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(54) Closure for a liquid container

Verschluss für einen Flüssigkeitsbehälter

Fermeture pour récipient de liquide

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Description

[0001] The present invention refers to a closure for recipients containing liquid products, in particular but not necessarily liquid food products.

[0002] In order to close recipients containing drinks or other liquid food products, screw closing devices are known to be used, made up of two elements: a threaded cap, which actually closes and possibly seals the recipient, and an inner safety seal, arranged below such a cap. The function of the inner safety seal is that of preserving the integrity of the liquid product contained inside the recipient until the recipient itself has been opened for the first time by the user.

[0003] A first known and common type of this kind of inner safety seal, commonly used on recipients manufactured in plastic or cardboard containing for example milk, fruit juice, infusions or other non-alcoholic drinks, is made up of an aluminium film that is securely connected to the opening of the recipient. In the act of opening the recipient for the first time, the user must manually breake or perforate the film, which normally remains partially fixed to the opening of the recipient itself, thus coming into contact with the liquid product.

[0004] Therefore, in order to avoid contact between the inner safety seal, once broken, and the liquid contained in the recipient, breakable walls made of plastic material have been made, fixed to the opening of the recipient and positioned below the closing cap. Such breakable walls are provided with a holding tab so that the user, after the cap has been opened for the first time, can completely extract them from the opening of the recipient, breaking their constraints that connect them to the latter. Such a closure, with breahable wall, is disclosed in US 2001/0015355. However, even if these walls provided with a tab can be completely extracted from the recipient, they require, in any case, a finger of the user to be inserted into the opening of the recipient itself to remove them, with consequent possibility of contamination of the liquid food product.

[0005] The general purpose of the present invention is therefore that of making a closure for recipients containing liquid products, in particular but not necessarily for liquid food products, which is able to solve the aforementioned drawbacks of the prior art in an extremely simple, cost effective and particularly functional manner.

[0006] In particular, one purpose of the present invention is that of making a closure for recipients containing liquid products that is able to form a safety seal for the recipient without such a safety seal coming into contact with the liquid product after its removal.

[0007] Another purpose of the invention is that of making a closure for recipients containing liquid products in which the removal of the safety seal, after the recipient has been opened for the first time, does not have to be carried out manually by the user.

[0008] These purposes according to the present invention are achieved by making a screw cap for recipients containing liquid products, in particular but not necessarily liquid food products, as outlined in claim 1. EP2020385 discloses a closure in accordance with the preable of claim 1.

[0009] Further characteristics of the invention are highlighted in the dependent claims.

[0010] The characteristics and the advantages of a closure for recipients containing liquid products according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, with reference to the attached schematic drawings in which:

figure 1 is a perspective view of a closure for recipients containing liquid products according to the present invention;
figure 2 is a top plan view of the closure of figure 1;
figure 3 is a section view, obtained along the line A-A of figure 2, of the closure of figure 1;
figure 4 is an enlarged view of the detail indicated with "C" in figure 3;
figure 5 is a perspective view of a first component of the closure of figure 1;
figure 6 is a side elevational view of the first component of figure 5;
figure 7 is a top plan view of the first component of figure 5;
figure 8 is a section view, obtained along the line B-B of figure 7, of the first component of figure 5;
figure 9 is a perspective view of a second component of the closure of figure 1;
figure 10 is a side elevational view of the second component of figure 9;
figure 11 is a bottom plan view of the second component of figure 9; and
figure 12 is a section view, obtained along the line C-C of figure 11, of the second component of figure 9.

[0011] With reference to the figures, a closure for recipients containing liquid products according to the present invention is shown, wholly indicated with reference numeral 10. The closure 10 is configured for being applied to a generic recipient for liquid products (not shown), of the type made for example in recyclable cardboard and provided, on its upper wall, with an outlet hole for the liquid contained therein.

[0012] The closure 10 comprises a first cylindrical dispenser element 12 in the form of a sleeve (figures 5-8), provided with an external thread 14 and with an annular base 16 configured so as to be fixedly connected, for example through heat coupling or through glueing, to the wall of the recipient at the relative outlet hole for the liquid contained therein. The sleeve 12 thus forms a mouth through which it is possible to dispense the liquid contained inside the recipient.

