STOPPER CLOSURE MEANS FOR BOTTLES COMPRISING TAMPER-EVIDENT SEAL
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MOYEN DE FERMETURE DE BOUCHONS DE BOUTEILLES AVEC INDICATEUR D’EFFRACTION

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OBJECT OF THE INVENTION

[0001] The present invention refers to a means for sealing bottle caps with evidence of opening, that is to say, it is set as an objective that it should be made apparent after the cap is first opened that this opening has taken place.

[0002] The present invention is characterised by its special configuration and design, thereby achieving a means of closure for bottle caps with a configuration such that, in the event of opening, this is made quite evident with no possibility at all of restoration, so that it represents a sure and effective seal.

[0003] The present invention therefore lies in the field of closures for spirits bottles and more specifically of bottle cap closures which provide lasting evidence that the bottle has been opened.

BACKGROUND OF THE INVENTION

[0004] To date the commonest means of evidence of seal breakage are those described in the patent with publication number ES2126651, which consist of a perimeter band connected to the cap by means of easily broken bridges.

[0005] This skirt is separated from the body of the cap once the bottle is opened for the first time because the body of the bottle has a retaining flange which acts in conjunction with a series of ribs provided on the inner side of the cap skirt to separate the skirt when first opened.

[0006] Other bottle opening evidence systems are those described in the patent with publication number WO92/05085, which consists of using an inner sealing means and a cap.

[0007] The inner sealing means is arranged directly on the mouth of the bottle. This sealing means has a flange that extends outwards and is folded back over the outer surface of the cap. The presence of this flange represents evidence that the bottle has not been opened.

[0008] This means of evidence prevents unauthorized opening by providing means for indicating the opening of the bottle.

[0009] The patent with publication number WO97/38912 describes means of evidence of opening for bottle cap closure also based on an element in the form of a perimeter skirt that extends from the lower rim of the cap, to which it is joined by means of lines of perforation.

[0010] To achieve the separation of the cap from this skirt at the time of opening, on the inside the skirt has a series of hook-shaped protrusions, which are retained in some perimeter shoulders with which the bottle neck is provided.

[0011] In any case, all the means of evidence of opening of bottle cap closures may be easily concealed.

[0012] The object of the present invention is to secure means of evidence of opening based on a double action, on the one hand, the separation of the two parts of the outer aluminium capsule and, on the other, the release of a previously deformed evidential perimeter tongue.

In the state of the art it is known opening evidence means as the one disclosed in WO 02/096771, based on an aluminium capsule on which there is a frangible portion housed within a notch. Although this solution works as opening evidence means, the aim of the present invention is to design a closure for bottles provided with a double opening evidence means, wherein one of the evidence means is based on the use of a breakable seal ring, being designed in such a way that both means work cooperatively that serves to the aim of providing a closure with double opening evidence means.

DESCRIPTION OF THE INVENTION

[0013] The bottle cap closure means with evidence of opening according to the present invention consists of making bottle opening quite apparent by means of a double action, the separation of the aluminium capsule into two parts and the release of a tongue, which adopts a position that prevents the possibility of obtaining a continuous new capsule again.

[0014] The bottle closure that is the object of this invention consists of a cap that is threaded on the inside against the outer thread on the pourer, which may be of the non-refill type.

[0015] All round its underside this cap has a ring seal joined to the cap by means of perforations or breakable bridges, which break at the time of opening, producing a separation between the cap and the ring seal.

[0016] This seal is provided with a tongue on its upper outer perimeter. Before fitting, the tongue is bent upwards slightly leaving a notch under it free.

[0017] After the aluminium capsule is set in place, a notching operation is performed on the outside of the capsule matching up with the notch in the ring seal. This operation has a number of simultaneous effects:

• obtaining a perimeter cut in the capsule defining two lips, one on either side of the cut,
• these lips are bent towards the inside of the notch, the lower one holding the perimeter ring down and the other one holding the perimeter tongue up,
• the perimeter tongue undergoes a certain degree of strain, which generates a stress, so that thereafter it exerts a pressure downwards, tending to close the notch, a circumstances that does not arise because this is prevented by the upper lip of the capsule.

