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(54) **Elastic dispenser of bag-in-bottle type**

(57) The present invention provides a dispenser (10) for dispensing a product, particularly a cosmetic product. The dispenser comprises a container (12) comprising a brim (26), at least one bag (14) for storing the product, wherein the bag (14) is located within the container (12) and has an upper end (32) attached to the brim (26), a valve assembly (16) adapted to selectively allow the product to be dispensed or prevent the product to be dispensed, wherein the bag (14) further comprises flat lateral edges (28) and is arranged so as to comprise a bottom fold (30).

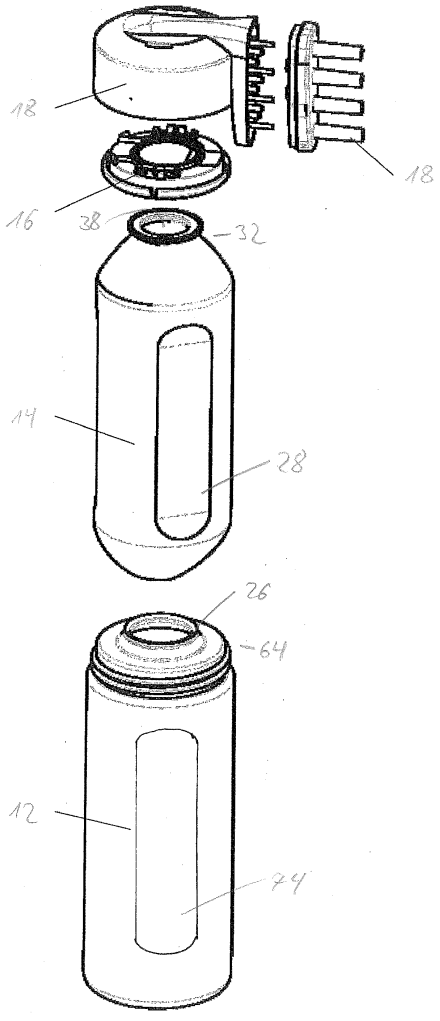

Fig. 1

EP 2 949 601 A1

Description

[0001] The present invention relates to a dispenser comprising at least one inner flexible bag containing a dispensable product and an associated valve.

[0002] DE 39 23 903 A1 discloses a dispenser of bag-in-bottle type comprising an inner bag, wherein the inner bag has a bottom fold extending in a direction away from the bag.

[0003] DE 41 21 179 A1 discloses a dispenser of bag-in-bottle type comprising an inner bag, wherein the inner bag has a fold towards the upper end of the bag.

[0004] DE 2 103 447 B1 discloses a dispenser of bag-in-bottle type comprising an inner bag, wherein the inner bag has flat lateral areas.

[0005] The use of the so called bag-in-bottle-type technology is a known technology, wherein an inner bag is disposed within a bottle or can of a dispenser. The bag comprises a valve at an upper end through which a stored product may be expelled. The bottle or can is usually made of an elastic material such as plastics. If the bottle or can is pressed, the inner bag is pressed as well and the stored product is expelled through the valve. The bag-in-bottle-type technology is a technology for increasing the dispensable amount of the product stored within the bag because the bag may be compressed to a considerable degree. As the product stored in the inner bag may be expensive, e.g. cosmetic or medical products, there is a desire to further increase the dispensable amount of the content of a container using the bag-in-bottle technology.

[0006] Therefore, it is an object of the present invention to provide a dispenser allowing to further increase the dispensable amount of a product stored in a bag of a container using the bag-in-bottle technology.

[0007] This object is achieved by a dispenser according to the present invention. Particularly, the dispenser increases the dispensable amount so a to decrease waste of stored product.

[0008] These and other advantages and features of the various embodiments of the invention disclosed herein, will be made more apparent from the description, drawings and claims that follow. Summarizing the ideas of the present invention, the following items are preferred:

Item 1: A dispenser for dispensing a product of the present invention, particularly for dispensing a cosmetic product, comprises a container comprising a brim, at least one bag for storing the product, wherein the bag is located within the container and has an upper end attached to the brim, and is provided with a valve assembly adapted to selectively allow the product to be dispensed or prevent the product to be dispensed, wherein the bag further comprises flat lateral edges and is arranged so as to comprise a bottom fold.

Item 2: The dispenser of item 1, wherein the bag may be located within the container such that a space between the container and the bag is left, wherein the valve assembly comprises at least one venting hole adapted to allow a gas within the space to be vented from the space if a pressing force is applied to the container and to allow a gas to enter the space if the pressing force is released.

Item 3: The dispenser of item 2, wherein the valve assembly may comprise at least one pivotal flap selectively blocking or opening the venting hole.

Item 4: The dispenser of item 2, wherein the bag may comprise a brim, wherein the brim includes air guiding channels adapted to communicate the venting hole and the space.

Item 5: The dispenser of item 1, wherein the valve assembly may comprise a central opening through which the product is dispensable and a pivotal flap selectively blocking or opening the opening.

Item 6:The dispenser of item 1, wherein the bottom fold may be directed towards the upper end or the lower end of the bag.

Item 7: The dispenser of item 1, wherein the bag may comprise two flat triangular portions forming the bottom fold each extending from its bottom edge to its lateral edge so as to form an angle of about 90° between the portions.

Item 8: The dispenser of item 1, wherein the container may comprise two flat areas.

Item 9: The dispenser of item 1, wherein The dispenser may further comprise two bags for storing the product, wherein the bags are arranged so as to form the bottom fold.

Item 10: The dispenser of item 6, wherein the valve assembly may comprise two pivotal flaps.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a schematic explosion view of a dispenser of a first embodiment of the present invention.

Fig. 2 is a schematic partly cross-sectional view of the dispenser of Fig. 1.

Fig. 3 is a schematic cross-sectional view of a bag of the dispenser of Fig. 1.

Fig. 4 is another schematic cross-sectional view of a bag of the dispenser of Fig. 1.

Fig. 5 is a schematic cross-sectional view of a bag of the dispenser of Fig. 1 in a folded state.

Fig. 6 is an enlarged view of an upper end of the bag.

Fig 7A is a schematic cross-sectional view of a valve assembly of the dispenser of Fig. 1.

Fig. 7B is a schematic plan view of a lower portion of the valve assembly.

Fig. 7C is a schematic plan view of an upper portion of the valve assembly.

Fig. 8 is a schematic view of the operational principle of the valve assembly.

Fig. 9 is a schematic explosion view of a dispenser of a second embodiment of the present invention.

Fig. 10 is a schematic cross-sectional view of the dispenser of Fig. 9.

Fig 11A is a schematic cross-sectional view of a valve assembly of the dispenser of Fig. 9.

Fig. 11B is a schematic plan view of a lower portion of the valve assembly.

