(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 June 2016 (16.06.2016)

WIPO | PCT

(10) International Publication Number
WO 2016/092483 A1

(51) International Patent Classification:
B65D 41/00 (2006.01)

(21) International Application Number:
PCT/IB2015/059466

(22) International Filing Date:
9 December 2015 (09.12.2015)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
102014018155.3 10 December 2014 (10.12.2014) DE

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

[Continued on next page]

(54) **Title**: TAMPER EVIDENT SECURITY CLOSURE TO ACCESS OPENING OF A CONTAINER, IN PARTICULAR A BOTTLE

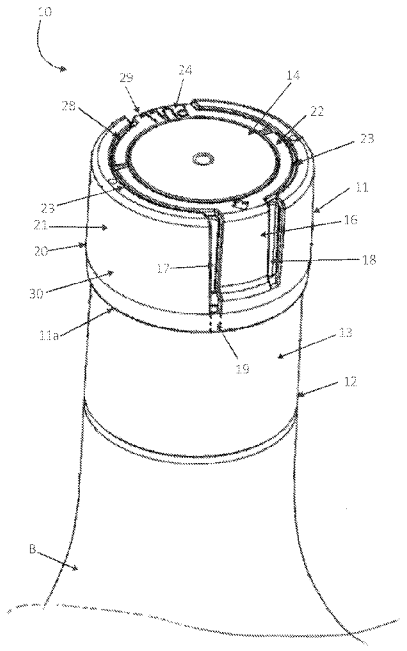

Figure 1

(57) **Abstract**: A tamper evident closure for an access opening in a container, in particular a bottle, has a closure part which is placeable onto the access opening in a sealing manner and has a bottom sleeve portion and an upper cover portion, which are connected in one piece to each other via a first tamper evident indicator. Furthermore, a hood-like indicator cap is provided which forms a second tamper evident indicator and at least partially surrounds at least the cover portion of the closure part, wherein access to the first tamper evident indicator is possible only when the indicator cap is destroyed. A tear off tab is formed in the indicator cap, which tear off tab is bounded by two grooves which are arranged at a distance and end at a distance from the bottom rim of the indicator cap, wherein at least one of the grooves is assigned a breaking point which extends as far as the bottom rim of the indicator cap.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

"Tamper evident security closure to access opening of a container, in particular a bottle"

The invention relates to a tamper evident closure for an access opening in a container, in particular a bottle, with a closure part which is placeable onto the access opening in a sealing manner and has a bottom sleeve portion and a top cover portion, which are connected in one piece to each other via a first tamper evident indicator, and with a hood-like indicator cap which forms a second tamper evident indicator and at least partially surrounds at least the cover portion of the closure part, wherein access to the first tamper evident indicator is possible only when the indicator cap is destroyed, and wherein a tear off tab is formed in the indicator cap.

For some products, for example drugs or even alcoholic beverages, it is desirable for the user to recognize whether the container, for example a bottle, has already been opened once previously or is still in the closed original state. For this purpose, what is referred to as a tamper evident closure is known which is at least partially destroyed during the initial opening and thus irreversibly indicates that the closure has already been opened once.

It is assumed below that the tamper evident closure is mounted on an upright bottle which is oriented substantially vertically and the longitudinal axis of which runs in the vertical direction, wherein the details "at the top", "at the bottom", "axially" and "radially" relate to this orientation of the bottle. However, the

invention is not restricted to a correspondingly oriented bottle.

In the case of a beverage bottle, a tamper evident closure customarily has a first tamper evident indicator which is formed between a cover portion, which is customarily in the form of a screw cap screwable onto the top end of the bottle, and a sleeve portion arranged there below. The sleeve portion sits on the bottle in such a manner that it cannot be pulled off axially therefrom. If the user rotates the cover portion or the screw cap, one piece moulded webs which, in the undamaged state, connect the cover portion to the sleeve portion inevitably break off since the cover portion is raised axially by the rotational movement and the sleeve portion cannot follow this axial movement. The broken-off webs serve as an irreversible indication to the user that the closure has already been opened.

It is known in some cases, for transport and/or for hygiene reasons, to additionally fit a wrapping in the form of an outer plastics film onto a bottle which is provided with a tamper evident closure mentioned, said wrapping being shrunk onto the closure part. In order to open the bottle, the user first of all has to damage and remove the shrink film before the user has access to the cover portion of the closure part and can open the bottle by destroying the webs mentioned. The shrink film is thereby effective as a second tamper evident indicator which indicates to the user that the bottle is still in its original state.

A portion on the indicator cap formed by the shrink film is customarily in the form of a tear off tab at which the user can grasp the shrink film. It has been shown that, in particular at the beginning of the tear off movement, when dynamic forces resulting from the tear off movement are still not effective, it is relatively difficult and awkward for inexpert users to apply adequate tensile forces via the very small tear off tab to the shrink film or the indicator cap, as a result of which the opening of the tamper evident closure is laborious.

The invention is based on the object of providing a tamper evident closure of the type mentioned which can be opened in a simple and reliable manner for a user.

This object is achieved by a tamper evident closure with the features of Claim 1. It is provided here that the tear off tab is bounded by two grooves which are arranged at a distance and end at a distance from the bottom rim of the indicator cap, and that at least one of the grooves is assigned a breaking point which extends as far as the bottom rim of the indicator cap.

The invention starts from the basic consideration of forming the tear off tab between two vertical grooves in the skin surface of the indicator cap, and therefore, the user has to grasp the tear off tab and pull the latter downwards, which constitutes a movement which is easy to carry out for said user. The tear off tab preferably extends here from the top rim of the indicator cap downwards on the skin surface thereof to shortly before the bottom rim of the indicator cap.

In order to completely destroy the indicator cap and to remove same from the closure part, the user pulls the tear off tab downwards to such an extent that the breaking point running between the bottom end of the at least one groove and the bottom rim of the indicator cap is loaded with a tensile force and tears off, as a result of which the indicator cap is interrupted or opened in the circumferential direction and can be removed from the closure part lying there below.