[0018] When opening takes place through turning the cap, the bridges linking the cap to the lower seal are broken and both parts separate.
On the one hand and at the same time, the outer aluminium capsule is separated into the two parts defined by the perimeter cut over the notch, so that the upper lip corresponding to the capsule slides over the ring seal and releases it.

The stress created by deformation of the tongue at the time of notching is released, so that the tongue regains a lower position, closing the cavity corresponding to the notch.

The ring seal is integral with the bottle, being secured wholly or partly by the upper lip of the part below the cut in the aluminium capsule.

The upper part of the aluminium capsule covers the cap with the lower lip bent inwards.

As for the tongue, upon regaining its lower position closing the cavity corresponding to the notch, the upper perimeter tongue of the ring seal covers the inward bent lip of the lower section of the aluminium capsule, which secures the ring seal wholly or partly.

In this way, the most visible part, including after closing the cap, is the tongue. When the tongue is a different colour from that of the aluminium it is easily distinguished and reveals evidence of opening.

In subsequent closing, the lower lip of the what is now the upper portion of the aluminium capsule cannot now raise the tongue again and clasp it because it has already escaped from its grasp at the time of first opening and bent downwards. This circumstance reveals the irreversibility of the seal ring arrangement.

Now, once closed, instead of seeing a notch, from the outside we see a ring of a different colour, which indicates that the cap has already been opened.

In order to assist the slight flexion that takes place in the seal tongue, a series of cuts is made in the tongue to improve its flexibility.

On the other hand, in order to increase the strength of the aluminium capsule so that it may offer its lower edge bent at the notch point, the aluminium used is alloyed, thereby enhancing its strength.

DESCRIPTION OF THE DRAWINGS

This descriptive report is supplemented with a set of drawings to illustrate the preferred specimen embodiment but never to limit the scope of the invention.

Figure 1 shows a simplified sectional view of the evidential means situated in the closure assembly of a bottle before opening, according to an initial embodiment of the invention. A close view A is also included in which the area corresponding to the ring seal section is enlarged.

Figure 2 shows the same figure as above after opening. A close view B is also included in which the area corresponding to the ring seal section is enlarged.

Figure 3 shows a simplified sectional view of the evidential means situated in the closure assembly of a bottle before opening, according to a second embodiment of the invention. The capsule is not represented for the sake of clearer understanding.

SPECIMEN EMBODIMENTS OF THE INVENTION

In the light of the foregoing figures two specimen embodiments of the invention are described below, together with an explanation of the drawings.

First specimen embodiment

Figure 1 shows a cap (1) linked by its underside to a ring seal (2) by means of breakable bridges (4). These bridges (4) are the ones that will break at the time when the cap is first turned.

The turning of the cap (1) gives rise to a helical movement, i.e. turn is combined with an axial movement

If the ring seal (2) is locked, as is the case of this first specimen, the turn generates a shear stress on the breakable bridges (4).

The axial movement in turn applies a traction stress on the same breakable bridges (4) due to the strain exerted by the separation between the cap (1) and the ring (2).

The result of the helical turn of the cap (1) is a tensional stress that is the result of two stresses, a tensional and a shear stress, giving rise to breakage after surpassing the permissible stress of the material.

To lock the ring seal (2), this seal (2) is integral with the body (3) of the pourer and therefore prevented from relative turn. The means preventing relative turn consist of outer teeth (3.1) presented by the pourer body (3), applied against the ring seal (2).

The number and size of the breakable bridges (4) will depend on the breaking strength that we wish the assembly to offer.

At the top, the ring seal (2) has a salient or tongue that arises all the way round (2.1) forming a cavity (2.1.1) immediately below it.

Enclosing the whole assembly there is an aluminium cover or capsule (5) which has a perimeter notch (6) after application of a cut such that it ensures that the lips of the cut are engaged in the cavity (2.1.1) through being curved inwards.

The perimeter cut which gives rise to the notch (6) in the aluminium capsule (5) is made during assembly. After setting the aluminium capsule (5) in place on the cap (1), a machine exerts pressure all the way round until cutting a groove in the capsule (5), which is when the tongue (2.1) undergoes a slight upward flexion.

Optionally, a series of perimeter cuts are made to enhance its flexibility.

