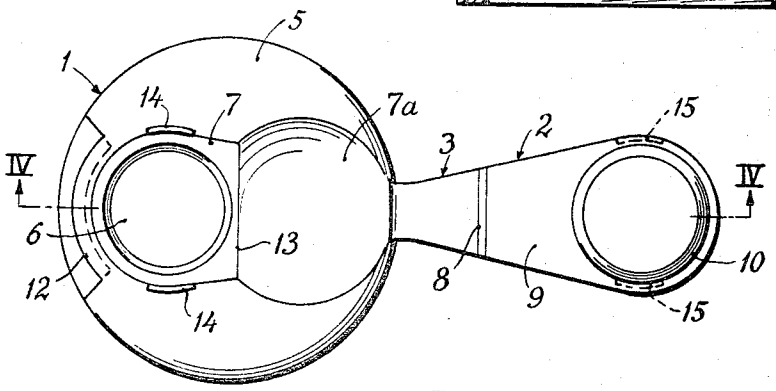

Fig. 4.

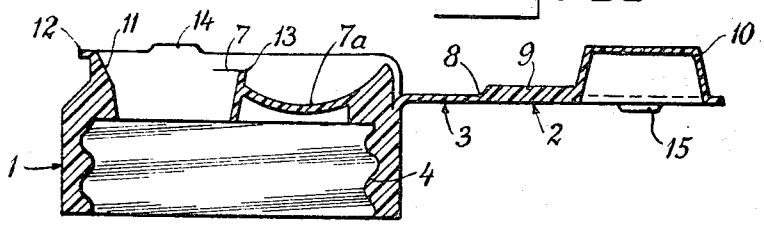

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Fig. 7.

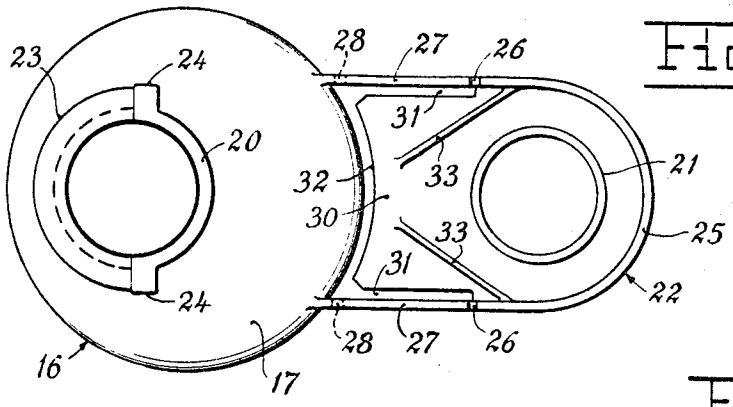

Fig. 11.

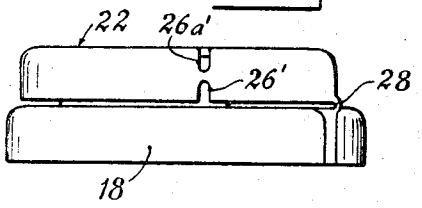

Fig. 6.

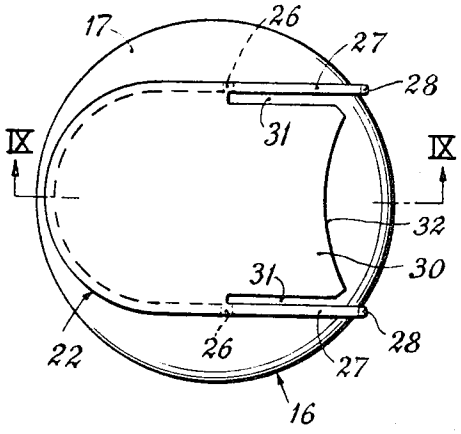

Fig. 10.

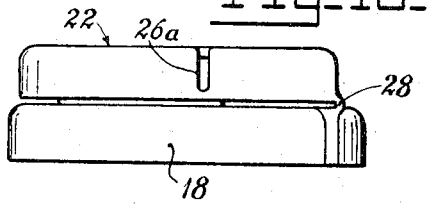

Fig. 9.