[0013] The sleeve 12 of the closure 10 is internally obstructed by a breakable circular wall 18, having a perpendicular extension with respect to the rotation axis of

the sleeve 12 itself and formed integral with it. The breakable circular wall 18 is connected to the inner side surface of the sleeve 12 by means of a circumferential weakened line 20. The breakable circular wall 18 thus acts as a safety seal for the closure 10, sealingly obstructing its mouth 12 until the recipient is opened for the first time, as shall be better specified hereafter.

[0014] The closure 10 also comprises a second cylindrical element 22, or covering cap (figures 9-12), closed by an upper end 24 . Along the inner side surface of the covering cap 22 a first female screw thread 26 is formed, operatively coupled with the external thread 14 formed on the outer side surface of the sleeve 12.

[0015] According to the invention, inside the covering cap 22 there is a second female screw thread 28 having a smaller diameter and opposite screwing direction with respect to the diameter and screwing direction of the first female screw thread 26. The second female screw thread 28 of the covering cap 22 is thus capable of engaging with a screw thread 30 formed integrally with the breakable circular wall 18 of the sleeve 12. In turn, also the screw thread 30, preferably made hollow inside, has a smaller diameter and opposite screwing direction with respect to the diameter and screwing direction of the external thread 14 of the sleeve 12.

[0016] In such a way, when the closure 10 is in its closed configuration before the recipient has been opened for the first time, the outer 26 and inner 28 female screw threads of the covering cap are engaged with the external thread 14 and the inner screw thread 30 of the sleeve 12, respectively, as shown in the section view of figure 3. By acting upon the covering cap 22 there will thus be the unscrewing and the lifting of the latter with respect to the sleeve 12 and, simultaneously, the screwing of the screw thread 30 inside the respective inner female screw thread 28. Consequently, with the same movement with which the unscrewing and the lifting of the covering cap 22 from the sleeve 12 is obtained, there is also the lifting of the breakable circular wall 18 and its detachment from the sleeve 12, through breaking of the circumferential weakened line 20.

[0017] Therefore, after the recipient has been opened for the first time, the circular wall 18, separated from the sleeve 12, and the relative screw thread 30 remain inserted inside the covering cap 22, without needing any manual intervention by the user to remove the safety seal, consisting of the circular wall 18 itself, and without such a safety seal accidentally being able to fall into the recipient and sink into the liquid contained therein, thus contaminating it.

In order to obtain the complete lifting and the consequent removal of the breakable circular wall 18 from the sleeve 12 at a different time with respect to that in which the complete unscrewing of the covering cap 22 from the sleeve 12 itself is obtained, the thread 14 of the sleeve 12 and that of the outer screw thread 26 is made with a different pitch and may also be made with a different length with respect to those of the screw thread 30 and of the inner female screw thread 28. In particular, based upon the example embodiment illustrated in the figures, the pitch of both the screw thread 30 and of the inner female screw thread 28 of the covering cap 22 is longer and equal to double the pitch of both the thread 14 of the sleeve 12 and the outer screw thread 26 of the covering cap 22.

[0018] The length of all the threads present inside the closure 10 can vary according to the specific needs. Based upon the example embodiment illustrated in the figures, the length of both the screw thread 30 and of the inner female screw thread 28 of the covering cap 22 is considerably smaller than the length of both the thread 14 of the sleeve 12 and the outer female screw thread 26 of the covering cap 22, so as to allow the complete lifting and the consequent removal of the circular wall 18 from the sleeve 12 before obtaining the complete unscrewing of the covering cap 22 from the sleeve 12 itself.

[0019] The covering cap 22 can be connected, at its lower edge, to an anti-tampering ring 32 through a plurality of breakable bridge elements 34. The first time the closure 10 is opened, it will thus be characterised, apart from by the detachment of the circular wall 18 from the sleeve 12, also by the breaking of the bridge elements 34, caused by the rotation and by the lifting of the covering cap 22 and by the consequent detachment of such a covering cap 22 from the underlying anti-tampering ring 32, held by a projecting lip 36 formed below on the outer surface of the sleeve 12.