In an embodiment, both the grooves of the indicator cap can be assigned with a breaking point and each of which extends as far as the bottom rim of the indicator cap from bottom end of the respective groove. In order to remove indicator cap from the closure part, when the user pulls the tear off tab downwards to such an extent that the breaking points running between the bottom end of the respective grooves and the bottom rim of the indicator cap is loaded with a tensile force and tear off. Tearing off of the breaking points results in interruption or opening of indicator cap which can be removed from the closure part lying there below.

In a preferred embodiment, both the grooves of the indicator cap are of equal length.

The indicator cap is preferably composed of an inherently stable plastic and sits on the closure part lying there below rotatably, but axially non-displaceably.

The two grooves preferably run in the circumferential direction of the indicator cap in a manner offset from and parallel to each other in the vertical orientation, wherein it is preferably provided that the grooves in each case begin at the top rim of the indicator cap and extend vertically downwards from there.

The breaking point at the lower end of the at least one groove can be formed by a cross-sectional weakening of the material of the indicator cap at this position and/or by a perforation.

In a preferred embodiment of the invention, it is provided that the tear off tab is offset radially inwards relative to the outer skin surface of the indicator cap. This affords the advantage that the user, when pulling down the tear off tab, carries out a jerk-like movement directed radially outward at the bottom end of said tear off tab in the vicinity of the bottom rim of the indicator cap, thus making it easier to tear the breaking point in the region at the bottom end of the at least one groove.

In one possible embodiment of the invention, it can be provided that the tear off tab formed on the wall of the indicator cap is directly grasped and pulled down by the user. However, a functional improvement is provided if, in a development of the invention, the tear off tab is connected at its top end facing away from the breaking point to a handle tab. The handle tab is preferably larger than the tear off tab, and therefore it can be grasped in a simple manner by users. The handle tab is

preferably moulded in one piece onto the tear off tab and, in the starting state, can be integrated in the indicator cap and fixed therein via breaking regions which can be broken off. In order to open the tamper evident closure, the user breaks the handle tab out of the indicator cap by destroying the breaking regions, which may be, for example, webs or perforation lines or cross-sectional weakening, folds the handle tab upwards and, at the latter, pulls the tear off tab vertically downwards.

In an unused, undestroyed state of the indicator cap, the handle tab preferably completely or at least partially forms the upper top wall of said tamper evident seal, and therefore the handle tab is firstly easily accessible and secondly does not require any additional construction space.

In order to release the handle tab from the position held and fixed in the indicator cap, according to the invention an actuating part for releasing and grasping the handle tab can be formed on the handle tab on the side facing away from the grooves. The actuating part is in the form, for example, of a projecting pushing edge at which the user can grasp the handle tab and lift same out of the indicator cap with the breaking regions being destroyed.

The closure part has a bottom sleeve portion and a cover portion which is arranged there above and is connected in one piece to the sleeve portion with the interconnection of the first tamper evident indicator sits on the

container under the indicator cap. The cover portion of the closure part is preferably in the form of a screw cap, and the bottom and the bottom of the container has a corresponding thread with which the screw cap can enter into engagement.

In an embodiment of the invention, it can be provided that the first tamper evident indicator is formed by webs via which the sleeve portion and the cover portion of the closure part are connected in one piece to each other and which inevitably break off when the cover portion is opened for the first time. Alternatively, it can be provided that the first tamper evident indicator is formed by a circumferential band which is bounded by two perforation lines and runs between the sleeve portion and the cover portion of the closure part. The circumferential band is preferably assigned a handle tab at which the user can grasp the band and can open same by destroying the perforation lines, and therefore the cover portion is released from the sleeve portion and can be removed from the container.

Further details and features of the invention are apparent from the description below of an exemplary embodiment with reference to the drawings, in which:

Fig. 1 shows a perspective illustration of a tamper evident closure according to the invention in the starting state,

Fig. 2 shows a rear view of the tamper evident closure according to Figure 1,

Fig. 3(a) shows a perspective view of an indicator cap of the tamper evident closure according to an embodiment the invention,

Fig. 3(b) shows a perspective bottom view of the indicator cap according to Figure 3(a),

Fig. 4 (a) shows a perspective view of an indicator cap of the tamper evident closure according to another embodiment the invention,

Fig. 4 (b) shows a top perspective view of an indicator cap of the tamper evident closure according to Fig. 4(a),

Fig. 4 (c) shows tamper evident closure with indicator cap according to Fig. 4(a),

Fig. 5 shows a perspective view of the tamper evident closure with the indicator cap removed, but with the closure part not yet destroyed.

Fig. 6 shows a sectional view of tamper evident closure take along a vertical plane passing through longitudinal axis X according to the invention.

Fig. 7 shows sectional view of tamper evident closure taken along plane a horizontal plane perpendicular to longitudinal axis X according to the invention.

Figure 1 shows a perspective view of a tamper evident closure 10 for a container B in the form of an upright bottle which has a customary access opening (not shown) at the top end of a bottle neck. A closure part 12 which is shown in detail in Figure 5 is placed onto the access opening. The closure part 12 has a bottom sleeve portion 13 which is placed from above onto the bottle neck and is held on the bottle axially non-displaceably, i.e. along the longitudinal axis X of the bottle, and additionally preferably for rotation therewith. For this purpose, as shown in Figure 6, the bottom sleeve portion 13 on its interior side can be provided with an annular ridge 31 engageable with a corresponding ridge 32 formed on the exterior of the bottle neck.

A cover portion 14 in the form of a screw cap which can be brought into engagement in a customary manner with a thread formed at the top end of the bottle neck is arranged above the sleeve portion 13 with the interconnection of a first tamper evident indicator 15.

The cover portion 14 and the sleeve portion 13 are connected in one piece to each other, wherein two substantially completely circumferential perforation lines 27 extending perpendicularly to the longitudinal axis X are provided, which perforation lines are spaced apart from one another in the direction of the longitudinal axis X such that a circumferential, one-piece moulded band 25, which has a one-piece handle tab 26 at one end, is formed between the two perforation lines 27.

In the mounted state, the closure part 12 sits on the access opening in the bottle in a sealing manner and is fixed on the bottle in such a manner that said closure part 12 can be removed only by the destruction of the first tamper evident indicator 15.

