(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 904 230 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.11.2021 Bulletin 2021/44

(51) Int Cl.:
B65D 51/28 *(2006.01)*

(21) Application number: **20172407.7**

(22) Date of filing: **30.04.2020**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Suppsolution GmbH**
8400 Winterthur (CH)

(72) Inventor: **Stettler, Mike**
8400 Winterthur (CH)

(74) Representative: **Liebetanz, Michael**
Isler & Pedrazzini AG
Giesshübelstrasse 45
Postfach 1772
8027 Zürich (CH)

(54) **PORTION CONTAINER, CONTAINER MIXING SYSTEM AND METHOD OF USE THEREFOR**

(57) A portion container (30) comprises a hollow body (31) to receive a first substance (48), which has a lower end portion containing a sealable opening (34), a rupturable membrane (45) adapted to engage and thereby seal the opening (34), and an actuation element (37) provided at an opposite upper end portion of the hollow body (31). The portion container (30) further comprises an insert (40) provided inside the hollow body (31) between the actuation element (37) and the rupturable membrane (45) and adapted to be pushed in the direction (400) towards the rupturable membrane (45), wherein the insert (40) has a cutting tip (43) at its free end adjacent near the rupturable membrane (45) which cutting tip (43) is positioned to be adapted to engage and rupture the rupturable membrane (45) when the actuation element (37) is pushed towards the rupturable membrane (45).

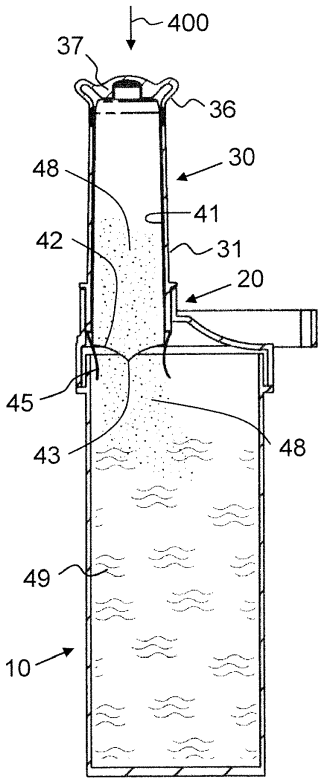

Fig. 4B

EP 3 904 230 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a portion container comprising a hollow body to receive a first substance, which has a lower end portion containing a sealable opening, a rupturable membrane adapted to engage and thereby seal the opening, and an actuation element provided at an opposite upper end portion of the hollow body; and furthermore to a container system comprising such a portion container as well a method of delivering a first substance to a container using such a portion container.

PRIOR ART

[0002] WO 2017/146625 A1 discloses a container with a lid. The lid has an insert to accommodate a portion of a powder. The container can be folded lengthwise so that the insert remains closed when folded. When the container is unfolded, the insert is released and the powder can get into liquid then filled into the container, with the insert then acting as a stirrer.

[0003] WO 2014/056079 A1 discloses a container with a lid. An insert is attached inside the lid holding a powder supplement. A piston is provided pushing the portion from its holding device. The insert separates completely and provides a stirrer.

[0004] EP 2 752 373 A1 describes an insert, closed and filled with a powder or liquid, which insert is held in a container by an attachment mechanism. When the insert is inserted into this mechanism, it is opened. The insert further comprises an identifying feature by which the contents can be identified.

[0005] EP 1 795 457 A1 discloses a container for mixing two liquids and includes: a container; a pouring cylinder that is provided extending upwards on a top portion of the container; an upward facing step portion that is formed on the container so as to be positioned below the pouring cylinder; a cap whose inner circumferential surface is screwed onto an outer circumferential surface of the pouring cylinder; a small container that is placed on an inner side of the cap; a cuttable first sheet that forms a bottom surface of the small container; a removable cylinder that is provided at a bottom end of the cap and is interposed between the cap and the upward facing step portion, and that is removed from the cap prior to the cap being screwed down onto the pouring cylinder; and a cutter that is provided on the container so as to face a bottom surface of the small container that is placed on the inner side of the cap, wherein the small container is made to approach the first container as a result of the cap being screwed down onto the pouring cylinder, and the first sheet is then cut by the cutter.

[0006] The EP 2 298 664 B1 from the same applicant as EP 1 795 457 A1 is quite similar and uses two cutters.

[0007] WO 99/44901 discloses a container for mixing a first and a second substance, wherein the container comprises a bottle defining a chamber adapted to receive the first substance, an opening having male thread formed thereon being provided in the bottle. The container further incorporates a cap for closing the opening and has cooperating female threads to engage with the above mentioned male thread as well as a button. The container further includes a cartridge adapted to be located in the opening. The cartridge is defining a cavity which is adapted to receive the second substance. The cartridge includes a rupturable membrane. In use, the button is able to be actuated so as to apply a rupturing force to the membrane which will cause the membrane to rupture and thereby cause the second substance to discharge from the cavity, through the opening, into the chamber. The preamble of the main claim relating to a portion container is based on WO 99/44901.

SUMMARY OF THE INVENTION

[0008] Based on this prior art it is an object of the present invention to improve the delivery of a packaged portion of a food supplement into the related container where inter alia no packaging part falls into the container during or after the delivery of the food supplement and mixing remains simple.

[0009] Based on the prior art a portion container comprising: a hollow body to receive a first substance, said hollow body having a lower end portion containing a sealable opening therein, a rupturable membrane adapted to engage and thereby seal said sealable opening and rupturable by pressure being applied thereto, and an actuation element provided at an opposite upper end portion of the hollow body adapted to be pushed in a direction towards the rupturable membrane to rupture it, is improved with the further features of an insert provided inside the hollow body between the actuation element and the rupturable membrane and adapted to be pushed in the direction towards the rupturable membrane, wherein the insert has a cutting tip at its free end adjacent near the rupturable membrane which cutting tip is positioned to be adapted to engage and rupture the rupturable membrane when the actuation element is pushed towards the rupturable membrane.

[0010] The portion container according to the invention ensures a secure delivery of the first substance into the

container.

[0011] The hollow body preferably comprises a flexible body comprising the actuation element as deformable dome portion. This material of the flexible body can be a flexible plastics material. The flexible body can be a part of the upper portion of the hollow body and would then be connected with a rigid lower body. The rigid body can be made of a second more rigid plastics material.

[0012] The portion container with its the rigid lower body and the upper flexible body has these parts attached together, especially glued or welded, along a connection portion of the portion container. There the material of the two body parts may be thinner and present adjacent shoulders. But the rigid lower body and the upper flexible body can also be connected through 2k-extrusion of its different plastics materials.

[0013] The insert can comprise a hollow cylindrical wall adjacent to the hollow body. The word cylindrical has to be understood in the mathematical sense, i.e. a plane curve in a plane (here the plane of the membrane) is shifted by a fixed distance along a line that is not contained in the plane. This line would be e.g. parallel to the pushing direction. This then also comprises forms with a polygonal plane curve as lower edge, i.e. the form of a prism or a parallelepiped. The angle between the curve and the line is a right angle.

[0014] In a preferred embodiment, it is not a cylinder but a conical frustum with the actuation element at the smaller diameter side. Then the pushing movement pushes the insert in the portion container in the direction where the two walls will separate more and more so the pushing will not fail and be blocked through too high friction between the two wall portions.

[0015] This is especially true for the flexible portion of the portion container wall.