[0020] In detail, on the inner surface of the anti-tampering ring 32 there are one or more wedge-shaped elements 38, preferably arranged evenly along the circumference of such an anti-tampering ring 32, which project radially inwards towards the sleeve 12. The function of the wedge-shaped elements 38 is that of making it possible for the anti-tampering ring 32 to engage with the projecting lip 36 foreseen on the outer surface of the sleeve 12, so as to limit the axial movement of such an annular ring 32 with respect to the covering cap 22 when it is screwed onto the sleeve 12 itself and the closure 10 is still sealed.

[0021] Finally, on the inner surface of the upper end 24, that is to say, the surface facing towards the opening of the sleeve 12, an annular sealing lip 40 can be formed projecting downwards (figure 4), intended to be inserted inside the upper edge of the sleeve 12 itself to improve the seal of the closure 10. Of course, the diameter of the annular sealing lip 40 is shorter than the diameter of the sleeve 12 in the respective contact area.

[0022] It has thus been seen that the closure for recipients containing liquid products according to the present invention achieves the previously highlighted purposes.

[0023] The closure for recipients containing liquid products of the present invention thus conceived can in any case undergo numerous modification and variants, all covered by the same inventive concept; moreover, all the details can be replaced by technically equivalent elements. In practice the materials used, as well as the

shapes and sizes, can be any according to the technical requirements.

[0024] The scope of protection of the invention is defined by the attached claims.

Claims

1. Closure (10) for a liquid product container comprising:

- a cylindrical dispenser element (12) in the form of a sleeve, provided with an external thread (14) , said cylindrical dispenser element (12) being internally obstructed by a breakable circular wall (18) connected to the inner side surface of said cylindrical dispenser element (12) by means of a circumferential weakened line (20), and
- a cylindrical covering cap (22), closed by an upper end (24) and provided, along its inner side surface, with a first female screw thread (26) able to be operatively coupled with said external thread (14) formed on the outer side surface of the cylindrical dispenser element (12), **characterised in that** the cylindrical dispenser element (12) is provided with an annular base (16) configured to be fixedly connected to the wall of the recipient at the relative outlet hole for the liquid contained therein and **in that** inside said cylindrical covering cap (22) there is a second inner female screw thread (28) having a smaller diameter and opposite screwing direction with respect to the diameter and screwing direction of said first female screw thread (26), said second inner female screw thread (28) being able to engage with a screw thread (30) formed integral with said breakable circular wall (18), said screw thread (30) having a smaller diameter and opposite screwing direction with respect to the diameter and screwing direction of said external threading (14) formed on the outer side surface of the cylindrical dispenser element (12), so as to simultaneously obtain both the unscrewing and the lifting of the cylindrical covering cap (22) with respect to the cylindrical dispenser element (12), and the screwing of the screw thread (30) inside the respective inner female screw thread (28) and the consequent detachment of the breakable circular wall (18) from the cylindrical dispenser element (12) through breaking of the circumferential weakened line (20),

the external thread (14) formed on the outer side surface of the cylindrical dispenser element (12) and the first female screw thread (26) being made with a different pitch with respect to the pitch of the screw thread (30) and of the second inner female screw thread (28),
the pitch of the thread both of the screw thread (30) and of the second inner female screw thread (28) being longer than the pitch both of the external thread (14) formed on the outer side surface of the cylindrical dispenser element (12) and of the thread of the first female screw thread (26).

2. Closure (10) according to claim 1 , **characterised in that** the external thread (14) formed on the outer side surface of the cylindrical dispenser element (12) and the first female screw thread (26) are made with a different length with respect to the length of the screw thread (30) and of the second inner female screw thread (28).

3. Closure (10) according to claim 2, **characterised in that** the length of the screw thread (30) and of the second inner female screw thread (28) is shorter than the length both of the external thread (14) formed on the outer side surface of the cylindrical dispenser element (12) and of the first female screw thread (26).

4. Closure (10) according to any one of the previous claims, **characterised in that** said covering cap (22) is connected, at its lower edge, to an anti-tampering ring (32) through a plurality of breakable bridge elements (34).

5. Closure (10) according to claim 4, **characterised in that** said anti-tampering ring (32) is provided, on its inner surface, with one or more wedge-shaped elements (38) that project radially inwards towards said cylindrical dispenser element (12), said wedge-shaped elements (38) allowing the engagement of said anti-tampering ring (32) with a projecting lip (36) provided on the outer surface of said cylindrical dispenser element (12).

