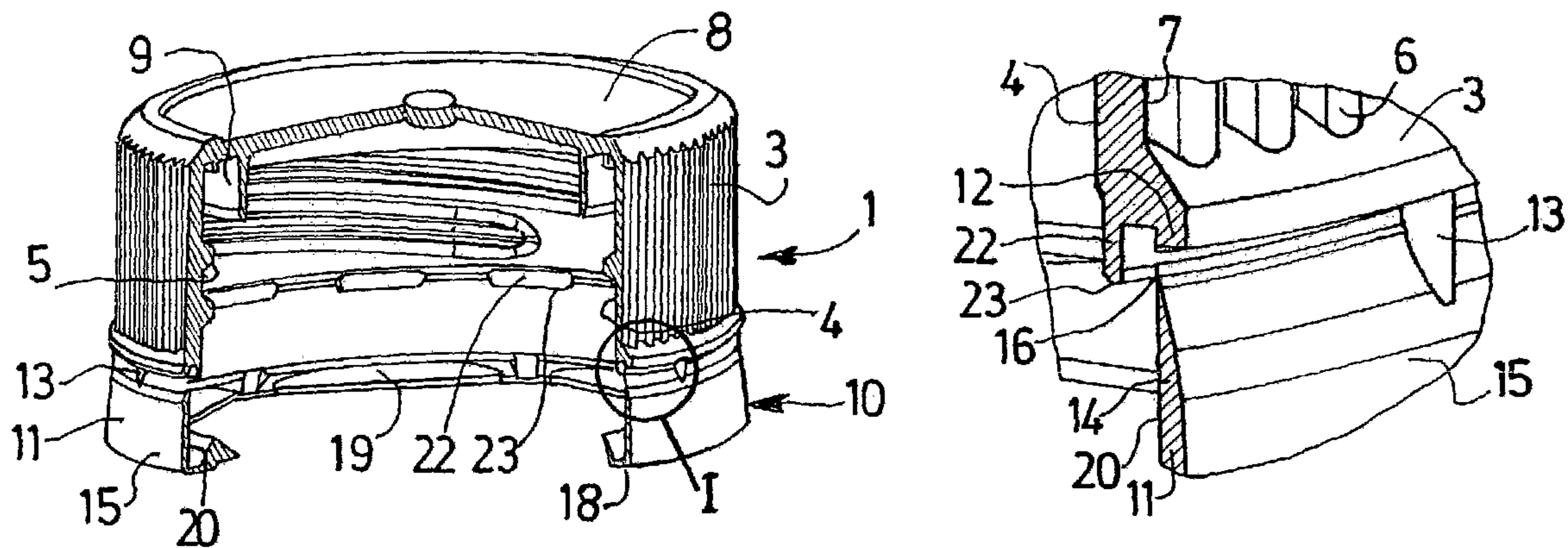




(86) Date de dépôt PCT/PCT Filing Date: 2001/08/13
(87) Date publication PCT/PCT Publication Date: 2002/02/28
(85) Entrée phase nationale/National Entry: 2003/02/24
(86) N° demande PCT/PCT Application No.: FR 2001/002609
(87) N° publication PCT/PCT Publication No.: 2002/016217
(30) Priorité/Priority: 2000/08/23 (00/10865) FR

(51) Cl.Int.⁷/Int.Cl.⁷ B65D 41/34
(71) Demandeur/Applicant:
BERICAP SARL, FR
(72) Inventeurs/Inventors:
GRANIER, FREDERIC, FR;
NUSBAUM, PHILIPPE, FR
(74) Agent: BERESKIN & PARR

(54) Titre : BOUCHON COMPORTANT DES MOYENS DE BLOCAGE DE LA DEFORMATION RADIALE DE LA BAGUE D'INVOLABILITE
(54) Title: CLOSURE COMPRISING MEANS FOR LOCKING RADIAL DEFORMATION OF THE TAMPERPROOF BAND



(57) Abrégé/Abstract:

The invention concerns a tamperproof system (10), for a closure (1), comprising breakable points (13) linking the free end part (12) of a skirt (3) of the closure and a ting (11), a gap being present between the skirt and the band. The tamperproof system comprises an annular projection (22) on the skirt, extending axially towards and inside the band, from the free edge of the skirt perpendicular to the gap and the free end part of the band facing the skirt. Said projection serves as a wall for locking the band inwards. Thus, when the closure is mounted on a container neck, the band is prevented from ill-timed penetration into the band, the bridges being maintained.



(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION
EN MATIÈRE DE BREVETS (PCT)(19) Organisation Mondiale de la Propriété
Intellectuelle
Bureau international(43) Date de la publication internationale
28 février 2002 (28.02.2002)

PCT

(10) Numéro de publication internationale
WO 02/16217 A1(51) Classification internationale des brevets⁷ : B65D 41/34(74) Mandataire : BOUJU DERAMBURE BUGNION; 52,
rue de Monceau, F-75008 Paris (FR).

