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(54) Bottle cap with tamper ring
Flaschenkappe mit Sicherungsring
Bouchon de récipient avec bande de garantie

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(56) References cited:
EP-A- 0 154 603
DE-A- 2 430 775
WO-A-92/13773
DE-A- 2 439 414

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Description

This invention relates to a closure cap for use on various types of bottles or other containers of the disposable or returnable type, and including a tell-tale device to indicate if the container has once been opened, and also including means for retaining the closure attached to the container, as is useful to reseal a partly used bottle of a carbonated beverage.

Various models of closure caps, at present, are provided with such means. However, they usually consist of a cylindrical body closed at the upper end, while the lower portion extends to a sealing part composed of a separable band interconnected with the said body by means of several separable bridges or links and, in addition, the said band is provided with internal means in the form of teeth or a suitable groove to provide a coupling action between the bottleneck and the cap when the latter is screwed onto the bottleneck because, at this moment, the teeth or groove will extend beyond a collar disposed on the said bottleneck, thereby providing secure attachment. Thus regardless of its internal design, the seal is designed to withstand the coupling action between the cap and flask, making it easier for the band to extend beyond the collar but, in an opposite direction, causing the links or bridges to split easily, thus giving proof if the assembly has been tampered with. Therefore, if the cap is unscrewed, there is no way of avoiding the band becoming fastened to the collar, causing separation thereof from the body of the bottle, which separation, however, will be incomplete because the band will in practice be transformed into a strip, held by one end of the body of the bottle and thereby preventing any further removal of the cap, which is important that the bottle is of the returnable type and the cap needs to be removed when the bottle is returned. Such an arrangement is described for example in DE-A-24 30 775.

It is usual in such known caps that, during opening, all the bridges split at the same time, so that a strong effort is needed to unscrew the cap, and this also increases the possibility of failure in the sealing system, while, in some cases, the band remains undesirably attached to the bottleneck.

There is further known, see EP-A-0 154 603 a closure cap having the features of the pre-characterising clause of claim 1.

Although such an arrangement has the advantage that the retaining band is not left on the bottle after removal of the cap, the configuration of the closure cap is relatively complicated and the production of a mould for the formation of the closure cap of synthetic plastics material would be correspondingly complex and expensive.

It is accordingly an object of the present invention to provide a closure cap having an equivalent function but that is of simpler mechanical construction.

This object is achieved by the characterising features of claim 1.

The present invention will now be described with reference to an embodiment thereof shown in the drawings, wherein:

FIGURE 1 is a perspective view of a closure cap from above;
FIGURE 2 is a perspective view thereof from below, showing part of its interior;
FIGURE 3 is a side view, half of which is in vertical section;
FIGURE 4 is a view of the full interior of the cap with the cylindrical skirt flattened out; and
FIGURES 5, 6 and 7 are illustrations in side view of three stages during which the seal is broken when the cap is removed.

Referring especially to Figures 1 to 4, there is shown a molded bottle cap, of the type commonly manufactured of a plastic material by injection-molding. It has at its top a flat upper disk 1 whose edge is slightly rounded at 2, and then extends vertically downward as a cylindrical skirt 3 which, exteriorly has a nonslip grippable surface 4, and interiorly has screw threads 5 to fit onto a threaded bottleneck. The lower portion of the skirt includes a sealing device 6 comprised of a tell-tale band or strip 7 interconnected to the lower part of the skirt by means of a wall or extension 8 of the skirt 3 itself, the inside surface of the said tell-tale band 7 being provided with a uniform annular, continuous inward projection 9 over almost all the inner surface of the band.

The said projection 9 is designed with an angular profile having an inwardly turned vertex whose lower face is substantially more slanted than the upper face, so that the lower face may assist the projection in extending over and beyond the bottleneck's collar "C" so as to achieve full coupling action, after which the less-slanted upper portion remains beneath the said collar and the irreversible coupling action of the two parts is achieved.