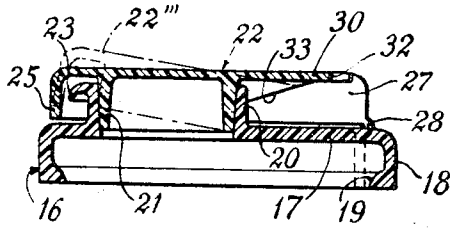

Fig. 8.

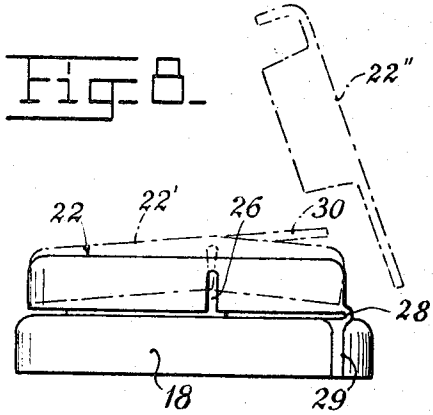

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Fig. 12.

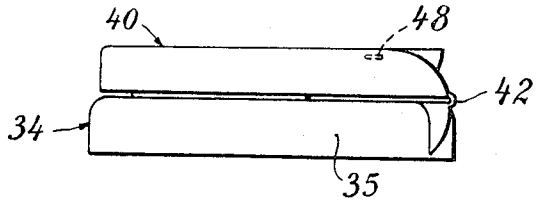


Fig. 14.

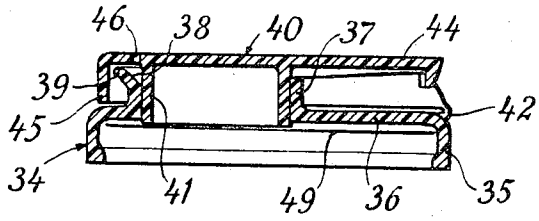
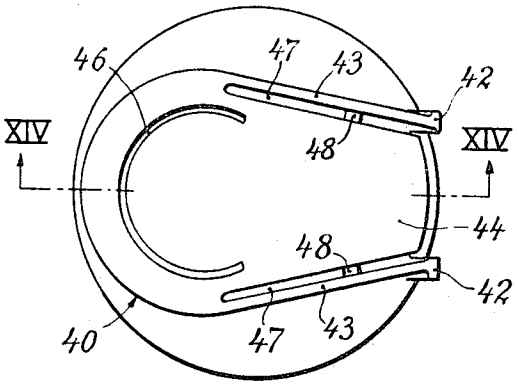


Fig. 13.



United States Patent Office 3,419,198 Patented Dec. 31, 1968

3,419,198

COVERING CAP WITH CLOSABLE OPENING FOR BOTTLE OR OTHER CONTAINER

Gunnar Nimrod Pettersen, Askim, Norway

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Claims priority, application Norway, Sept. 20, 1965, 159,760
14 Claims. (Cl. 222—541)

ABSTRACT OF THE DISCLOSURE

A plastic cap including a fastening portion for attachment to a bottle mouth and a cover. The cover is connected to the periphery thereof by flexible hinge means having a neutral position when the cover is open. Such portion has an outlet member remote from the hinge, and the cover a closing portion matching the outlet with frictional contact. A cover arm extends over the fastening portion from the closing portion to a point adjacent the hinge. By applying pressure to the arm when the cover is closed, the cover tilts about a fulcrum remote from the hinge releasing the frictional contact. Upon pressure release, the hinge swings the cover to open position.