[0016] The lower edge of the hollow cylindrical wall will preferably follow the shape of a truncated cylinder (or a curve similar to a truncated cylinder) with the cutting tip formed at its lower end.

[0017] The hollow cylindrical wall can comprise at least one opening at its lower end in the vicinity of the cutting tip. This opening allows to ensure to empty the insert, even if the membrane would only be partially ruptured, e.g. because the user has forgotten to take a protective foil away.

[0018] The hollow cylindrical wall can comprise two openings at its lower end in the vicinity of the cutting tip. Then preferably a vertical web is separating the two openings which vertical web is directly positioned above the cutting tip in the cutting direction; therefore the force exerted by pushing the flexible dome is transmitted via this web to the cutting tip.

[0019] The deformable dome portion can be attached to the upper portion of the insert to ensure that the insert cannot fall into the container, usually directly used as drinking vessel.

[0020] The deformable dome portion can be connected with shoulders at the transition between the flexible wall and the hard plastic wall. It is also possible that the two wall portions are connected at a circumferential edge, or in a 2k-coextrusion.

[0021] The rupturable membrane can include lines of weakness for an easier rupture action. The rupturable membrane can and is especially then covered by a protective foil, attached at the lower wall of the portion container. Such foil will usually be a metal foil.

[0022] The closure member can be provided with a tamper evident device as glued to the container which cannot be opened without destroying it.

[0023] A container mixing system comprises a container intended to accommodate the second substance comprising a lid with a lid opening being complimentary to the outside circumference of the lower wall of the portion container as mentioned above. The portion container then comprises a stopper abutting against a complementary abutment element of the lid.

[0024] A method of delivering a first substance to a space within a container having a lid, wherein the lid has an opening adapted to receive a portion container as mentioned above and comprising said first substance, comprises: positioning the portion container with its first substance on and/or in the opening of the lid with the lower edge reaching towards the space in the container, and applying pressure on the actuation element of the portion container in the direction towards the rupturable membrane, so that the cutting tip at the free end of the insert in the portion container adjacent near the rupturable membrane (45) engages and ruptures the rupturable membrane.

[0025] The invention usually is applied to a container, such as a drinking bottle in the range of 0.2 to 1 liter. It further comprises a container with a packaged portion of, for example, 5 to 50 grams, especially 10 to 30 grams, of a food supplement in said container. The container can be opened by an action of the user on the encompassing packaging and the contents, possibly after shaking, is mixing with the liquid present in the container. The opening action comprises boring or cutting into a surface of the packaged portion.

[0026] Further embodiments of the invention are laid down in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Preferred embodiments of the invention are described in the following with reference to the drawings, which are for the purpose of illustrating the present preferred embodiments of the invention and not for the purpose of limiting

the same. In the drawings,

Fig. 1	shows a partial perspective sectional view of a drinking vessel with a mounted portion container according to a first embodiment of the invention;
Fig. 2	shows a sectional view of the portion container of Fig. 1;
Fig. 3A, 3B & 3C	show the sequence of delivering the content of the portion container;
Fig. 4A	shows a sectional view of Fig. 1 with the closed portion container,
Fig. 4B	shows a sectional view of Fig. 4A after opening the closed portion container;
Fig. 5A & 5B	show two different side views of the insert of the portion container;
Fig. 6	shows a detail view of Fig. 5B with the bottom tip of the insert of the portion container;
Fig. 7A, 7B & 7C	show the sequence of delivering the content of a portion container with two security openings according to a further embodiment;
Fig. 8A, 8B & 8C	show the sequence of Fig. 7A, 7B & 7C in a different side view; and
Fig. 9A & 9B	show the two different side views of Fig. 7A and 8A of the insert of the portion container.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0028] Fig. 1 shows a partial perspective sectional view of a drinking vessel as container 10 with a mounted portion container 30. The container 10 can be a plastics or metal container, especially a cylindrical container comprising a container wall 11 with a container bottom 12 at one end and a container opening 16 at the upper end of the container wall 11. At said upper end is provided an outer container flange 13 wherein the container wall continues until an upper edge 14. The container 10 defines an inner cavity 15 intended to be filled with a liquid 49 as shown in other Figures.

[0029] The upper container opening 16 is closed with a lid 20. The lid 20 comprises a curved cover surface 22 between a lower cylindrical wall 21 and an upper cylindrical wall 23 enclosing the upper lid opening 26. The lower cylindrical wall 21 has a slightly larger diameter than the container wall 11. The cylindrical wall 21 can therefore be positioned on the container 10 until it completely surrounds and closes the opening 16 through contact of the upper surface outer edge 24 with the container upper edge 14 and/or the lower edge of the cylindrical wall 21 on the upper surface of the flange 13.

[0030] Although not shown in the drawings, the lid 20 can be connected with the container 10 through a thread combination on the outside of the container wall 11 above the flange 13 (or even without any flange 13) and a complementary thread on the inner side of the lower cylindrical wall 21. Of course it is also possible to provide a clipped connection between container 10 and lid 20, a bayonet closing and other closing means. The only important feature is an opening 26 in the lid 20. In the present drawings, bracket 25 of the cover opening provides the connection between the lid 20 and the container 10.

[0031] A portion container 30 is positioned on the lid opening 26 The portion container 30 has a lower portion as a rigid cylindrical wall 31 which can be slightly conical to a reduced diameter at the rounded dome 37 of the portion container 30. The rigid cylindrical wall 31 has an external flange 32 to be positioned on the lid opening 26, wherein a lower cylindrical wall 33 is entering the upper cylindrical wall 23 of the lid 20. It is possible to provide a threaded connection between the lower cylindrical wall 33 of the portion container 30 and the upper cylindrical wall 23 of the lid 20 but a frictional connection is usually sufficient. A clipping connection is of course also possible.

[0032] Beyond the outer rigid cylindrical wall 31 of the portion container 30 is following a flexible wall 35 comprising a cylindrical wall 36 and the rounded dome 37. In other words, it is possible to push from above in direction of the arrow 400 on the dome and deform the cylindrical wall 36 towards the rigid cylindrical wall 31. It will now be explained in connection with the following drawings what happens when the dome 37 is pushed downwards to the container 10. The line/axis according to the arrow 400 is preferably in line with the symmetry axis of the portion container 30, which is in the shown embodiment not centered above the container 10, but the symmetry axis of the container 10 is oriented in parallel to arrow 400.

[0033] Fig. 2 now shows a sectional view of the portion container 30 of Fig. 1. All identical features always receive the same identical reference numerals throughout the drawings.

[0034] It can be seen from Fig. 2 that the rigid wall 31 of the portion container 30 is an outer wall. Inside adjacent to the rigid wall 31 and the flexible wall 35 is provided the insert wall 41 of insert 40. The insert comprises a connection hat formed upper portion 44 to be inamovibly connected with the dome 37. The inner form of the "hat" is a top cavity 38 wherein the cylindrical sidewalls are adjacent the full material of the dome 37. At the top surface is a connection structure 47 which allows, e.g. molding of the dome 37 together with the insert 40. The insert 40 can be made out of paper or carton.

[0035] The insert walls 41 are extending slightly expanding along the flexible wall 36 and the rigid outer wall 31 of the portion container 30 towards their lower portion container edge 34. The side wall 41 ends near said edge 34, e.g. below the flange 32 in a way that the lower edge of insert wall 42 is concavely curved from two sides to a lower tip 43 which is positioned safely above the lower portion container edge 34 so it is possible to closer the lower edge 34 with a membrane 45, of course after having filled the portion container and especially the insert 40 with a food supplement (or

any other powder or even liquid to be filled in the portion container 30.

