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(54) **Screw cap with safety ring**

Schraubverschluss mit Sicherheitsring

Bouchon à vis avec bague de sécurité

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(73) Proprietors:
- **Ferrari, Guglielmo**
  26851 Borgo san Giovanni,
  Lodi (IT)
- **Ferrari, Silvia**
  26851 Borgo san Giovanni,
  Lodi (IT)

(72) Inventors:
- **Ferrari, Guglielmo**
  26851 Borgo san Giovanni,
  Lodi (IT)
- **Ferrari, Silvia**
  26851 Borgo san Giovanni,
  Lodi (IT)

(74) Representative: **Martegani, Franco et al**
Franco Martegani S.r.l.
Via Carlo Alberto, 41
20052 Monza (Milano) (IT)

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Description

[0001] The present invention refers to a closure cap with a safety ring for a container as defined in the preamble of claim 1.

[0002] It is known that containers holding drinks or other solid food products are closed using screw closure devices composed of two elements: a threaded capsule, which performs the actual closure and possibly sealing operation of the container, and a safety ring, positioned below such capsule and connected to it by means of frangible links, see DE-U-203 07 356. The safety ring is used to avoid unwanted opening of the container, through unscrewing and removal of the capsule itself, in that such operation would lead to breaking the links and thus detachment between the capsule itself and the safety ring positioned below.

[0003] However, given the relative fragility of the connection links, necessary to allow easy opening of the containers provided with screw closure devices like the ones described above, inadvertent breaking of such links before the container reaches the end user might occur. Such inadvertent breaking may occur, for example, right from the shaping process of the cap, which is performed through moulding, or when fixing the cap onto the related container or else during transport and transfer of the container after being filled with its contents and closed for the first time.

[0004] Therefore, closure devices were made equipped with safety rings provided with solutions such to avoid, or at least limit, the related movements, both in a radial and axial direction, that might occur between the capsule and the ring, thus preserving the integrity of the links up to the time when the content of the container is to be supplied.

[0005] For example, a closure device provided with a particular type of such solutions is known from document EP 0 441 112 B1.

[0006] Therefore, the object of the present invention is to realise a screw cap with a safety ring capable of overcoming the abovementioned drawbacks, thus avoiding inadvertent breakage of the connection links between the two elements composing the cap due to any direct stress in a radial manner that the cap could be subject to.

[0007] Another object of the present invention is to realise a screw cap with a safety ring easy and economical to manufacture with respect to the known art.

[0008] These objects according to the present invention are attained by realising a closure cap with a safety ring for a container as described in claim 1.

[0009] Further characteristics of the invention are described in the subsequent claims.

[0010] Characteristics and advantages of a screw cap with a safety ring according to the present invention shall be more evident from the following exemplifying and non-limiting description with reference to the schematic drawings attached wherein:

Figure 1 is a perspective view of a screw cap with a safety ring according to the present invention;

Figure 2 is a side elevational view, in partial section, of the cap in figure 1;

Figure 3 is an enlarged view of the detail indicated with "C" in figure 2;

Figure 4 is a side elevational view of the upper portion of a container on which a screw cap with a safety ring according to the present invention can be applied;

Figure 5 is a side elevational view, in partial section, of the upper portion of the container of figure 4, on which a cap according to the present invention is screwed; and

Figure 6 is an enlarged view in section of the container-cap assembly shown in figure 5.

[0011] With reference to the figures, shown herein is a closure cap for containers manufactured through moulding of plastic material, essentially comprising two elements composed of a capsule 10, of substantially cylindrical shape, and a safety ring 12 positioned below, in particular in the embodiment illustrated said capsule 10 and said ring 12 being of the same diameter.

[0012] More precisely, the capsule 10 is provided with a side wall 14, on the lower edge 16 of which a plurality of frangible link elements 18 are provided connecting said lower edge 16 to the upper edge 20 of the ring 12. On the internal surface of the side wall 14 of the capsule 10 thus a thread 42 is made adapted to engage with the corresponding thread 44 made on the mouth 46 of the container 48 (figure 4) on which the closure cap according to the present invention can be screwed.