6. Closure (10) according to any one of the previous claims, **characterised in that** on the inner surface of said upper end (24) an annular sealing lip (40) is formed that projects downwards, intended to be inserted in the upper edge of said cylindrical dispenser element (12) to improve the seal of the cap (10), the diameter of said annular sealing lip (40) being shorter than the diameter of said cylindrical dispenser element (12) in the respective contact area.

Patentansprüche

1. Verschluss (10) für einen Behälter eines flüssigen Produkts, umfassend:

- ein zylindrisches Spenderelement (12) in Form einer Hülse, das mit einem Außengewinde (14)

versehen ist, wobei das zylindrische Spenderelement (12) intern durch eine zerbrechliche kreisförmige Wand (18) versperrt ist, die mit der Innenseitenfläche des zylindrischen Spenderelements (12) mittels einer in Umfangsrichtung angeordneten Schwächungslinie (20) verbunden ist, und

- eine zylindrische Abdeckkappe (22), die durch ein oberes Ende (24) verschlossen ist und entlang ihrer Innenseitenfläche mit einem ersten Innenschraubgewinde (26) versehen ist, das funktional mit dem an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildeten Außengewinde (14) koppelbar ist,

dadurch gekennzeichnet, dass
das zylindrische Spenderelement (12) mit einer ringförmigen Basis (16) versehen ist, die derart ausgestaltet ist, dass sie fest mit der Wand des Rezipienten an dem betreffenden Auslassloch für die darin enthaltene Flüssigkeit verbunden ist, und dass innerhalb der zylindrischen Abdeckkappe (22) ein zweites inneres Innenschraubgewinde (28) vorgesehen ist, das einen kleineren Durchmesser und eine entgegengesetzte Schraubrichtung mit Bezug auf den Durchmesser und die Schraubrichtung des ersten Innenschraubgewindes (26) aufweist, wobei das zweite innere Innenschraubgewinde (28) mit einem Schraubgewinde (30) in Eingriff stehen kann, das einstückig mit der zerbrechlichen kreisförmigen Wand (18) gebildet ist, wobei das Schraubgewinde (30) einen kleineren Durchmesser und eine entgegengesetzte Schraubrichtung mit Bezug auf den Durchmesser und die Schraubrichtung des Außengewindes (14) aufweist, das an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildet ist, um somit gleichzeitig das Losschrauben und das Anheben der zylindrischen Abdeckkappe (22) mit Bezug auf das zylindrische Spenderelement (12), sowie das Schrauben des Schraubgewindes (30) innerhalb des jeweiligen inneren Innenschraubgewindes (28) und das daraus folgende Ablösen der zerbrechlichen kreisförmigen Wand (18) von dem zylindrischen Spenderelement (12) durch Zerbrechen der in Umfangsrichtung angeordneten Schwächungslinie (20) zu erhalten,
dass das Außengewinde (14), das an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildet ist, und das erste Innenschraubgewinde (26) mit einer unterschiedlichen Steigung mit Bezug auf die Steigung des Schraubgewindes (30) und des zweiten inneren Innenschraubgewindes (28) gebildet sind,
dass die Steigung des Gewindes sowohl des Schraubgewindes (30) als auch des zweiten inneren Innenschraubgewindes (28) länger als die Steigung sowohl des Außengewindes (14), das an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildet ist, und des Gewindes des ersten Innenschraubgewindes (26) ist.

2. Verschluss (10) nach Anspruch 1,
dadurch gekennzeichnet, dass
das Außengewinde (14), das an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildet ist, und das erste Innenschraubgewinde (26) mit einer unterschiedlichen Länge mit Bezug auf die Länge des Schraubgewindes (30) und des zweiten inneren Innenschraubgewindes (28) gebildet ist.

3. Verschluss (10) nach Anspruch 2,
dadurch gekennzeichnet, dass
die Länge des Schraubgewindes (30) und des zweiten inneren Innenschraubgewindes (28) kürzer als die Länge sowohl des Außengewindes (14), das an der Außenseitenfläche des zylindrischen Spenderelements (12) gebildet ist, als auch des ersten Innenschraubgewindes (26) ist.