(21) Numéro de la demande internationale :

PCT/FR01/02609

(81) États désignés (*national*) : AE, AG, AL, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ,
DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(22) Date de dépôt international : 13 août 2001 (13.08.2001)

(25) Langue de dépôt : français

(26) Langue de publication : français

(30) Données relatives à la priorité :

00/10865

23 août 2000 (23.08.2000)

FR

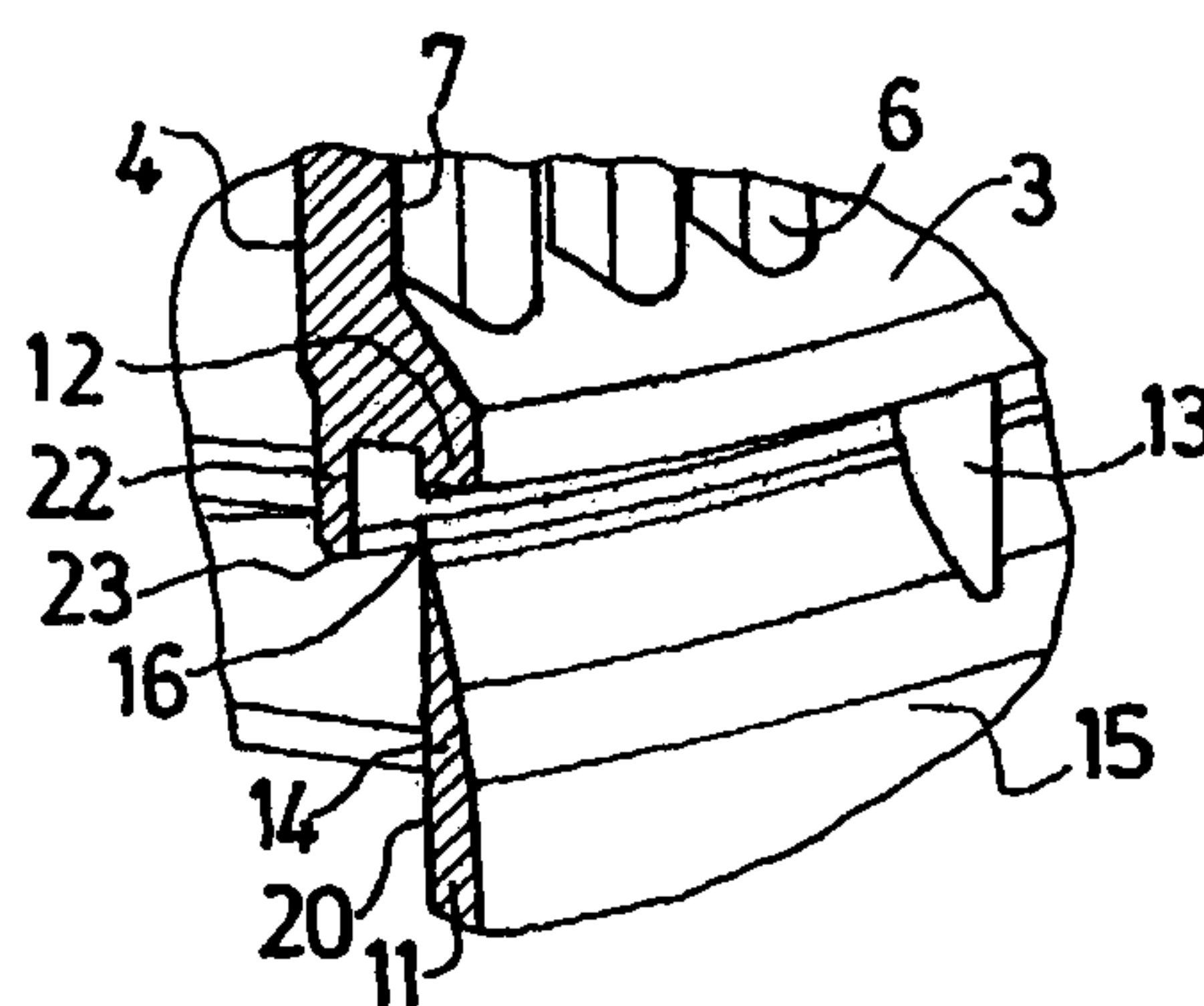
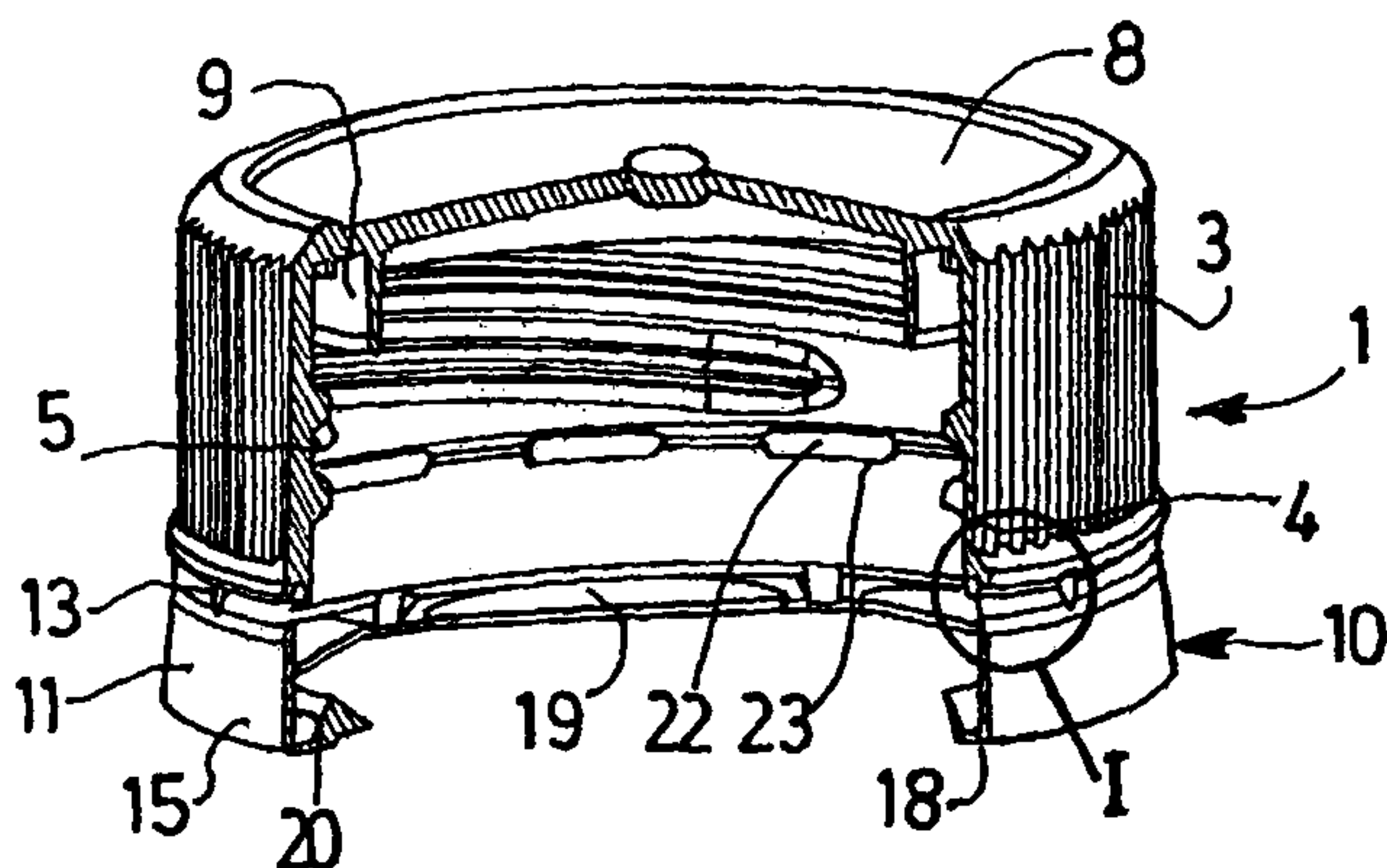
(71) Déposant : RICAL [FR/FR]; ZI - 1, bd Eiffel, F-21600
Longvic (FR).(84) États désignés (*régional*) : brevet ARIPO (GH, GM, KE,
LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), brevet eurasien
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), brevet européen
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,
MC, NL, PT, SE, TR), brevet OAPI (BF, BJ, CF, CG, CI,
CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).(72) Inventeurs: GRANIER, Frédéric; 6, place de la Mairie,
F-21490 Brognon (FR). NUSBAUM, Philippe; 3, rue des
Champs Moreaux, F-21121 Daix (FR).