Fig. 11C is a schematic plan view of an upper portion of the valve assembly.

Fig. 12 is a schematic view of the operational principle of the valve assembly.

DETAILED DESCRPTION OF THE EMBODIMENTS

[0010] Fig. 1 shows a dispenser 10 according to a first embodiment of the present invention. The dispenser 10 comprises an outer elastic container 12, an inner flexible bag 14 and a valve assembly 16 through which the product may be expelled or dispensed from the flexible bag 14. Further, the dispenser 10 may comprise a dispenser cap 18 as shown in Fig. 1. Particularly, the dispenser 10 may be used for storing and dispensing hairstyling/coloring products. The inner flexible bag 14 containing a dispensable product, e.g. a chemical product, a cosmetic product or a medical product. The flexible bag 14 may be made of a thermoplastic material such as polyethylene. The material of the bag 14 is preferably a soft material having a shore hardness smaller than 95.

[0011] As shown in Fig. 2, which shows a partly cross-sectional view of the dispenser 10, the flexible bag 14 is located within the outer elastic container 12 so that there is space 20 left between the flexible bag 14 and the container 12. More particularly, the space 20 exists between an inner wall 22 of the container 12 and an outer wall 24 of the flexible bag 14. The flexible bag 14 is attached to a upper brim 26 of the container 12.

[0012] Figs. 3 and 4 show cross-sectional views of the bag 14 taken along a longitudinal axis of the bag and shifted with an angle of 90 ° with respect to each other. Now, there will be discussed some particularly relevant details of the flexible bag 14. The flexible bag 14 can be made from a single material or from a composite material, which preferably comprises at least a polymeric layer and a layer which acts as a gas barrier, e.g., made from metal, such as aluminum. Preferably the inner material of the flexible bag 14 is inert to the contents of the product stored therein, and more preferably the inner material is also impenetrable by the contents of the product in the flexible bag 14. It is further preferred if the flexible bag comprises a layer of a material which is essentially impermeable to a gas such as ambient air outside of the bag and within the space 20, which generally may not intended to be mixed with the product in the flexible bag 14 during storage. Mixing of the product in the flexible bag 14 and the gas outside of the flexible bag 14 can be inappropriate to the properties of for example a cosmetic composition in the flexible bag 14 during storage, e.g., due to the fact that the gas outside of the flexible bag 14 influences the properties of the cosmetic composition during storage in a negative way.

[0013] This does, however, not preclude the possibility that the product inside of the flexible bag 14 and the gas outside of the flexible bag 14 are mixed upon dispensing of the cosmetic composition when the valve assembly 16 is triggered to open and to dispense the content of the flexible bag 14. A mixing channel or another appropriate measure can be used in such a case to mix the gas outside of the flexible bag 14 with the dispensed cosmetic composition, if this is desired.

[0014] The flexile bag 14 comprises flat lateral edges 28 as shown in Fig. 1 and is additionally arranged so as to comprise a bottom fold 30 directed towards an upper end 32 of the flexible bag 14 in order to allow a controlled collapse of the bag 14. Such a collapsed or folded stat is shown in Fig. 5. In the area of the bottom fold 30, the bag 14 can comprise two flat triangular portions 34 forming the bottom fold 30 each extending from its bottom edge 36 to its lateral edge 28 so as to form an angle of about 90° between the portions 34. This can further facilitate the collapse of the flexible bag 14 when compressed as shown in Fig. 5.

[0015] As shown in Fig. 6, The flexible bag 14 comprises at the upper end 32 thereof an opening 38 enclosed by a brim 40. The brim 40 comprises air guiding channels 42 which extend from an radial outer portion 44 to a position 46 on a lower side 48 of the brim 40 which is located radially inwards with respect to the radial outer portion 44. For example, the opening may comprise a diameter of about 17 mm and the brim 40 may comprise a diameter of about 24 mm. The upper side 50 of the brim 40 may serve as a sealing surface as will be explained below.

[0016] As shown in Figs. 7A to 7C, the valve assembly

16 consists of a lower portion 52 shown in Fig. 7B and an upper portion 54 shown in Fig. 7C. Generally, all types of valves can be part of the valve assembly 16. For example, the valve assembly 16 may be shaped as a disk or circular plate. The lower portion 52 of the valve assembly 16 comprises a central opening 56, which may be circular, and two venting holes 58, which may be rectangular. The upper portion 54 may be a cover for the lower portion 52 and is adapted to be mounted to the lower portion 52. The upper portion 54 comprises a central plate shaped flap 60 or baffle adapted to close or open the central opening 56 of the lower portion 52 and two venting flaps 62 adapted to close or open the venting holes 58 of the lower portion 52. The flap 60 and the flaps 62 may be two-way valve. The flap 60 and the flaps 62 may be pivotably mounted or hinged to the upper portion 54

[0017] As shown in Fig. 2 and 8, the flexible bag 14 and the valve assembly 16 are attached to the upper brim 26 of the container 12 such that an upper end 64 of the container 12 engages the lower side 48 of the brim 40 of the bag 14 in a gas tight manner and the valve assembly 16 engages the upper side 50 of the brim 40 of the bag 14 and the container 12 in a gas tight manner, wherein an annular space 66 is left between the valve assembly 16 and the container 12. Accordingly, the interior of the flexible bag 14 and the space 20 between the container 12 and the flexible bag 14 are each independently sealed.

[0018] The operational principle of the dispenser will be explained with reference to the above mentioned drawings and particularly with reference to Fig. 8. If the container 12 is pressed, the flexible inner bag 14 is pressed as well because the container 12 transmits the pressing force to the bag 14. If the pressure acting on the outer container 12 and the bag 14 exceeds a threshold, which is determined by the characteristics of the flap 60 of the valve assembly 16, the flap 60 is pivoted in an upward direction as indicated by an arrow 68 in Fig. 8 such that the central opening 56 is no longer blocked and is opened. Thus, the contents of the bag 14 is dispensed through the opening 38 of the bag 14 and the central opening 56 of the valve assembly 16. Further, gas from within the space 20 is vented from the space 20 between the outer container 12 and the bag 14 in that the air flows through the air guiding channels 42 within the brim 40 of the bag 14, enters the space 66 and passes through the venting holes 58 as the flaps 62 are pivoted upwards as indicated by arrows 70 in Fig. 8. If the pressure is released the outer container 12 returns to the original form due to its wall rigidity and the flap 60 of the valve assembly 16 closes the central opening 56. Further, ambient air may pass the venting holes 58 and flow into the space 66 between the outer container 12 and the valve assembly 16 as the flaps 62 are pivoted downwards as indicated by arrows 72. The air may further flow through the air guiding channels 42 within the brim 40 of the bag 14 and enter the space 20 between the outer container 12 and the bag 14. Accordingly, the venting holes 58 allow ambient air to enter and exit the space 20 between the container 12 and the flexible bag 14. Thus, the venting holes 58 and the space 20 communicate by means of he air guiding channels 42. As no air enters the flexible bag 14, the flexible bag 14 is continuously pressed together according to the number of pressing operations. Thereby, the product may be dispensed from throughout the bag 14 including product remaining at the bottom of the bag 14. As can be taken from the above, the dispensable amount of a product stored within the bag 14 may be increased by the combination of the arrangement of the bag 14 so as to comprise a bottom fold 30, the provision of the valve assembly 16 at the upper end 24 of the bag 14 and the flat lateral edges 28 of the bag 14. Even product remaining at the bottom of the bag 14 may be dispensed because the bottom fold 30 allows the bag 14 to be compressed in a manner that the triangular portions 32 cause the product to escape therefrom. The dispensable amount may be further increased if the container 12 comprises two flat areas 74, which may be gripped by a human hand and facilitates to apply the pressing force onto the container 12 and the bag 14. Each flat area 74 may be provided so as to be aligned in the circumferential direction with respect to the flat lateral edges 28 of the bag 14, which further facilitates the collapsing of the bag 14.