4. Verschluss (10) nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
die Abdeckkappe (22) an ihrem unteren Rand mit einem Manipulationsschutzring (32) durch eine Vielzahl von zerbrechlichen Brückenelementen (34) verbunden ist.

5. Verschluss (10) nach Anspruch 4,
dadurch gekennzeichnet, dass
der Manipulationsschutzring (32) an seiner Innenfläche mit einem oder mehreren keilförmigen Elementen (38) versehen ist, die radial nach innen in Richtung des zylindrischen Spenderelements (12) vorspringen, wobei die keilförmigen Elemente (38) den Eingriff des Manipulationsschutzrings (32) mit einer vorspringenden Lippe (36) zulassen, die an der Außenfläche des zylindrischen Spenderelements (12) vorgesehen ist.

6. Verschluss (10) nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
an der Innenfläche des oberen Endes (24) eine ringförmige Dichtlippe (40) gebildet ist, die nach unten vorspringt und dazu dient, in den oberen Rand des zylindrischen Spenderelements (12) eingesetzt zu werden, um die Dichtung der Kappe (10) zu verbessern, wobei der Durchmesser der ringförmigen Dichtlippe (40) kürzer als der Durchmesser des zylindrischen Spenderelements (12) in der jeweiligen Kontaktfläche ist.

Revendications

1. Dispositif de fermeture (10) pour récipient de produit

liquide comprenant :

- un élément distributeur cylindrique (12) sous la forme d'un manchon, pourvu d'un filetage externe (14), ledit élément distributeur cylindrique (12) étant obstrué intérieurement par une paroi circulaire frangible (18) connectée à la surface latérale intérieure dudit élément distributeur cylindrique (12) au moyen d'une ligne périphérique affaiblie (20), et
- un bouchon cylindrique (22), fermé par une extrémité supérieure (24) et pourvu, sur sa surface latérale intérieure, d'un premier filetage femelle (26) apte à être accouplé fonctionnellement audit filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12), **caractérisé en ce que** l'élément distributeur cylindrique (12) est pourvu d'une base annulaire (16) configurée pour être connectée de manière fixe à la paroi du récipient au niveau du trou de sortie relatif pour le liquide qui y est contenu, et **en ce que**, à l'intérieur dudit bouchon cylindrique (22), se trouve un deuxième filetage femelle interne (28) ayant un plus petit diamètre et une direction de vissage contraire par rapport au diamètre et à la direction de vissage dudit premier filetage femelle (26), ledit deuxième filetage femelle interne (28) étant apte à se mettre en prise avec un filetage (30) formé d'un seul tenant avec ladite paroi circulaire frangible (18), ledit filetage (30) ayant un plus petit diamètre et une direction de vissage contraire par rapport au diamètre et à la direction de vissage dudit filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12), afin d'obtenir simultanément à la fois le dévissage et la montée du bouchon cylindrique (22) par rapport à l'élément distributeur cylindrique (12), et le vissage du filetage (30) à l'intérieur du filetage femelle interne respectif (28) et le détachement consécutif de la paroi circulaire frangible (18) d'avec l'élément distributeur cylindrique (12) par une rupture de la ligne périphérique affaiblie (20),

le filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12) et le premier filetage femelle (26) étant réalisés avec un pas différent de celui du filetage (30) et de celui du deuxième filetage femelle interne (28),
le pas du filet à la fois du filetage (30) et du deuxième filetage femelle interne (28) étant plus long que le pas à la fois du filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12) et du filet du premier filetage femelle (26).

2. Dispositif de fermeture (10) selon la revendication 1, **caractérisé en ce que** le filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12) et le premier filetage femelle (26) sont réalisés avec une longueur différente de celle du filetage (30) et du deuxième filetage femelle interne (28).