[0013] According to the invention, the upper edge 20 of the ring 12 is provided with, made in one piece with the ring 12 itself, one or more teeth 22 projecting in axial direction upwards towards the side wall 14 of the capsule 10. The upper portion of each of said one or more teeth 22 is positioned in shape coupling within a corresponding cavity 24 provided on the side wall 14 of the capsule 10, at its lower edge 16. In turn, each cavity 24 is provided with a bottom wall 26 extending in the axial direction of the cap and against which the related tooth 22 can abut, thus preventing the capsule 10 and the ring 12 from being subjected to related movements in the radial direction of the cap such to cause damage to one or more of the link elements 18.

[0014] According to the embodiment illustrated, the cavities 24 are made on the external surface of the side wall 14 of the capsule 10. In addition, each of such cavities 24 is provided with a slanted side 28 with respect to the axis of the cap, with an inclination angle approximately equivalent to the one of the corresponding slanted side 30 of the tooth 22, while the opposite side 32 of each cavity 24 is substantially parallel to the axis of the cap, just like the corresponding side 34 of the tooth 22 in shape coupling with said cavity 24.

[0015] The straight walls 32 and 34 respectively of

each cavity 24 and the related tooth 22 serve as a means of resistance against the torsional moment generated during the first screwing step of the cap on the container 48, in the assembly step, which otherwise could lead to yielding of the link elements 18. Vice versa the opposite slanted walls 28 and 30 facilitate intentional opening of the cap according to the invention, through unscrewing and simultaneous lifting of the capsule 10 by the user, thus allowing disengagement of the teeth 22 from the respective cavities 24 so as to attain the breakage of the link elements 18.

[0016] Conveniently, given the same shape, the dimensions of the cavities 24 are greater than the dimensions of the corresponding teeth 22 in such a manner that, when manufacturing the cap, that is when making the connection between the capsule 10 and the safety ring 12 through the link elements 18, there is a clearance between the teeth 22 and the cavities 24.

[0017] In addition, on the lower edge 16 of the capsule 10 there can be provided a plurality of spacing elements 36 which extend downwards in the axial direction of the cap, that is towards the safety ring 12. Such spacing elements 36 are distributed uniformly along the circumference of the ring 12 and they are used to limit the related movements in axial direction between the capsule and the ring, thus cooperating with the teeth 22 to preserve the integrity of the link elements 18 during all the steps prior to the first opening of the cap.

[0018] Lastly, on the internal surface of the safety ring 12 there can be provided one or more wedge-shaped elements 38, provided with or without related adjacent openings 40 and preferably distributed uniformly along the circumference of said ring 12, projecting radially inwards towards the neck 46 of the container 48. The wedge-shaped elements 38 are used to allow engagement of the safety ring 12 with some corresponding protrusions 50 provided on the neck 46 of the container 48 on which the cap is applied according to the invention, thus further limiting the rotational and axial movements of the ring 12 with respect to the capsule 10 screwed on the container 48 itself.

[0019] Thus it is clear that the screw cap with a safety ring according to the present invention attains the objects described previously, allowing in particular to avoid inadvertent breakage of the connection links between the safety ring and the closure capsule in a simple and economical manner, given that, as a matter of fact, the teeth and the cavities provided respectively on the ring and on the threaded capsule can be easily made during the moulding step.

[0020] However, the screw cap with a safety ring thus conceived according to the present invention is susceptible to several modifications and variants, all falling within the same inventive concept; in addition, all details can be replaced by other technically equivalent elements. In practice, the material used, alongside shapes and dimensions, may vary depending on the technical requirements.

[0021] Therefore, the protection scope of the invention is defined by the attached claims.