It is known to form covering caps for upwardly facing mouths of bottles or other containers with a closable outlet opening, the opening being formed in a fastening portion which is attached to the mouth in any desired manner, and to which there is hinged on one side a cover which is capable of closing the opening with frictional engagement of the fastening portion. Further, it is known to make covering caps of this kind in one piece of plastic material in which the fastening portion and the cover are interconnected by a flexible link, the production taking place by pressure molding and with the hinging link straightened so that the cover is originally lying upside-down, substantially flush with the fastening portion, whereby the link in use may spring resiliently outwards and swing the cover into a fully open position as soon as the frictional engagement has been released.

Further, there are known embodiments in which this releasing of the frictional engagement may be effected with one finger by a lever action, the cover being provided with a beak or the like on the pouring side, i.e. on the side facing away from the hinging link, so that it is easy to get a grip for pushing up the cover.

A drawback of this structure is that in order to release the frictional engagement it is necessary to touch the cap at a point at which it may very well have been soiled by the liquid contents by previous pourings.

This is avoided by the present invention, which relates to a covering cap of the kind outlined above, but with the difference that the cover is provided with an actuating arm extending towards the hinging side from the closure portion matching the opening.

Generally, the fastening portion will be formed in the usual manner with a centering flange matching the mouth, preferably on the outside. In that connection an important novel feature of the invention consists in that the outlet opening is eccentrically displaced relative to the flange in the direction away from the hinging side and the actuating arm substantially extends over the fastening member in the closed position. Hence it becomes possible to give the cap as a whole in closed condition an exterior shape which is so close to that of usual bottle caps and the like that it can fit into a packing line in existing machinery.

Additional features of the invention as well as their advantages will appear from the following description in connection with the accompanying drawings, which illustrate several embodiments, and in which

FIG. 1 is a top view of the cap in one embodiment in closed position.

FIG. 2 is a corresponding view of the same cap in elevation from the pouring side.

FIG. 3 is a top view of the same cap as pressure molded originally.

FIG. 4 is a vertical longitudinal section along the line IV—IV in FIG. 3.

FIG. 5 is a corresponding section along the line V—V in FIG. 1.

FIG. 6 is a top view of the cap in another embodiment in closed position.

FIG. 7 is a top view corresponding to FIG. 3 of this embodiment.

FIG. 8 is a lateral view to FIG. 6.

FIG. 9 shows a section along the line IX—IX in FIG. 6.

FIGS. 10, 11 and 12 are lateral views corresponding to FIG. 7 of three further embodiments.

FIG. 13 is a top view of the embodiment according to FIG. 12 in a closed position and before the cap is opened for the first time.

FIG. 14 is a view in vertical longitudinal section along the line XIV—XIV in FIG. 13.

The covering cap in the embodiment of FIGS. 1 to 5 consists of a fastening portion **1**, a cover **2** and a flexible hinging link **3**. The fastening portion is formed with a centering skirt **4** extending downwards from a bottom **5** and is provided with internal screw threads so as to be capable of being attached tightly on an outwardly threaded mouth of a bottle or the like in a manner similar to that of a screw cap. The bottom **5** has an eccentrically located outlet opening **6** which expands conically upwardly and opens into a recess **7** into which the cover **2** matches. The flexible link **3** constituting the hinge extends from the edge of the bottom **5** remote from the opening **6** and merges via a weak spot, provided by a transverse notch **8**, into the cover **2**, which is relatively rigid and continues with increasing width in the form of an arm **9** and further in a closure portion having an inwardly bulging conical plug **10** fitting into the opening **6**. The latter has outside the end of the cover a bevelled face **11** extending to an undercut pouring edge **12** on the bottom **5**.

Under the arm **9** and the adjacent portion of the hinging link **3** the recess **7** is extended in depth and width so as to form a largely spheric depression **7***a* which adjacent the opening **6** is limited by a straight transverse edge **13**. It thus becomes possible to press the arm **9** down with a finger, for example by pressing it with the nail close to the weak spot **8**, whereby the cover **2** will act as a two-armed lever having its pivotal axis on the edge **13**, so as to adopt a position substantially as shown in dash-and-dot lines at 2′ in FIG. 5. Consequently the frictional engagement between the plug **10** and its seat in the opening **6** will be released so that, when the finger is again removed, the hinging link **3** may spring freely to a relaxed position and hence the cover **2** will adopt a fully opened position, for example substantially as shown in dash-and-dot lines at 2″ in FIG. 5.