An indicator cap 11 is placed from above onto the cover portion 14 and the first tamper evident indicator 15 and is preferably latched to the closure part 12. In such a way that said indicator cap 11 is held fixedly relative to the closure part 12 in the direction of the longitudinal axis X and can be removed from the closure part 12 only by being destroyed. As shown in Figures 6, a circumferential rib 33 extending perpendicularly to the longitudinal axis X is provided at interior of the indicator cap 11 which is engageable with a corresponding circumferential rib 34 formed on upper part of the sleeve portion 13. The circumferential ribs 33, 34 provided on the indicator cap and the sleeve portion are configured so as to snap-fittingly engage the indicator cap with the closure part and to hold the indicator cap 11 fixedly relative to the closure part 12 in the direction of the longitudinal axis X. Once the indicator cap is engaged or latched with the closure part 12, the engagement or latching there between can be further secured by suitable means selected from, but not limited to, welding, gluing, ultrasonic welding or laser welding etc at the location of engagement or latching (i.e. at the location of engagement of circumferential ribs (33, 34). Preferably, the indicator cap 11 is also held on the closure part 12 for rotation therewith. As shown in Figure 7, the

indicator cap can be provided with projections 35 elongated in direction of longitudinal axis X, being disposed circumferentially on interior of the indicator cap 11. The elongated projections 35 of the indicator cap 11 are receivable in corresponding recesses 36 formed at exterior of the cover portion 14 thereby relative movement between the indicator cap 11 and the cover portion 14 is restrained.

According to Figure 3, the indicator cap 11, which, in its entirety, forms a second tamper evident indicator 20, has a circular-cylindrical, sleeve-shaped basic body 30, in the wall of which a vertically upwardly extending tear off tab 16 is integrated, said tear off tab being bounded on its sides by two grooves 17 and 18 which run in parallel and vertically and are formed in the wall of the basic body 30. The grooves 17 and 18 extend as far as the top rim of the indicator cap 11 and merge there into a circumferential ring gap 28 which extends in the circumferential direction and extends on the top surface of the indicator cap 11 over the top circumference of the indicator cap 11. Radially within the circumferential ring gap 28, a loop or ring shaped handle tab 22 is arranged in the top surface of the indicator cap, said handle tab 22 being moulded in one piece onto the tear off tab 16 and being connected to the basic body 30 of the indicator cap 11 via a plurality of breaking regions 23, 37, which may be perforations and/or material weakenings and which are formed in the circumferential ring gap 28, and being fixed in its starting position illustrated in the figures. An actuating part 24 in the form of a projecting edge is formed on the handle tab 22,

in that portion thereof which is diametrically opposite the tear off tab 16, said projecting edge projecting into a gap 29 in the basic part 30 of the indicator cap 11, and therefore being readily accessible to a user (see Figure 2). As shown in Figure 3(a) and 4(b),the handle tab 22 is connected by at least two breaking regions 37, being disposed in the ring gap 28 adjacent to the actuating part 24 and plurality of breaking regions 23 disposed in the ring gap 28 adjacent to the tear off tab 16, facing away from the breaking regions 37.

As Figures 1, 3(a) and 3(b) show, the vertical grooves 17 and 18 do not extend as far as the bottom rim lla of the indicator cap 11, but rather end at a distance above the latter. In an extension of the left groove 17 according to Figures 3(a) and 3(b), a breaking point 19 which extends as far as the bottom rim lla of the indicator cap 11 is formed between the bottom end of the groove 17 and the bottom rim lla of the indicator cap 11. As the bottom view in Figure 3(b) shows, the breaking point 19 is formed by a cross-sectional weakening of the wall of the indicator cap 11 and, according to Figures 3(a) and 3(b), runs in alignment with the vertical groove 17.

As shown in Figures 4(a) and 4(b), both the grooves 17, 18 can be provided with breaking points 19, 19a as extensions of grooves 17, 18. The breaking points 19, 19a each extend as far as the bottom rim lla of the indicator cap 11 are formed between the bottom end of the groove 17 18, respectively, and the bottom rim lla of the indicator cap 11. As shown in Figure 4(c), dimensions of the gap 29 can be increased for enhancing the accessibility of the

actuating part 24 to a user. As shown in Figures 4(a) and 4(b), both the grooves 17, 18 extend vertically and equally in direction of longitudinal axis X towards the bottom rim of the indicator cap 11. In other words, both the grooves 17, 18 having equal length in direction of longitudinal axis X.

The basic body 30 of the indicator cap 11 has a substantially circular-cylindrical shape with a skin surface 21 which is continuous apart from the region of the grooves 17 and 18 and the tear off tab 16, wherein the tear off tab 16 is offset radially inwards in relation to the skin surface 21 of the indicator cap 11, as can be gathered from Figs 1, 3(a)-(b) and 4(a)-(b).

The person skilled in the art would understand that diameter of the indicator cap may be sized so that outer peripheral surface 21, may be aligned with the outer surface of the sleeve portion 13 or offset from the outer surface of the sleeve portion 13.

Figures 1 and 2 show the indicator cap 11 in the unused and undamaged starting state. In order to open the container B or the bottle, the user exerts a force which is directed upwards in the longitudinal direction X on the actuating part 24, as is indicated by the arrow P in Figure 2. By means of this force, the breaking regions 23 in the circumferential ring gap 28 tear and the handle tab 22 can be pivoted upwards such that it can be grasped by the user. The user then pulls the handle tab 22, and therefore also the tear off tab 16 which is connected thereto, downwards, as a result of which a tensile force

is exerted on the breaking point 19, said tensile force causing the breaking point 19 to tear off. In case of two breaking points 19, 19a as shown in Figure 4(a)-(c), said tensile force causes tearing off of one or both the breaking points 19, 19a.By means of the tearing off of the breaking point 19 or tearing off of the breaking points 19, 19a, the indicator cap is no longer closed in the circumferential direction and can be extended radially and removed. The breaking off of the indicator cap 11 at the breaking point 19 is clearly visible to a user, and therefore the indicator cap 11 in its entirety forms a second tamper evident indicator 20 which indicates whether it has already been attempted to open the bottle or whether the bottle is still in its starting state.

