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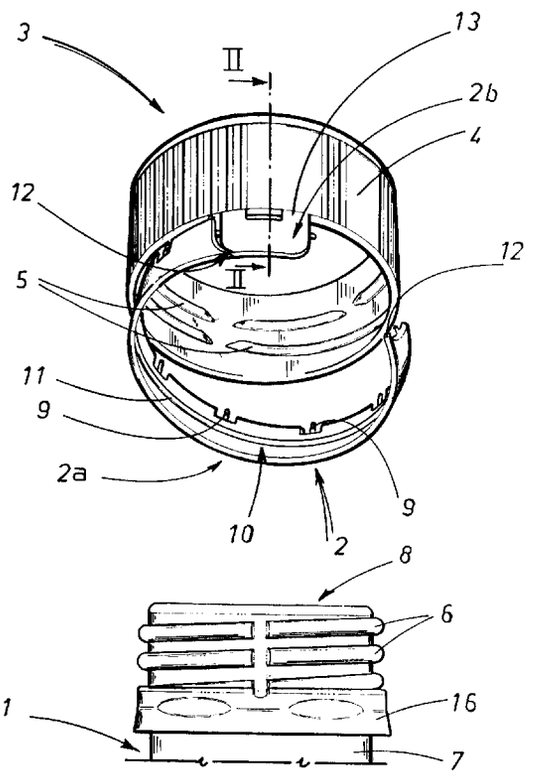
(54) Plastic closure with tamper evident ring

(57) A capsule (3) in plastic with a tamper evident ring and provision for the means (10) of anchorage and partial separation of the same ring (2) from the cap (4) of a bottle (1), which has a projection or tooth (11) around the entire circumference of the ring (2), thus allowing anchorage to the lower edge of a collar (16).

FIG 1



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Description

The present invention relates to a plastic capsule for the hermetic sealing of bottles with a tamper evident ring, particularly for sealing bottles in glass or thermoplastic which contain drinks.

It is known that for some time bottling companies (with particular reference to the mineral water and soft drinks sectors, etc) have used thermoplastic bottles, for example polyethylene (or polyethylene terephthalate commonly known by the abbreviation PET) or similar, or glass which can be used again, thrown away and lost or recycled for further use.

It is also known that caps known as capsules are generally used to seal these bottles, and they are usually made of plastic.

A requirement of bottling companies is that the capsules are made so that it is easy to apply them to the neck of the bottle during bottling, and to attach them to the elements for safeguarding: usually this is done by using a tamper evident ring which is found in practically all capsules available on the market and is designed to show whether a container is intact and has not been tampered with or used. In effect the market requires that the capsule has attached to its lower edge a ring which is attached to the body of the capsule with a series of bridges uniformly distributed along the circumference.

These bridges are designed to enable the tamper evident ring to be detached from the cap after it has been unscrewed, thus demonstrating that the container has not been opened.

The producers of the capsule have dealt with the problem of a cap which can be placed onto the neck of the bottle without the danger of breaking the projections, while at the same time they have to break easily when the bottle is being opened by the consumer. This requirement has to take into account market tendencies and the needs of the bottles, who require that the tamper evident ring, after the capsule has been used, remains firmly anchored to the neck of the bottle or the cap itself; this is because it's necessary to eliminate the extra task of throwing away the tamper evident ring due to, in the case of thermoplastic bottles, the need to simplify the recycling of primary material.

An example of solutions relating to this problem is to be found in the patent publication EP-254.673 where the capsule is fixed in such a way that when the tamper evident ring is torn from it the two remain connected after the unscrewing of the cap and its removal from the neck of the bottle: this is achieved therefore by a special combination and relative position between the projections and the teeth around the inside of the tamper evident ring and the means of holding the ring to the collar underneath the threads on the neck of the bottle. Specifically the ring of the tamper evident ring is divided into two segments of different lengths, fixed together by projections, which perform the same function as the aforementioned bridges, these projections being positioned on the longest segment. In this solution the teeth are positioned on the longer segment, and uniformly distributed along it at an angle slightly greater than flat: this is to ensure, on one hand that it is as easy as possible to place the cap on the bottle in a way which, as said before, should not break the projections, and on the other to ensure that they do break when the cap is unscrewed. In effect the asymmetry of the position of the teeth is designed to enable the ring to be moved radially when placing it on the bottle (this is also partly the result of the elasticity and flexibility of the material), and the anchorage of the teeth on the cap onto the lower threads which ensure the breakage of the bridges before, and then at least one of the projections, thus breaking the ring while keeping it connected to the cap.