[0036] The flexible wall 36 and the rigid wall 31 of the portion container 30 each comprises a circumferential complementary shoulder so that the flexible wall 36 is e.g. glued or welded or 2k-formed on the rigid wall 31 of the portion container 30 along a sufficient length of the longitudinal direction of the portion container 30.

[0037] Fig. 3A, 3B& 3C show the sequence of delivering the content 48 of the portion container 30 into the container 10. The content 48 of the portion container 30 is shown as points, e.g. as a powder: it can also be pellet-like material or on the other side a liquid. The content 48 has to be sufficient flowable.

[0038] Fig. 3A shows the portion container 30 with the closing membrane 45 and filled with the food supplement 48. The following steps are usually executed when the lower cylindrical wall 33 is engaging the upper cylindrical wall 23 of the container 10 and it is clear from the drawing of Fig. 1 that there is a free space below the membrane 45 (until the level of a liquid 49.

[0039] Fig. 3B shows the slightly pushed dome 37, which is moving down in the direction of arrow 40 0 and thus moves the lower end of the insert 40 downwards and especially the tip 43 towards the membrane 45 and displaces it. Although it is shown that the membrane 45 detaches from the lower edge 34 it is also possible that the sharp tip 43 followed by the cutting concave lower edges 42 of insert wall 41 is cutting through the membrane and tears it up.

[0040] Fig. 3C then shows the final position, when the user has pushed the flexible wall 36 all the way down until it touches the rigid wall 31. Then it is ensured that the membrane 45 has almost fully detached.

[0041] Fig. 4A shows a sectional view of Fig. 1 with the closed portion container 30 positioned on the lid 20 on the container 10 and Fig. 4B shows a sectional view of Fig. 4A after opening the closed portion container 30. Since the sectional view of Fig. 4B is 90 degree rotated compared to Fig. 3C it can be seen that the membrane 45 remains attached at the position opposite to the tip 43 and follows in its curvature more or less the concave lower edge 42 of the insert wall 41.

[0042] Fig. 5A & 5B show two different side views of the insert 40 of the portion container 30 before inserted into the latter. Opposite to the tip 43 is - on both sides of the tip 43 at the end of the lower edge 42 a rounded transition 46 into the cylindrical insert wall 41. The rounded transition 46 ensure that, when the insert 40 is pushed down by pushing on the dome 37 of the portion container 30, the content of the portion container 30, which is still blocked by the membrane 45 does not obstructs the move of the insert wall 41 adjacent to the portion container wall 31.

[0043] Fig. 6 shows a detail view of Fig. 5B with the bottom tip 43 of the insert 40 of the portion container 30. The wall 41 of the insert is just cut out with the concave edges 42 creating a tip 43 having an angle of about 90 degree between the adjoining concave edges 42, sufficiently sharp to cut through the membrane 45. The angle can also be an acute angle which is preferred over a more obtuse angle.

[0044] Fig. 7A, 7B & 7C show the sequence of delivering the content of a portion container 130 with two security openings 50 according to a further embodiment. On the lower edge 34 of the container 130 is provided the destructible membrane 45 covering the lower opening. On "top", here below, of the destructible membrane 45 is provided a protective foil 60 which is to be removed before positioning the portion container 130 on the lid 20 of the container 10. The protective foil 60 can have the shape of a "L" with the shorter portion 61 being connected, e.g. glued to the lower cylindrical wall 33. The longer portion is positioned on the closing membrane 45 and is only connected at the end of the grip area 62 with the portion container 130 which can be slightly attached at the lower cylindrical wall 33.

[0045] On the side of and near to the tip 43 can be provided one or more security openings 50. In the embodiment shown there are two security openings 50 side by side. The function of the openings 50 becomes clear when the tip 43 has pushed through the membrane 45 as can be seen in Fig. 7B and 7C. Even in the case that the membrane 45 does not fully open up, the content of the portion container 30 will flow through the openings 50 beyond the tip 43 directly into the container 10.

[0046] In the embodiment shown in Fig. 7A to 7C there is a central web 51 between two essentially trapezoid openings 50. This web 51 is in line with the longitudinal direction of the wall 41 of the insert 40 and supports the attack of the tip 43 of the insert 40 at the membrane 45, i.e. web 51 is just in the prolongation of the tip 43.

[0047] Beside shoulders 39 at the transition between the hard plastic wall 31 and the flexible wall 36 it is also possible that they are connected at a circumferential edge.

[0048] Fig. 8A, 8B & 8C show the sequence of Fig. 7A, 7B & 7C in a different side view. The connection element 47 of Fig. 8A is here the same as in Fig. 2 comprises a circular rim 37' in the flexible dome 37. The passage 36' between the dome 37 and the flexible wall 36 is moving outward when the dome 37 is pushed in direction 400. This outward movement creates a side cavity 38' of the insert material of outward bent portion 36' outside the insert 41 which can be pushed down easily by the rim 37' when pushing on the dome 37.

LIST OF REFERENCE SIGNS

10	container	38	top cavity
11	container wall	38'	side cavity
12	container bottom	39	connection portion of flexible wall

(continued)

13	container flange	39'	connection portion of rigid wall
14	container upper edge	40	insert
15	container cavity	41	insert wall
16	container opening	42	lower edge of insert wall
20	lid	43	tip of insert
21	lower cylindrical wall	44	connection portion to flexible wall
22	cover surface	45	closing membrane
23	upper cylindrical wall	46	rounded transition
24	upper surface outer edge	47	connection element
25	bracket of lid	48	food supplement (powder)
26	lid opening	49	liquid
30	portion container	50	security opening
31	rigid wall of portion container	51	central web
32	portion container flange	60	protective foil
33	lower cylindrical wall	61	shorter portion
34	lower portion container edge	62	grip area
35	flexible wall of portion container	130	portion container
36	cylindrical portion	140	insert
36'	outward bent portion	400	push direction
37	dome		
37'	circular rim		

Claims

1. A portion container (30, 130) comprising:

- a hollow body (31) adapted to receive a first substance (48), said hollow body (31) having a lower end portion containing a sealable opening (34) therein,
- a rupturable membrane (45) adapted to engage and thereby seal said sealable opening (34) and rupturable by pressure being applied thereto, and
- an actuation element (37) provided at an opposite upper end portion of the hollow body (31) adapted to be pushed in a direction (400) towards the rupturable membrane (45) to rupture it,

characterized in that the portion container (30, 130) further comprises

- an insert (40, 140) provided inside the hollow body (31) between the actuation element (37) and the rupturable membrane (45) and adapted to be pushed in the direction (400) towards the rupturable membrane (45),

wherein the insert (40, 140) has a cutting tip (43) at its free end adjacent near the rupturable membrane (45) which cutting tip (43) is positioned to be adapted to engage and rupture the rupturable membrane (45) when the actuation element (37) is pushed towards the rupturable membrane (45).

2. The portion container according to claim 1, wherein the hollow body (30, 130) comprises a flexible body (36) comprising the actuation element as deformable dome portion (37).

3. The portion container according to claim 2, wherein the flexible body (36) is part of the upper portion of the hollow body (30, 130) and is connected with a rigid lower body (31).