If it is desired to make certain that the cap is not opened unintentionally or by unauthorized persons before it comes into the hands of the buyer, the cover may be sealed in a closed position by welding. For this purpose, the bottom **5** is provided with upwardly projecting tabs **14** on either side of the recess **7** and the closure portion of the cover **2** is provided with corresponding tabs **15** which in the closed position project upwards just inside the tabs **14** and therefore can easily be welded thereto.

In the embodiment of FIGS. 6 to 9 the fastening portion **16** has again a bottom **17** and a skirt **18**, which in this case is formed with an inwardly projecting bead **19**

at the lower edge and for the rest is smooth on the inside so as to be capable of being pressed firmly onto a bottle mouth or the like having an exterior bead. The outlet opening is here again expanded conically upwards and placed eccentrically but is formed by an upwardly projecting socket **20** into which a corresponding socket **21** on the cover **22** matches. On the pouring side the socket **20** has a pouring edge **23** which extends throughout 180° and at its outer extremity has a thin downwardly projecting lip which facilitates pouring without soiling. At either end the pouring edge **23** terminates in extensions **24** on the socket **20** having flat outer faces.

The cover **22** is formed by a bottom from which the socket **21** projects downwards, and which at its free edge has a downwardly projecting flange **25** which extends throughout 180° and which in a closed position extends outside the pouring edge **23**. The internal radius of the flange **25** is substantially equal to the half of the spacing of the outer faces of the projections **24**. The flange **25** continues in parallel tangentially extending flange portions, which each by a deep notch **26** are separated from legs **27** of the same height connected through thin flexible hinging links **28** to square-angled projections **29** on the outside of the flange **18**. Between the legs **27** the cover **22** continues in a flat arm **30**, which is separated from the legs by narrow slots **31** and terminates in a concave free edge **32**. The cover is on its bottom side also stiffened by ribs **33** extending with decreasing height from the inside of the flange **25** on either side of the socket **21** and obliquely towards each other and merging into the bottom of the cover slightly short of the edge **32**.

When the cap is closed, the parts adopt a position as shown in FIGS. 6, 8 and 9. The flexible hinging links **28** are folded together. The flange **25** engages tightly the projections **24** on either side, which provides additional security against inadvertent opening for example by shaking of the bottle, with the material of the socket **20** being pressed together by a wedging effect between the flange **25** and the socket **21** on both sides. At the same time the flange **25** and the rigid legs **27** wholly or approximately engage the upper surface of the bottom **17** of the fastening portion **16**. This is of advantage during handling, which will be explained later, and likewise when the cap is mounted on the bottle in a machine by pressure on top of the cover.

The simplest way of opening the cap will now be to push the edge **32** of the actuating arm **30** upwards with the inside of the thumb of the hand holding the bottle so as to flex the weakened spot at the notches **26**. The cover will then act as a one-armed lever and the frictional engagement will be released, with the cover adopting a position substantially as shown at **22'** in FIG. 8. When the thumb is then removed, the connecting links **28** will spring outwards so that the cover will adopt a position substantially as shown at **22''**. By this manner of releasing the frictional engagement it is achieved that the cover does not at once bound upwards at the forward edge, so that the pressure which may occur when the engagement is released, can not cause liquid that may adhere to the socket **21** to spurt out, but detached drops will fall down into the bottle mouth. In order that this manner of operation shall be possible, the notches **26** must be sufficiently deep and large to permit the flange **25** and the legs **27** to be rocked relative to each other so as to form a downwardly facing obtuse angle as indicated for position **22'**.

If however, the plug, i.e. the socket **21**, should be too firmly seated for permitting easy releasing in the described manner, it is possible instead to press on top of the arm **30**. Thus the legs **27** are pressed firmly down against the bottom **17** so that they will form a support for the cover, with the latter turning as a two-armed lever so as to release the engagement whereby it will adopt a position substantially as shown at **22'''** in FIG. 9, in order thereafter, on removal of the finger, to swing further to position **22''**.