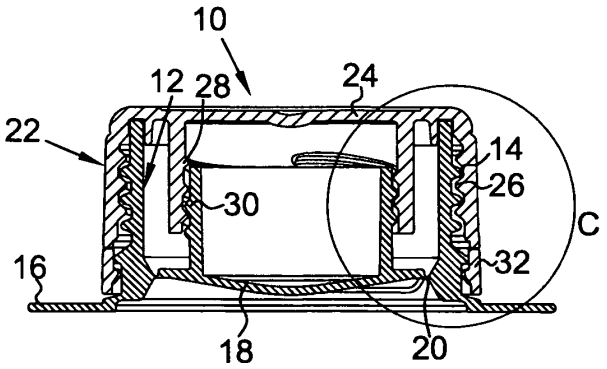
3. Dispositif de fermeture (10) selon la revendication 2, **caractérisé en ce que** la longueur du filetage (30) et du deuxième filetage femelle interne (28) est inférieure à la fois à la longueur du filetage externe (14) formé sur la surface latérale extérieure de l'élément distributeur cylindrique (12) et du premier filetage femelle (26).

4. Dispositif de fermeture (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit bouchon (22) est connecté, au niveau de son bord inférieur, à une bague d'inviolabilité (32) par l'intermédiaire d'une pluralité d'éléments de jonction frangibles (34).

5. Dispositif de fermeture (10) selon la revendication 4, **caractérisé en ce que** ladite bague d'inviolabilité (32) est pourvue, sur sa surface intérieure, d'un ou de plusieurs éléments en forme de coin (38) qui font saillie radialement vers l'intérieur en direction dudit élément distributeur cylindrique (12), lesdits éléments en forme de coin (38) permettant l'accrochage de ladite bague d'inviolabilité (32) à une lèvre saillante (36) prévue sur la surface extérieure dudit élément distributeur cylindrique (12).

6. Dispositif de fermeture (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, sur la surface intérieure de ladite extrémité supérieure (24), une lèvre d'étanchéité annulaire (40) est formée, qui fait saillie vers le bas et est destinée à être insérée dans le bord supérieur dudit élément distributeur cylindrique (12) pour améliorer l'étanchéité du dispositif de fermeture (10), le diamètre de ladite lèvre d'étanchéité annulaire (40) étant inférieur au diamètre dudit élément distributeur cylindrique (12) dans la région de contact respective.

Fig. 3



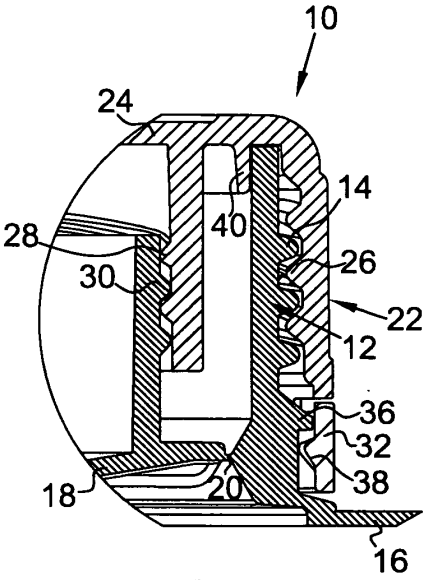


Fig. 4

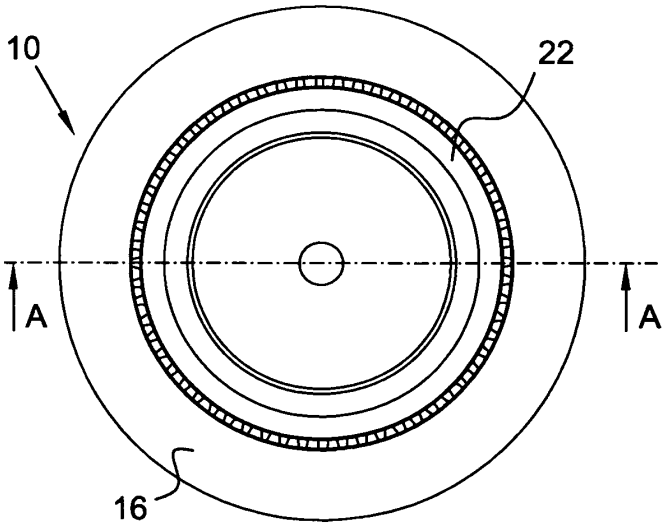
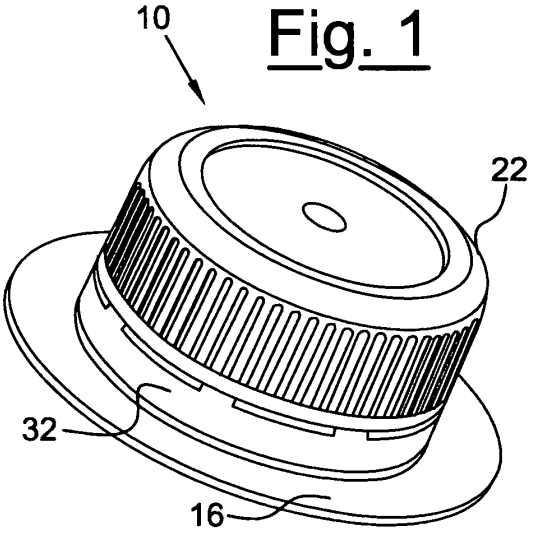