Figure 2 shows how the assembly appears after the first time the bottle is opened. After this initial opening of the bottle, the aluminium capsule (5) is separated into two parts: an upper (5.2) and a lower (5.1) portion, both with the lips of the cut tucked in.
In the upper part (5.2) of the aluminium capsule (5), after separation, its tucked-in lip (5.3) ceases to retain the tongue (2.1), so that it recovers the natural position to which it tends, i.e. downwards.

Furthermore, thanks to the notching (6) in the aluminium capsule (5), the lower lip (5.3) of the upper half (5.2) of the aluminium capsule (5) retains the shape given, covering the lower rim of the cap (1).

As regards the lip (5.4) of the lower half (5.1) of the aluminium capsule (5), it also retains the shape given in the notching (6), so that this lip (5.4) is engaged in the cavity (2.1.1) and partly covered under the tongue (2.1) of the ring seal (2).

On account of this configuration after opening, the tongue (2.1) is visible even when cap is closed again, in which case a ring of the same colour as the tongue (2.1) is visible, and it is not possible to conceal or restore the situation prior to opening by bending the tongue (2.1) and the lips (5.3, 5.4) of the parts into which the aluminium capsule (5) is divided.

Figure 4 shows how the tongue (2.1) is visible and the ring seal (2) joined to the lower portion (5.1) of aluminium capsule (5) by way of its upper lip (5.4), a fastening that is supplemented with the teeth (3.1) of the pourer cap (3) which prevent the ring seal (2) from turning.

This same figure shows the outer fluting (1.1) with which the cap (1) is provided, as the upper section of the aluminium capsule (5.2) has been partly removed in this representation in order to show this fluting (1.1) which helps the cap (1) to grip the capsule (5) and prevents them from turning in relation to each other.

**Second specimen embodiment**

Figure 3 shows a second specimen embodiment of the invention, which slightly modifies the configuration of the ring seal (2) to establish another way of shearing the breakable bridges (4).

In this second specimen embodiment of the invention the pourer body (3) does not include outer teeth (3.1) to impede relative turn between the body (3) and the ring seal (2).

It is, however, provided with a perimeter shoulder (3.2) with a pronounced step below it, preferably sharp-edged, situated below the screw threads (3.3).

The ring seal (2) also has another internal perimeter shoulder (2.2) which rests under the perimeter shoulder (3.2) of the pourer body (3).

The mechanical tie between the ring seal (2) and the pourer body (3) is only axial as the ring seal (2) is no longer prevented from turning.

The result of this arrangement is that at the time of first opening the turn of the cap (1) continues to be helical, i.e. a turn plus an axial movement; and the ring (2) presents the same turn as the cap (1) as this does not have the extent of its freedom of movement impeded.

Therefore, the relative movement between the cap (1) and its ring seal (2) is that of a distancing in the axial direction.

The axial distancing between both bodies causes the stress in the breakable bridges (4) to be mainly due to tensile stress, while shear stress is reduced to the minimum required to overcome the ring seal (2) friction forces.

As a result, the ring seal (2) remains secured axially by two means, one by the pair of internal shoulders (3.2, 2.2) operating together and the grip offered by the lip (5.4), not shown in this third figure for the sake of clarity.

In this way, the influence that the degree of upper lip (5.4) strain exerts, previously the only means responsible for securing the ring seal (2), is made independent of the adjustment of the machinery that performs the notching (6) to provide a good grip on the tongue (2.1); and, in turn, the ring seal (2) retaining means are the ones that reduce the probability of failure due to inadequate fastening.

The other items in the specimen embodiment are not described as they are the same as those described in the first embodiment.

Changes in the materials, shape, size and arrangement of the component items, described in a non-restrictive way, do not alter the essentials of this invention and this description is sufficient for an expert to be able to proceed to its reproduction.