In an embodiment, hinges 38 are disposed, along a hinge axis A-A, opposite to each other on the handle tab 22, dividing the handle tab 22 into a first handle tab portion 22a and a second handle tab portion 22b. As shown in Figures 3(a) and 4(b), the first handle tab portion (22a) is connected to the basic body 30 of the indicator cap 11 via at least two breaking regions 37 and the second handle tab portion 22b is connected to the basic body 30 of the indicator cap 11 via breaking regions 23. By means of Force P, as shown in Figures 1 and 2, at least two breaking regions 37 in the circumferential ring gap 28 tear and the first handle tab portion 22a is pivoted upwards about the hinge area such that it can be grasped by the user. The user then further pulls the second handle tab portion 22b tearing the breaking regions 23 in the circumferential ring gap 28. The user

then pulls the handle tab 22, and therefore also the tear off tab 16 which is connected thereto, downwards, as a result of which a tensile force is exerted on the breaking point 19, said tensile force causing the breaking point 19 (or causing the two breaking points 19, 19a as shown in Figure 4(a)-(c)) to tear off.

After the indicator cap 11 has been broken open and removed, the bottle still continues to be closed by the closure part 12, as illustrated in Figure 5. In order to open the bottle, the user has to break open the first tamper evident indictor 15, i.e. has to grasp the band 25 at the handle tab 26 and tear said band out of its connection with the cover portion 14 and the sleeve portion 13 at the circumferential perforation lines 27.

As a result, the cover portion 14 is released from the sleeve portion 13 and can subsequently be removed or unscrewed from the bottle in a customary manner. Alternatively, provision may be made to break open the first tamper evident indictor 15 by unscrewing the cover portion 14 since the cover portion 14 is raised axially by the unscrewing operation and is thereby displaced relative to the axially fixed sleeve portion 13.

The claim:-

1. Tamper evident closure (10) for an access opening in a container (B), with a closure part (12) which is placeable onto the access opening in a sealing manner and has a bottom sleeve portion (13) and a cover portion (14), which are connected in one piece to each other via a first tamper evident indicator (15), and with a hood-like indicator cap (11) which forms a second tamper evident indicator (20) and at least partially surrounds at least the cover portion (14) of the closure part (12), wherein access to the first tamper evident seal (15) is possible only when the indicator cap (11) is destroyed, and wherein a tear off tab (16) is formed in the indictor cap (11), the tear off tab (16) is bounded by two grooves (17, 18) which are arranged at a distance and end at a distance from bottom rim (11a) of the indicator cap (11), and in that at least one of the grooves (17, 18) is assigned a breaking point which extends as far as the bottom rim (11a) of the indicator cap (11).

2. Tamper evident closure according to Claim 1, characterized in that the breaking point assigned to at least one of the grooves (17, 18), is formed by a cross-sectional weakening and/or a perforation.

3. Tamper evident closure according to Claim 1, characterized in that each of grooves (17, 18) is assigned a breaking point (19, 19a) each of which

extends as far as the bottom rim (11a) of the indicator cap (11).

4. Tamper evident closure according to Claim 3, characterized in that the breaking points (19, 19a) are formed by a cross-sectional weakening and/or a perforation.

5. Tamper evident closure according to any one of Claims 1 to 4, characterized in that the grooves (17, 18) run vertically.

6. Tamper evident closure according to any one of Claims 1 to 5, characterized in that both the grooves (17, 18) of the indicator cap (11) are of equal length.

7. Tamper evident closure according to one of Claims 1 to 6, characterized in that the tear off tab (16) is offset radially inwards relative to outer skin surface (21) of the indicator cap (11).

8. Tamper evident closure according to one of Claims 1 to 7, characterized in that the tear off tab (16) is connected at its upper end facing away from the breaking point (19, 19a) to a handle tab (22).

9. Tamper evident closure according to Claim 8, characterized in that the handle tab (22) is integrated in the indicator cap (11) and is fixed therein via breaking regions (23, 37) which can be broken off.

10. Tamper evident closure according to Claim 9, characterized in that the handle tab (22) is provided with hinges 38 disposed on the handle tab 22 along a hinge axis A-A, dividing the handle tab 22 into a first handle tab portion 22a and a second handle tab portion 22b.

11. Tamper evident closure according to Claim 10, characterized in that the first handle tab portion 22a of the handle tab 22 is connected with the indicator cap 11 via at least two breaking regions 37 and the second handle tab portion 22b is connected to the indicator cap 11 via breaking regions 23.

12. Tamper evident closure according to Claim 8 or 9, characterized in that an actuating part (24) for releasing the handle tab (22) is formed on the handle tab (22) on the side facing away from the grooves (17, 18).

13. Tamper evident closure according to any one of Claims 1 to 12, characterized in that the cover portion (14) of the closure part (12) is screw cap.

14. Tamper evident closure according to any one of Claims 1 to 13, characterized in that the first tamper evident indicator (15) is formed by webs via which the sleeve portion (13) and the cover portion (14) are connected to each other and which can

inevitably break off when the cover portion (14) is opened for the first time.

15. Tamper evident closure according to any one of Claims 1 to 13, characterized in that the first tamper evident indicator (15) is formed by a circumferential band (25) which is bounded by two perforation lines (27) and runs between the sleeve portions (13) and the cover portion (14) of the closure part(12).

16 Tamper evident closure according to any one of Claims 1 to 15, characterized in that the indicator cap 11 is placed from above onto the cover portion 14 and the first tamper evident indicator 15 and is preferably latched to the closure part 12.

17. Tamper evident closure according to Claim 16, characterized in that a circumferential rib 33 is provided at interior of the indicator cap 11 which is engageable with a corresponding circumferential rib 34 provided on upper part of the sleeve portion 13 to latching or engaging the indicator cap 11 with the closure part 12.

18. Tamper evident closure according to Claim 17, characterized in that the engagement or latching between the indicator cap 11 and closure part 12 is further secured by provide welding or gluing at the location of engagement or latch.

19. A hood-like indicator cap for a tamper evident closure, comprising a sleeve-shaped basic body 30, a tear off tab (16) is formed in the basic body 30, the tear off tab (16) is bounded by two grooves (17, 18) which are arranged at a distance and end at a distance from bottom rim (11a) of the indicator cap (11), and in that at least one of the grooves (17, 18) is assigned a breaking point which extends as far as the bottom rim (11a) of the indicator cap (11).