[0019] Fig. 9 shows a dispenser 10 of a second embodiment of the present invention. It is to be appreciated that only the differences from the dispenser of the first embodiment will be described and like numerals are intended to indicate like constructional members.

[0020] According to the dispenser 10 of the second embodiment, the dispenser 10 comprises two inner flexible bags 14 each containing a dispensable product, which may be adapted to complement each other. As shown in Fig. 10, the bags may be arranged within the container 12 so as to comprise a bottom fold 30 which is directed towards a lower end 76 of the bags 14. Figs. 11A to 11 C show the valve assembly 16 of the dispenser 10 of the second embodiment. The upper portion 54 includes two flaps 60 adapted to close the opening 56. The flaps 60 may be hinged at a bar 78 extend along a direction of the diameter of the opening 56.

[0021] The operation of the dispenser 10 according to the second embodiment is almost identical to the operation of the dispenser of the first embodiment as shown in Fig. 12 such that a detailed description of the operation is omitted. The only difference is that the dispenser 10 of the second embodiment allows to simultaneously dispense two products each stored within a bag 14. Further, if the container is pressed and the pressure exceeds a threshold determined by the characteristics of the flaps 60, both flaps 60 pivot in an upward direction as indicated by arrows 70.

[0022] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean

both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

Claims

1. Dispenser (10) for dispensing a product, particularly a cosmetic product, comprising a container (12) comprising a brim (26),
at least one bag (14) for storing the product, wherein the bag (14) is located within the container (12) and has an upper end (32) attached to the brim (26),
a valve assembly (16) adapted to selectively allow the product to be dispensed or prevent the product to be dispensed, wherein the bag (14) further comprises flat lateral edges (28) and is arranged so as to comprise a bottom fold (30).

2. Dispenser (10) for dispensing a product of claim 1, wherein the bag (14) is located within the container (12) such that a space (20) between the container (12) and the bag (14) is left, wherein the valve assembly (16) comprises at least one venting hole (58) adapted to allow a gas within the space (20) to be vented from the space (26) if a pressing force is applied to the container (12) and to allow a gas to enter the space (20) if the pressing force is released.

3. Dispenser (10) for dispensing a product of claim 2, wherein the valve assembly (16) comprises at least one pivotal flap (62) selectively blocking or opening the venting hole (58).

4. Dispenser (10) for dispensing a product of claim 2, wherein the bag (14) comprises a brim (40), wherein the brim (40) includes air guiding channels (42) adapted to communicate the venting hole (58) and the space (20).

5. Dispenser (10) for dispensing a product of claim 1, wherein the valve assembly (16) comprises a central opening (56) through which the product is dispensable and a pivotal flap (60) selectively blocking or opening the opening (56)

6. Dispenser (10) for dispensing a product of claim 1, wherein the bottom fold (30) is directed towards the upper end (32) or the lower end (76) of the bag (14).

7. Dispenser (10) for dispensing a product of claim 1, wherein the bag (14) comprises two flat triangular portions (34) forming the bottom fold (30) each extending from its bottom edge (36) to its lateral edge (28) so as to form an angle of about 90° between the portions (34).

8. Dispenser (10) for dispensing a product of claim 1, wherein the container (12) comprises two flat areas (74).

9. Dispenser (10) for dispensing a product of claim 1, comprising two bags (14) for storing the product, wherein the bags (14) are arranged so as to form the bottom fold (30).

10. Dispenser (10) for dispensing a product of claim 6, wherein the valve assembly (16) comprises two pivotal flaps (60).