If even this manner of operation should be too heavy because the person's fingers are too weak, or if the person hesitates to use it because of the possibility of spurting, there is still a possibility pushing a finger or tool in from the hinging side into the space confined by the arm **30**, the bottom **17** and the legs **27**, so that the cover is forced upwards by a wedging action to the position **22'**. This way of handling gives a particular great effect relative to the force exerted so that it will inter alia be of great interest for breaking an original seal.

The provision of the sealing tabs has not been shown specifically in the FIGS. 6 to 9, but can easily be arranged in any desired manner, for example in the area of the projections **24**.

It will be seen that both embodiments described are well suited for a production by pressure molding, for example of polypropylene, in a shape as shown in FIGS. 3 and 4 or in FIG. 7 respectively. The pressure molding can be effected mainly between tools on the top and bottom sides with the skirt **4** or **18** being capable of yielding sufficiently to permit pulling off from the bottom form. For the undercut pouring edge **12** or **23** it is possible to use mold tools that may be withdrawn laterally. When this is done the edge **23**, if made sufficiently thin, will easily be able to yield during the withdrawal.

The embodiment shown in FIG. 10 differs from that shown in FIGS. 6 to 9 only in that the slots **26*a*** in the lateral flanges extend from the top edge thereof instead of from the bottom edge so that the flexible transition to the closing portion will be located at the bottom edge. This embodiment is particularly well suited for opening by pressing upwards with a small force and hence also with little strain on the flexible hinging links **28**.

The same advantage may be obtained to a certain degree in combination with the possibility of also causing opening motion by downward pressure if the embodiment shown in FIG. 11 is used. In this case slots **26'** and **26*a'*** are formed which extend from the bottom and from the top respectively while leaving a flexible transitional portion in the middle of the height of the flange.

FIGS. 12 to 14 show an embodiment which is of particular advantage for a manner of operation as described in connection with the embodiment shown in FIGS. 6 to 9 and especially for releasing the frictional engagement in a manner corresponding to that shown at **22''** in FIG. 8.

The fastening portion **34** is again formed with a skirt **35**, a bottom **36** and an outlet opening in a socket **37** having a bevelled face **38** and a pouring edge **39**. The cover **40** has a closing portion with a plug **41** and is connected to both hinging links **42** by two legs extending on either side of the actuating arm **44** of the cover and substantially tangentially in continuation of a circumferential flange **45** surrounding the pouring edge. However, in this case no weak spot is provided between the legs **43** and the arm **44**. Instead the cover is formed with a slot **46** extending in a circular arc of somewhat more than 180° around the closing portion and slightly past the inner ends of the slots **47** separating the actuating arm **44** from the legs **43**. Thus, between the slot **46** and the slots **47** there are formed weak spots permitting the closing portion with the plug **41** and the arm **44** to be turned relative to the legs **43** and the flange **45** by pushing the arm upwards.

Due to the fact that the notches **26** (or **26*a*** or **26'**, **26*a'***) are omitted the cap as a whole has a more pleasant appearance and in addition is more sturdy so that it is particularly well suited for standing rough treatment in the machinery and especially a mounting on the bottle by heavy pressure since the flange and the legs have a continuous edge which will engage the bottom **36**.

FIGS. 12 and 13 also illustrate a different way of forming a seal which must be opened before the cap can be used. During the pressure molding in this case thin cross-connections **48** are left which bridge the slots **47** at a

considerable distance from their inner ends, and which must be broken for example with a knife, coin or the like before the actuating arm 44 can be turned.

Finally, FIG. 14 shows a foil 49 inserted in the fastening portion 34 below the bottom 36. This foil may for example consist of aluminum and will ensure a diffusion proof closure, which may be of importance for many liquids such as wines, and must be perforated for example by insertion of a pointed tool before the liquid can be dispensed, so that it will give the buyer an additional guarantee that the contents are untouched so long as the foil has not been damaged.

