

BACKGROUND OF THE INVENTION

The invention relates to a screw closure with a security and guarantee strip, for bottles.

Security and guarantee strips today are formed on most screw closures in order to indicate the first opening of the bottle and to prevent that by unauthorised persons, the contents of the bottle may be contaminated. The security strips consist of a cylinder-jacket shaped section which is connected to the lower edge of the jacket of the screw closure via connecting webs. The strips on their circumference may comprise weakened regions which tear on opening for the first time. The strip sections remain connected to the screw closure. They may however be manufactured as one-piece and remain after the opening for the first time below a retaining rib located axially below the thread on the bottle neck. With the conventional security and guarantee strips either on the lower edge of these or on their inner surface distributed over the circumference and protruding into the clear cross section there are arranged a multitude of retaining cams distributed over the circumference. On screwing on the lid at the bottler these retaining cams slide over the retaining rib and latch under this. On opening the screw closure the security strip is retained by the retaining cams which above comprise a retaining surface and the connecting webs between the screw closure and the security strip break. On screwing on or placing on the lid of the screw closure at the bottler, by way of the resistance which occurs when the cam passes over the retaining rib, problems may occur and the safety strip may if it is manufactured obliquely be pressed and jammed between the bottle neck and the jacket of the screw closure. The security strip or the connecting webs for the closure may already tear on the closure procedure. The security strip with this loses its purpose. With high output bottling plants a defect of the mentioned type may lead to a stoppage of the whole plant.

But also on opening the screw lid the known security strips often tear only on one side or are partly pushed out beyond the retaining rib. On reclosing, the security strip jams between the bottle neck and the jacket of the screw closure, so that a sealed reclosure is not possible when previously the security strip has not been removed by hand or pushed back.

BRIEF SUMMARY OF THE INVENTION

The object of the present invention was to provide a security strip which at the bottler on high output bottling machines may be deposited onto the bottle without trouble and which on opening the bottle by the consumer separates perfectly from the screw closure and remains back below the retaining rib on the bottle neck, or with returnable bottles tears and remains connected to the screw closure.

This object is achieved by a security and guarantee strip according to the features of patent claim 1.

The retaining cams arranged axially displaced on placing on the lid effect considerably lower spreading forces onto the security strip and prevent the premature destruction of this.

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Two retaining cams arranged in pairs and axially displaced to one another, on screwing on the screw lid, likewise slide after one another over the retaining rib, by which means the security strip on account of the oval deformation is hardly stretched and a slight axial pressing force is necessary in order to permit the jumping over of the retaining rib. On opening the bottle firstly the two upper-lying holding cams are held back by the retaining rib and here only tensile forces occur on the connecting webs which are preferably formed laterally to the retaining cams, and tear through these. As soon as the first connecting webs are torn the next retaining cams get to the retaining rib and tear through the neighboring connecting webs. An oblique position of the security strip is avoided by way of this and if formed as one piece it always stays back below the retaining rib on the bottle neck. A security strip with a predetermined breaking location and a connection to the screw closure remains connected to the latter.

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BRIEF DESCRIPTION OF THE DRAWINGS

The invention is hereinafter described by way of an embodiment example. There are shown:

Figure 1 an axial cross-section through a screw closure with a security and guarantee strip as well as below, the neck of a PET bottle,

Figure 2 a cross section along line II-II between the lower edge of the jacket of the screw closure and the upper edge of the security strip,

Figure 3 a cross section along line II-II through the security strip in Figure 1 during the screwing on of the lid,

Figure 4 a perspective representation of the closure unit according to Figures 1-3,

Figure 5 a cross section along line III-III between the lower edge of the jacket of the screw closure and the upper edge of the security strip in Figure 6,

Figure 6 a perspective representation of a further formation of the invention with a connected security strip.

DETAILED DESCRIPTION OF THE INVENTION

In the Figures 1 and 2 with the reference numeral 1 there is schematically shown a closure unit consisting of a screw closure 2 and a security strip 3. The closure unit 1 consists of thermoplastic plastic and is manufactured by injection moulding. The screw closure 2 comprises a base 4 on which a sealing rib 5 running concentrically to the symmetry axis A may be mounted. To the base 4 there connects a jacket 6 which on its inner side preferably in sections carries apportioned thread windings 7. The formation of the screw closure 2 is generally known and here is not described in more detail. The security and guarantee strip 3 is connected to the lower edge 8 of the jacket 6 of the screw closure 2 by very thin webs 9 of few tenths of a millimeter thick. The length of the connecting webs 9 or the

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distance between the upper edge 10 of the security strip is very small and lies in the size order of a few tenths of a millimetre.

On the inner jacket surface 11 of the security strip in the example shown there are formed two pairs of retaining cams 12a, 12b; 13a, 13b. The retaining cams 12a and 12b as well as the retaining cams 13a and 13b lie diagonally opposite, are displaced by approx 90° and are axially, i.e. with respect to the axial extension of the security strip 3, displaced by an amount a. The retaining cams 12a and 12b as a result lie closer to the lower edge 14 of the security strip 3 than the retaining cams 13a and 13b by the amount a. The distance a is preferably smaller than the height b of a circumferential retaining rib 15 on the neck 16 of a bottle 17 e.g. manufactured from PET. On the neck 16 of the bottle 17 there are visible thread sections 18 protruding outwardly from the bottle neck 16, these being envisaged for coming into engagement with the corresponding thread sections 7 on the inner side of the jacket 6 of the screw closure 2.