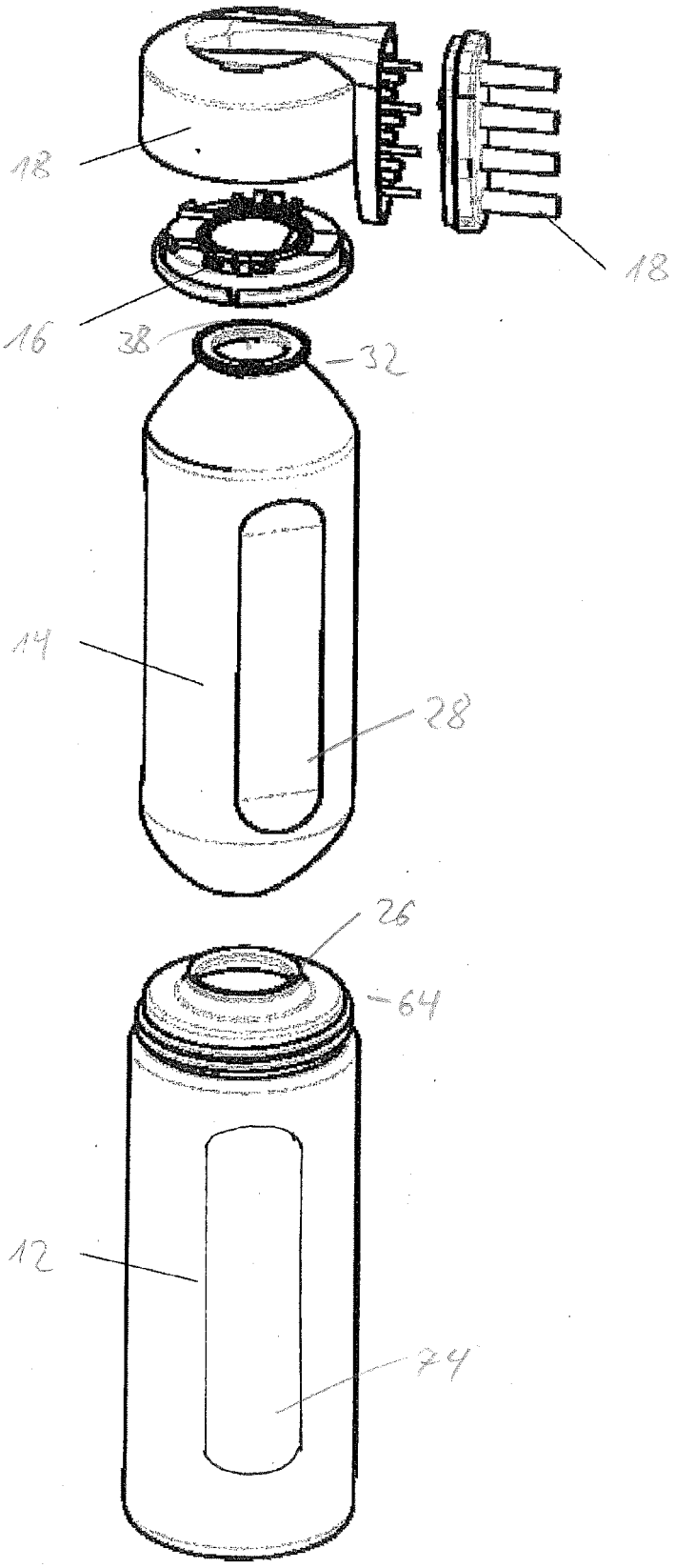

Fig. 1

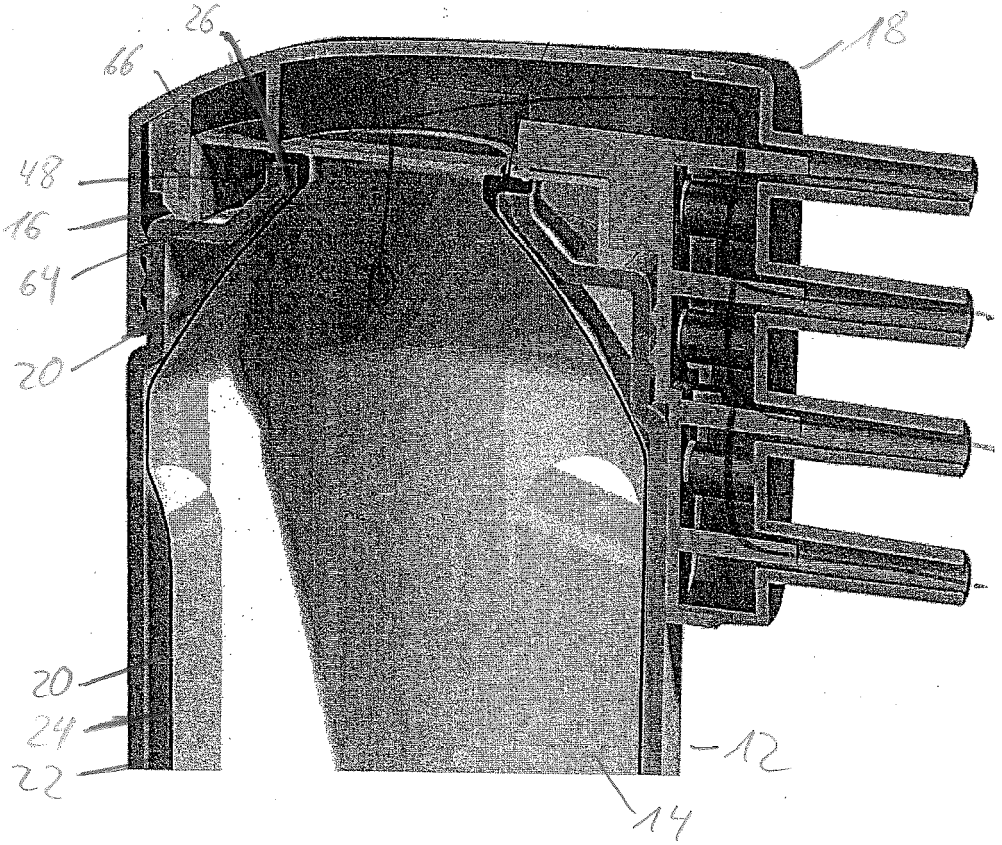

Fig. 2

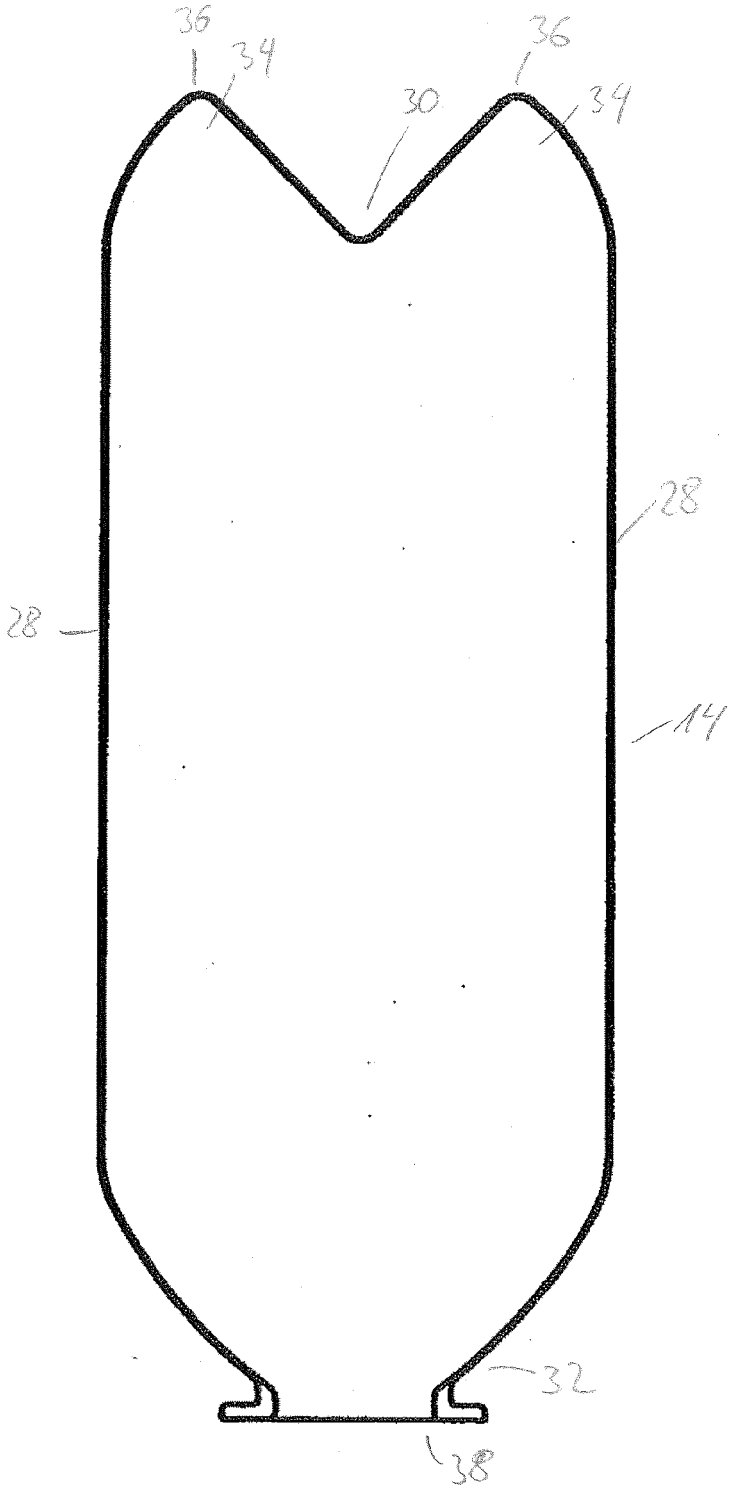

Fig. 3

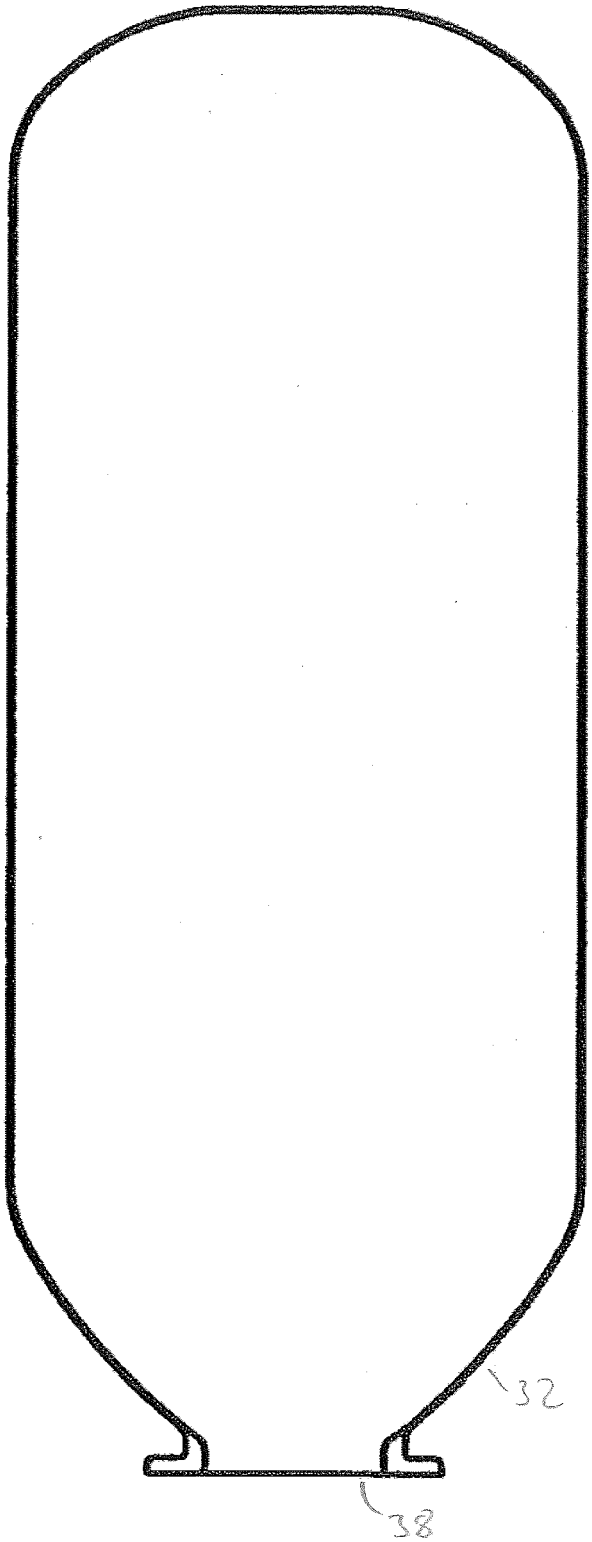

Fig. 4

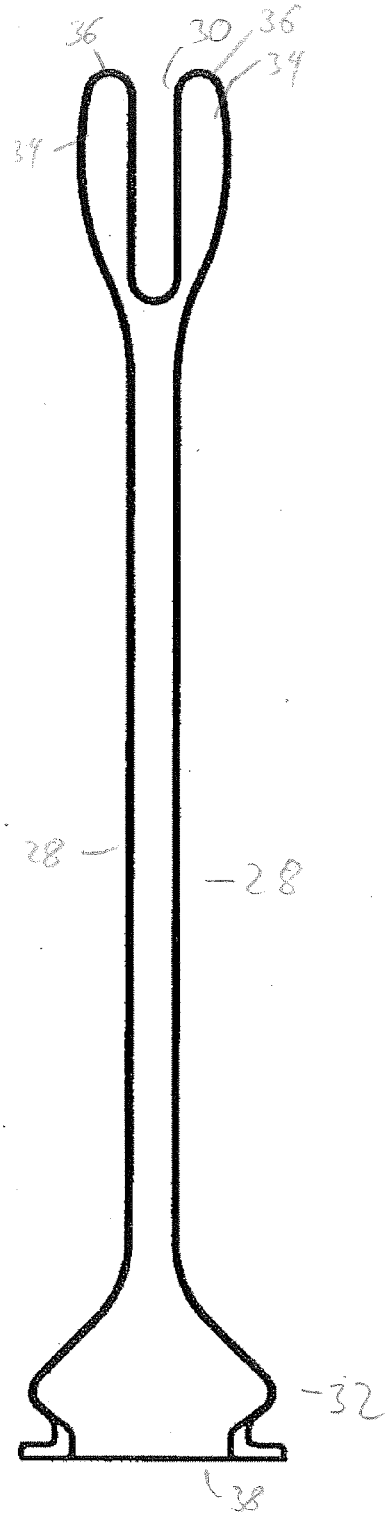

Fig. 5

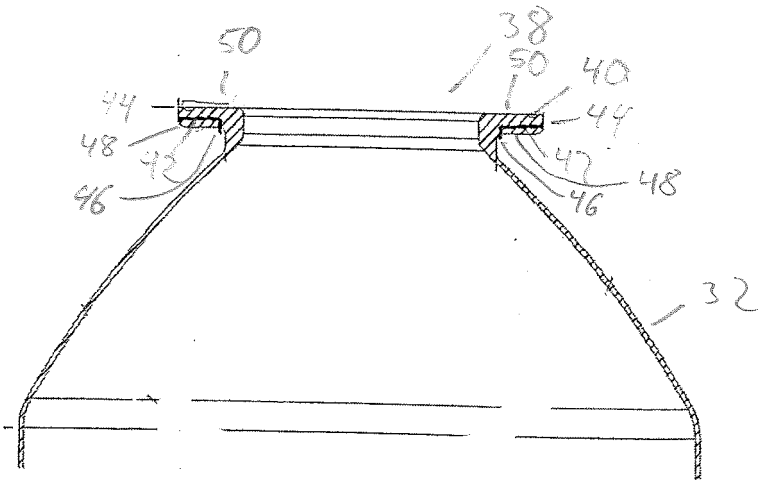

Fig. 6

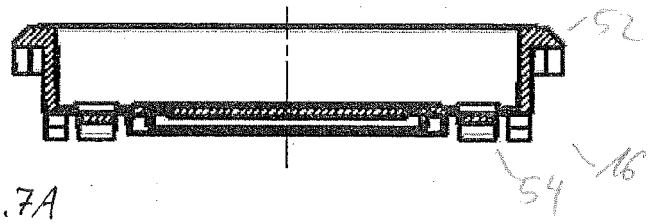