The wall or natural extension of wall 8 is substantially thinner as compared to the skirt 3 and the telltale band 7 due to a reduction in the external diameter of the cap at this transition region 10, this wall also being thinner and provided with an interrupted annular rupturable line 11, in which the interruptions 12 are either equidistant or otherwise and substantially smaller as compared to the cut-through segments 11', but with one of them 12' being substantially larger, preferably twice or three times as compared to a cut-through segment 11', while also, on said larger interruption 12', one of the ends of a cutting segment 11'' is interconnected with another vertical cut 13 which, in turn, extends to a considerable portion of the telltale band 7, causing it to be more fragile along an imaginary vertical line 14, as likewise occurs with the interruptions '11', which then begin to function as rupturable parts when the cap is removed. The reduction in the thickness of the wall 8 is needed since the cutting line must exhibit a certain amount of interference because it provides the severable portions 12.
which, due to said thickness, are not very deep. If the wall thickness 8 at this part were equal to that of the skirt 3, the cuts 11 would be deeper and, as a result, the severable portions 12 would be sturdier and thus require a different design, difficult to provide. Furthermore, the severable portions need to exhibit a certain degree of elasticity, sufficient to change the molecular orientation and transparency (refraction) of the thermoplastic material used to manufacture the assembly, without which a possible effort to sever the sections 12 would not be successful. This reduction in thickness also helps to provide the strip 7 with a degree of elasticity when it is being fitted to the neck of the bottle.

Referring to Figures 5, 6 and 7, it is seen that, when the cap is unscrewed, the telltale band 7 is forced apart precisely at its opposite section relative to the larger interruption or nonseverable portion 12'. Therefore, when the cap is unscrewed, interruptions 12 of the rupturable line 11 unavoidably and progressively begin to split and, when the cap is almost halfway through its outgoing travel, other interruptions or severable parts 11' will begin to split, also at the said vertical line 13, at which time the cap will become fully detached, as will likewise occur with the seal's strip, but with the latter remaining attached to the cap, even after complete removal thereof.

Figure 7 shows a part of the telltale band 7 that does not become detached from the skirt 3, which part corresponds to section 12' not provided with a cutting line 11 and, therefore, when the cap is unscrewed, the said telltale band 7 is not fully separated from the skirt 3 so that it can be returned together with the bottle. Accordingly, section 12' will, at all times, be superimposed on the bottleneck, but the fact of its being extremely short will not provide any type of gripping action and is only sufficient for the telltale band to remain attached to the skirt 3.

The lower edge of the telltale band 7 is preferably molded with a sharp, almost wedge-shaped cross section 15, which would cause discomfort or a sensation of pain if the cap and seal are forced manually outward during a possible attempt to push off the unbroken cap.

In a preferred modification of the cap, the interruptions 11' of the rupturable line 11, also defined as severable parts, will change color if they are subjected to a stretching effort, but without the interruption 11' being severed, since such a stretching force will be sufficient to change the molecular orientation and transparency (refraction) of the thermoplastic material employed.

Features of the cap of the invention include:

a) the telltale ring 7 which, by means of a cutting line interrupted at various severable points, is structurally attached to the body of the cap, so that, when the latter is unscrewed, the said severable parts 12 split in a crosswise direction, while the band or seal 7 (lower ring) also comes apart vertically at the weakened line 13;

b) the telltale ring 7 has a suitable cross section so that it may be locked under the locking ring or collar [C] on the neck of a glass or plastics bottle [F];

c) the splitting of the telltale band avoids the need to rework the sealing ring for removal thereof from returnable bottles and also provides double proof if the container has been tampered with;

d) the screw thread 5 can have gaps 16 to allow quick decompression of a pressurized product contained within the bottle. In carbonated beverages, it is common for pressure to build up at the upper part of the container, due to the product's gas content (usually CO₂). If the container is inadvertently opened, or reopened, this pressure may cause the cap to be ejected unexpectedly, and can inflict physical harm on the consumer. If the screw thread or fillet is split or has intervals this allows the container's gas or internal pressure to be dispersed quickly before the cap has been fully removed; and

e) the cap can have dimensions of its walls and inside thread profiles which cooperate with the threads on the bottleneck of containers for gas-charged beverages, so as to be able to withstand the internal pressures of these liquid, gas-charged or carbonated products.