Claims

1. Closure cap for a container (48), of the type comprising a capsule (10) of a substantially cylindrical shape, threaded internally, provided with a side wall (14) on the lower edge (16) of which a plurality of frangible link elements (18) are provided connecting said lower edge (16) of said capsule (10) to the upper edge (20) of a safety ring (12), said upper edge (20) of said safety ring (12) being provided with, made in one piece with said safety ring (12), one or more teeth (22) projecting in axial direction upwards towards said side wall (14) of said capsule (10), the upper portion of each of said one or more teeth (22) being positioned in shape coupling within a corresponding cavity (24) provided on said side wall (14) of said capsule (10) at said lower edge (16), **characterised in that** each of said cavities (24) is provided with a bottom wall (26) extending in the axial direction of the cap and against which the related tooth (22) abuts to prevent said capsule (10) and said safety ring (12) from being subjected to related movements in radial direction of the cap such to cause damage to one or more of said link elements (18).

2. Cap according to claim 1, **characterised in that** said cavities (24) are realised on the external surface of said side wall (14) of said capsule (10).

3. Cap according to claim 1, **characterised in that** each of said one or more teeth (22) is provided with a slanted side (30) with respect to the axis of said cap, while the other side (34) is substantially parallel to the axis of said cap.

4. Cap according to claim 3, **characterised in that** each of said cavities (24) is provided with a slanted side (28) with respect to the axis of said cap, with an inclination angle approximately equivalent to the one of said slanted side (30) of each of said one or more teeth (22), while the other side (32) is substantially parallel to the axis of said cap.

5. Cap according to claim 4, **characterised in that** the dimensions of each of said cavities (24) are greater, given the same shape, than the dimensions of each of said one or more teeth (22), thus leaving clearance between said teeth (22) and the corresponding cavity (24).

6. Cap according to claim 1, **characterised in that** on said lower edge (16) of said capsule (10) there is a plurality of spacing elements (36) which extend

downwards towards said safety ring (12) in the axial direction of said cap.

7. Cap according to claim 6, **characterised in that** said spacing elements (36) are distributed uniformly along the circumference of said safety ring (12).

8. Cap according to claim 1, **characterised in that** on the inner surface of said safety ring (12) there is one or more wedge-shaped elements (38) projecting radially inwards towards the neck (46) of said container (48), said one or more wedge-shaped elements (38) being engageable with one or more corresponding protrusions (50) provided on said neck (46) of said container (48).

9. Cap according to claim 8, **characterised in that** said one or more wedge-shaped elements (38) are distributed uniformly along the circumference of said safety ring (12).

10. Cap according to claim 8, **characterised in that** each of said one or more wedge-shaped elements (38) is provided with an adjacent opening (40).

11. Cap according to claim 1, **characterised in that** said capsule (10) and said safety ring (12) have the same diameter.

12. Cap according to claim 1, **characterised in that** it is manufactured through moulding of plastic material.

13. Container (48) **characterised in that** it is provided with a closure cap according to any one of the claims 1 to 12.

Patentansprüche

1. Verschlusskappe für einen Behälter (48) des Typs mit einer Kapsel (10) mit einer im Wesentlichen zylindrischen Form, die ein Innengewinde besitzt und mit einer Seitenwand (14) an dem unteren Rand (16) versehen ist, von dem eine Mehrzahl zerbrechlicher Verbindungselemente (18) vorgesehen ist, die den unteren Rand (16) der Kapsel (10) mit dem oberen Rand (20) eines Sicherheitsrings (12) verbinden, wobei der obere Rand (20) des Sicherheitsrings (12) mit einem oder mehreren Zähnen (22), die einteilig mit dem Sicherheitsring (12) ausgebildet sind, versehen ist, die in der axialen Richtung aufwärts zu der Seitenwand (14) der Kapsel (10) vorragen, wobei der obere Abschnitt von jedem des einen oder der mehreren Zähne (22) in Formkopplung in einem entsprechenden Hohlraum (24) positioniert ist, der an der Seitenwand (14) der Kapsel (10) an dem unteren Rand (16) vorgesehen ist,
dadurch gekennzeichnet, dass
jeder der Hohlräume (24) mit einer Bodenwand (26) versehen ist, die sich in der axialen Richtung der Kappe erstreckt und gegen die der damit in Verbindung stehende Zahn (22) anliegt, um zu verhindern, dass die Kapsel (10) und der Sicherheitsring (12) damit in Verbindung stehenden Bewegungen in radialer Richtung der Kappe ausgesetzt sind, um so einen Schaden an einem oder mehreren der Verbindungselemente (18) zu bewirken.

2. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
die Hohlräume (24) an der Außenfläche der Seitenwand (14) der Kapsel (10) vorgesehen sind.

3. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
jeder des einen oder der mehreren Zähne (22) mit einer schräggestellten Seite (30) in Bezug auf die Achse der Kappe versehen ist, während die andere Seite (34) im Wesentlichen parallel zu der Achse der Kappe ist.

4. Kappe nach Anspruch 3,
dadurch gekennzeichnet, dass
jeder der Hohlräume (24) mit einer schräggestellten Seite (28) in Bezug auf die Achse der Kappe mit einem Neigungswinkel versehen ist, der etwa gleich dem der schräggestellten Seite (30) von jedem des einen oder der mehreren Zähne (22) ist, während die andere Seite (32) im Wesentlichen parallel zu der Achse der Kappe ist.

5. Kappe nach Anspruch 4,
dadurch gekennzeichnet, dass
die Abmessungen von jedem der Hohlräume (24), denen dieselbe Form gegeben ist, größer sind als die Abmessungen von jedem des einen oder der mehreren Zähne (22), wodurch ein Zwischenraum zwischen den Zähnen (22) und dem entsprechenden Hohlraum (24) belassen wird.

6. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
an dem unteren Rand (16) der Kapsel (10) eine Mehrzahl von Abstandselementen (36) vorgesehen ist, die sich abwärts zu dem Sicherheitsring (12) in der axialen Richtung der Kappe erstrecken.

7. Kappe nach Anspruch 6,
dadurch gekennzeichnet, dass
die Abstandselemente (36) gleichförmig entlang des Umfangs des Sicherheitsrings (12) verteilt sind.

8. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
an der Innenfläche des Sicherheitsrings (12) ein oder

mehrere keilförmige Elemente (38) vorgesehen sind, die radial einwärts zu dem Hals (46) des Behälters (48) vorragen, wobei das eine oder die mehreren keilförmigen Elemente (38) mit einem oder mehreren entsprechenden Vorsprüngen (50) in Eingriff bringbar sind, die an dem Hals (46) des Behälters (48) vorgesehen sind.

9. Kappe nach Anspruch 8,
dadurch gekennzeichnet, dass
das eine oder die mehreren keilförmigen Elemente (38) gleichförmig entlang des Umfangs des Sicherheitsrings (12) verteilt sind.

10. Kappe nach Anspruch 8,
dadurch gekennzeichnet, dass
jedes des einen oder der mehreren keilförmigen Elemente (38) mit einer benachbarten Öffnung (40) versehen ist.

11. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
die Kapsel (10) und der Sicherheitsring (12) denselben Durchmesser besitzen.

12. Kappe nach Anspruch 1,
dadurch gekennzeichnet, dass
sie durch Formen aus Kunststoffmaterial hergestellt ist.

13. Behälter (48),
dadurch gekennzeichnet, dass
er mit einer Verschlusskappe nach einem der Ansprüche 1 bis 12 versehen ist.

Revendications

1. Bouchon de fermeture pour récipient (48), du type comprenant une capsule (10) de forme substantiellement cylindrique, filetée intérieurement, pourvue d'une paroi latérale (14) sur le bord inférieur (16) de laquelle est prévue une pluralité d'éléments de liaison cassants (18) reliant ledit bord inférieur (16) de la capsule (10) au bord supérieur (20) d'une bague de sûreté (12), ledit bord supérieur (20) de la bague de sûreté (12) étant pourvu d'une ou de plusieurs dents (22) formée(s) d'un seul tenant avec la bague de sûreté (12) et faisant saillie axialement dans une direction axiale vers le haut, en direction de ladite paroi latérale (14) de la capsule (10), la partie supérieure de chacune desdites une ou plusieurs dents (22) étant positionnée en accouplement de formes dans une cavité correspondante (24) prévue sur ladite paroi latérale (14) de la capsule (10) au niveau dudit bord inférieur (16), **caractérisé en ce que** chacune desdites cavités (24) est pourvue d'une paroi inférieure (26) s'étendant dans la direction axiale du bouchon et contre laquelle la dent concernée (22) bute pour empêcher ladite capsule (10) et ladite bague de sûreté (12) d'être soumises à des mouvements relatifs dans la direction radiale du bouchon aptes à endommager un ou plusieurs des éléments de liaison (18).