Fig. 7A

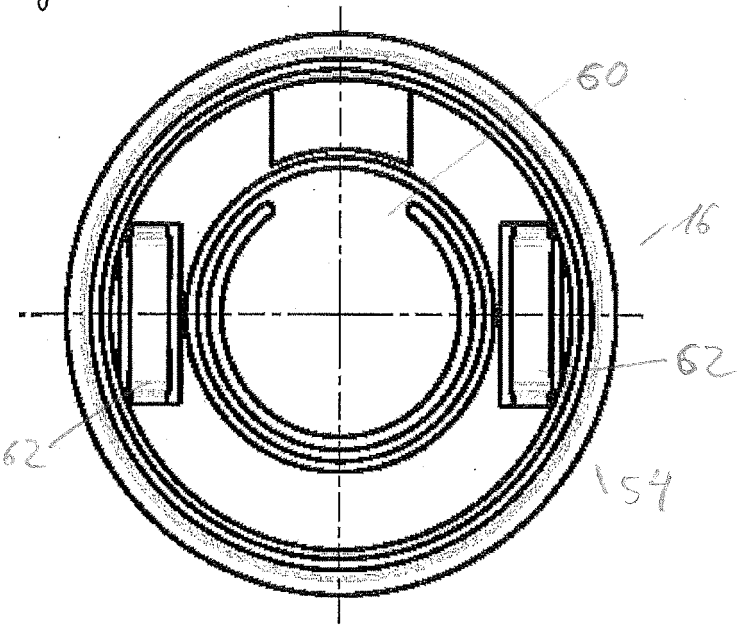

Fig 7B

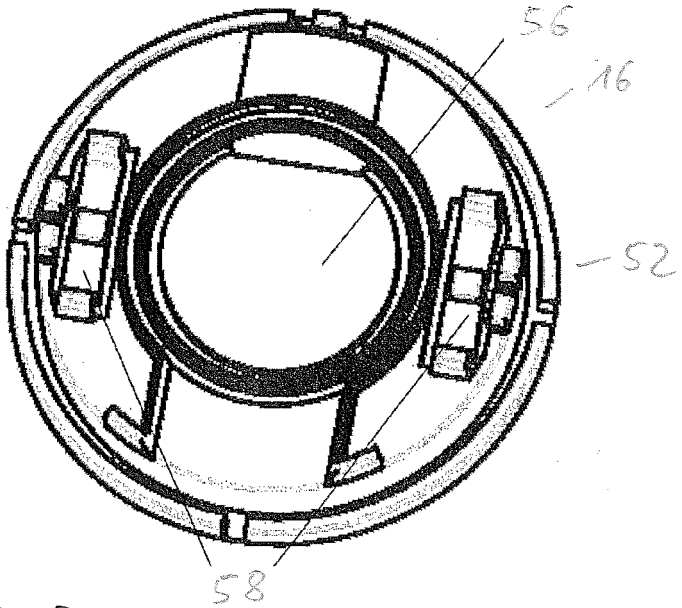

Fig. 7C

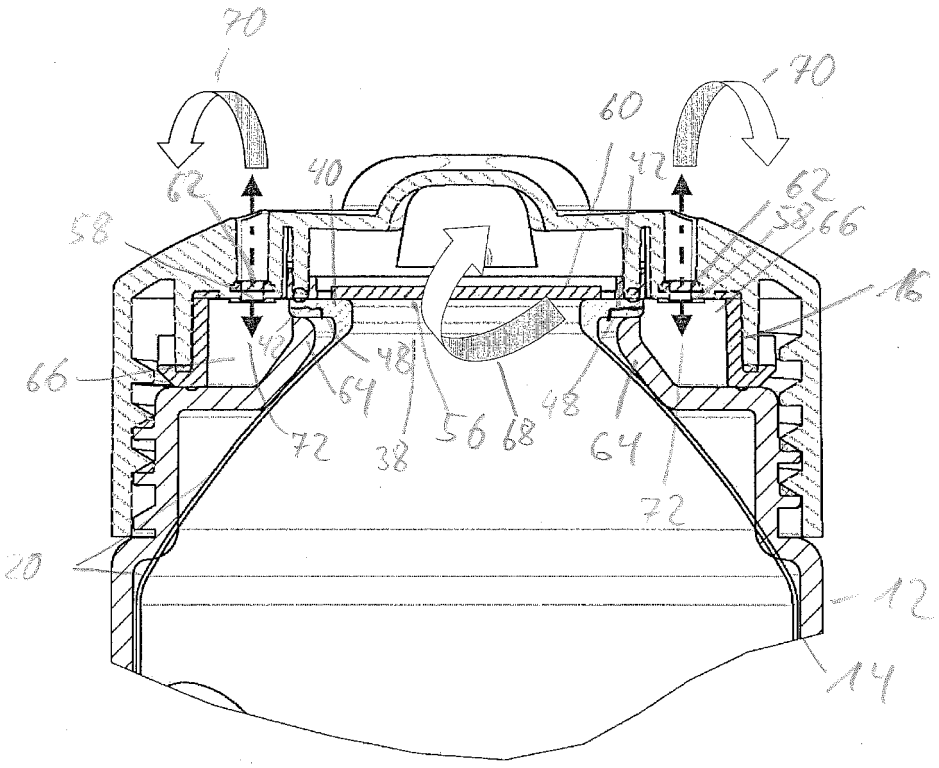

Fig. 8

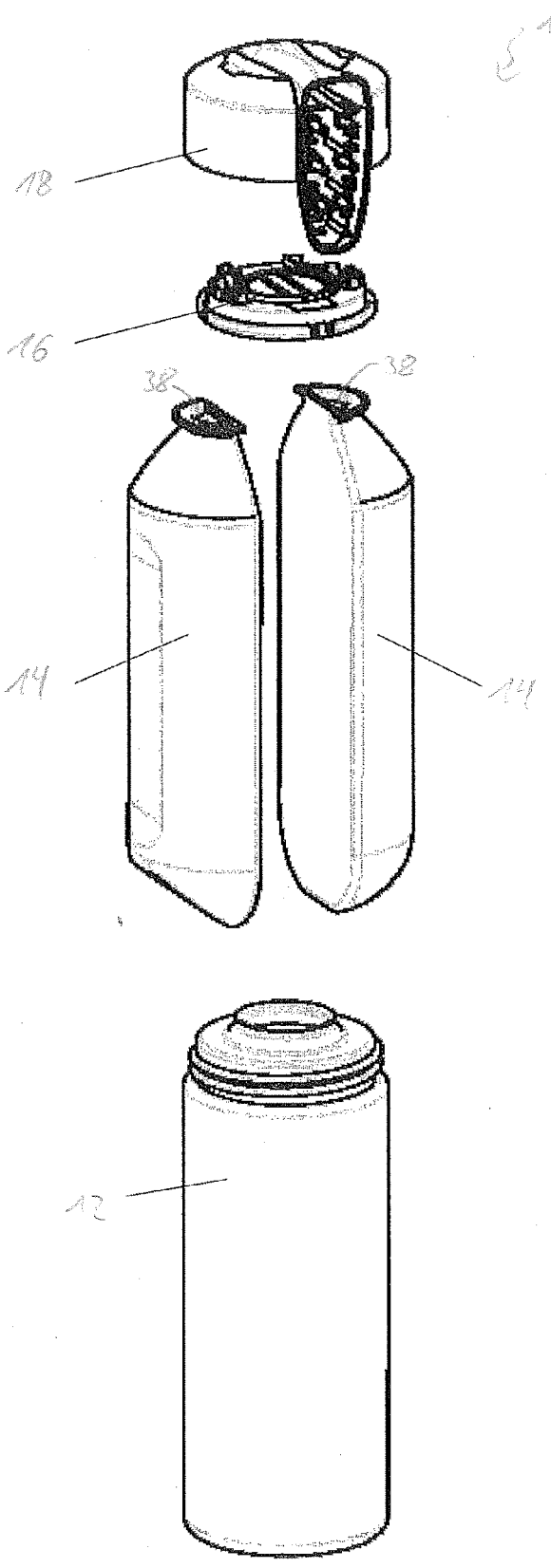

Fig. 9

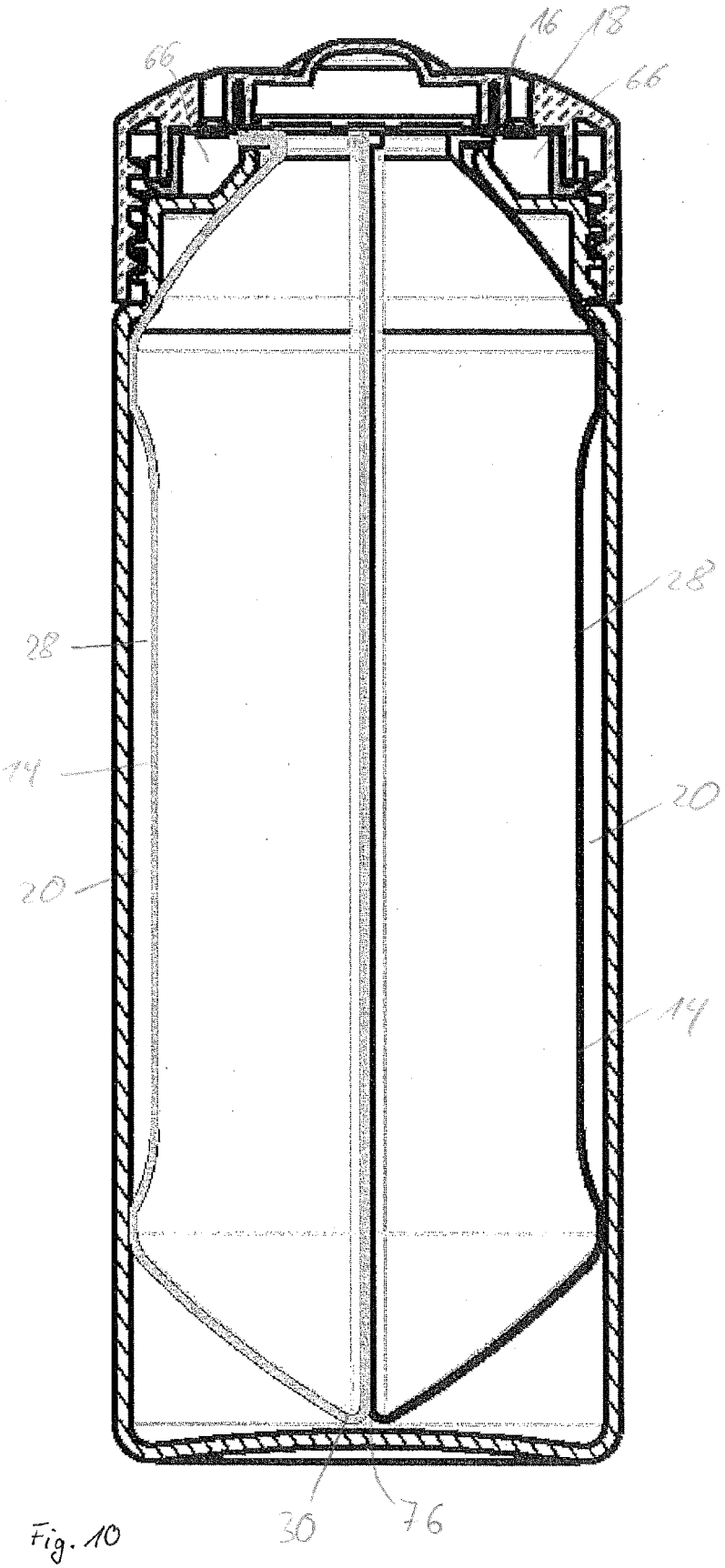

Fig. 10

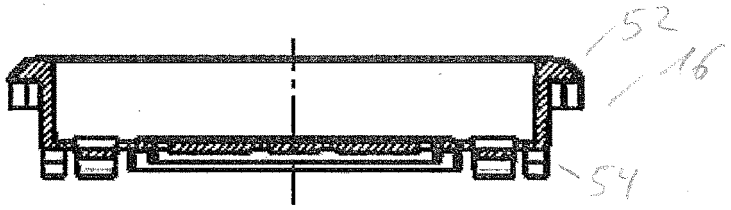

Fig. 11A

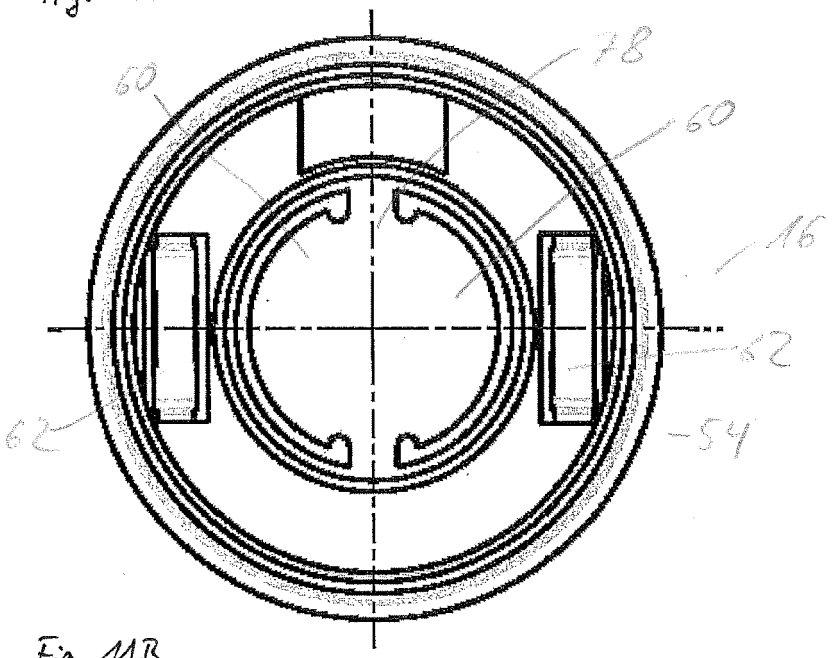