Publiée :

— avec rapport de recherche internationale

[Suite sur la page suivante]

(54) Title: CLOSURE COMPRISING MEANS FOR LOCKING RADIAL DEFORMATION OF THE TAMPERPROOF BAND

(54) Titre : BOUCHON COMPORTANT DES MOYENS DE BLOCAGE DE LA DEFORMATION RADIALE DE LA BAGUE
D'INVOLABILITE

(57) Abstract: The invention concerns a tamperproof system (10), for a closure (1), comprising breakable points (13) linking the free end part (12) of a skirt (3) of the closure and a ring (11), a gap being present between the skirt and the band. The tamperproof system comprises an annular projection (22) on the skirt, extending axially towards and inside the band, from the free edge of the skirt perpendicular to the gap and the free end part of the band facing the skirt. Said projection serves as a wall for locking the band inwards. Thus, when the closure is mounted on a container neck, the band is prevented from ill-timed penetration into the band, the bridges being maintained.

(57) Abrégé : Système d'invocabilité (10) pour un bouchon (1), comportant des ponts frangibles (13) reliant la partie extrême libre (12) d'une jupe (3) du bouchon et une bague (11), un espace existant entre la jupe et la bague. Le système d'invocabilité comporte une saillie annulaire (22) sur la jupe, s'étendant en direction axiale vers et à l'intérieur de la bague, à partir du bord libre de la jupe au droit de l'espace et de la partie extrême libre de la bague tournée vers la jupe. Cette saillie sert de paroi de blocage pour la bague vers l'intérieur. Ainsi, lors du montage du bouchon sur un col de récipient, la bague est empêchée de rentrer de façon intempestive dans la jupe, les ponts étant préservés.

WO 02/16217 A1

WO 02/16217 A1



En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

CAP HAVING MEANS OF BLOCKING THE RADIAL DEFORMATION OF THE
TAMPER-PROOF RING

The invention relates to a tamper-proof system especially
5 intended for a cap made from plastic material, a cap having
such a tamper-proof system and, finally, a container having
such a cap, this container being empty or at least partially
full.

Caps made from plastic material are already known, of the
10 type comprising an annular side wall with an internal
thread, a transverse end wall, internal sealing means
intended to cooperate with the neck of the container for
which the cap is intended and, finally, a tamper-proof
15 system of the type having breakable bridges connecting the
free end part of the side wall and a ring intended to have,
towards the inside, projecting coupling means.

In the embodiment which has just been considered, the free
edge of the side wall is at a distance from the facing free
edge of the ring, a space existing between them, and said
20 free end part of the ring thins to a point towards the free
edge of the side wall.

Such a cap - and the tamper-proof system it includes -
generally gives satisfaction.

However, there is a risk that, during fitting of the cap on
25 the neck of the container for which it is intended, the free
end part of the ring turned towards the side wall is
deformed towards the axis of the cap by being, so to speak,
"swallowed" by the side wall from its free edge.

This situation is prejudicial on several accounts: the ring risks being deformed. It risks being jammed in the side wall. The bridges risk being subjected to excessive stresses and breaking.

5 These risks are all the greater since the ring is thin and tapered to a point towards its free end part, turned towards the side wall.

The document WO 96/31404 describes a cap of the aforementioned type, comprising a tamper-proof band connected to
10 the free end part of the side wall by breakable bridges, these being situated towards the inside of the cap.

The tamper-proof band has the shape of a V, a first branch of which is connected to the free end part of the side wall by the bridges, a second branch being intended to be placed
15 so as to lock under the flange of a container neck.

The two branches of the tamper-proof band have substantially the same length, and the second branch is provided, towards its upper end, with a rim directed towards the axis of the cap.

20 During the fitting of the cap on a neck, the second branch comes to rest against the flange.

The tamper-proof band is then subjected to a radial force towards the outside of the cap, applied towards the rim, that is to say towards the upper part of the tamper-proof
25 band, connected to the side wall. Consequently, the tamper-proof band has a tendency to pivot in the direction indicated by the arrows depicted in Figure 7 of this document, the upper part of the tamper-proof band moving away from the axis of the cap.

In order to limit this displacement, the side wall has a blocking wall, extending axially towards the tamper-proof band, and situated towards the external face of the side wall.

5 The tamper-proof system described in this document has a number of drawbacks.

As the breakable bridges are situated towards the inside of the cap and the blocking wall towards the external face of the side wall, it is difficult for a consumer to check at
10 the time of purchase that the bridges are still intact, and thus that the container has not been opened.

Furthermore, the blocking wall described in this document is ineffective in the case of a tamper-proof band comprising a substantially cylindrical wall equipped with coupling
15 projections at its free end - not connected to the side wall. This is because, in this case, during the fitting of the cap on a neck, when the coupling projections pass at the level of the flange, the radial force is exerted on the tamper-proof band in the region of its lower part, not
20 connected to the side wall.

Thus, the band has a tendency to pivot in the opposite direction to the case of the document WO 96/31404, the lower part of the tamper-proof band moving away from the axis of the cap, while the upper part is "swallowed" by the side
25 wall, towards the axis of the cap.

The document EP-A-0 371 920 describes a cap of the same type, the tamper-proof band being connected to the free end part of the side wall by breakable bridges situated towards the inside of the cap.

The side wall has, towards its free end part, a support lug extending obliquely from the internal face of the side wall towards the inside of the cap.

5 The purpose of the support lug is to prevent, during the fitting of the cap on a container neck, the tamper-proof band entering the cap by being displaced axially upwards.

On the other hand, the system provided by the document EP-A-0 371 920 does not make it possible to limit the pivoting of the upper part of the band towards the axis of the cap.

10 This is because, on the one hand the support lug is inclined with respect to the axis of the cap, and, on the other hand, its length is insufficient, said lug not extending in line with the free end part of the ring turned towards the side wall.