4. The portion container according to claim 3, wherein the rigid lower body (31) and the upper flexible body (36) are attached together, especially glued or welded, along a connection portion (39, 39') of the portion container (30).

5. The portion container according to claim 3, wherein the rigid lower body (31) and the upper flexible body (36) are connected through 2k-extrusion of its different plastics materials.

6. The portion container according to any one of claims 2 to 5, wherein the insert (40, 140) comprises a hollow cylindrical wall (41) adjacent to the hollow body (31, 36) and wherein the lower edge (42) of the hollow cylindrical wall (41)

follows the shape of a truncated cylinder with the cutting tip (43) formed at its lower end.

7. The portion container according to claim 6, wherein the hollow cylindrical wall (41) comprises at least one opening (50) at its lower end in the vicinity of the cutting tip (43).

8. The portion container according to claim 7, wherein the hollow cylindrical wall (41) comprises two openings (50) at its lower end in the vicinity of the cutting tip (43), wherein a vertical web (51) is separating the two openings (50) which vertical web (51) is directly positioned above the cutting tip (43) in the cutting direction (400).

9. The portion container according to any one of claims 2 to 8, wherein the deformable dome portion (37) is attached to the upper portion of the insert (40, 140).

10. The portion container according to any preceding claim, wherein the rupturable membrane (45) includes lines of weakness.

11. The portion container according to any one of the preceding claims, wherein the rupturable membrane (45) is covered by a protective foil (60), attached at the lower wall (33) of the portion container (30, 130).

12. The portion container according to any one of the preceding claims, wherein the closure member (45) is provided with a tamper evident device.

13. A container mixing system comprising a container (10) intended to accommodate the second substance (49) comprising a lid (20) with a lid opening (26) being complimentary to the outside circumference of the lower wall (33) of the portion container (30, 130) according to any one of claims 1 to 12, wherein the portion container (30, 130) comprises a stopper (32) abutting against a complementary abutment element (23) of the lid (20).

14. A method of delivering a first substance (48) to a space within a container (10) having a lid (20), wherein the lid (20) has an opening (26) adapted to receive a portion container (30, 130) according to any one of claims 1 to 12 and comprising said first substance (48), wherein the method comprises

- positioning the portion container (30, 130) with its first substance (49) on and/or in the opening (26) of the lid (20) with the lower edge (34) reaching towards the space in the container (10), and
- applying pressure on the actuation element (37) of the portion container (30, 130) in the direction (400) towards the rupturable membrane (45), so that the cutting tip (43) at the free end of the insert (40, 140) in the portion container (30, 130) adjacent near the rupturable membrane (45) engages and ruptures the rupturable membrane (45).