2. Bouchon selon la revendication 1, **caractérisé en ce que** lesdites cavités (24) sont réalisées sur la surface externe de ladite paroi latérale (14) de la capsule (10).

3. Bouchon selon la revendication 1, **caractérisé en ce que** chacune desdites une ou plusieurs dents (22) est pourvue d'un côté incliné (30) par rapport à l'axe dudit bouchon, tandis que l'autre côté (34) est substantiellement parallèle à l'axe du bouchon.

4. Bouchon selon la revendication 3, **caractérisé en ce que** chacune desdites cavités (24) est pourvue d'un côté incliné (28) par rapport à l'axe dudit bouchon, avec un angle d'inclinaison à peu près équivalent à celui dudit côté incliné (30) de chacune desdites une ou plusieurs dents (22), tandis que l'autre côté (32) est substantiellement parallèle à l'axe du bouchon.

5. Bouchon selon la revendication 4, **caractérisé en ce que** les dimensions de chacune desdites cavités (24) sont plus grandes, avec la même forme, que les dimensions de chacune desdites une ou plusieurs dents (22), laissant ainsi un espace libre entre lesdites dents (22) et la cavité correspondante (24).

6. Bouchon selon la revendication 1, **caractérisé en ce que**, sur ledit bord inférieur (16) de la capsule (10), se trouvent une pluralité d'éléments d'espacement (36) qui s'étendent vers le bas, en direction de ladite bague de sûreté (12) dans la direction axiale du bouchon.

7. Bouchon selon la revendication 6, **caractérisé en ce que** lesdits éléments d'espacement (36) sont régulièrement répartis le long de la circonférence de ladite bague de sûreté (12).

8. Bouchon selon la revendication 1, **caractérisé en ce que**, sur la surface intérieure de ladite bague de sûreté (12), il y a un ou plusieurs élément(s) en forme de coin (38) faisant saillie radialement vers l'intérieur, en direction du col (46) dudit récipient (48), lesdits un ou plusieurs élément(s) en forme de coin (38) pouvant se mettre en prise avec une ou plusieurs protubérance(s) (50) prévues sur ledit col (46) du récipient (48).

9. Bouchon selon la revendication 8, **caractérisé en ce que** lesdits un ou plusieurs élément(s) en forme

de coin (38) sont régulièrement répartis le long de la circonférence de ladite bague de sûreté (12).

10. Bouchon selon la revendication 8, **caractérisé en ce que** chacun desdits un ou plusieurs élément(s) en forme de coin (38) est pourvu d'une ouverture adjacente (40).

11. Bouchon selon la revendication 1, **caractérisé en ce que** ladite capsule (10) et ladite bague de sûreté (12) ont le même diamètre.

12. Bouchon selon la revendication 1, **caractérisé en ce qu'**il est fabriqué par moulage d'une matière plastique.

13. Récipient (48) **caractérisé en ce qu'**il est pourvu d'un bouchon de fermeture selon l'une quelconque des revendications 1 à 12.