15 The aim of the invention is to remedy these drawbacks.

To that end, it proposes a tamper-proof system intended for a cap of the type having breakable bridges connecting the free end part of a side wall of the cap and a ring intended to have coupling means projecting in the region of its end
20 part opposite to the side wall, and towards the inside, the free edge of the side wall being at a distance from the facing free edge of the ring, a space existing between them.

According to the invention, the tamper-proof system also has an annular projection on the side wall extending in the
25 axial direction towards and inside the ring from the free edge of the side wall in line with said space and at least in line with the free end part of the ring turned towards the side wall.

This projection acts as a blocking wall for the ring towards the inside so that, during fitting of the cap on the neck of the container for which it is intended, the ring is prevented from inadvertently going within the side wall, the bridges being furthermore protected.

For example, the breakable bridges are situated towards the outside of the cap.

Thus, the invention makes it possible on the one hand to equip a cap with bridges which are perfectly visible to a consumer, so that they can check that the container has not been opened, and on the other hand to guarantee the integrity of the bridges after fitting of the cap on the container neck.

According to other characteristics, the annular blocking projection is close, in particular in immediate proximity, radially, to the free end part of the ring turned towards the side wall.

The annular blocking projection has a radial thickness such that it cannot be deformed, or can be deformed only slightly, when stressed by the ring during fitting of the cap on the neck of the container for which it is intended.

According to a first embodiment, the annular projection is discontinuous, in particular in places.

According to another embodiment, the annular projection is continuous.

According to one possible embodiment, the projecting coupling means of the ring are constituted by the free end part of the ring opposite to the side wall folded back towards the inside of the ring.

According to another aspect, the invention relates to a cap made from plastic material, of the type comprising an annular side wall with an internal thread, a transverse end wall, sealing means and a tamper-proof system as just described.

Finally, according to a third aspect, the invention relates to a container provided with a cap as just described, this container being empty or at least partially full.

The other characteristics of the invention will emerge from the description which follows with reference to the accompanying figures in which:

- Figure 1 is a perspective view with quarter removed of a cap having a tamper-proof system according to the invention;
- Figure 2 is an enlarged view of the detail I of Figure 1;
- Figure 3 is an axial sectional view of the cap of Figure 1;
- Figure 4 is an enlarged view of the detail II of Figure 3;
- Figure 5 is a half-view from underneath of the cap of Figure 1, equipped with the tamper-proof system.

Reference is made to Figures 1, 3 and 5 which depict a cap 1 with axis 2, the cap 1 being for example produced from a plastic material.

The cap 1 comprises first of all an annular side wall 3, on the internal face 4 of which there is a thread 5, for screw-fitting of the cap 1 on the neck of a container (not depicted), said neck having an external thread complementary to the thread 5 of the cap 1.

The side wall 3 also has knurling 6 on its external face 7, this knurling 6 being intended to facilitate the screwing and unscrewing of the cap 1 by a user, by offering a better hand grip and limiting the slipping of the fingers of the user on the external face 7 of the side wall 3.

The cap 1 next comprises a transverse end wall 8 and, finally, an annular flange 9, which projects on the transverse wall 8 towards the inside of the cap 1, the flange 9 and the side wall 3 being substantially concentric.

The flange 9 is intended to cooperate, at the time of screwing of the cap 1 onto the neck of the container, with the internal surface of said neck, in particular for the purpose of sealing.

The cap 1 is equipped with a tamper-proof system 10, which comprises a ring 11 connected to the free end part 12 of the side wall 3 by breakable bridges 13.

The description of the tamper-proof system is given with reference to all the accompanying figures.

The end part 14 of the ring 11 connected to the side wall 3, when the bridges 13 have not been broken, thins to a point towards the free end part 12 of the side wall 3. For example, the thinning is implemented on the side of the external face 15 of the ring 11, as illustrated in Figure 2.

The breakable bridges 13 are connected to the external face 15 of the ring 11, in the region of the thinned area of the end part 14. Thus, the bridges 13 are situated outside the cap 1.

The edge 16 of the ring 11 situated facing the side wall 3 is at a distance axially from the free edge 17 of the side wall 3, a space *e* existing between them. "Free edge 17" means the imaginary annular surface substantially parallel to the transverse wall 8 and resting partly on the end surface of the free end part 12 of the side wall 3 (see Figure 4).

The ring 11 has, in the region of its end part 18 situated opposite to the edge 16, coupling projections 19 directed towards the inside of said ring 11. The coupling projections 19 are for example in the form of a portion of a disc, comprising a circular edge resting substantially on the internal face 20 of the ring 11 and a rectilinear edge 21 forming substantially a chord of the ring 11 (see Figure 5).

Of course, the coupling projections 19 can have a different form. In particular, the coupling projections 19 can be constituted by the end part 18 of the ring 11, folded back towards the inside of said ring 11.