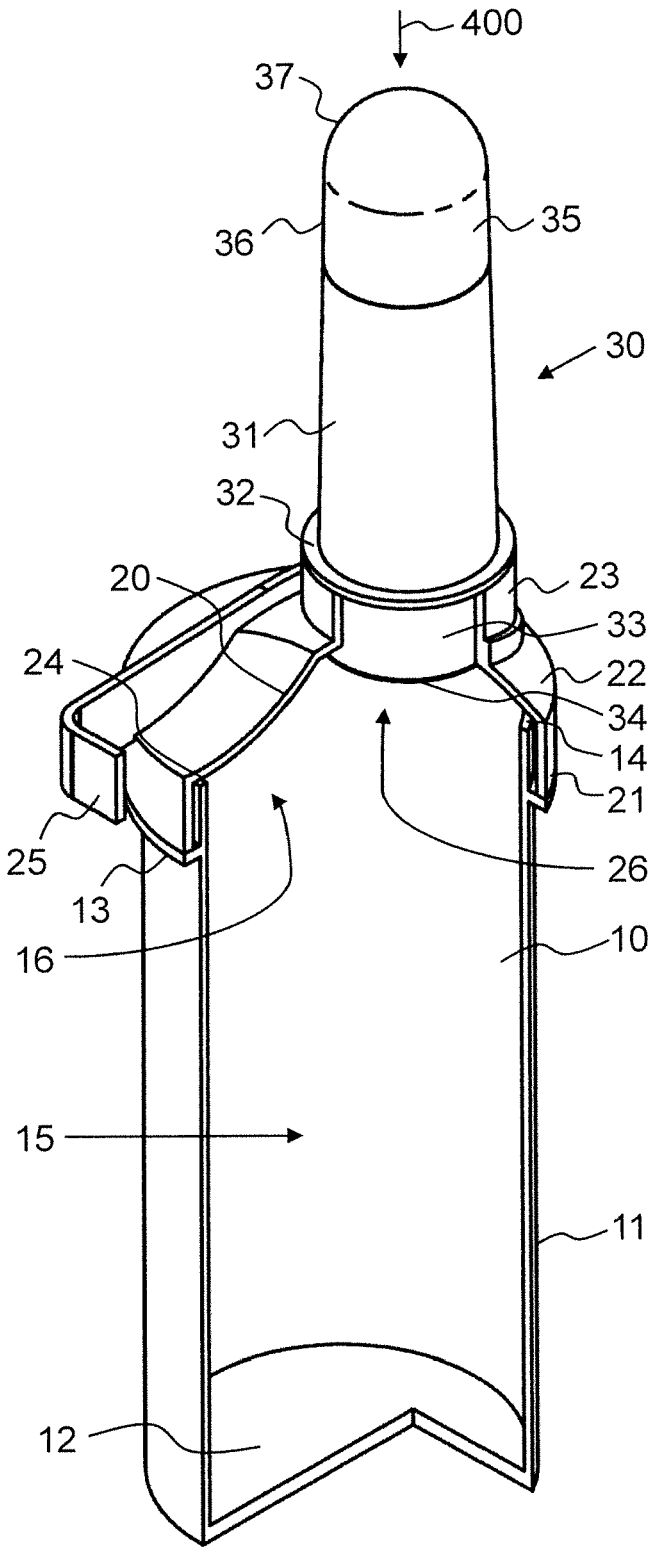

Fig. 1

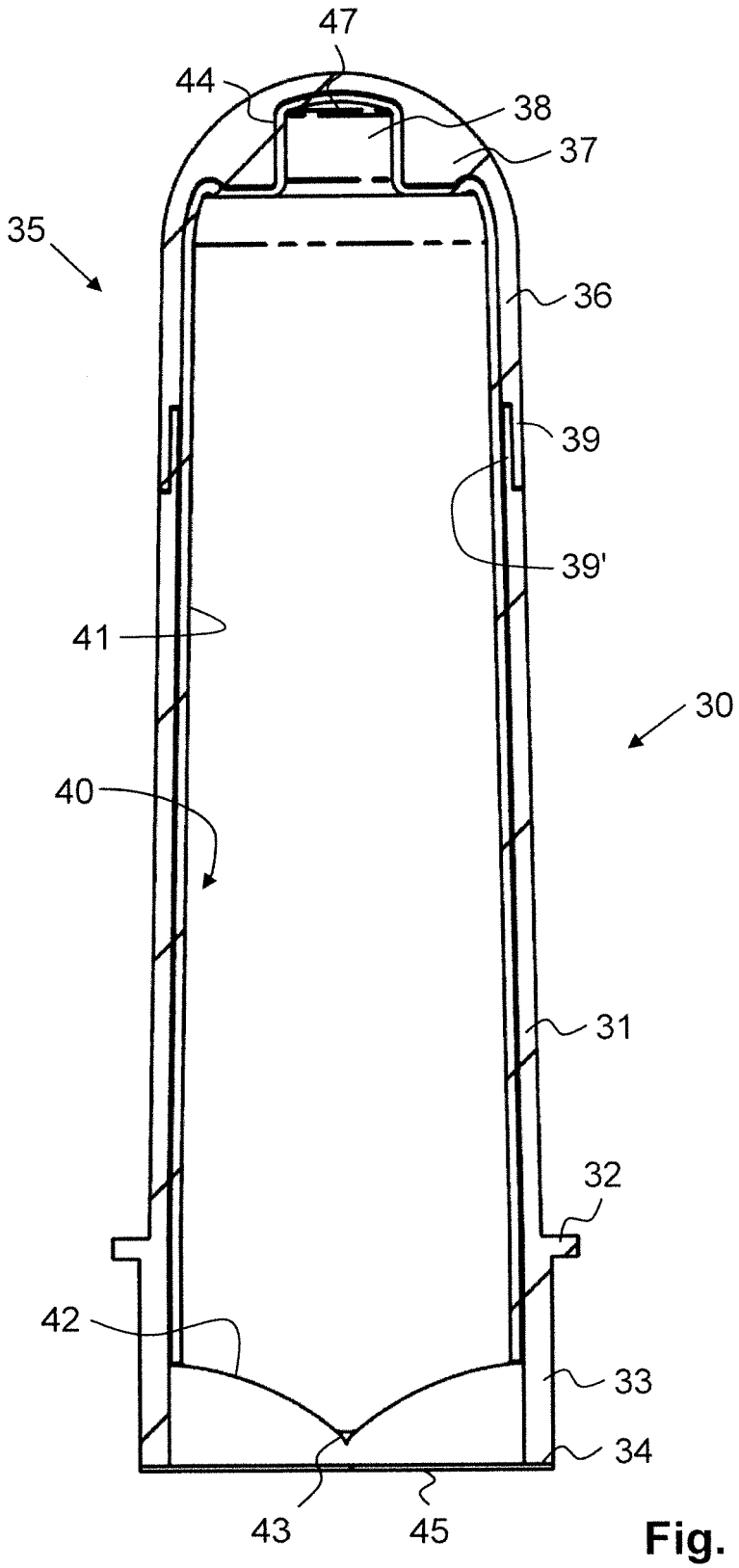

Fig. 2

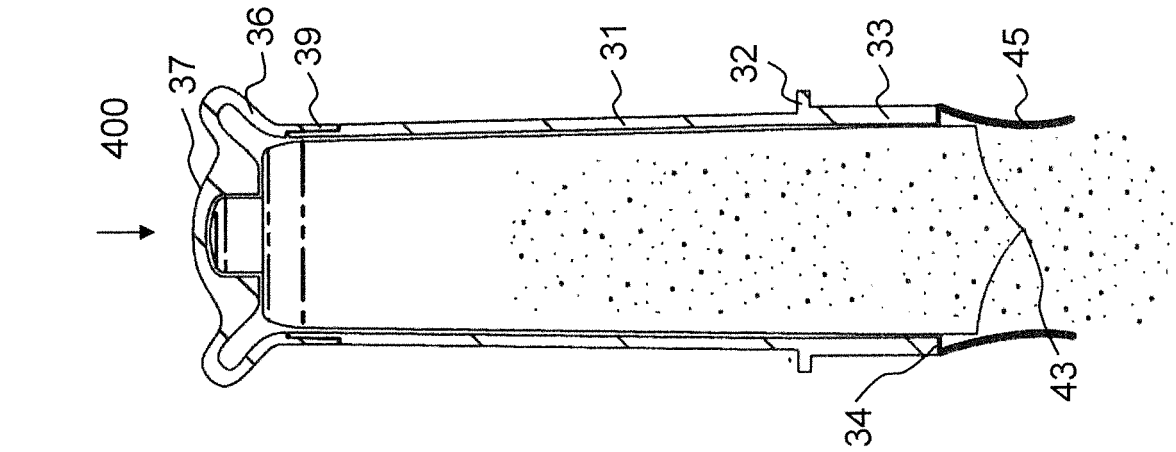

Fig. 3C

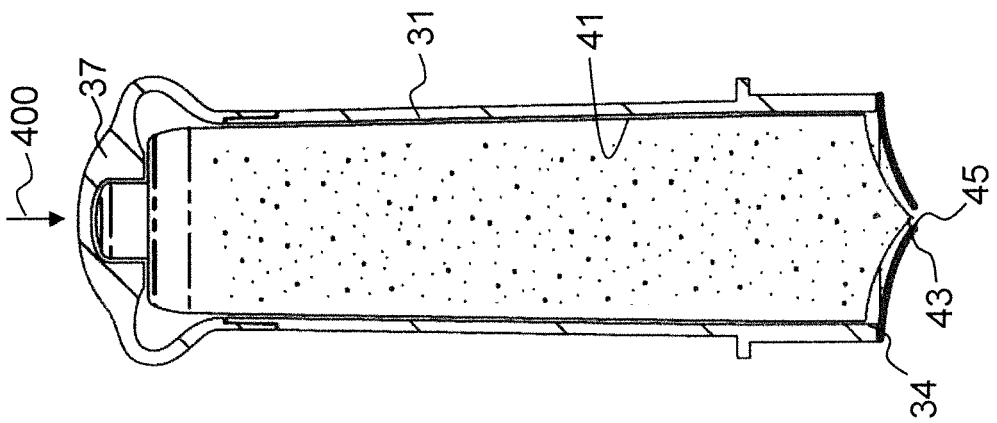

Fig. 3B

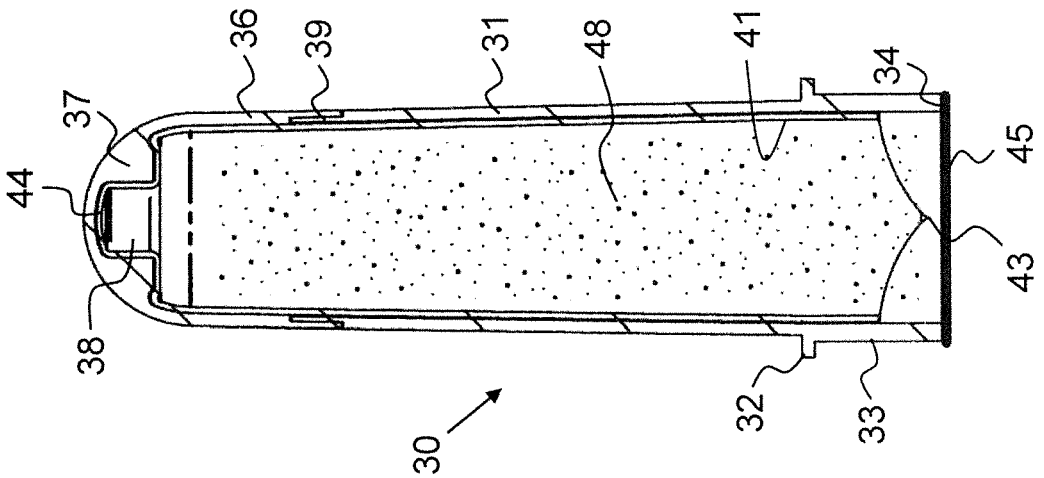