It will be understood that the invention is not restricted to the embodiments disclosed since many modifications are possible within the scope of the appended claims, and especially that many of the features described in connection with the embodiments may be combined in other manners than those particularly shown and described for the specific embodiments, in so far as they are technically consistent.

What I claim is:

1. A covering cap of plastic for mounting on an upwardly facing mouth of a container, comprising a fastening portion adapted to be tightly affixed to the mouth and provided with an outlet, a cover having a closing portion for tightly closing the outlet with frictional contact, connection means integrally interconnecting the fastening portion and cover and including flexible hinge means spaced from the closing portion and joined to the fastening portion at the periphery thereof, said hinge means having a neutral position in which the cover is in a fully open position, an actuating arm for said cover extending from said closing portion and adapted on actuation by a finger to release the frictional contact by a lever action, said arm terminating adjacent the hinge means and said connection means having a resilient flexibility such as to allow the part of the arm nearest the junction between the hinge means and the fastening portion, on actuation of the arm in closed position of the cover, to be moved vertically relative to the junction for permitting the cover to turn about a fulcrum remote from the hinge means for disengaging the frictional contact.

2. The covering cap as claimed in claim 1, in which the fastening portion has a skirt matching the mouth, the outlet being displaced eccentrically relative to the skirt in the direction away from the hinge means.

3. The cap as claimed in claim 2, in which the actuating arm extends at a distance above the fastening portion so that releasing of the frictional engagement can be effected by pressing down the arm.

4. The cap as claimed in claim 3, in which the actuating arm connects the closing portion with a flexible link fixed at the edge of the fastening portion.

5. The cap as claimed in claim 4, in which the cover in a closed position is substantially countersunk in the fastening portion.

6. A covering cap of plastic for mounting an upwardly facing mouth of a container, comprising a fastening portion formed with an outlet opening, a cover having a closing portion for coaction with the outlet opening, said cover being movably interconnected on one side for permitting opening of the cover with a finger by lever action

and with resiliency in the connection whereby the cover, on releasing a frictional engagement with the fastening portion at the outlet opening, will spring into a fully open position, an actuating arm for the cover extending in the direction towards said one side from the closing portion of the cover, a leg extending along each side of the actuating arm and which at one end is connected to the closing portion and at its other end to the edge of the fastening portion by flexible links, and the actuating arm having a terminal edge facing away from the closing portion and accessible from below so that it can be pushed up so as to release the frictional engagement.

7. A cap as claimed in claim 6, characterized in that the space between the actuating arm, the legs and the fastening portion is open towards said one side.

8. A cap as claimed in claim 7, characterized in that in the closed position when the cover is pressed firmly onto the fastening portion the legs engage the top of the fastening portion so as to have a support on the same.

9. A cap as claimed in claim 6, characterized in that the legs extend substantially tangentially in continuation of a circumferential flange formed on the cover and in the closed position covers a pouring edge formed at the end of an outlet socket on the side of the latter far from the hinging side.

10. The cap as claimed in claim 9, characterized in that the closing portion apart from fitting into the outlet socket with a plug is formed with such dimensions that its circumferential flange fits the outer faces of projections formed on the outer face of the outlet socket at the ends of the pouring edge so as to enforce the frictional engagement.

11. The cap as claimed in claim 1, characterized in that on both sides of the central plane of motion of the cover the fastening portion and the cover have mutually matching weld tabs for sealing.

12. The cap as claimed in claim 6, characterized in that at a distance from the flexible links connecting the actuating arm to the legs the arm is connected thereto by easily breakable bridges.

13. The cap as claimed in claim 1, characterized in that the fastening portion has an undercut pouring edge having a thin downwardly projecting yielding lip at its outer extremity.

14. The cap as claimed in claim 1, characterized in that an easily breakable tightening foil is inserted in the fastening portion under the bottom thereof.

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U.S. Cl. X.R.

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