



US 20100237079A1

(19) **United States**

(12) **Patent Application Publication**
Sharon et al.

(10) **Pub. No.: US 2010/0237079 A1**

(43) **Pub. Date: Sep. 23, 2010**

(54) **CONTAINER AND DIVIDER THEREFOR**

Publication Classification

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(51) **Int. Cl.**
B65D 1/24 (2006.01)
B65D 25/04 (2006.01)
B23P 11/00 (2006.01)
(52) **U.S. Cl.** **220/502**; 220/505; 29/428; 220/501;
220/529; 220/554

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(57) **ABSTRACT**

The present invention relates to a divider device for use with a container having at least one opening, each such opening having an associated cap. The divider device includes a dividing wall for releasable sealing engagement with an interior wall of the container and for dividing the container into two separate compartments, a first compartment above the dividing wall and a second compartment below the dividing wall. The divider further includes an operable portion coupled to the dividing wall for moving the dividing wall between a sealed position, separating the first and second compartments, and an unsealed position, defining a flow passage permitting flow communication between the first and second compartments. The operable portion including means for engaging a closure member, so as to close said operable portion. The divider device is removably couplable to the container when at least partly disposed inside the container.

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(21) Appl. No.: **12/377,603**

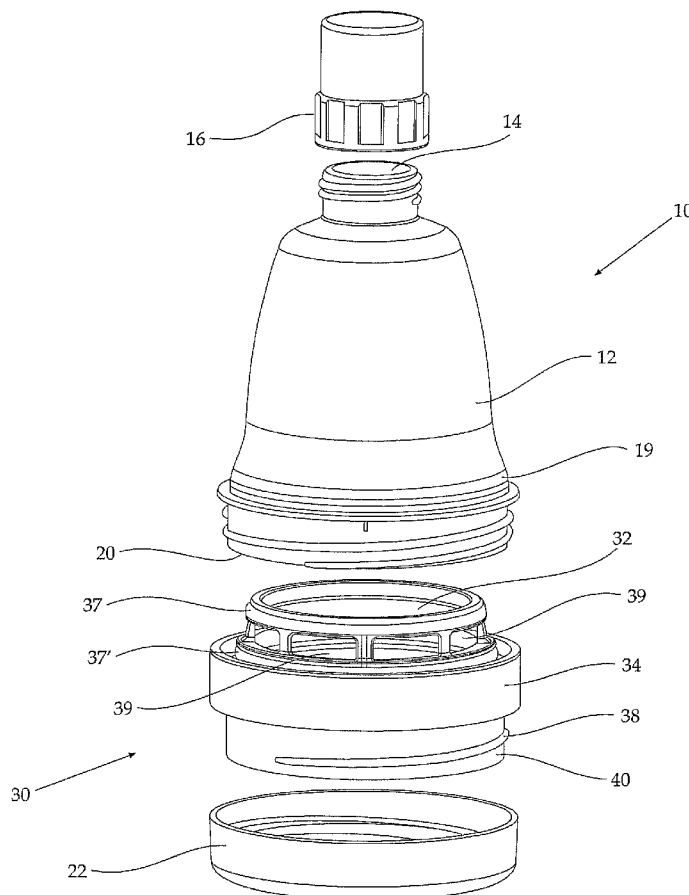
(22) PCT Filed: **Aug. 14, 2007**

(86) PCT No.: **PCT/IL07/01015**