Claims

1. A closure cap for a bottle or similar container having a threaded neck, said cap including a downwardly extending cylindrical skirt (3) comprising a body portion having internal screw threads (5) that mate with said threaded neck and a retaining band (7) having an inwardly directed projection (9) the lower face of which is angled inwardly to allow it to be forced over an annular collar on the neck of the bottle, said retaining band (7) including a vertical rupturable line (13,14) formed by a vertical cut (13) through said band (7) with vertical interruptions and being interconnected to said body portion by an interconnecting wall (8) of uniform thickness and of an external diameter smaller than that of said body portion; the interconnecting wall (8) including narrower frangible portions (12) and a wider portion (12) adjacent to said vertical rupturable line (13,14), whereby upon unscrewing of the closed cap the retaining band (7) becomes detached from said skirt (3) except at said wider portion (12') and becomes split apart along said vertical rupturable line (13,14), characterised in that said portions (12,12') of said interconnecting wall (8) are formed by interruptions between a plurality of cut segments (11) aligned and located inside said interconnecting wall in a circular fashion and axially spaced from said body portion such that the axial extent of the cut segments is substantially less than the axial extent of said interconnecting wall and the interruptions (12) are substantially smaller than the segments (11) apart from one interruption (12') which is at least twice the length of the adjacent segments.
2. A closure cap as claimed in Claim 1, wherein the said band (7) has a sharp lower edge which inhibits an attempt to remove the cap by pushing it upwards.

3. A closure cap as claimed in Claim 1 or 2, wherein the said longer interruption (12') is two to three times the length of the cut-through segments (11') of therupturable line (11).

4. A closure cap as claimed in Claim 1, 2 or 3, wherein at least the skirt of the cap is made of a polymeric material which will change color when subjected to a stretching force even if such force is insufficient to liberate the cap from the thread neck.

5. A bottle or similar container closed by means of a closure cap as claimed in any preceding claim.

6. A bottle or similar container as claimed in Claim 5, which contains a carbonated beverage.

**Patentansprüche**

1. Verschluszkappe für eine Flasche oder einen ähnlichen Behälter, die bzw. der einen mit Gewinde versehenen Hals aufweist, wobei die Kappe mit einem nach unten reichenden zylindrischen Mantel (3) versehen ist, der einen Körperteil mit Innengewinde (5), das zu dem mit Gewinde versehenen Hals paßt, und ein Sicherungsband (7) mit einem nach innen gerichteten Vorsprung (9) aufweist, dessen Unterseite nach innen abgewinkelt ist, um über einen ringförmigen Kragen auf den Hals der Flasche geschoben werden zu können, wobei das Sicherungsband (7) eine vertikale Bruchlinie (13, 14) aufweist, die von einem sich durch das Band (7) hindurch erstreckenden vertikalen Einschnitt (13) mit vertikalen Unterbrechungen gebildet ist, und das Sicherungsband mit dem Körperteil über eine Verbindungswand (8) von gleichförmiger Dicke und einem kleineren Außendurchmesser als dem des Körperteils verbunden ist; wobei die Verbindungswand (8) schmale, schwache Teile (12) und einen breiteren Teil (12') benachbart der vertikalen Bruchlinie (13, 14) aufweist, wodurch beim Aufschrauben der geschlossenen Kappe das Sicherungsband (7) von dem Mantel (3) bis auf den an dem breiteren Teil (12') liegenden Bereich getrennt und entlang der vertikalen Bruchlinie (13, 14) durchgerissen wird, dadurch gekennzeichnet, daß die Teile (12, 12') der Verbindungswand (8) durch Unterbrechungen zwischen einer Mehrzahl von Schnittsegmenten (11') gebildet sind, die kreisförmig und axial in Abstand von dem Körperteil ausgebildet und innerhalb der Verbindungswand derart angeordnet sind, daß die axiale Erstreckung der Schnittsegmente wesentlich kleiner als die axiale Erstreckung der Verbindungswand ist und die Unterbrechungen (12) bis auf eine Unterbrechung (12'), die mindestens die doppelte Länge der benachbarten Segmente (11') hat, wesentlich kleiner als die Segmente (11') sind, daß das Sicherungsband (7) und der nach innen gerichtete Vorsprung (9) von gleichförmiger kreisförmiger Gestalt sind, und daß eine einzige vertikale Bruchlinie vorgesehen ist, deren oberes Ende mit einem der Enden eines Schnittsegments (11') verbunden ist.