20. A hood-like indicator cap according to Claim 19, characterized in that the breaking point assigned to at least one of the grooves (17, 18), is formed by a cross-sectional weakening and/or a perforation.

21. A hood-like indicator cap according to Claim 19, characterized in that each of grooves (17, 18) is assigned a breaking point (19, 19a) each of which extends as far as the bottom rim (11a) of the indicator cap (11).

22. A hood-like indicator cap according to Claim 21, characterized in that the breaking points (19, 19a) are formed by a cross-sectional weakening and/or a perforation.

23. A hood-like indicator cap for a tamper evident closure according to Claim 19 characterized in that the tear off tab (16) is offset radially inwards relative to outer skin surface (21) of the basic body 30.

24. A hood-like indicator cap for a tamper evident closure according to Claim 19 characterized in that the tear off tab (16) is connected at its upper end facing away from the breaking point to a handle tab (22).

25. A hood-like indicator cap for a tamper evident closure according to Claim 24 characterized in that the handle tab (22) is connected to the basic body via breaking regions (23, 37) which can be broken off.

26. A hood-like indicator cap for a tamper evident closure according to Claim 25 characterized in that the handle tab 22 is provided with hinges 38 disposed on the handle tab 22 along hinge axis A-A, thereby dividing the handle tab 22 into a first handle tab portion 22a and a second handle tab portion 22b.

27. A hood-like indicator cap for a tamper evident closure according to Claim 26 characterized in that the first handle tab portion 22a of the handle tab 22 is connected with the basic body 30 via at least two breaking regions 37 and the second handle tab portion 22b is connected to the indicator cap 11 via breaking regions 23.

28. A hood-like indicator cap for a tamper evident closure according to Claim 24, characterized in that an actuating part 24 for releasing the handle tab 22

is formed on the handle tab 22 on the side facing away from the grooves 17, 18.