Fig.1

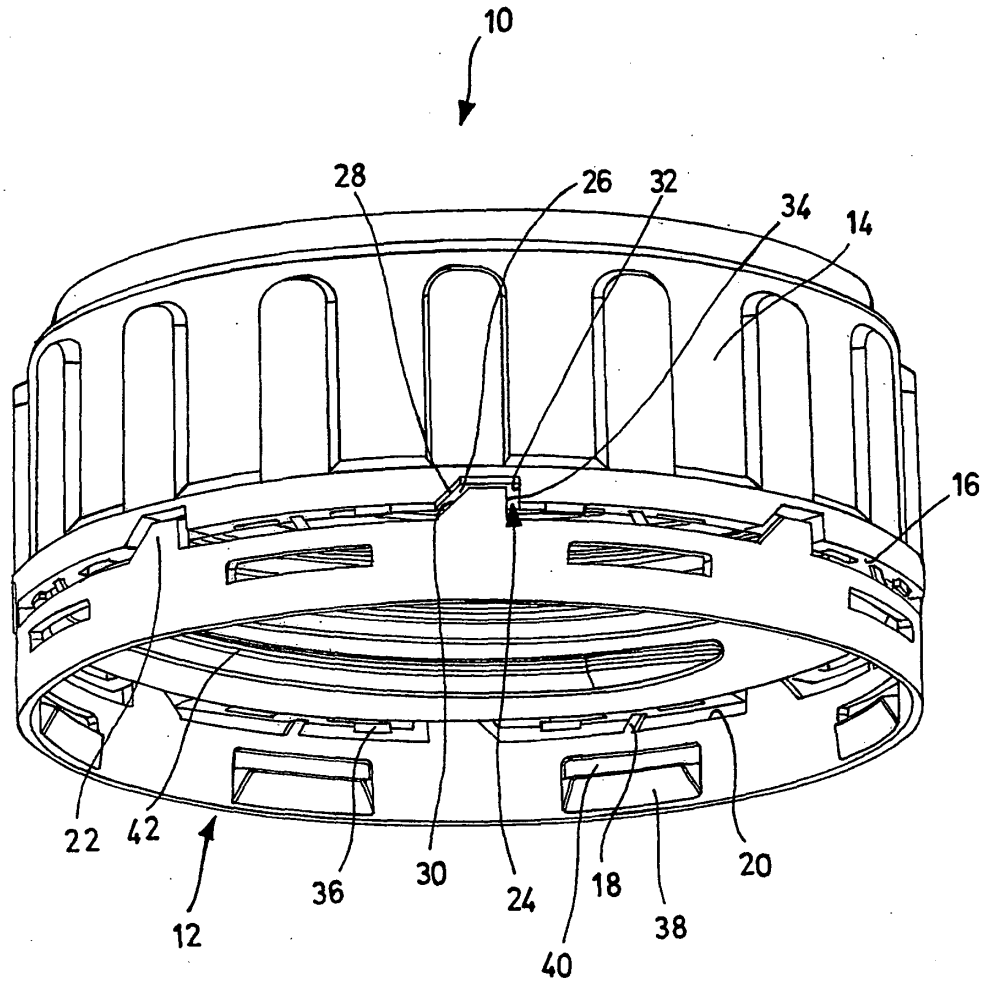


Fig.2

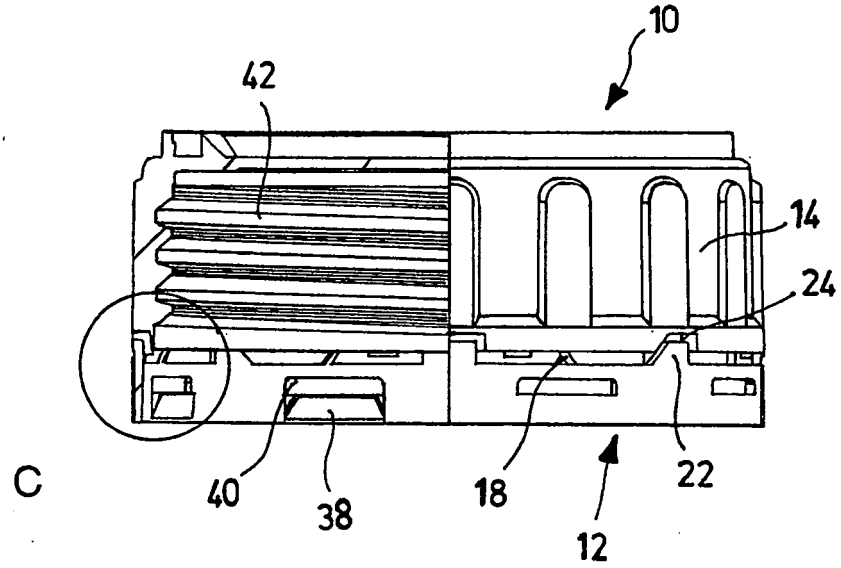
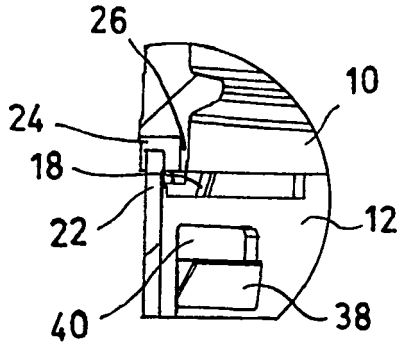