The coupling projections 19 are intended to cooperate with the seat of the neck of the container receiving the cap 1, so that the ring 11, once put in place on the neck of the container, remains coupled to said neck. To that end, the coupling projections 19 are inclined towards the transverse end wall 8 of the cap 1 so as to provide a better coupling of the ring 11 to the seat of the neck of the container.

The cap 1, equipped with the tamper-proof system 10, is forcibly put in place on the neck of the container, the coupling projections 19 on the one hand, and the threads of the neck and of the cap 1 on the other hand, constituting an obstacle to the movement of the cap 1 towards the seat of the neck.

Once the cap has been put in place, the thread of the neck of the container and the thread 5 of the cap 1 are then engaged, while the coupling projections 19 are coupled to the seat of the neck of the container. On account of the ring 11 being coupled to the neck of the container by the coupling projections 19, the cap 1 cannot be unscrewed without breaking the bridges 13.

The fact that the bridges 13 connecting the ring 11 to the side wall 3 of the cap are not broken guarantees that the container has not been opened after the cap 1 was put in place, at the time of manufacture.

At the time of the first opening of the container, a user exerts a force on the side wall 3 of the cap 1, so as to unscrew the cap 1. This force tends to displace the cap 1 in a spiral movement with axis 2, and therefore, in particular, to move the cap away from the seat of the neck of the container.

The ring 11 being coupled, by the coupling projections 19, to the seat of the neck of the container, it cannot move away from said seat by following the movement imparted to the cap 1 by the user.

The unscrewing force exerted by the user, if it is sufficient, leads to the breaking of the breakable bridges 13. The cap 1 is then separated from the ring 11, said cap being capable of being fully unscrewed so as to free the opening of the neck of the container.

Furthermore, the end part 12 of the side wall 3 of the cap 1 has an annular blocking projection 22. The blocking projection 22 extends substantially axially towards and inside the ring 11, over a length such that the free end 23 of said blocking projection 22 is situated, radially, facing

the end part 14 of the ring 11. As illustrated in Figure 4, the blocking projection 22 is situated towards the inside of the cap 1 with respect to the end part 14 of the ring 11.

5 The blocking projection 22 is close - radially - to the end part 14 of the ring 11. In particular, the blocking projection 22 can be in immediate proximity to said end part 14.

10 During fitting of the cap 1, equipped with the tamper-proof system 10, on the neck of the container, on account of the force exerted on the ring 11, the latter has a tendency to deform, the end part 14 of said ring 11 being subjected to a force tending to displace said end part 14 towards the axis 2 of the cap 1, along a line D (see Figure 4). In the absence of the blocking projection 22, the line D would be
15 the theoretical line of "swallowing" of the end part 14 of said ring 11 by the side wall 3. The blocking projection 22 is placed on this "swallowing" line D, so that it opposes this movement.

20 The end part 14 of said ring 11 then comes into contact with the blocking projection 22, and exerts thereon a radial force directed towards the axis 2 of the cap 1.

The radial thickness of the blocking projection 22 is sufficient for said blocking projection 22 to oppose this radial movement, the blocking projection 22 not being
25 deformed or being deformed only slightly following this stressing.

In this way, the ring 11 is prevented from inadvertently going within the side wall 3 of the cap 1 during the fitting of said cap 1 on the neck of the container. Consequently,
30 as the radial displacement of the ring 11 with respect to the side wall 3 is limited, the force exerted on the

breakable bridges 13 connecting the ring 11 to the side wall 3 of the cap 1 is limited. If this force is sufficiently small, there will be no breaking of the bridges 13 during the operation of fitting the cap 1 on the neck of the container.

It will be understood that the force exerted on the breakable bridges 13 during the operation of fitting the cap 1 on the neck of the container depends in particular on the radial distance between the blocking projection 22 and the end part 14 of the ring 11. This is because, the smaller this radial distance, the more limited will be the displacement of the end part 14, and therefore the lower will be the risk of breaking of the bridges 13.

In the embodiment depicted in the accompanying figures, the blocking projection 22 is discontinuous, and comprises twelve elements distributed substantially regularly inside the cap 1.

Of course, this configuration is not limitative, the blocking projection 22 being capable in particular of being continuous.

The invention also relates to an assembly comprising a cap 1 equipped with the tamper-proof system 10 as just described and a container, the container in question being empty or at least partially full and having a neck with an external thread intended to cooperate with the thread 5 of the cap 1.

CLAIMS

1. A tamper-proof system (10) especially intended for a cap (1) made from plastic material, of the type having breakable bridges (13) connecting the free end part (12) of a side wall (3) of the cap (1) and a ring (11) intended to have coupling means (19) projecting in the region of its end part (18) opposite to the side wall (3), and towards the inside, the free edge (17) of the side wall (3) being at a distance from the facing free edge (16) of the ring (11), a space (e) existing between them, characterised by the fact that it also has an annular projection (22) on the side wall (3) extending in the axial direction towards and inside the ring (11) from the free edge (17) of the side wall (3) in line with said space (e) and at least in line with the free end part (14) of the ring (11) turned towards the side wall (3), this projection (22) acting as a blocking wall for the ring (11) towards the inside so that, during fitting of the cap (1) on the neck of the container for which it is intended, the ring (11) is prevented from inadvertently going within the side wall (3), the bridges (13) being furthermore protected.