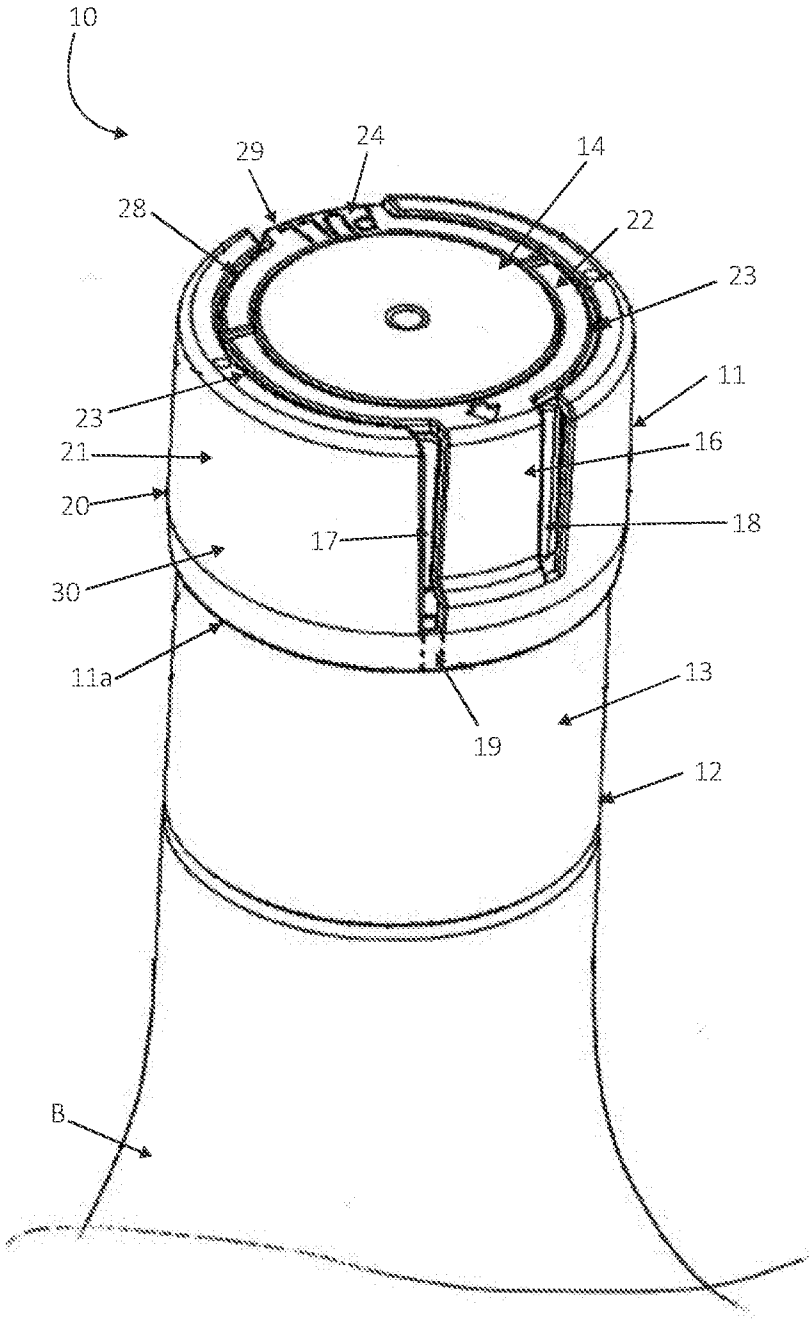


Figure 1

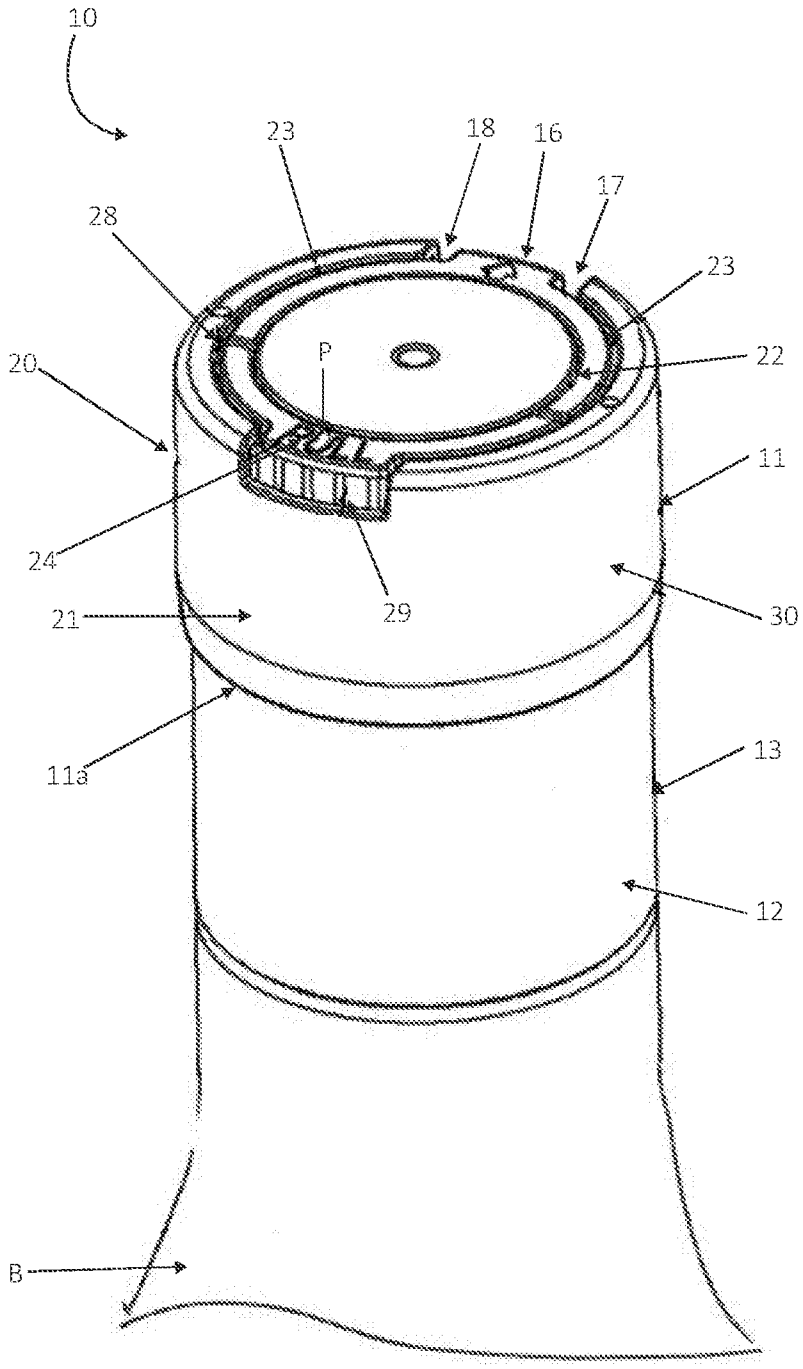
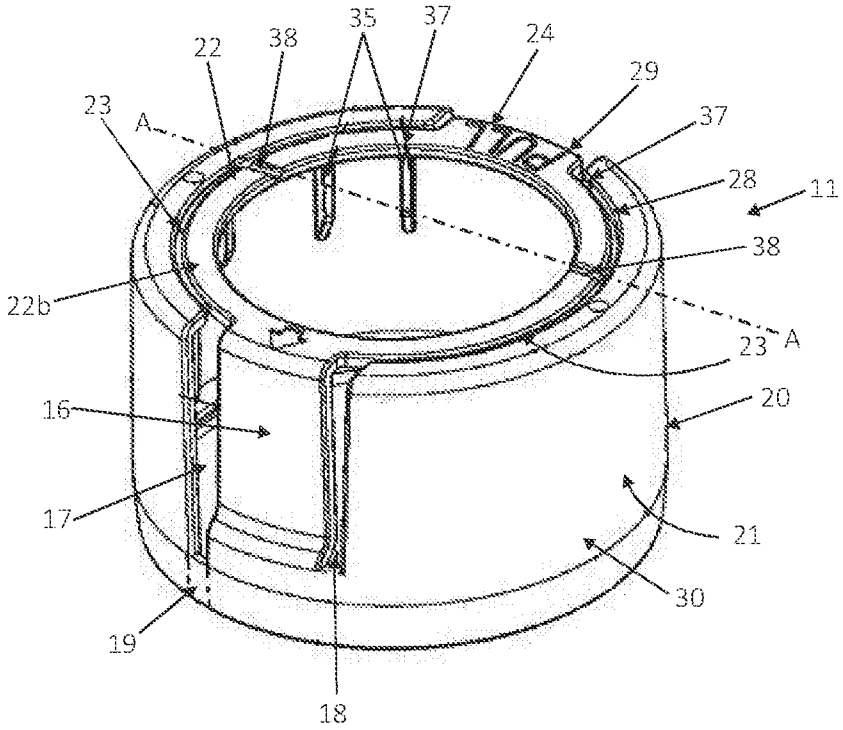