Fig.3



Detail C

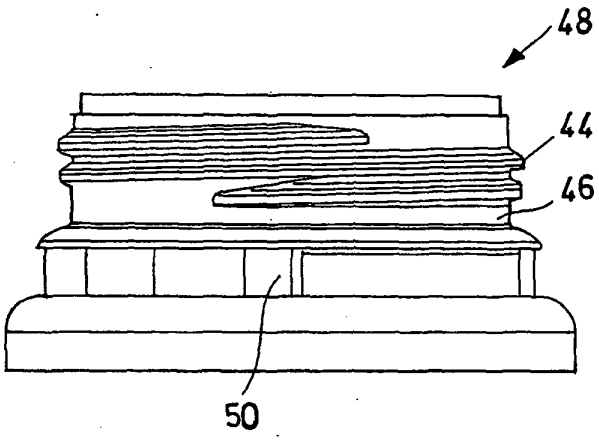
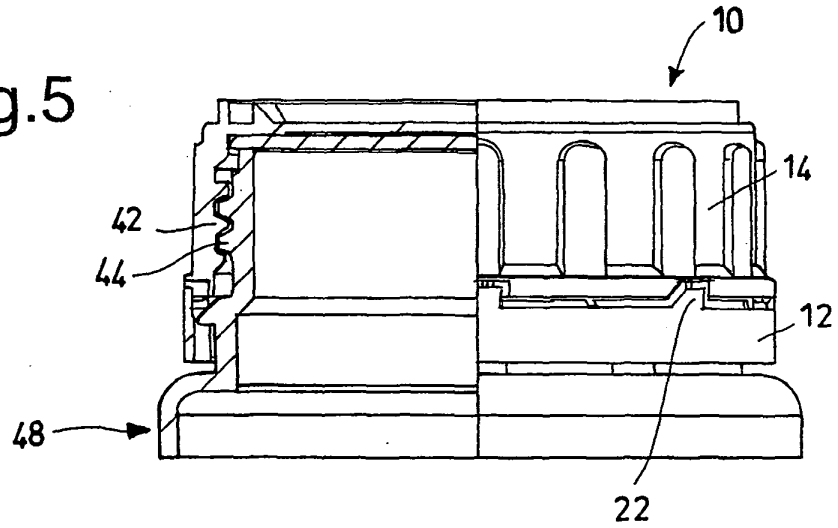


Fig.4

Fig.5



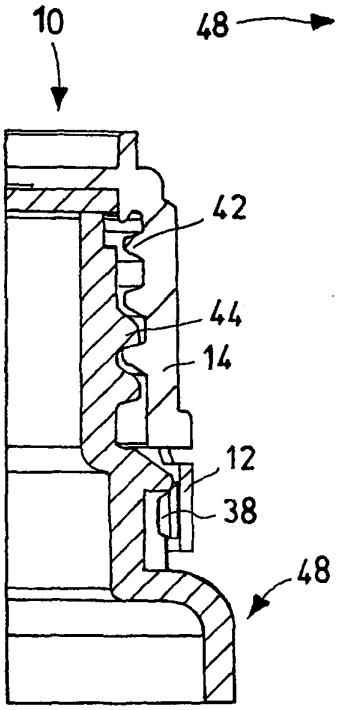


Fig.6

REFERENCES CITED IN THE DESCRIPTION

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