This structural necessity has confirmed with experience that in these cases (for example when the dimensions of the cap and the threads of the bottle are at the limits of the dimensions required this leads to the excessive reuse and defects at the first moulding stage) it is possible to break open the capsule removing the whole cap from the ring, for example by turning the cap in the opposite direction to the one used when the capsule is placed on the bottle.

Following further experiments the applicant has confirmed that, surprisingly, with the insertion of one single tooth of fixed size, placed uniformly along the internal circumference of the of the ring, it is easier to ensure that the bottle remains intact, and can be unscrewed by the consumer without distorting the capsule itself.

The technical characteristics of the invention are laid out in the claims below and the advantages of the disclosure are apparent from the detailed description which follows, with reference to the accompanying drawings, which illustrate a preferred embodiment of the invention by way of example and in which:

- figure 1 is a front exploded perspective of the plastic capsule with tamper evident ring disclosed by the present invention already unscrewed from the neck of the bottle and with the ring partially detached.

- figure 2 illustrates a cross section 11-11 of figure 1, but with the ring shown as intact.

According to the figure in the enclosed diagram, with particular reference to figure 1, the capsule is made in plastic and used for the hermetic sealing of bottles containing water or other soft drinks.

The capsule 3 consists of a cap 4 with threads inside 5 which can be screwed to relative threads 6 on the neck 7 of the bottle 1 which has an opening 8 for pouring out the contained liquid, and of a collar 16 placed below the threads 6.

The cap 4 has a tamper evident ring 2, which consists of a circular ring subdivided in two parts or circular segments of which one 2a is the larger and one 2b is the smaller. The two segments 2a and 2b are linked together

by projections 12, in effect by narrowing the larger segment; the larger segment has a number of bridges 9 uniformly distributed and joined to the opening of the cap 4, while the smaller segment 2b is solidly connected to the cap 4 by just one bridge 13: with this structure the ring is only partially separated from the cap 4 when the capsule 3 is unscrewed.

In figure 1, 10 indicates the means of anchoring the ring 2 to the collar 16 of the bottle 1; these means 10 enable the closure of the bottle 1 to be kept intact and the partial separation of the cap 4 when it is unscrewed. In particular these means positioned on the internal surface of the ring 2 correspond to the threads 6 on the neck 7 of the bottle 1.

More specifically these means 10 for anchoring the ring 2 and for separating the same consist of a transversal projection or teeth 11, around the circumference of the ring 2, thus reducing its internal diameter and anchoring it to the lower edge of the collar of the neck 7 of the bottle 1.

As is clearly shown in the cross section figure 2 the projection or tooth 11 is an integral part of the ring 2, is positioned as a longitudinal section of the capsule 3, in the centre of the ring 2 (the section was produced as an integral part of the ring).

This particular design of the ring 2 has proved successful with one tooth 11 along its length which guarantees that the bottle remains intact, eliminates the possibility of lifting off the cap with the ring whole, and at the same time maintains the feature of partial separation of the ring from the cap when it is unscrewed.

The invention described can be subject to modifications and variations without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1) A plastic capsule for the hermetic sealing of bottles (1) consisting of a tamper evident ring (2), capsule (3) which consists of a cap (4) with a thread inside (5) screwable to the threads (6) on the neck (7) of the said bottle (1) with a relative opening (8) with a collar (16) at its bottom edge; the said cap (4) with said cap (2) consisting of a circular ring, subdivided in two circular parts, and joined in relation to the opening of the cap (4) by means of a plurality of bridges (9) uniformly distributed around the circumference of the ring (2) the latter being designed to be partially separated from the cap (4) when the capsule (3) is unscrewed; means (10) for anchoring of the said ring (2) to the said collar (16), and designed to ensure the said partial separation from the cap (4) being envisaged with on the internal surface of the said ring (2) corresponding to the said neck (7), characterised in that the said means (10) for anchoring and partial separation of the said ring (2) consist of a projection or tooth (11) right around the circumference of the ring (2), thus to be connected to the lower rim of the collar (16).

2) The capsule according to claim 1, characterised in that the said projection or tooth (11) is positioned, as a longitudinal section of the said capsule (3), in the centre of the width of the said ring (2) and as an integral part of it.