2. Verschlußkappe nach Anspruch 1, bei welcher das Band (7) eine scharfe Unterkante hat, die einen Versuch verhindert, die Kappe durch Nachoben- schieben zu entfernen.

3. Verschlußkappe nach Anspruch 1 oder 2, bei welcher die längere Unterbrechung (12) die zwei- bis dreifache Länge der Schnittsegmente (11') der Bruchlinie (11) hat.

4. Verschlußkappe nach Anspruch 1, 2 oder 3, bei der mindestens der Mantel der Kappe aus einem Poly- merwerkstoff gefertigt ist, welcher die Farbe wechselt, wenn er einer Streckkraft ausgesetzt wird, selbst wenn diese Kraft unzureichend ist, um die Kappe von dem mit Gewinde versehenen Hals zu lösen.

5. Flasche oder ähnlicher Behälter verschlossen mittels einer Verschlußkappe nach einem der vorher- gehenden Ansprüche.


**Revendications**

1. Bouchon pour une bouteille ou un récipient simi- laire muni d'un goulot fileté, ledit bouchon compren- nant une jupe cylindrique (3) se prolongeant vers le bas, comprenant une partie formant corps muni de filets intérieurs (5) qui s'accoupolent avec ledit goulot fileté, et une bande de retenue (7) comporte- tant une saillie (9) orientée vers l'intérieur, dont la face inférieure est inclinée vers l'intérieur pour lui permettre d'être emmanchée à force sur un cordon annulaire ménagé sur le goulot de la bouteille, ladite bande de retenue (7) comportant une ligne verticale pouvant être rompue (13, 14) formée par une fente verticale (13) réalisée à travers ladite bande (7) avec des interruptions verticales, et étant interconnectée avec ladite partie formant corps par une paroi d'interconnexion (8) d'une épaisseur uni-
forme et d'un diamètre extérieur plus petit que celui de ladite partie formant corps ; la paroi d'interconnexion (8) comportant des parties cassables plus étroites (12) et une partie plus large (12') adjacente à ladite ligne verticale pouvant être rompue (13, 14), de telle sorte qu'après dévissage du bouchon, la bande de retenue (7) se détache de ladite jupe (3), sauf au niveau de ladite partie plus large (12') et se désolidarise le long de ladite ligne verticale pouvant être rompue (13, 14), caractérisé en ce que lesdites parties (12, 12') de ladite paroi d'interconnexion (8) sont formées par des interruptions entre plusieurs segments coupés (11') alignés et placés à l'intérieur de ladite paroi d'interconnexion selon une disposition circulaire et espacés dans le plan axial de ladite partie formant corps, de sorte que l'étendue axiale des segments de coupe est sensiblement inférieure à l'étendue axiale de ladite paroi d'interconnexion et que les interruptions (12) sont sensiblement plus petites que les segments (11'), à l'exception d'une interruption (12') qui correspond au moins à deux fois la longueur des segments adjacents (11'), en ce que ladite bande de retenue (7) et ladite saillie orientée vers l'intérieur (9) ont une configuration circulaire uniforme, et en ce qu'il existe un ligne verticale unique pouvant se rompre, dont l'extrémité supérieure est interconnectée avec une des extrémités d'un segment de coupe (11').

2. Bouchon selon la revendication 1, dans lequel ladite bande (7) comporte un bord inférieur vif qui interdit toute tentative de retirer le bouchon en le poussant vers le haut.

3. Bouchon selon la revendication 1 ou 2, dans lequel ladite interruption plus longue (12') correspond à deux à trois fois la longueur des segments coupés (11') de la ligne pouvant être rompue (11).

4. Bouchon selon la revendication 1, 2 ou 3, dans lequel au moins la jupe du bouchon est réalisée dans un matériel polymère qui changera de couleur lorsqu'il sera soumis à une force d'étirement, même si cette force est insuffisante pour désolidariser le bouchon du goulot fileté.

5. Bouteille ou récipient similaire fermé au moyen d'un bouchon réalisé selon l'une quelconque des revendications qui précèdent.

6. Bouteille ou récipient similaire selon la revendication 5, contenant une boisson gazéifiée.