Fig. 3A

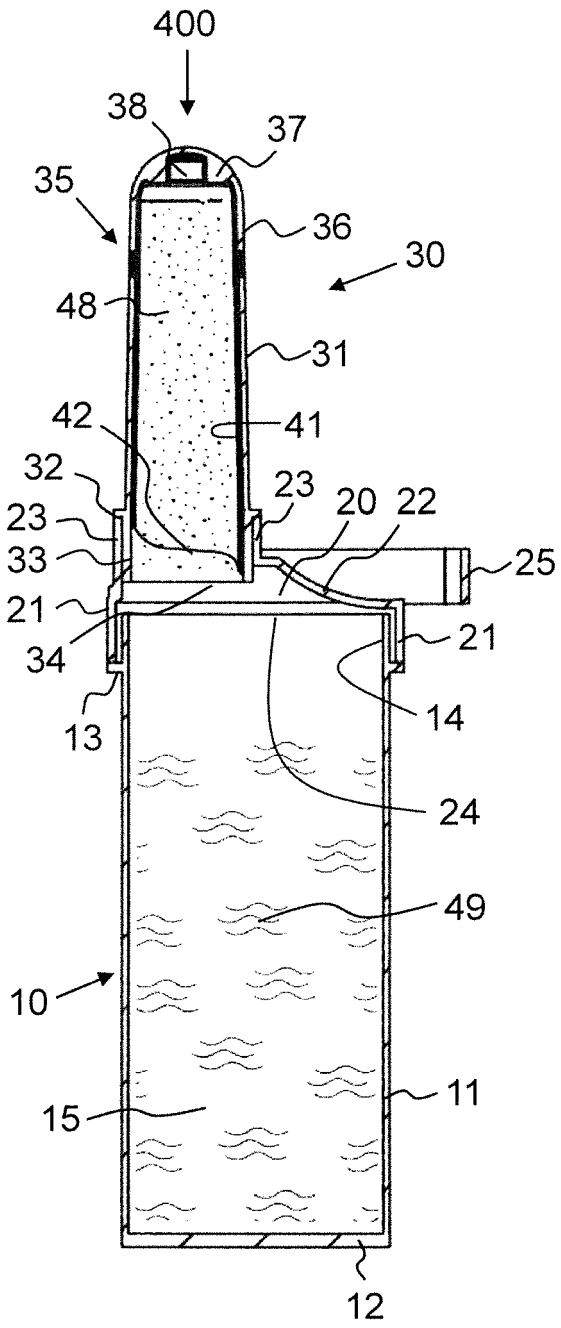
400
38
37
35
36
30
48
31
42
41
32
23
23
20
22
33
25
21
21
34
14
13
24
49
10
11
15
12

Fig. 4A

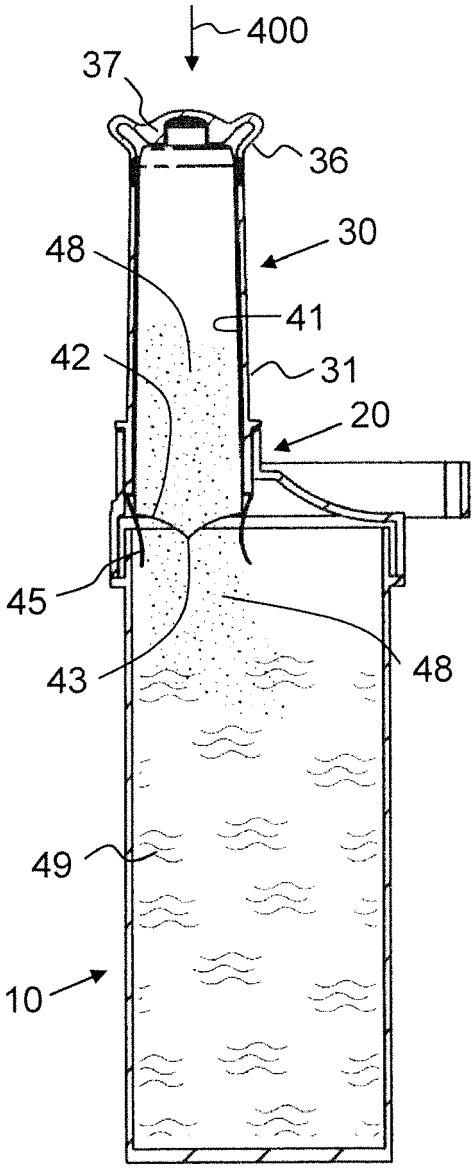
400
37
36
48
30
41
42
31
20
45
48
43
49
10