FIG 1

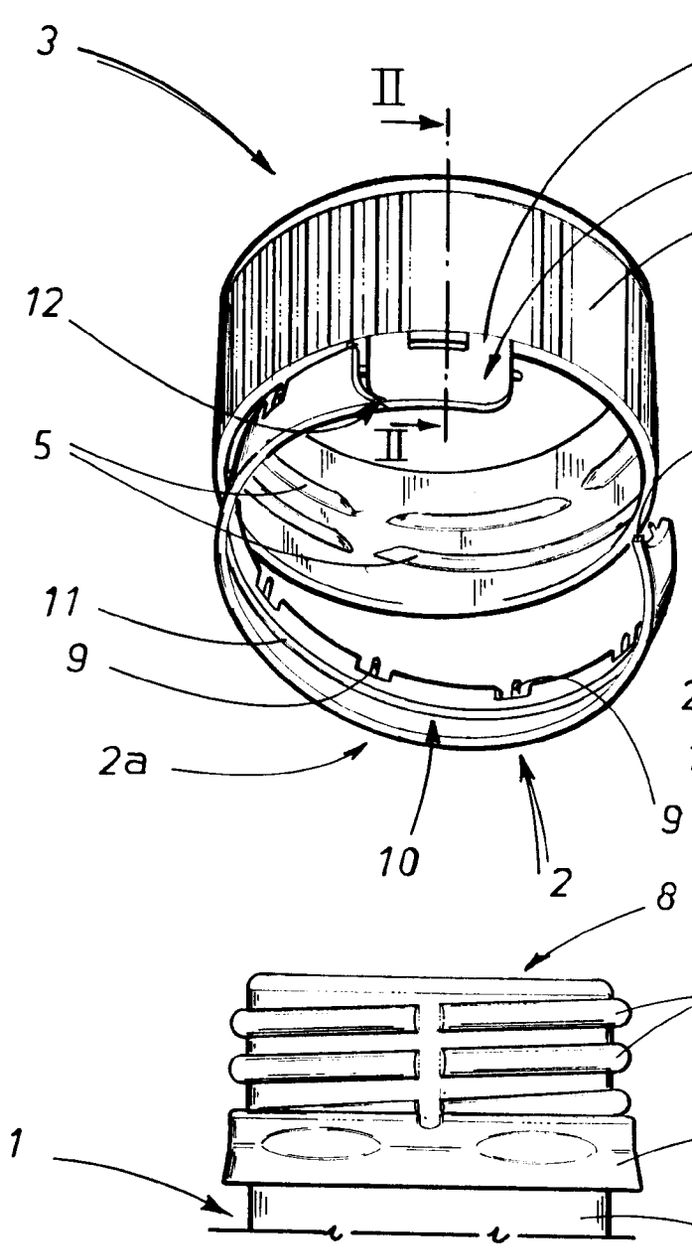
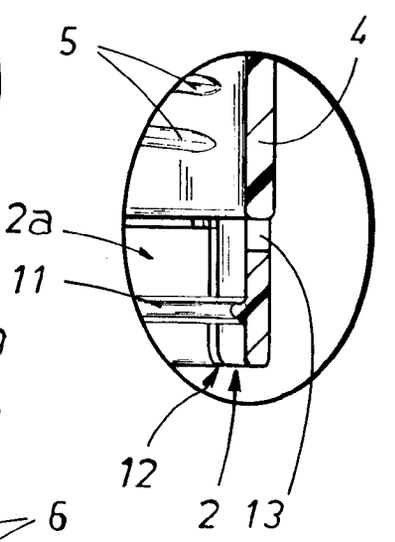


FIG 2



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EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0382

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US-A-5 257 705 (DE SANTANA) * the whole document *	1,2	B65D41/34
X	US-A-4 432 461 (MUMFORD ET AL.) * the whole document *	1,2	
X	FR-A-2 310 932 (ALCA SA) * figures *	1	
X	EP-A-0 451 102 (CROWN CORK AG) * the whole document *	1,2	
X	GB-A-2 199 571 (METAL CLOSURES LTD.) * abstract; figures *	1	
X	US-A-3 904 062 (GRUSSEN) * abstract; figures *	1	
X	US-A-5 215 204 (BECK ET AL.) * the whole document *	1,2	
X	EP-A-0 004 500 (CAPTOCAP LTD.) * figures 10-14 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D
X	US-A-5 246 125 (JULIAN) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 January 1996	Gino, C

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