Fig. 11B

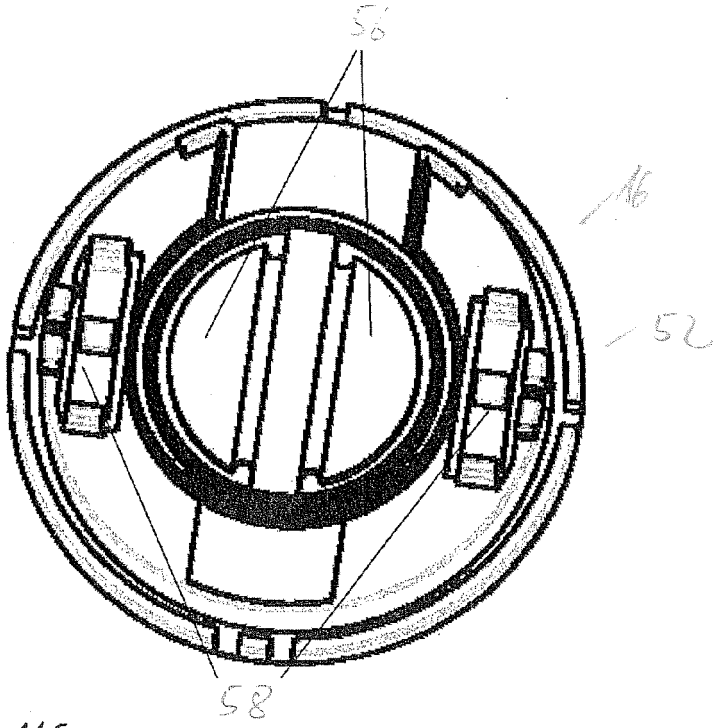

Fig. 11C

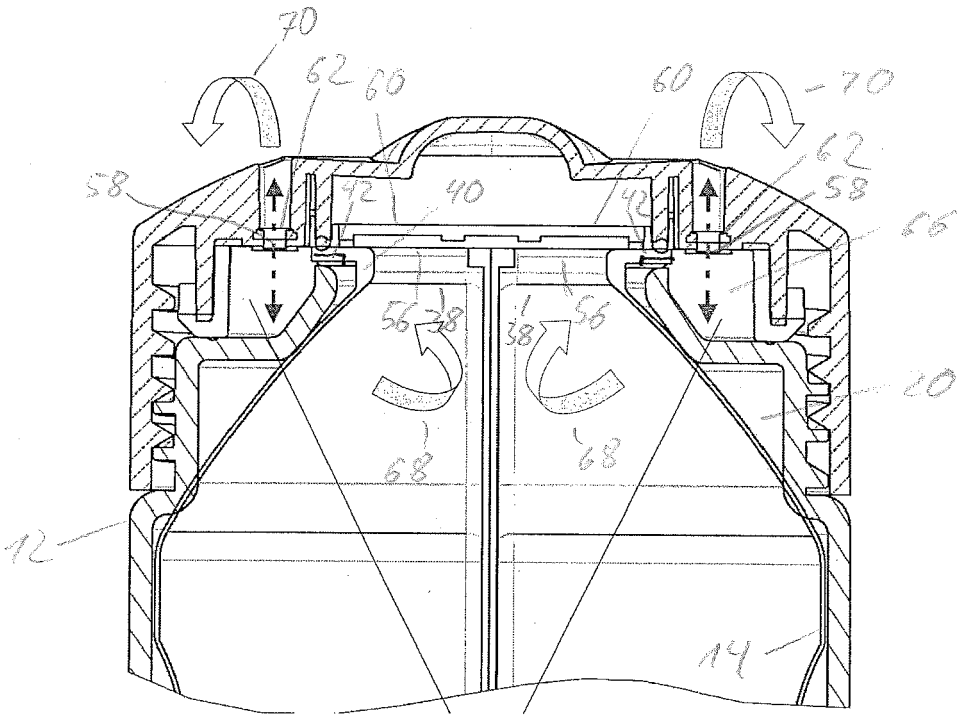

Fig. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 0231

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	DE 21 03 447 B1 (PRESSPACK CO) 17 August 1972 (1972-08-17) * column 3, lines 11-23 - column 4; figures 1,2 * -----	1-10	INV. B65D83/00
A	US 2013/292421 A1 (CHUANG MING-LANG [TW]) 7 November 2013 (2013-11-07) * paragraphs [0006] - [0008], [0019] - [0021]; figures 4-6 * -----	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 October 2014	Visentin, Mauro

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 17 0231

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20-10-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2103447 B1	17-08-1972	NONE	
US 2013292421 A1	07-11-2013	NONE	

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

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- DE 3923903 A1 **[0002]**
- DE 4121179 A1 **[0003]**
- DE 2103447 B1 **[0004]**