**Claims**

1. Closure means for bottles with evidence of opening, wherein a cap (1) is enclosed by a capsule (5), which is cut and notched (6) to form two horizontal lips (5.3, 5.4), one on either side of the cut, engaged in a cavity (2.1.1), **characterised in that** the cap (1) is connected at the bottom to a ring seal (2) by means of breakable bridges (4), while this ring seal (2) is provided with a perimeter tongue (2.1) on its upper outer side, which forms the perimeter concave cavity (2.1.1) underneath, where the two lips (5.3) and (5.4) of the capsule are engaged in such a way that the tongue (2.1) is flexed upwards under pressure and retained by the lower lip (5.3) of the upper section (5.2) of the capsule (5) for its release when the cap (1) is first opened, so that said tongue (2.1) adopts its natural shape and is visible in the form of a ring after re-closure, as the lip (5.3) of the upper section (5.2) of the capsule (5) is arranged so as to cover the lower portion of the cap (1), while the lip (5.4) of the lower section (5.1) of the capsule (5) is engaged below the tongue (2.1) in the cavity (2.1.1).

2. Closure means for bottle caps with evidence of opening, according to claim 1, **characterised in that** the capsule (5) is made of aluminium.
3. Closure means for bottle caps with evidence of opening, according to claim 2, characterised in that the aluminium used in the capsule (5) is alloyed aluminium in order to increase its strength.

4. Closure means for bottle caps with evidence of opening, according to claim 1, characterised in that the colour of the tongue (2.1) is different from that of the capsule (5) to highlight the evidence in the event of opening.

5. Closure means for bottle caps with evidence of opening, according to claim 1, characterised in that the tongue (2.1) has cuts to enhance its flexibility.

6. Closure means for bottle caps with evidence of opening, according to claim 1, characterised in that the ring seal (2) is made integral with the pourer body (3) by means of teeth (3.1), which stop it from turning, and it is the lip (5.4) of the lower section (5.1) of the capsule which retains it axially.

7. Closure means for bottle caps with evidence of opening, according to claim 1, characterised in that the ring seal (2) is not retained in respect of turn by the pourer body (3), which has an annular shoulder (3.2) below the screw threads (3.3) on which another inner annular shoulder (2.2) of the seal ring (2) rests for axial retention purposes, said axial retention being increased by that offered by the lip (5.4) of the lower section (5.1) of the capsule (5).

8. Closure means for bottle caps with evidence of opening, according to claim 7, characterised in that the annular shoulder (3.2) below the screw threads (3.3) of the pourer body (3) presents a sharp-edged step on its lower portion.

Patentansprüche

1. Verschlussmittel für Flaschen mit Öffnungshinweis, wobei ein Deckel (1) durch eine Kapsel (5) umschlossen wird, die eingeschnitten und gekerbt (6) ist, um zwei waagerechte Lippen (5.3, 5.4) zu bilden, eine auf jeder Seite des Schnitts, die in eine Vertiefung (2.1.1) einrasten, dadurch gekennzeichnet, dass der Deckel (1) unten mit einer Ringdichtung (2) verbunden ist mittels durchbrechbarer Brücken (4) während die Ringdichtung (2) über eine umfängliche Zunge (2.1) auf der oberen Aussenseite verfügt, der die umfängliche Vertiefung (2.1.1) darunter bildet, in die die zwei Lippen (5.3) und (5.4) der Kapzel eingreifen, so dass die Zunge (2.1) nach oben unter Druck gebogen ist und von der unteren Lippe (5.3) des oberen Bereichs (5.2) der Kapsel (5) zurückgehalten wird, damit sie gelöst wird, wenn der Deckel (1) zum ersten Mal geöffnet wird, so dass die besagte Zunge (2.1) ihre ursprüngliche Form annimmt und nach dem Wiederverschliessen in Form eines Rings sichtbar ist, da die Lippe (5.3) des oberen Bereichs (5.2) der Kapsel (5) so angebracht ist, um den unteren Teil des Deckels (1) zu bedecken, während die Lippe (5.4) des unteren Bereichs (5.1) der Kapsel (5) unter der Zunge (2.1) in der Vertiefung (2.1.1) einrastet.

2. Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 1, dadurch gekennzeichnet, dass das Aluminium der Kapsel (5) aus einer Aluminiumlegierung besteht.


4. Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 1, dadurch gekennzeichnet, dass die Farbe der Zunge (2.1) anders als die der Kapsel (5) ist, um die Öffnungsmöglichkeit hervorzuheben.

5. - Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 1, dadurch gekennzeichnet, dass die Zunge (2.1) Einschnitte aufweist, die ihre Flexibilität verstärken.

6. Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 1, dadurch gekennzeichnet, dass die Ringdichtung (2) in den Giesskörper (3) integriert ist mittels Zähnen (3.1), die diese am Drehen hindern und es ist die Lippe (5.4) des unteren Bereichs (5.1) der Kapsel, die diese axial zurückhält.

7. Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 1, dadurch gekennzeichnet, dass die Ringdichtung (2) nicht hinsichtlich der Drehung des Giesskörpers (3) zurückgehalten wird, der eine ringförmige Schuler (3.2) unter den Schraubenwindungen (3.3) auflagert, auf der eine weitere innere ringförmige Schuler (2.2) des Dichtungsrings (2) auflagert zum axialen Rückhalten, wobei besagte axiale Rückhaltung durch die von der Lippe (5.4) des unteren Bereichs (5.1) der Kapsel (5) gebotenen verstärkt wird.

8. Verschlussmittel für Flaschen mit Öffnungshinweis gemäss Anspruch 7, dadurch gekennzeichnet, dass die ringförmige Schuler (3.2) unter den Schraubenwindungen (3.3) des Giesskörpers (3) eine scharfkantige Stufe im unteren Bereich aufweist.
Revendications

1. Moyen de fermeture pour bouteilles avec évidence d’ouverture, dans lequel un bouchon (1) est enfermé dans une capsule (5), qui est coupée et rainurée (6) pour former deux lèvres horizontales (5.3, 5.4), une sur chaque côté de la coupure, engagée dans une cavité (2.1.1), caractérisé en ce que le bouchon (1) est connecté à la partie inférieure d’un joint d’étanchéité (2) au moyen de ponts cassables (4), tandis que ce joint d’étanchéité (2) est pourvu d’une languette périmétrale (2.1) sur son côté extérieur supérieur, qui forme le fond de la cavité (2.1.1) concave périmétrale, où les deux lèvres (5.3) et (5.4) de la capsule sont engagées de manière que la languette (2.1) fléchisse vers le haut sous pression et elle est retenue par la lèvre inférieure (5.3) de la section supérieure (5.2) de la capsule (5) pour sa libération lorsque le bouchon (1) est ouvert pour la première fois, de manière que ladite languette (2.1) adopte sa forme naturelle et qu’elle soit visible sous la forme d’un anneau après la ré-fermeture, car la lèvre (5.3) de la section supérieure (5.2) de la capsule est disposée de manière à couvrir la portion inférieure du bouchon (1), tandis que la lèvre (5.4) de la section inférieure (5.1) de la capsule (5) est engagée sous la languette (2.1) dans la cavité (2.1.1).

2. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 1, caractérisé en ce que la capsule (5) est faite en aluminium.

3. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 2, caractérisé en ce que l’aluminium utilisé dans la capsule (5) est un alliage d’aluminium pour augmenter sa force.

4. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 1, caractérisé en ce que la couleur de la languette (2.1) est différente de celle de la capsule (5) pour mettre en relief l’évidence en cas d’ouverture.

5. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 1, caractérisé en ce que la languette (2.1) a des coupures pour améliorer sa flexibilité.

6. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 1, caractérisé en ce que le joint d’étanchéité (2) est solidaire du corps verseur (3) au moyen de dents (3.1), qui l’empêche de tourner, et c’est la lèvre (5.4) de la section inférieure (5.1) de la capsule qui le retient axialement.

7. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 1, caractérisé en ce que le joint d’étanchéité n’est pas retenu, en ce qui concerne la rotation, par le corps verseur (3), lequel a un épaulement (3.2) sous les filetages (3.3) sur lesquels un autre épaulement annulaire interne (2.2) du joint d’étanchéité (2) repose à des fins de retenue axiale, ladite retenue axiale étant incrémentée par celle pourvue par la lèvre (5.4) de la section inférieure (5.1) de la capsule (5).

8. Moyen de fermeture pour bouchons de bouteille avec évidence d’ouverture, selon la revendication 7, caractérisé en ce que l’épaulement annulaire (3.2) sous les filetages (3.3) du corps verseur (3) présente un échelon à arêtes vives sur sa portion inférieure.