§ 371 (c)(1),
(2), (4) Date: **Feb. 16, 2009**

(30) **Foreign Application Priority Data**

Aug. 17, 2006 (IL) 177549



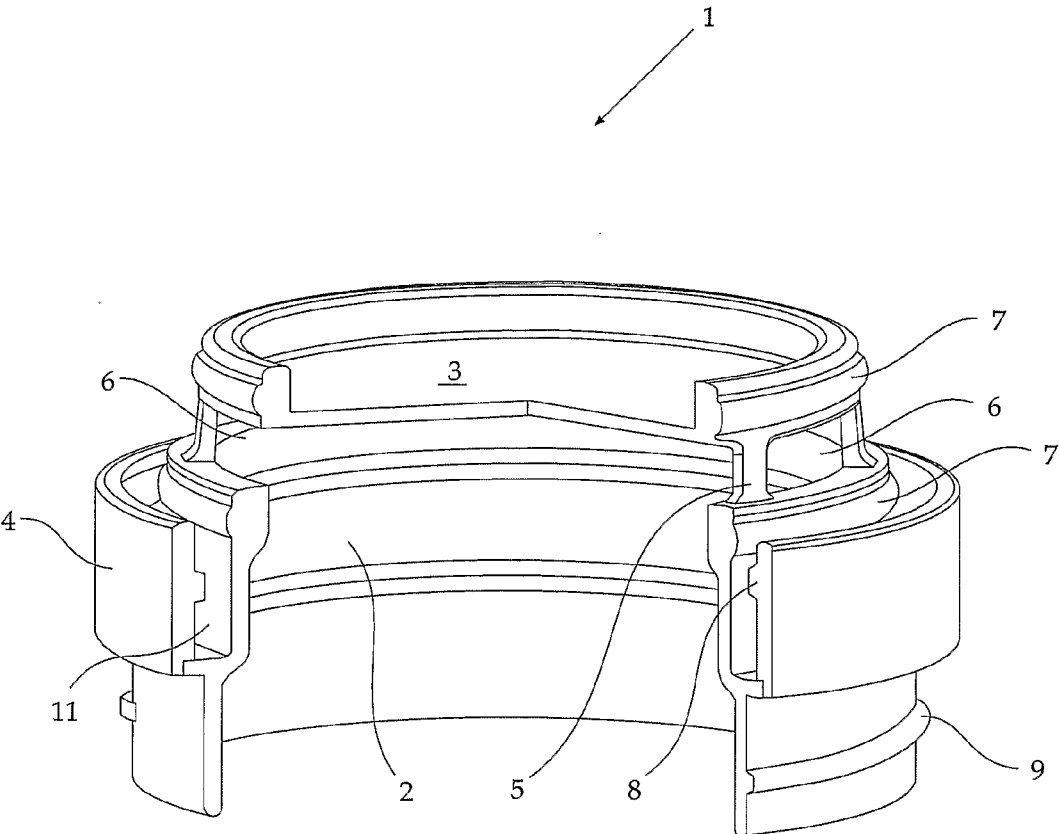


FIG. 1

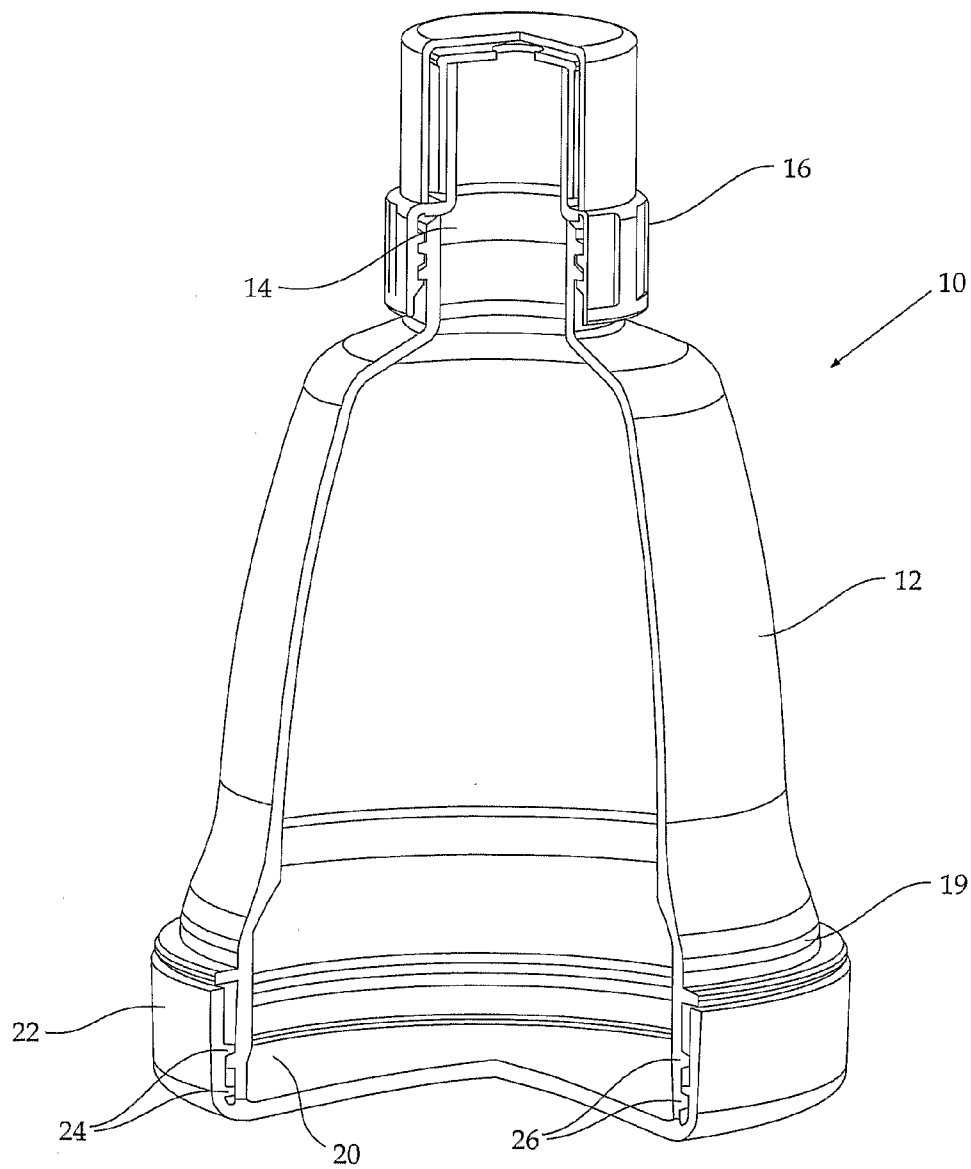


FIG. 2

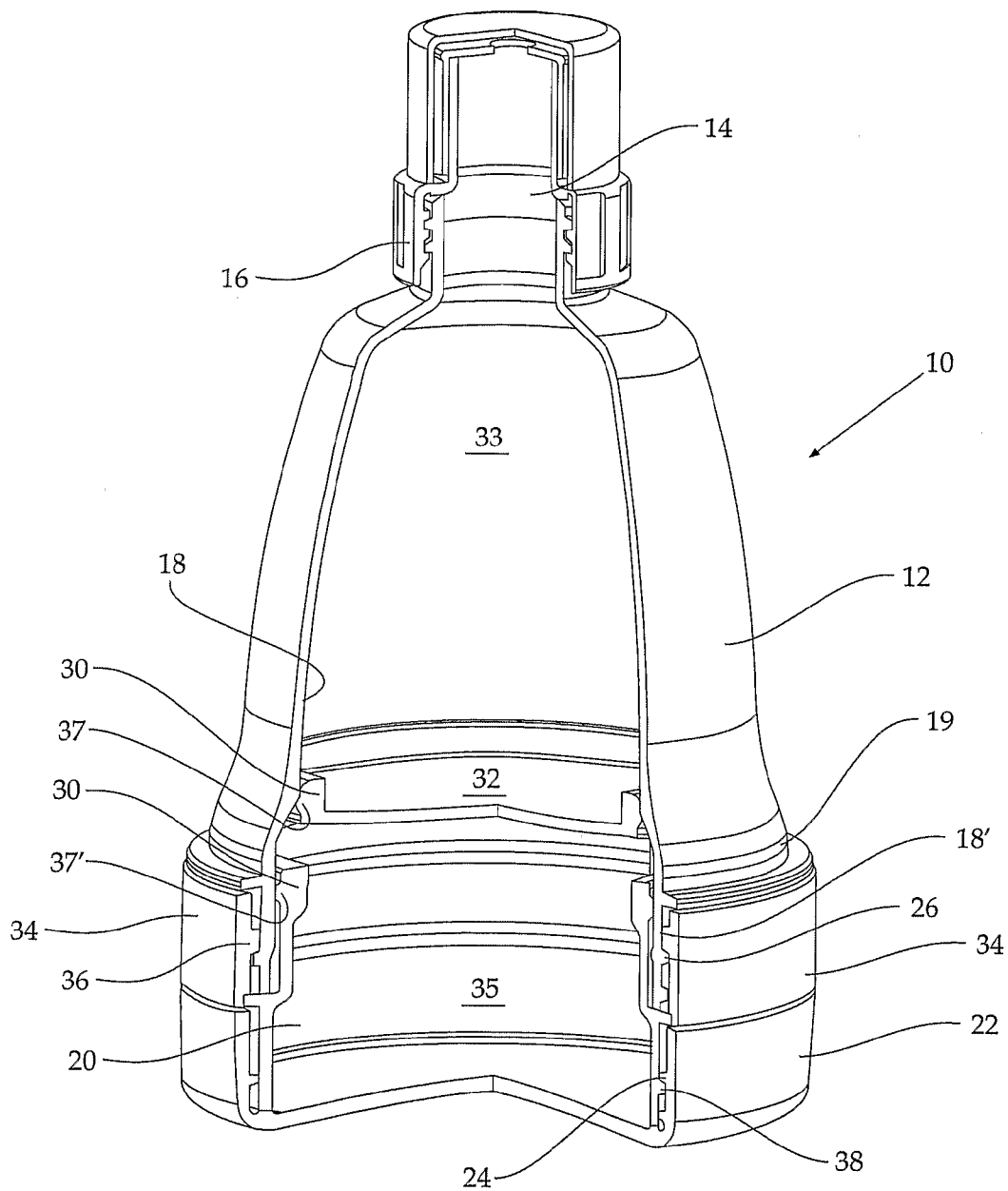


FIG. 3

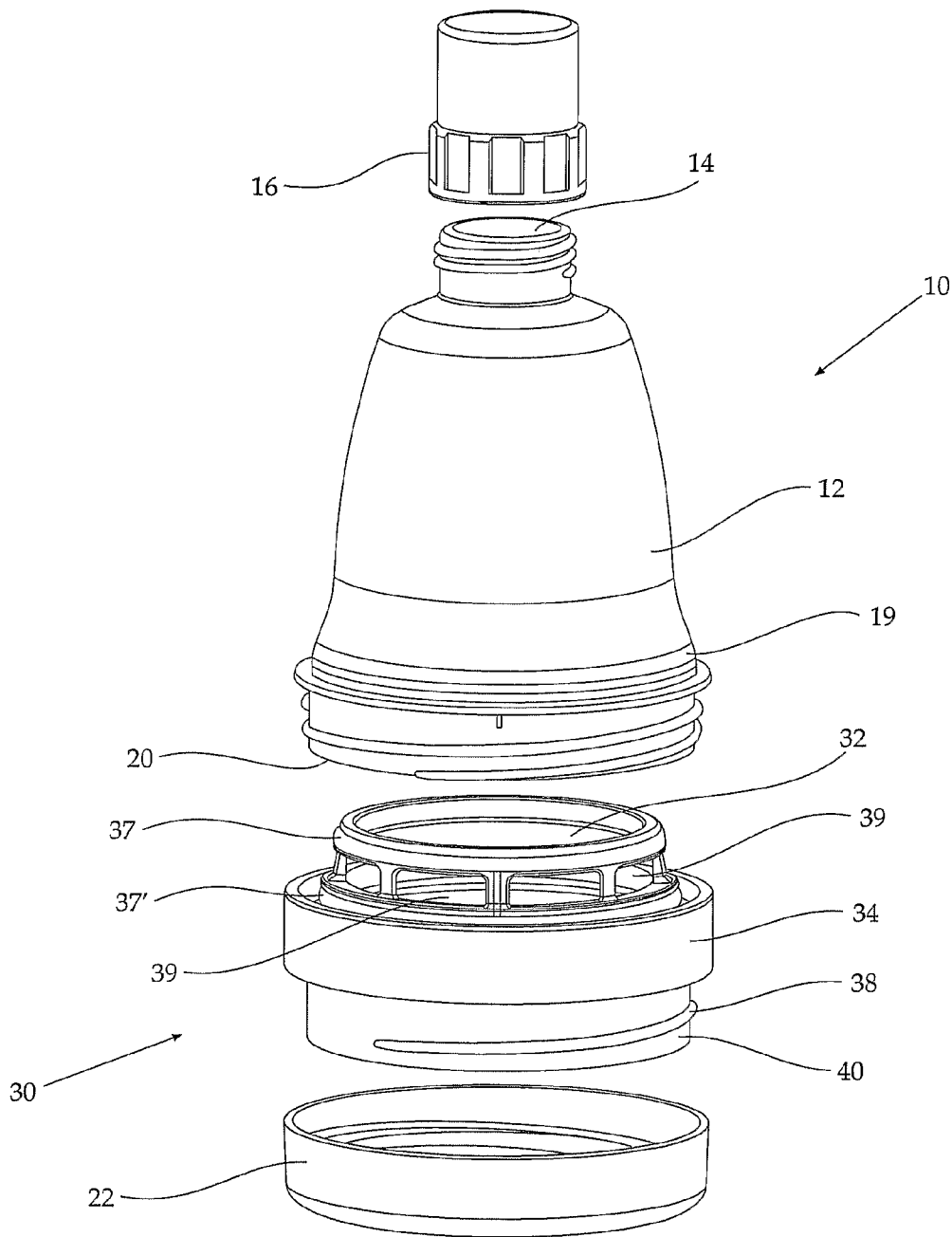


FIG. 4a