2. A tamper-proof system according to Claim 1, characterised by the fact that the breakable bridges (13) are situated towards the outside of the cap (1).

3. A tamper-proof system according to Claim 1 or 2, characterised by the fact that said free end part (14) of the ring (11) thins to a point towards the free end part (12) of the side wall (3).

4. A tamper-proof system according to any one of Claims 1 to 3, characterised by the fact that the annular blocking

projection (22) is close, in particular in immediate proximity, radially, to the free end part (14) of the ring (11) turned towards the side wall (3).

5 5. A tamper-proof system according to any one of Claims 1 to 4, characterised by the fact that the annular blocking projection (22) has a radial thickness such that it cannot be deformed, or can be deformed only slightly, when stressed by the ring (11) during fitting of the cap (1) on the neck of the container for which it is intended.

10 6. A tamper-proof system according to any one of Claims 1 to 5, characterised by the fact that the annular projection (22) is discontinuous, in particular in places.

15 7. A tamper-proof system according to any one of Claims 1 to 5, characterised by the fact that the annular projection (22) is continuous.

20 8. A tamper-proof system according to any one of Claims 1 to 7, characterised by the fact that the projecting coupling means (19) of the ring (11) are constituted by the free end part (18) of the ring (11) opposite to the side wall (3), folded back towards the inside of the ring (11).

9. A cap made from plastic material, of the type comprising an annular side wall (3) with an internal thread, a transverse end wall (8), sealing means and a tamper-proof system (10) according to any one of Claims 1 to 8.

25 10. A container comprising a neck with an external thread and a cap (1) according to Claim 9, the container being empty or at least partially full.