The connecting webs 9 lie, observed in the circumferential direction, between the retaining ribs 12a, 12b; 13a, 13b. Alternatively to the webs 9 also film-like connections may hold together the screw closure 2 and the security strip 3.

The functioning manner of the security strip 3 of the first embodiment example is subsequently explained by way of Figure 3. On closing the bottle 17 with the closure unit 1, the latter is placed from above axially onto the bottle neck 16, and seen from above, is rotated clockwise. With this firstly the thread sections 7 on the screw closure 2 come into engagement with the thread sections 18 on the bottle neck 16. On further rotation and by way of this axial advance of the closure unit 1 the two retaining cams 12a and 12b are pressed radially outwards and simultaneously the two retaining cams 13a and 13b displaced by approx. 90° are pulled inwards. The security strip 3 with this assumes an oval shaping and stretches only extremely slightly and at the most within the elasticity limit. As soon as the two apexes S_1 on the retaining cams 12a and 12b as well as the apex S_2 on the retaining rib 15 have slid over one another, the two retaining cams 12a and 12b are again pulled radially inwards since at this moment the two retaining cams 13a and 13b arranged axially displaced now also come into contact with the retaining rib 15 and analogously to the two other ribs are forced radially outwards. With this the cross section of the security strip 3 becomes oval again. Already after a short time also the two retaining cams 13a and 13b slide over the retaining rib 15 and thereafter are located, as also the two retaining cams 12a and 12b, in the cylindrical region 20 of the bottle neck. On closing the bottle 16 the thin connecting webs 9 are only slightly mechanically loaded, since by way of the axial pressure the security strip 3 with its upper edge 10 bears on the lower edge 8 of the jacket and the connecting webs 9 at the same time are only squeezed.

On opening the screw closure firstly the two retaining cams 13a and 13b lying diagonally opposite one another come into contact with the retaining rib 15 on the bottle neck 16. Since however neither on the retaining cams 13a and 13b nor on the retaining rib 15 do inclined surfaces meet one another and permit a pushing apart of the two parts as with screwing on or on closing, but the retaining rib 15 does not let past the retaining cams 13a and 13b, the latter are held back and the connecting webs 9 lying laterally of the retaining cams 13a and 13b are torn in two. On further rotation for example by a quarter or half turn, then also the retaining cams 12a and 12b come to bear on the retaining rib 15. On account of the already torn webs 9 the security strip 3 is again deformed ovaly and with this

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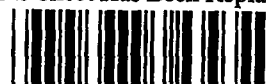
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pulls the retaining cams 12a, 12b now in engagement under the retaining rib 15. With this the remaining connecting webs 9 are torn. The security strip 3 remains now in the region 20 below the retaining rib 15. Without the now torn off security strip 3 the screw closure 2 for the reclosure of the bottle 17 may be screwed onto its neck 16.

With the formation of the invention according to the Figures 5 and 6 the security strip 3 in the region (X) is unreleasably connected to the jacket 6 of the screw closure 2. The remaining circumferential region of the security strip is tearably fastened by the thin connecting webs 9 on the lower edge 10. A predetermined breaking location 22 in the form of an incision, a weakening line or a film-like reduction in size of the wall thickness permits the tearing of the security strip 3 on opening the screw closure 2. A first retaining cam 12a lies neighboring the predetermined breaking location 22 below the connecting region X. Preferably directly opposite the connection region X there is formed an individual or a pair of retaining cams 12b lying closely to one another. Displaced by 90° to this there lies two further retaining cams 13a, 13b. The retaining cams 13a or 13a and 13b lie axially further distanced from the lower edge 14 of the security strip 3 and thus come to bear with the retaining rib 15 earlier than the retaining cams 12a, 12b. The webs 9 laterally of the retaining cams 13a and 13b as well as the predetermined breaking location 22 are therefore torn before the remainder.

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CLAIMS



1. A screw closure with a security and guarantee strip for bottles, with which the annularly formed security strip is connected to the jacket of the screw closure by webs and on its inner surface carries retaining cams protruding into the clear cross section, wherein a first pair of retaining cams lying diagonally opposite one another and at least one further retaining cam displaced by approx. 90° and axially displaced by the amount (a) are arranged on the security strip.
2. A screw closure with a security and guarantee strip according to claim 1, wherein on the security strip there are arranged at least two pairs of retaining cams, which lie diagonally opposite and axially displaced to one another.
3. A screw closure with a security and guarantee strip according to one of the claims 1 and 2, wherein the axial displacement (a) of the retaining cams is smaller than the height (b) of a retaining rib on the neck of the bottle.
4. A screw closure with a security and guarantee strip according to one of the claims 1 and 3, wherein the webs, observed in the circumferential direction, lie between the retaining cams.
5. A screw closure with a security and guarantee strip according to one of the claims 1 and 4, wherein in each case two webs lie between the retaining cams.
6. A screw closure with a security and guarantee strip according to one of the claims 1 and 5, wherein the security strip comprises a rigid, non-tearing connection region with the jacket of the screw closure, and a predetermined breakage location.
7. A screw closure with a security and guarantee strip according to claim 6, wherein one retaining cam is arranged diagonally opposite the connection region.

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