Figure 2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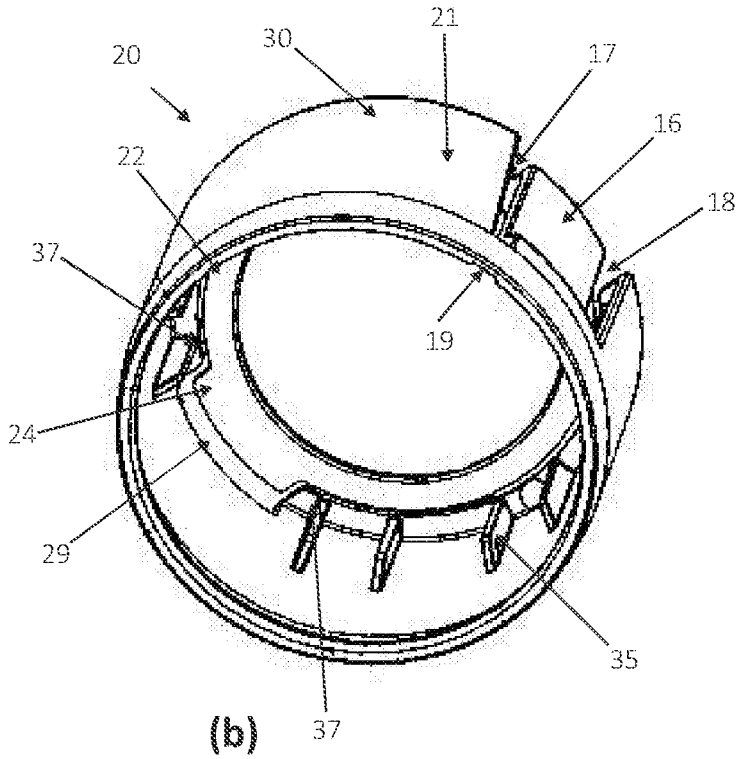
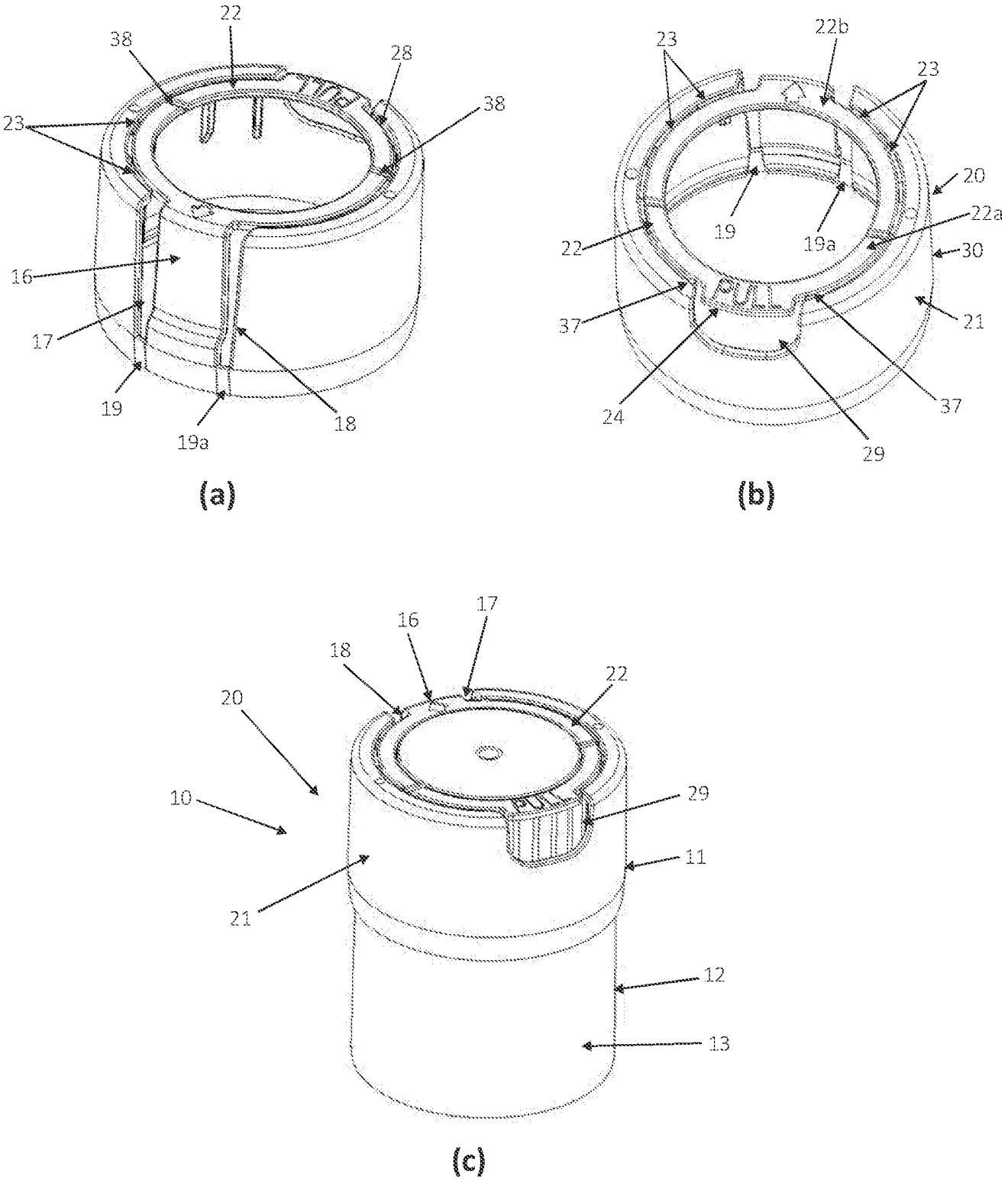
(a)


21
30
20
17
16
22
18
37
19
24
29
35
37

(b)

Figure 3


22
38
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19a
18
(a)
22b
23
23
20
19
19a
22a
22
30
PULL
37
21
24
37
29
(b)
17
16
18
22
20
10
29
11
21
12
13
(c)