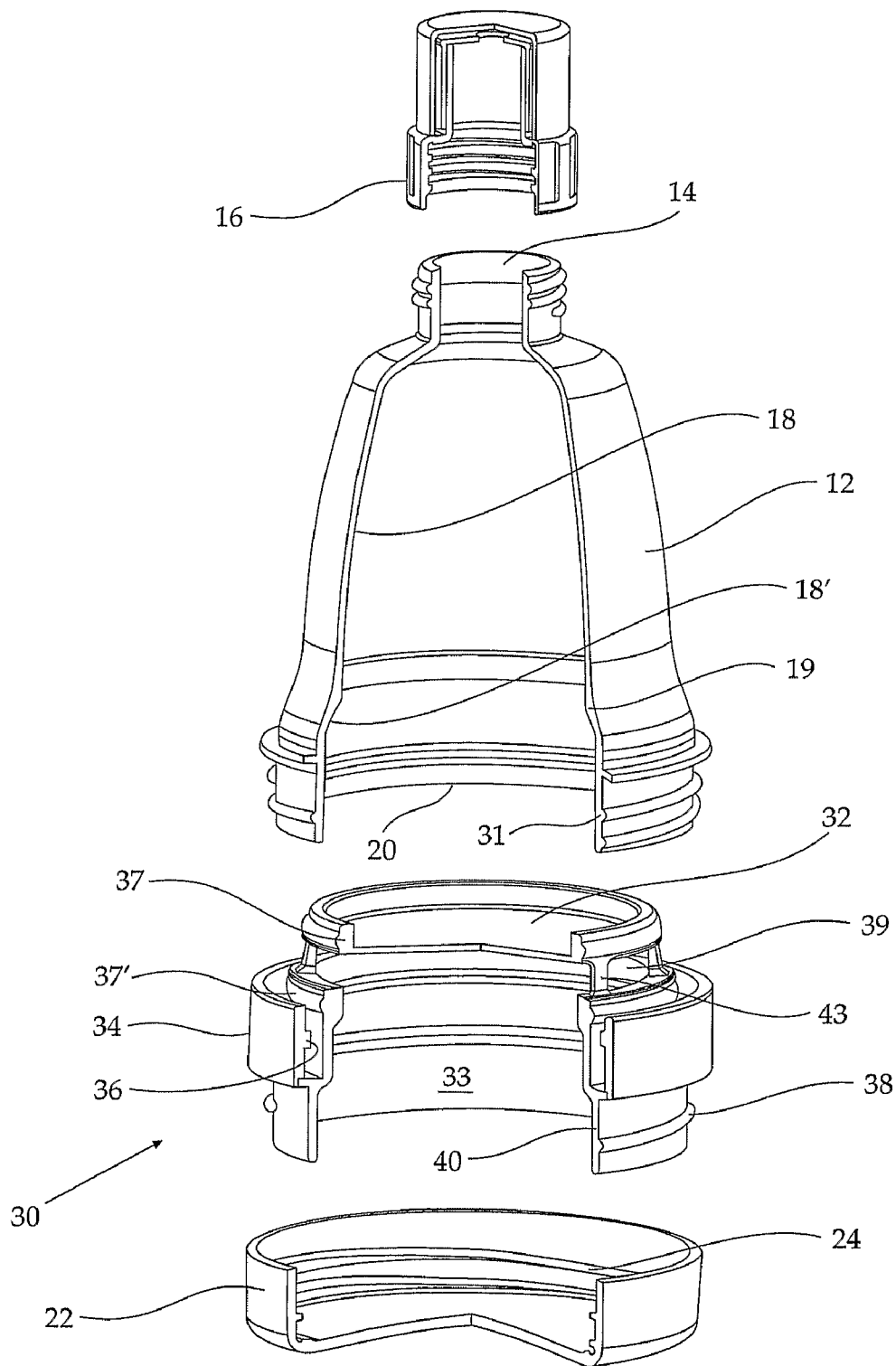


FIG. 4b

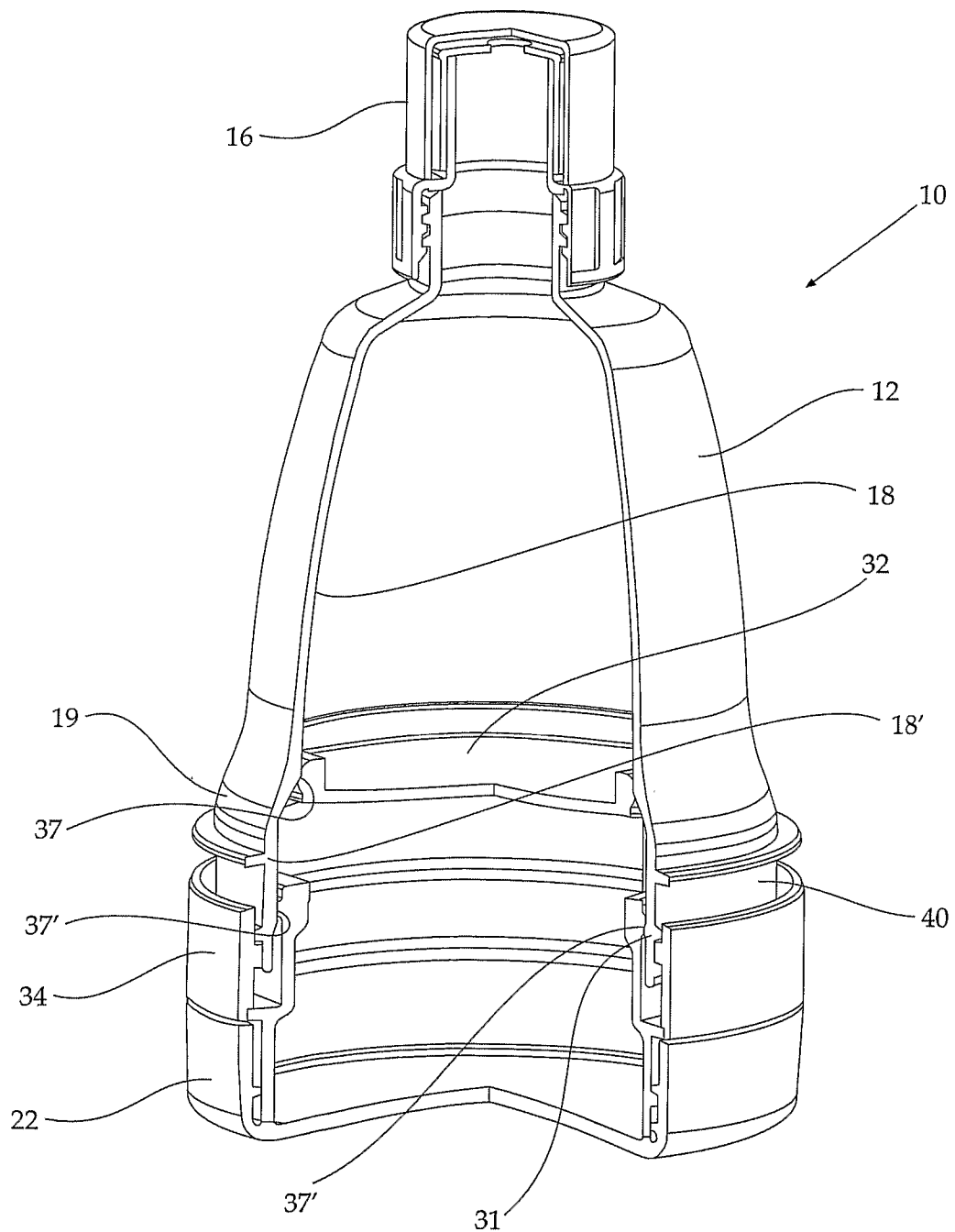


FIG. 5

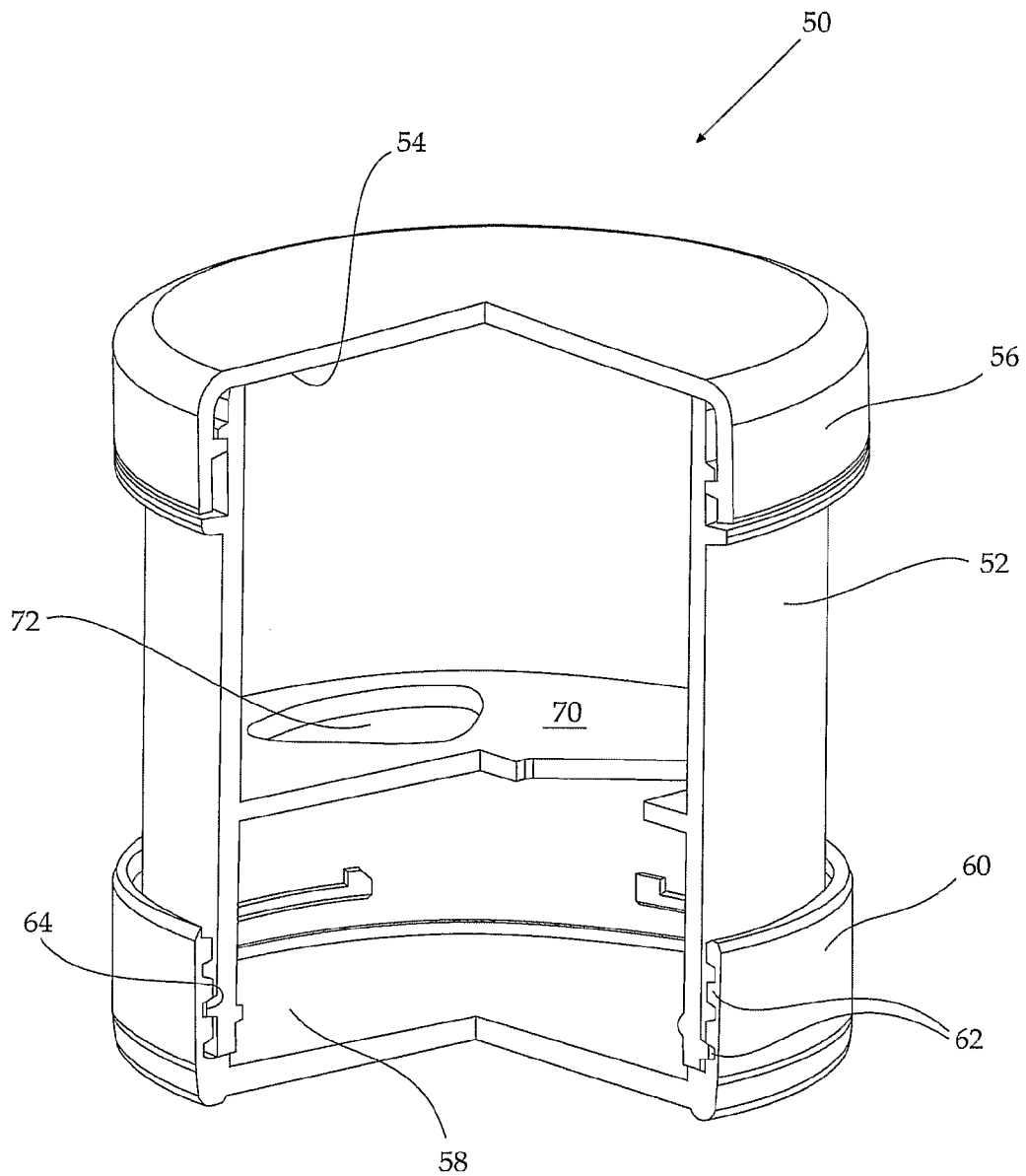


FIG. 6a

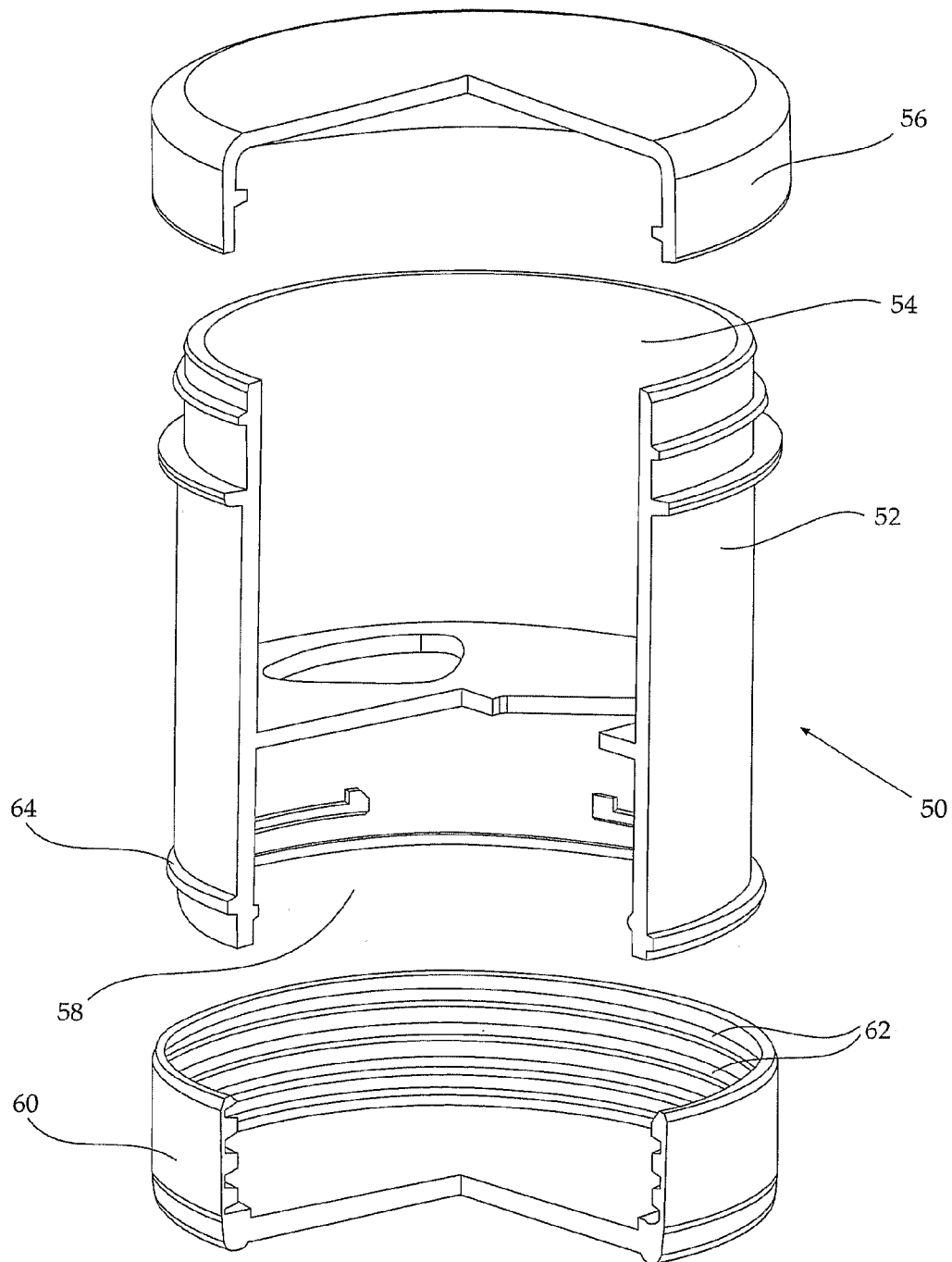


FIG. 6b

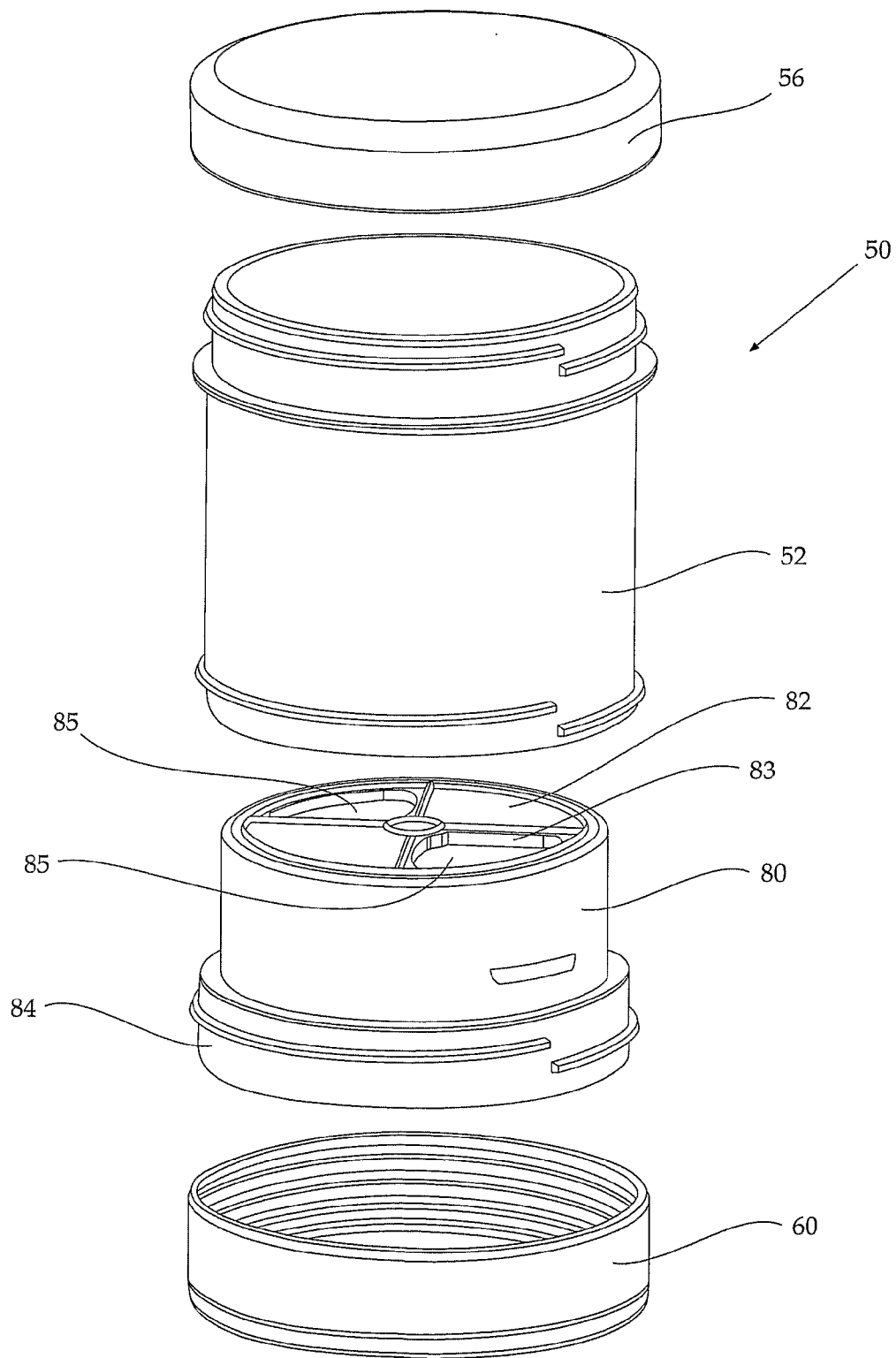


FIG. 7a

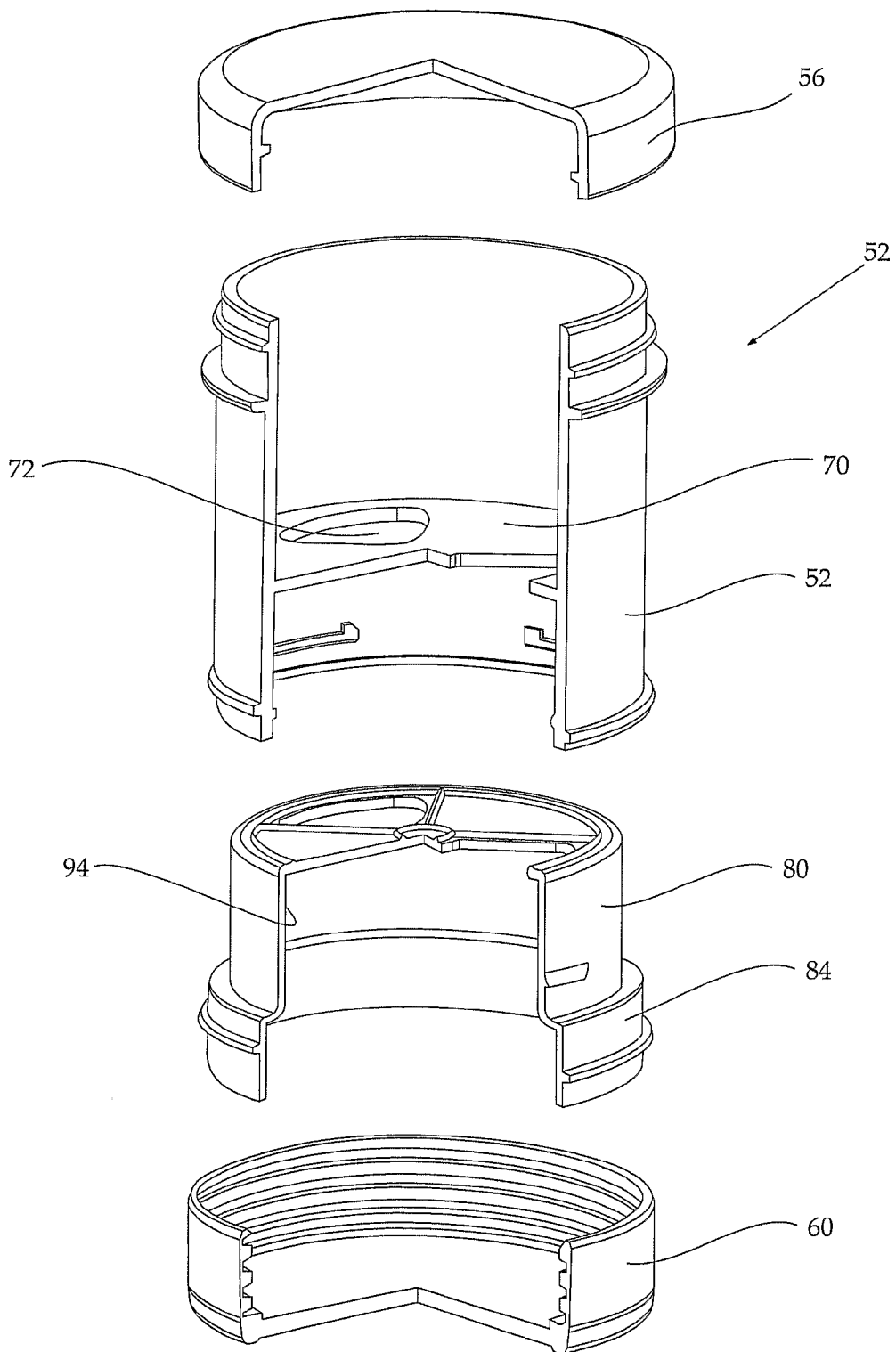


FIG. 7b

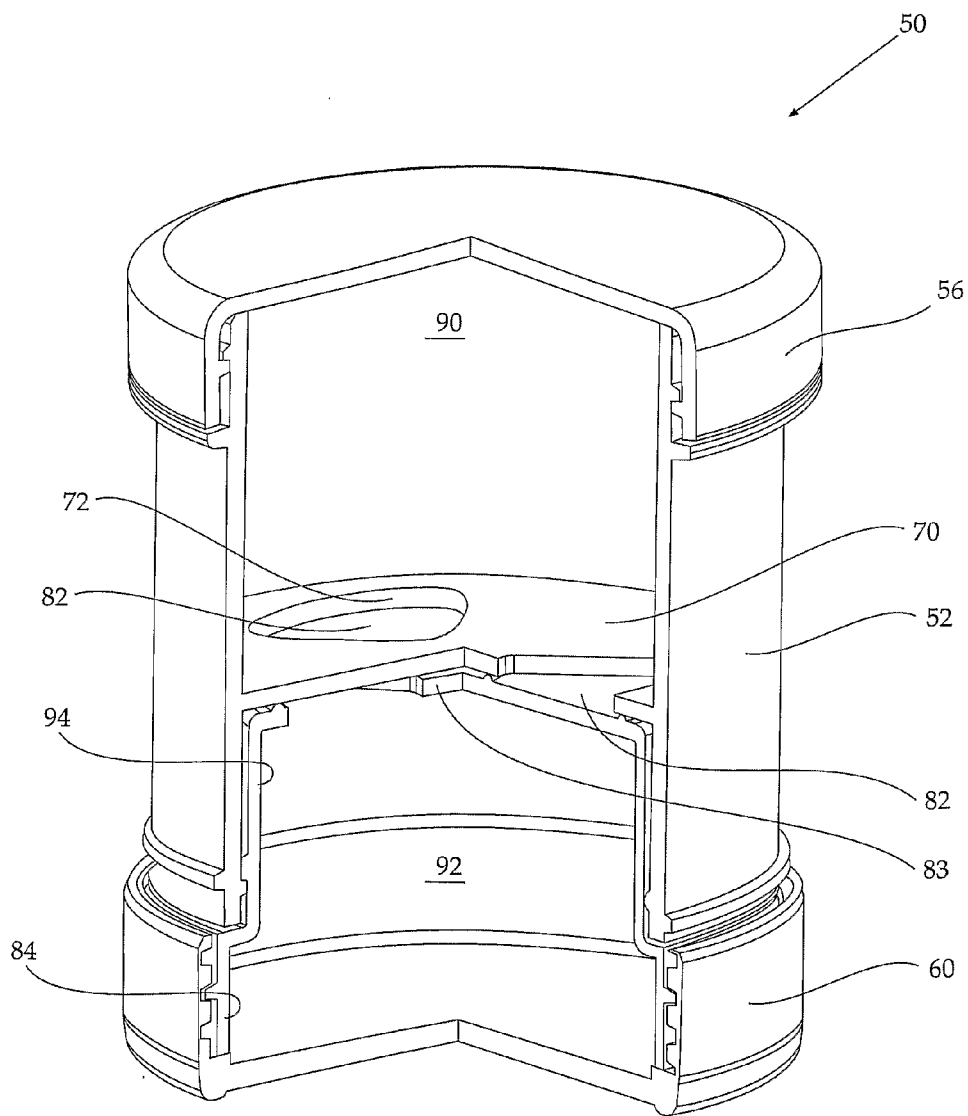