Fig. 4B

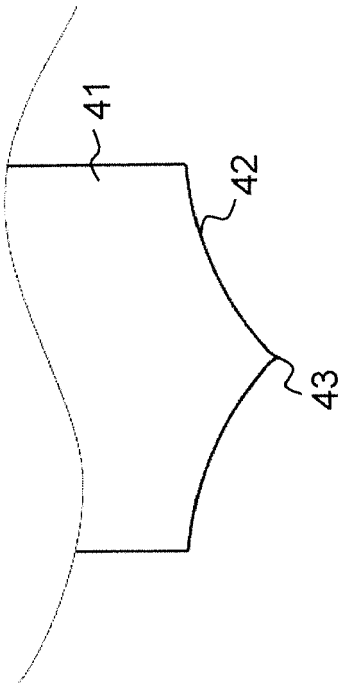

Fig. 6

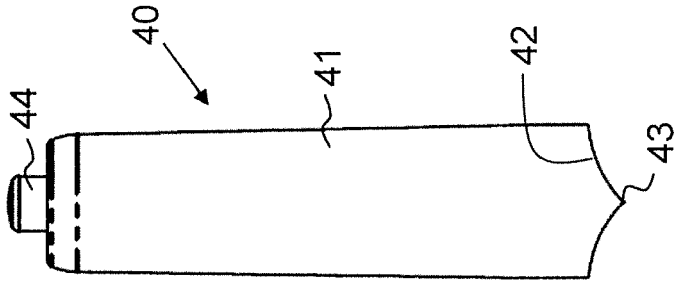

Fig. 5B

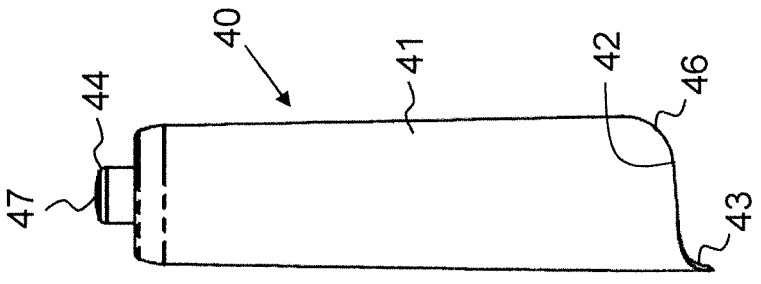

FIG. 5A

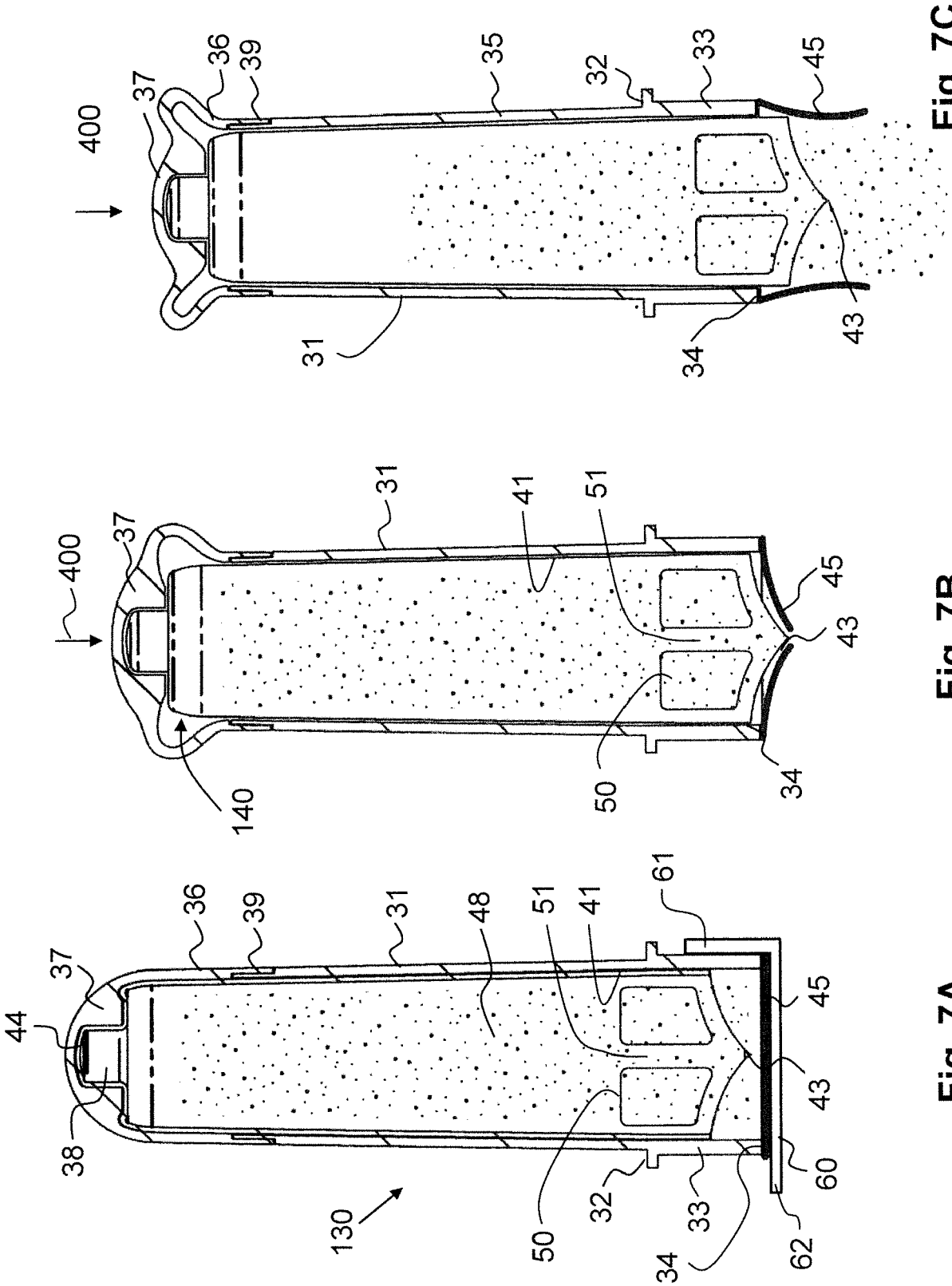

Fig. 7C

Fig. 7B

Fig. 7A

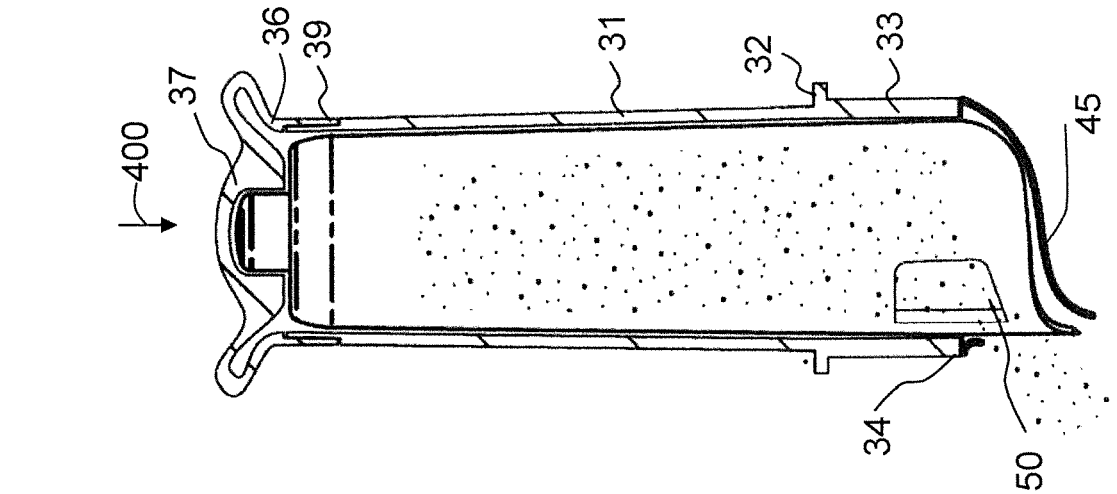

Fig. 8C

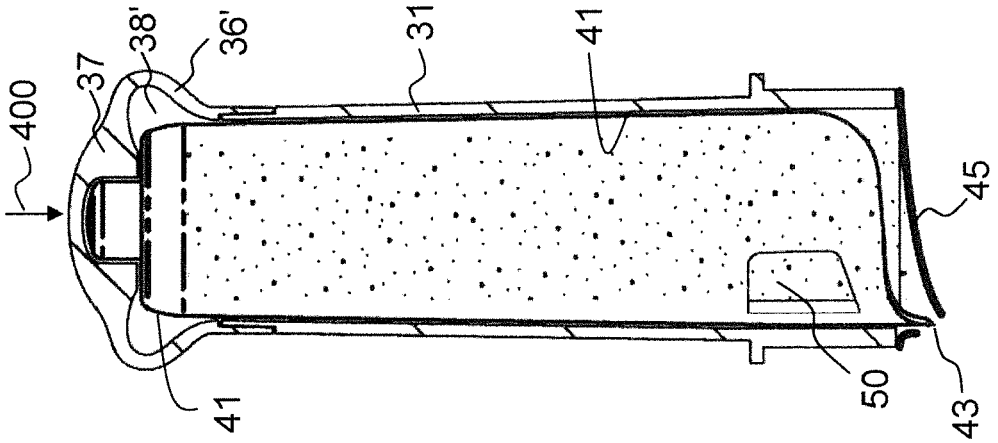

Fig. 8B

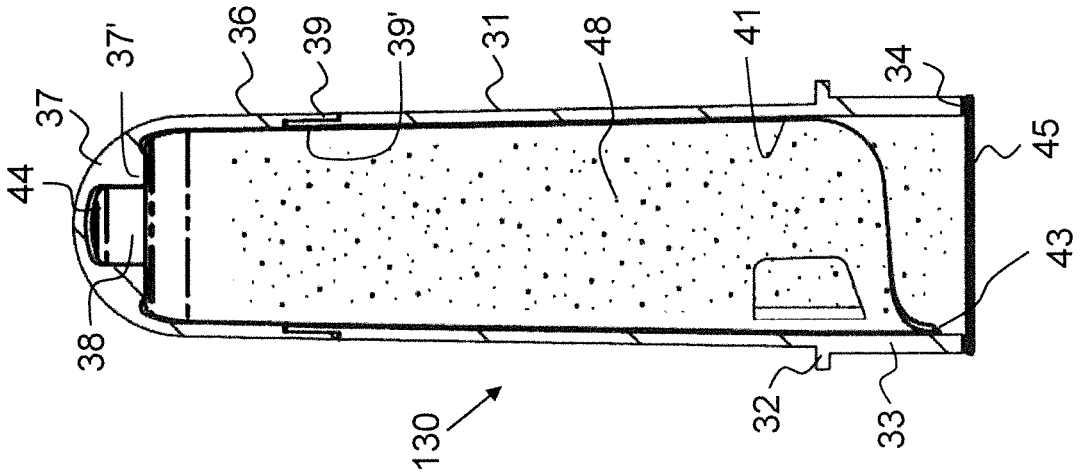

Fig. 8A

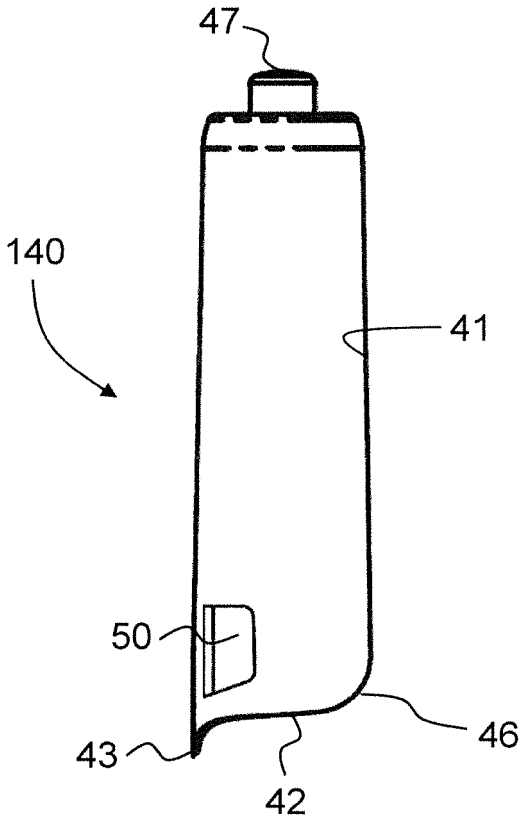

Fig. 9A

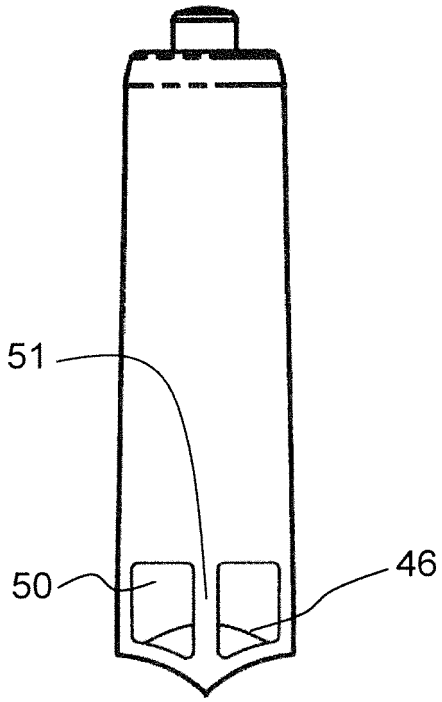

Fig. 9B

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 17 2407

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 700 589 A2 (LEE SEONG-JAE [KR]; LEE SU-JAE [KR]) 26 February 2014 (2014-02-26) * paragraph [0132]; figures 72, 99, 120 *	1-5,7,8, 10-12,14	INV. B65D51/28
X	CN 107 985 788 A (BEIJING BEIJING 3D DIGITAL TECH CO LTD; CHEN XIAOQIANG) 4 May 2018 (2018-05-04) * paragraphs [0040] - [0044]; figure 2 *	1-11,14	
X	JP H10 59373 A (TOYO SEIKAN KAISHA LTD) 3 March 1998 (1998-03-03) * paragraph [0028]; figures 5-7 *	1,12	
X	CH 714 331 A2 (BEVASWISS AG [CH]) 15 May 2019 (2019-05-15) * paragraphs [0007] - [0017] *	1,2,12	
X	WO 2017/046420 A1 (BEVASWISS AG [CH]) 23 March 2017 (2017-03-23) * paragraph [0016] *	1,2,12	
X	JP 2005 247382 A (NIPPON TANSAN GAS CO LTD) 15 September 2005 (2005-09-15) * paragraphs [0026] - [0037]; figures *	1-4,6	TECHNICAL FIELDS SEARCHED (IPC) B65D
A	WO 2006/046730 A1 (COCA COLA CO [US]; IWASHITA HIROMASA [JP] ET AL.) 4 May 2006 (2006-05-04) * figures *	7,8	
A	US 2003/213709 A1 (GIBLER GREGORY A [US] ET AL) 20 November 2003 (2003-11-20) * figures *	10	