1/2

FIG.1

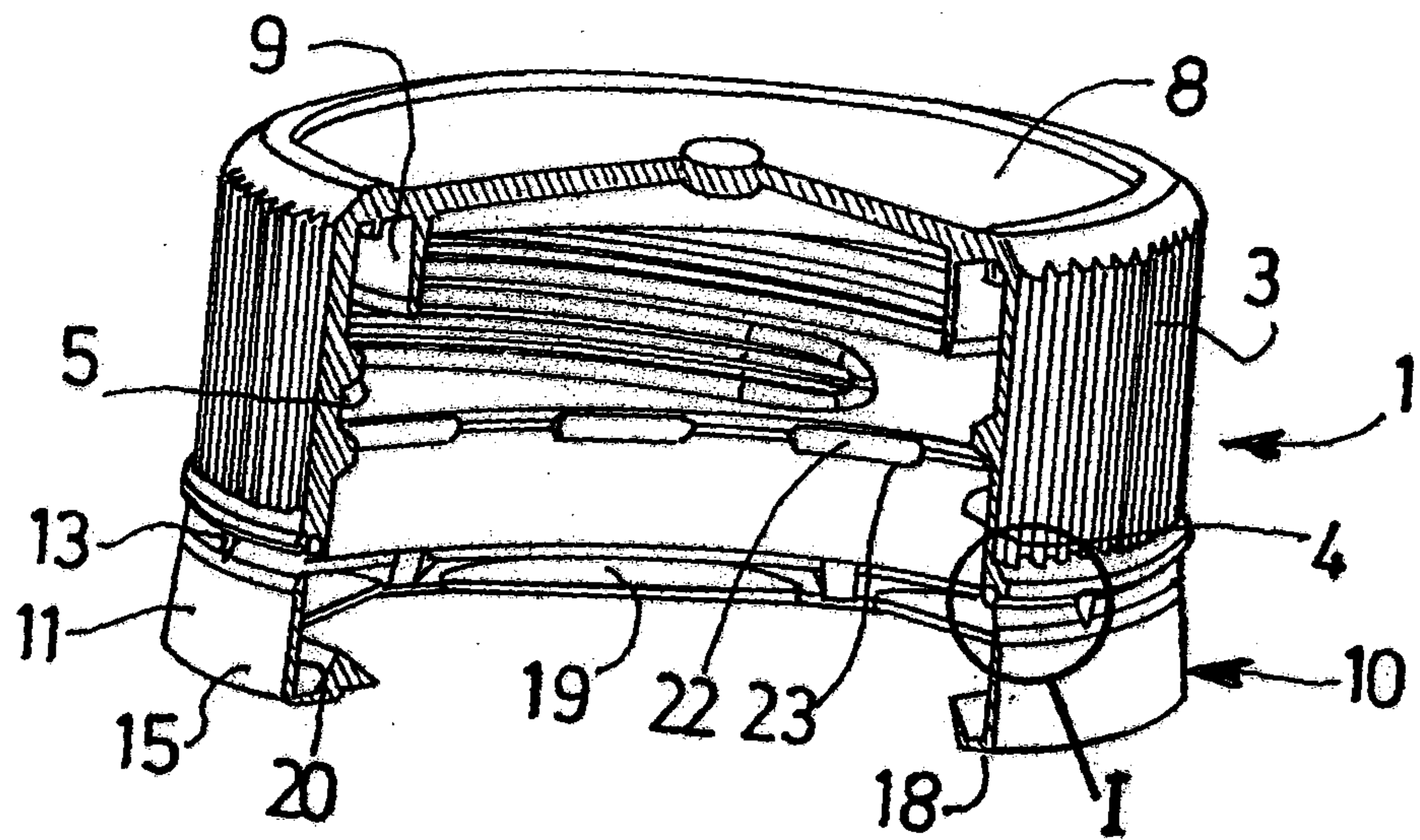


FIG.2

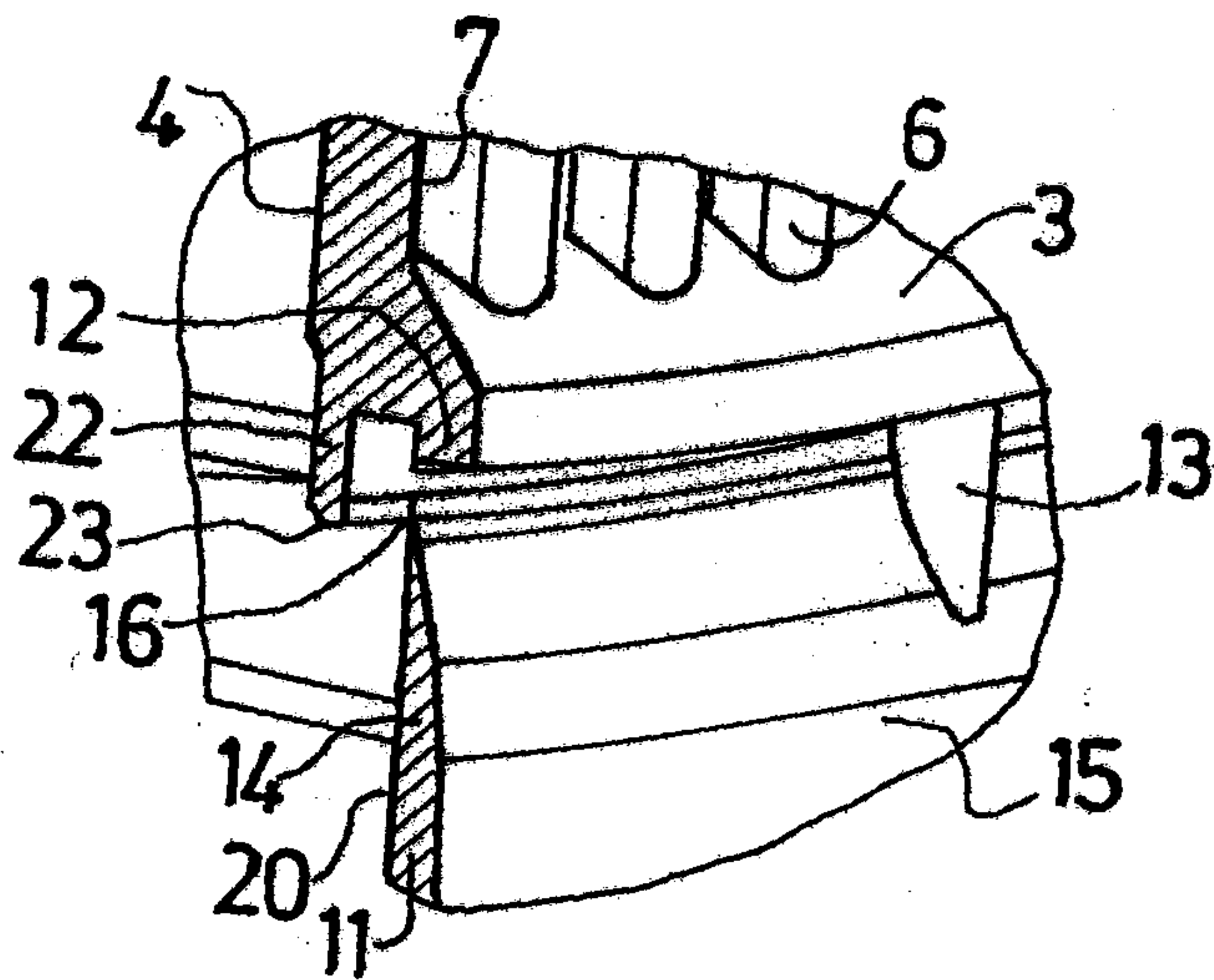


FIG.4