Fig. 2

Fig. 1



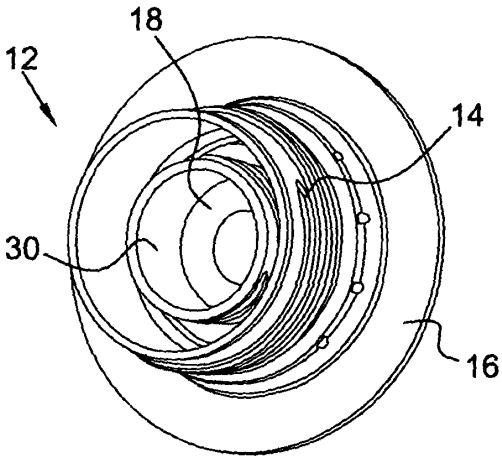


Fig. 5

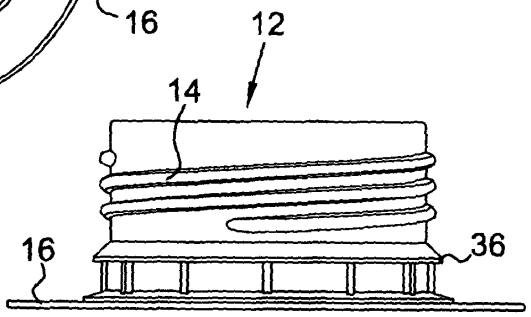


Fig. 6

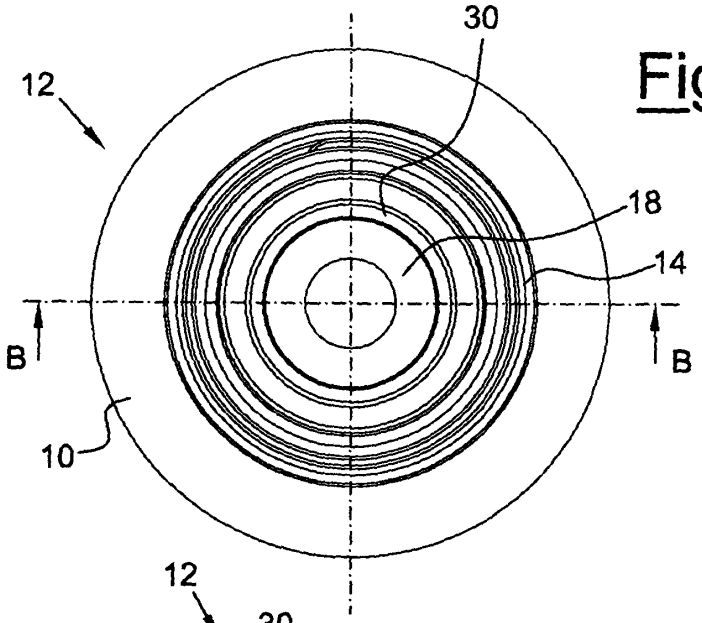


Fig. 7

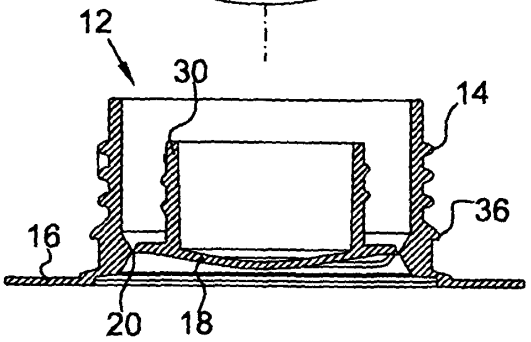


Fig. 8

Fig. 9

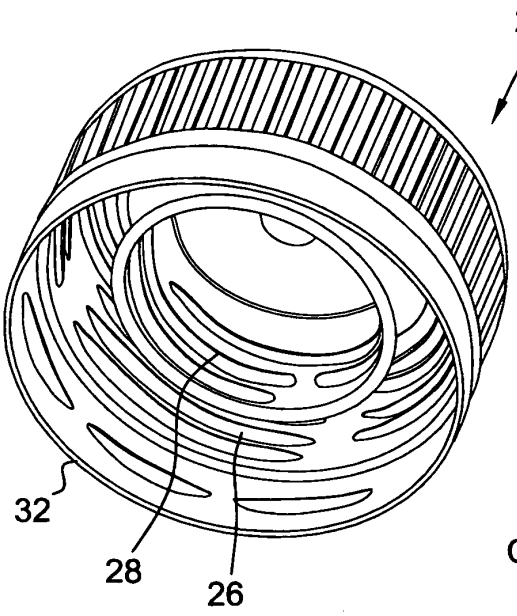