X	US 5 543 042 A (FILAN FINBARR J [IE] ET AL) 6 August 1996 (1996-08-06) * column 3, line 40 - column 4, line 45; figures *	13	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 November 2020	Fournier, Jacques

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 17 2407

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-11-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2700589 A2	26-02-2014	CA 2838483 A1	26-10-2012
		CN 103619722 A	05-03-2014
		EP 2700589 A2	26-02-2014
		US 2014305818 A1	16-10-2014
		US 2016090222 A1	31-03-2016
		WO 2012144802 A2	26-10-2012
CN 107985788 A	04-05-2018	NONE	
JP H1059373 A	03-03-1998	NONE	
CH 714331 A2	15-05-2019	CH 714331 A2	15-05-2019
		WO 2019096845 A1	23-05-2019
WO 2017046420 A1	23-03-2017	CH 711552 A2	31-03-2017
		CN 108349635 A	31-07-2018
		EP 3350093 A1	25-07-2018
		JP 2018527261 A	20-09-2018
		US 2018265268 A1	20-09-2018
		WO 2017046420 A1	23-03-2017
JP 2005247382 A	15-09-2005	NONE	
WO 2006046730 A1	04-05-2006	AR 051234 A1	27-12-2006
		JP 2007276786 A	25-10-2007
		TW 200630277 A	01-09-2006
		WO 2006046730 A1	04-05-2006
US 2003213709 A1	20-11-2003	AU 2003268129 A1	13-12-2004
		US 2003213709 A1	20-11-2003
		WO 2004103853 A1	02-12-2004
US 5543042 A	06-08-1996	AT 225193 T	15-10-2002
		AU 701564 B2	04-02-1999
		CA 2216956 A1	03-10-1996
		DE 69624108 T2	12-06-2003
		DK 0827414 T3	16-12-2002
		EP 0827414 A1	11-03-1998
		ES 2186776 T3	16-05-2003
		JP 3707561 B2	19-10-2005
		JP 2002516578 A	04-06-2002
		PT 827414 E	28-02-2003
		US 5543042 A	06-08-1996
		WO 9630061 A1	03-10-1996

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2017146625 A1 **[0002]**
- WO 2014056079 A1 **[0003]**
- EP 2752373 A1 **[0004]**
- EP 1795457 A1 **[0005] [0006]**
- EP 2298664 B1 **[0006]**
- WO 9944901 A **[0007]**