Figure 4

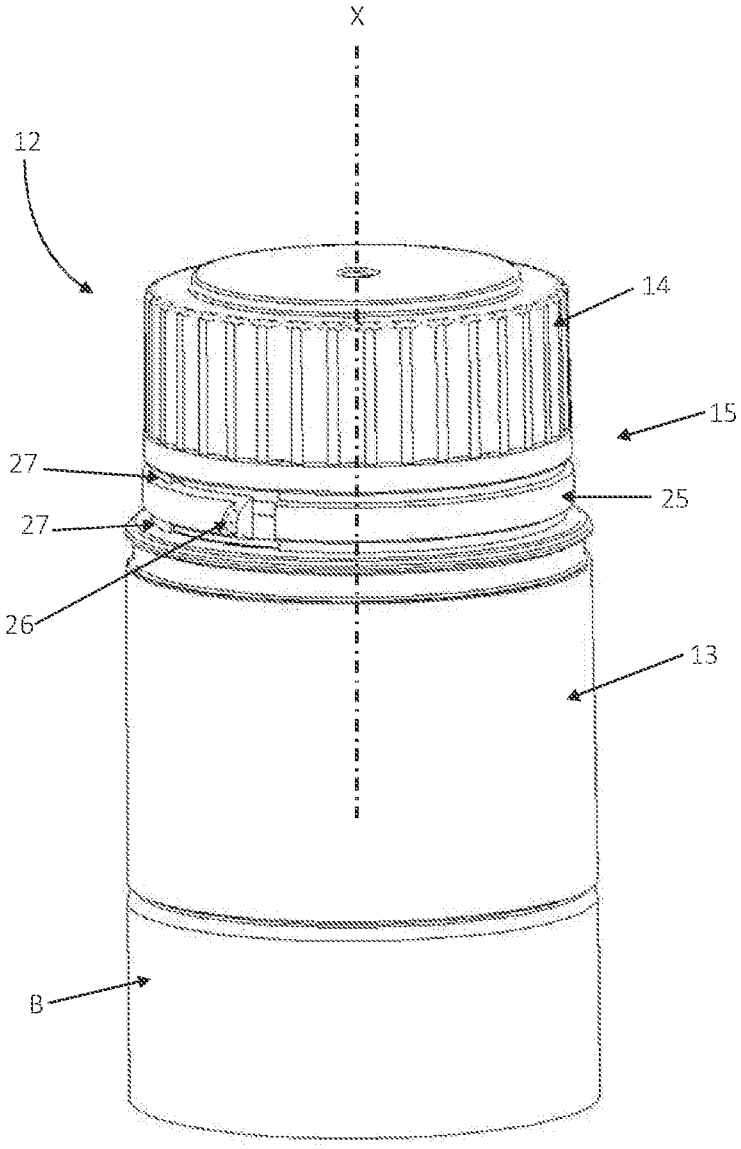

Figure 5

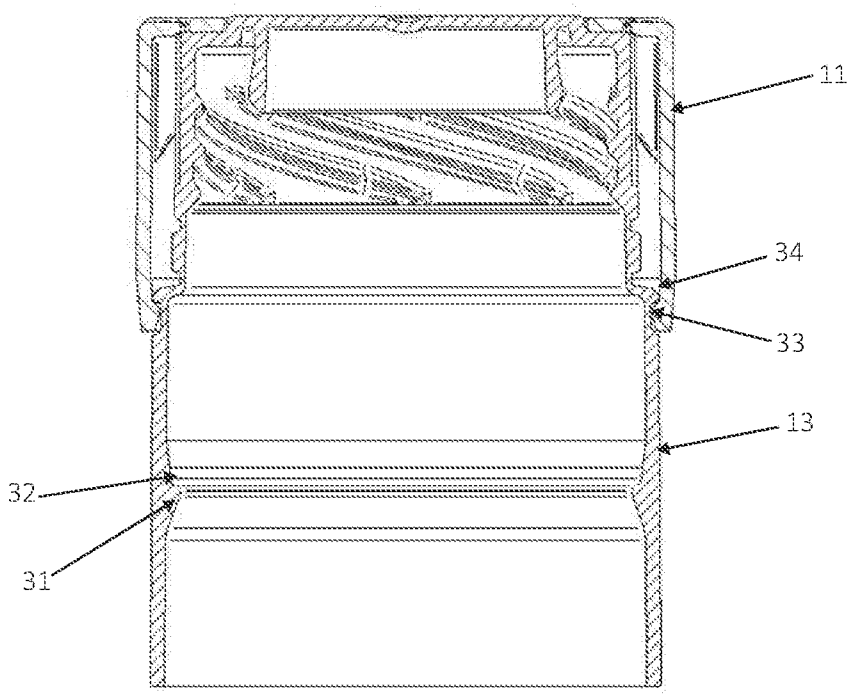

Figure 6

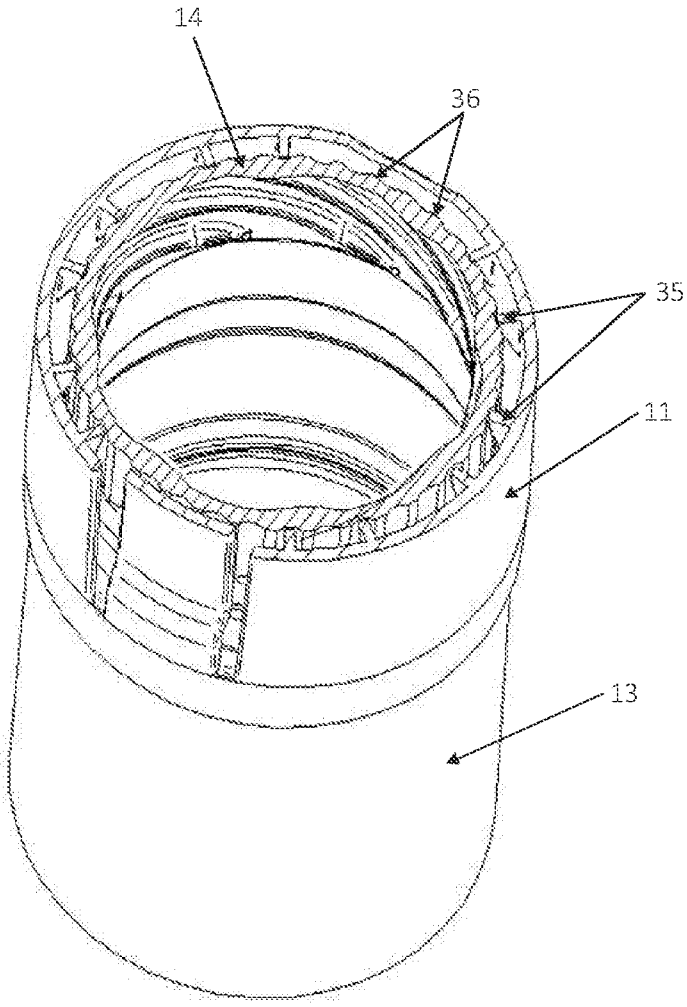

Figure 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2015/059466

A. CLASSIFICATION OF SUBJECT MATTER
B65D41/32 Version=2016.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D41/32

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5456374 A (MATTHEW R BECK) 10 October 1995 WHOLE DOCUMENT ,ABSTRACT ,FIGURES. 01-05	1-28
Y	US 4709823 A (JAMES M BECK, ROBERT D ROHR) 1 December 1987 WHOLE DOCUMENT ,ABSTRACT ,FIGURES. 01-017	1-28

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11-05-2016	11-05-2016

Name and mailing address of the ISA/	Authorized officer
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Facsimile No.	Telephone No. +91-1125300200

International application No.
PCT/IB2015/059466

Citation	Pub.Date	Family	Pub.Date
US 5456374 A	10-10-1995	CA 2153565 A1	20-03-1996
		CA 2153565 C	05-01-1999