Fig. 11

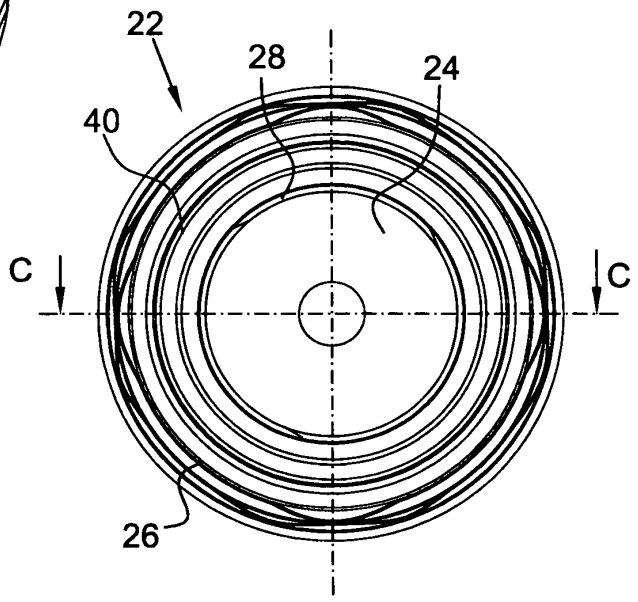
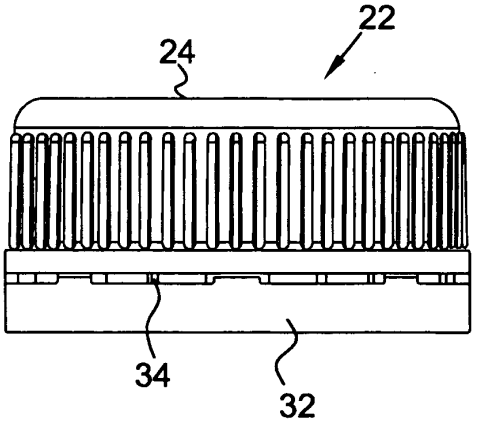


Fig. 10



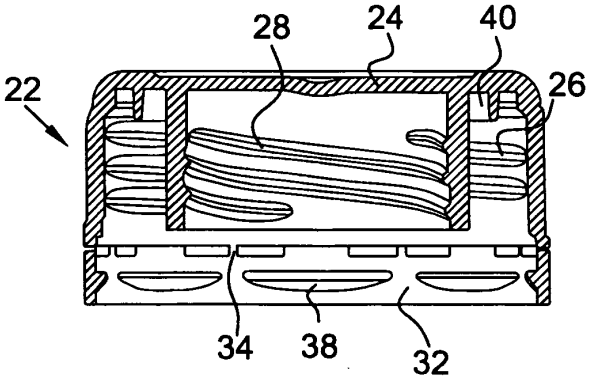


Fig. 12

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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