FIG. 8a

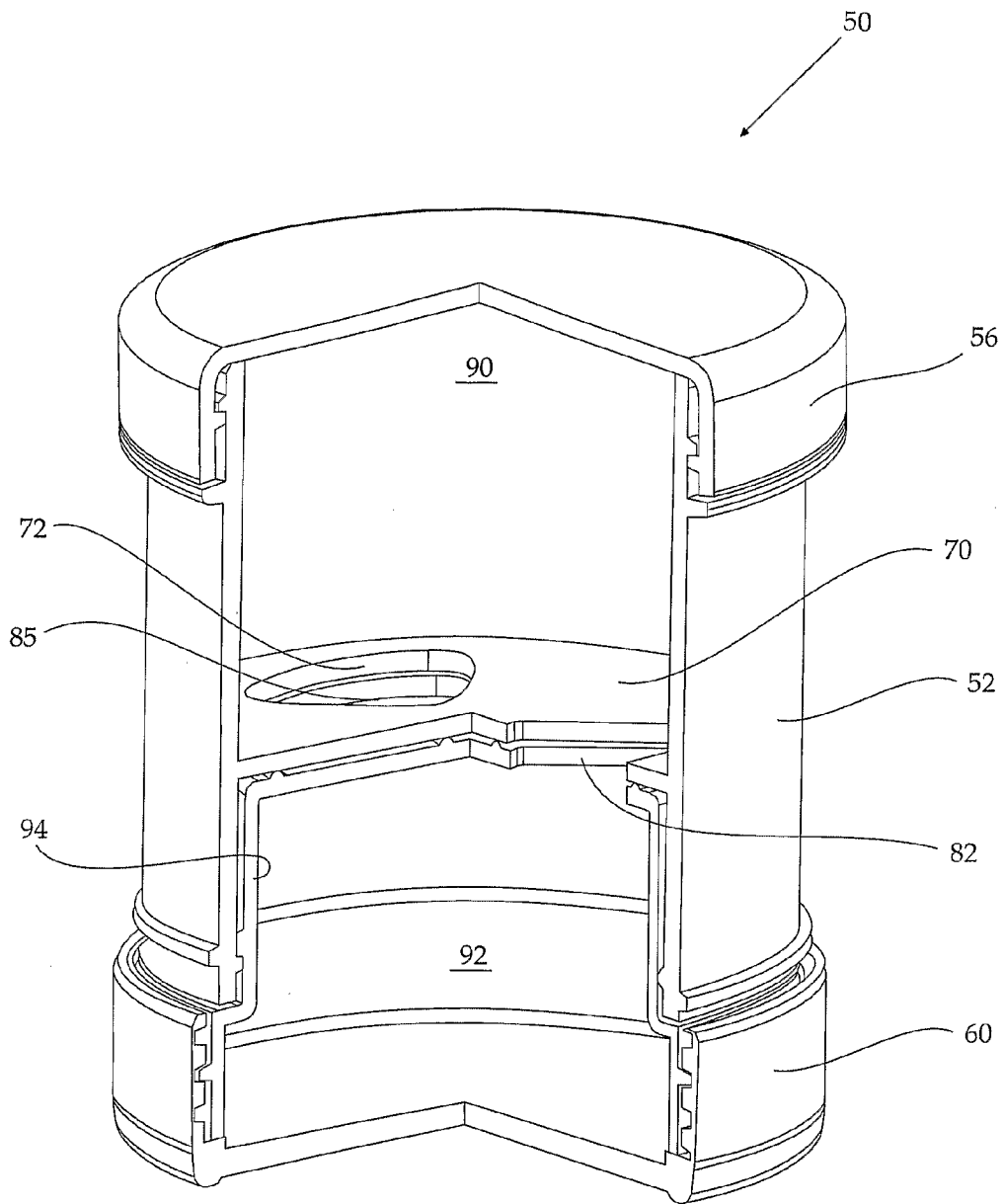


FIG. 8b

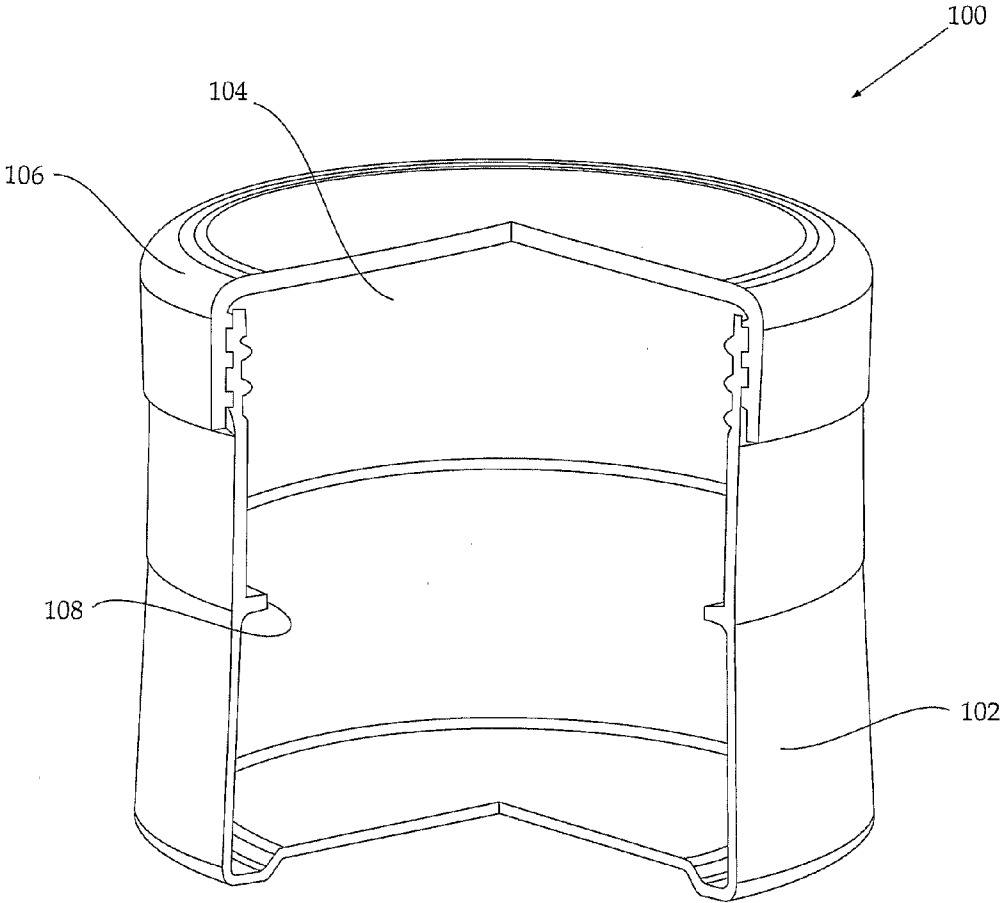


FIG. 9a

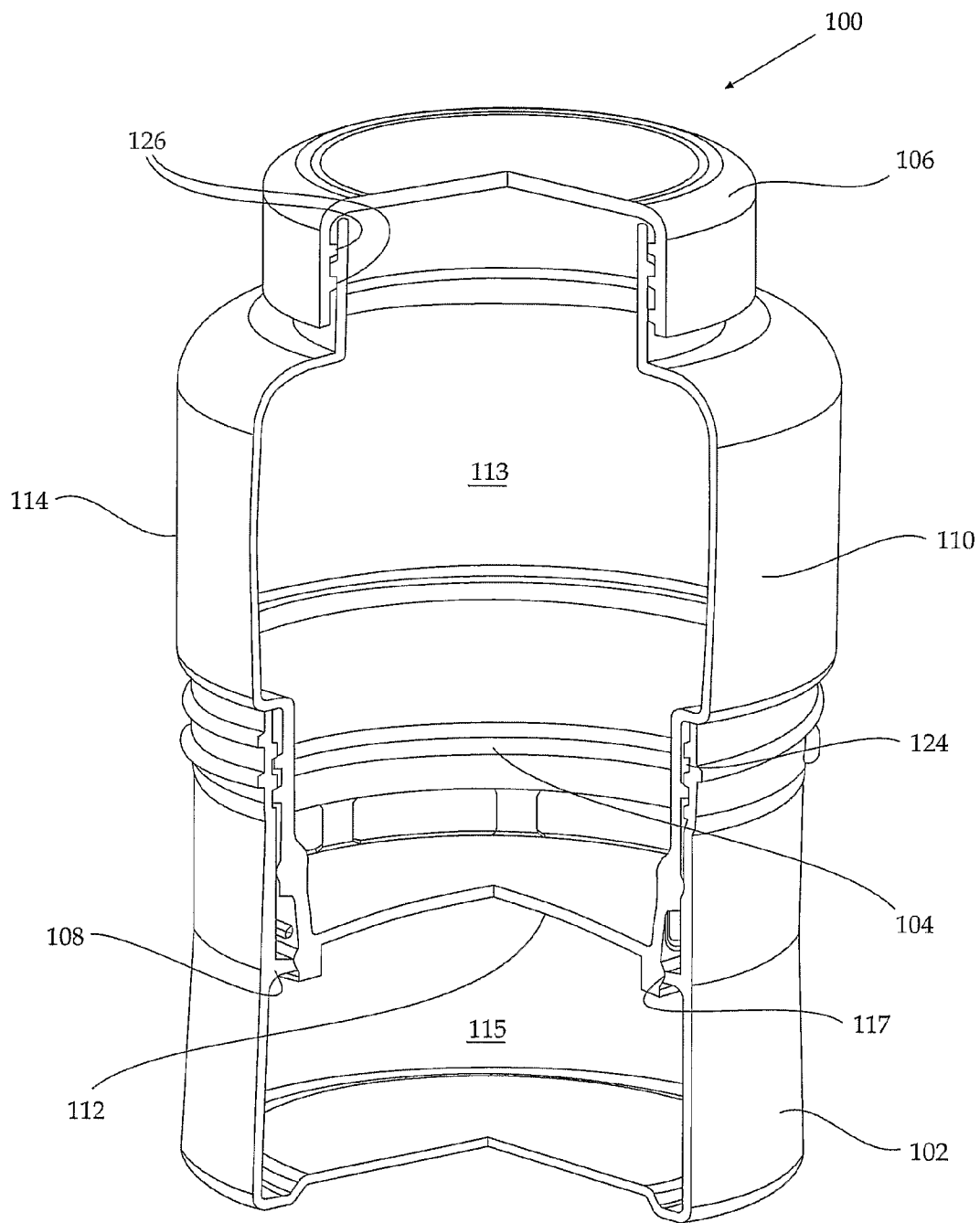


FIG. 9b

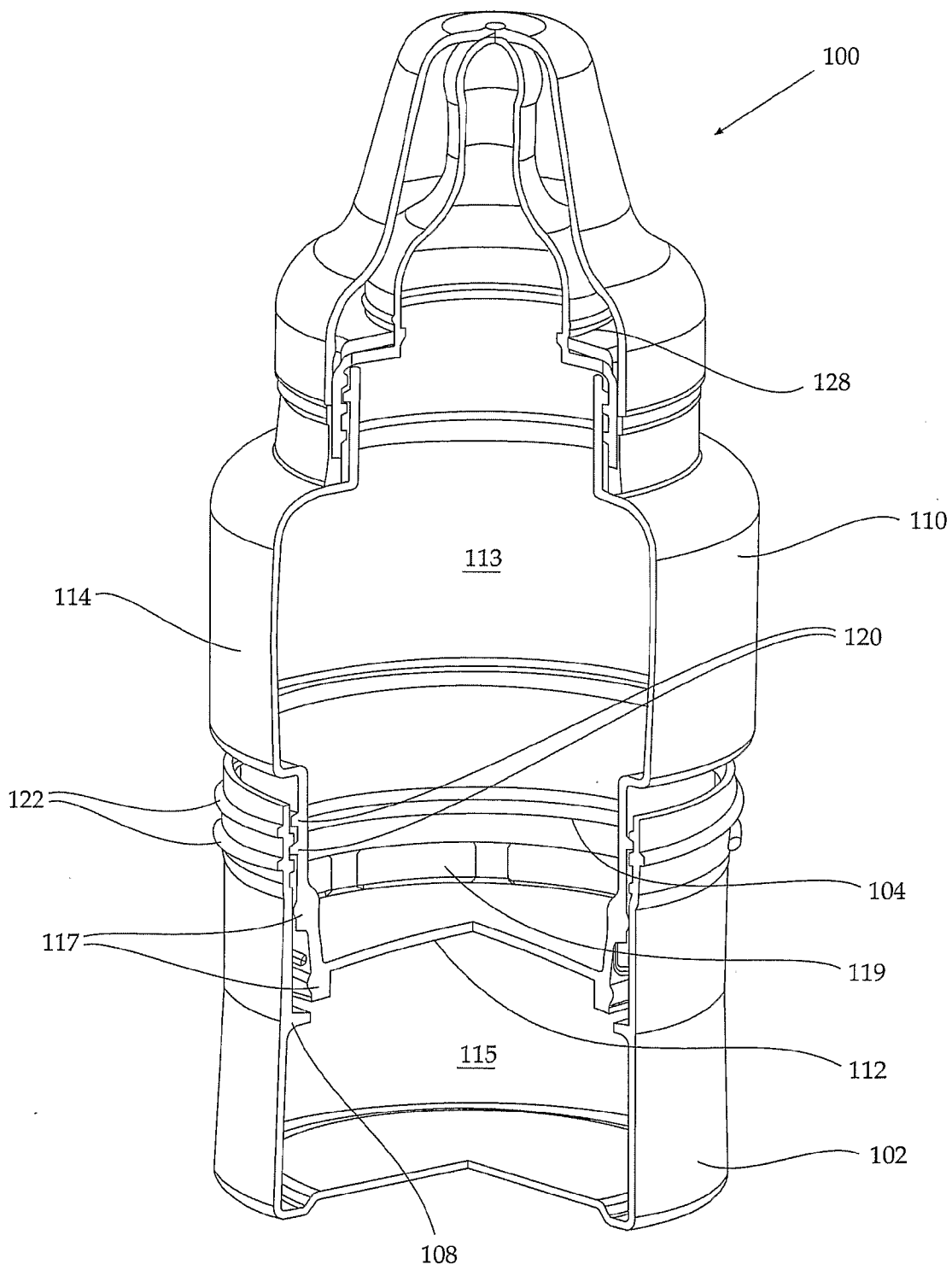


FIG. 9c

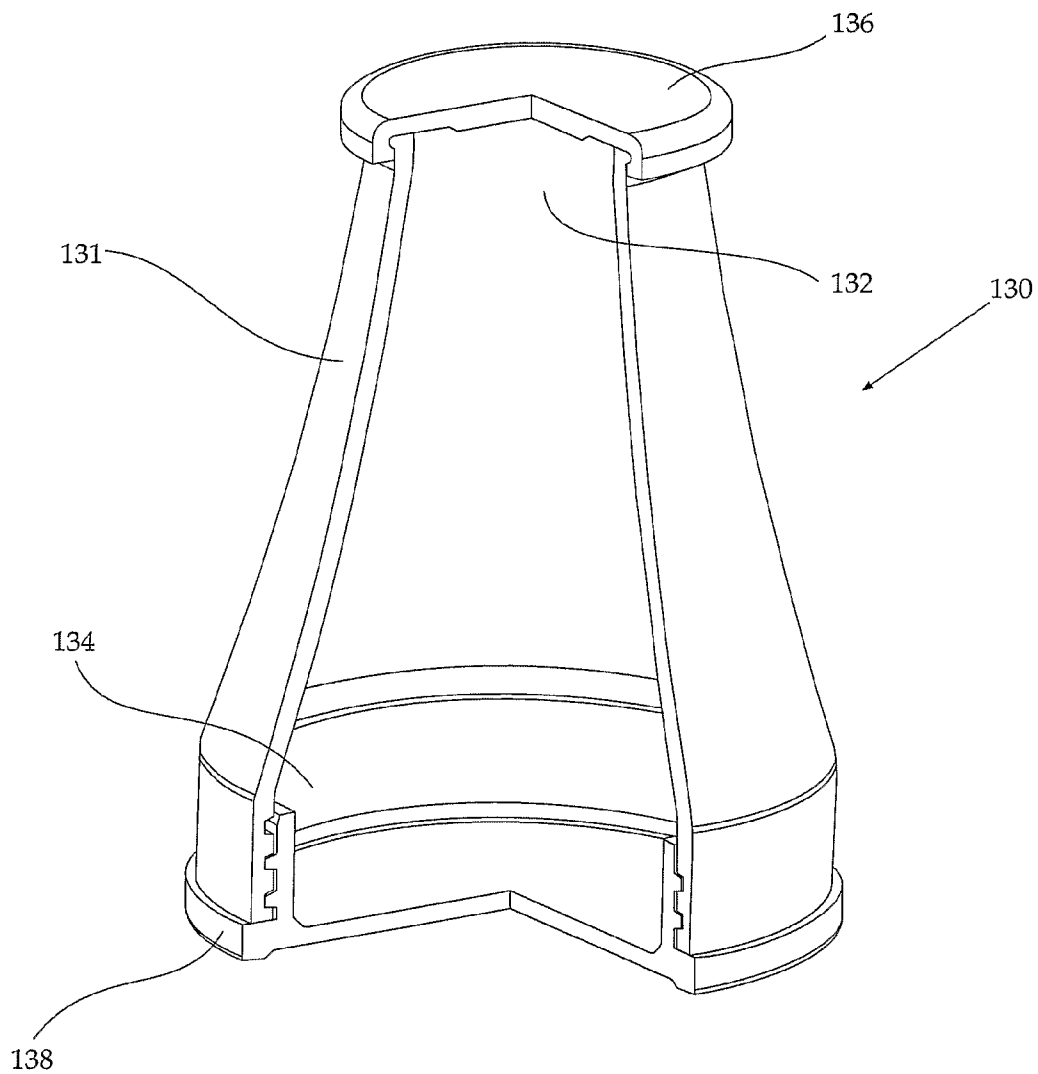


FIG. 10a

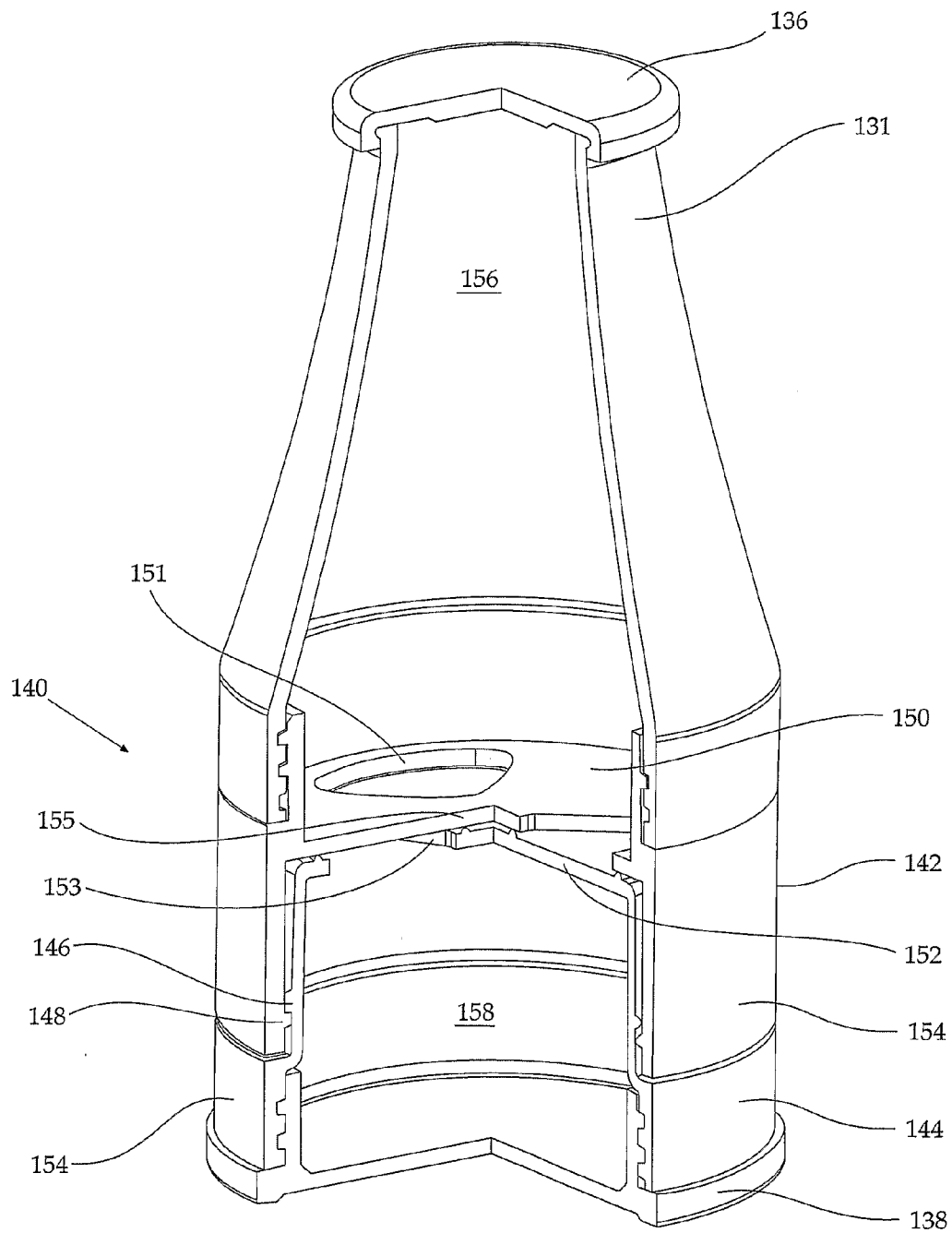


FIG. 10b

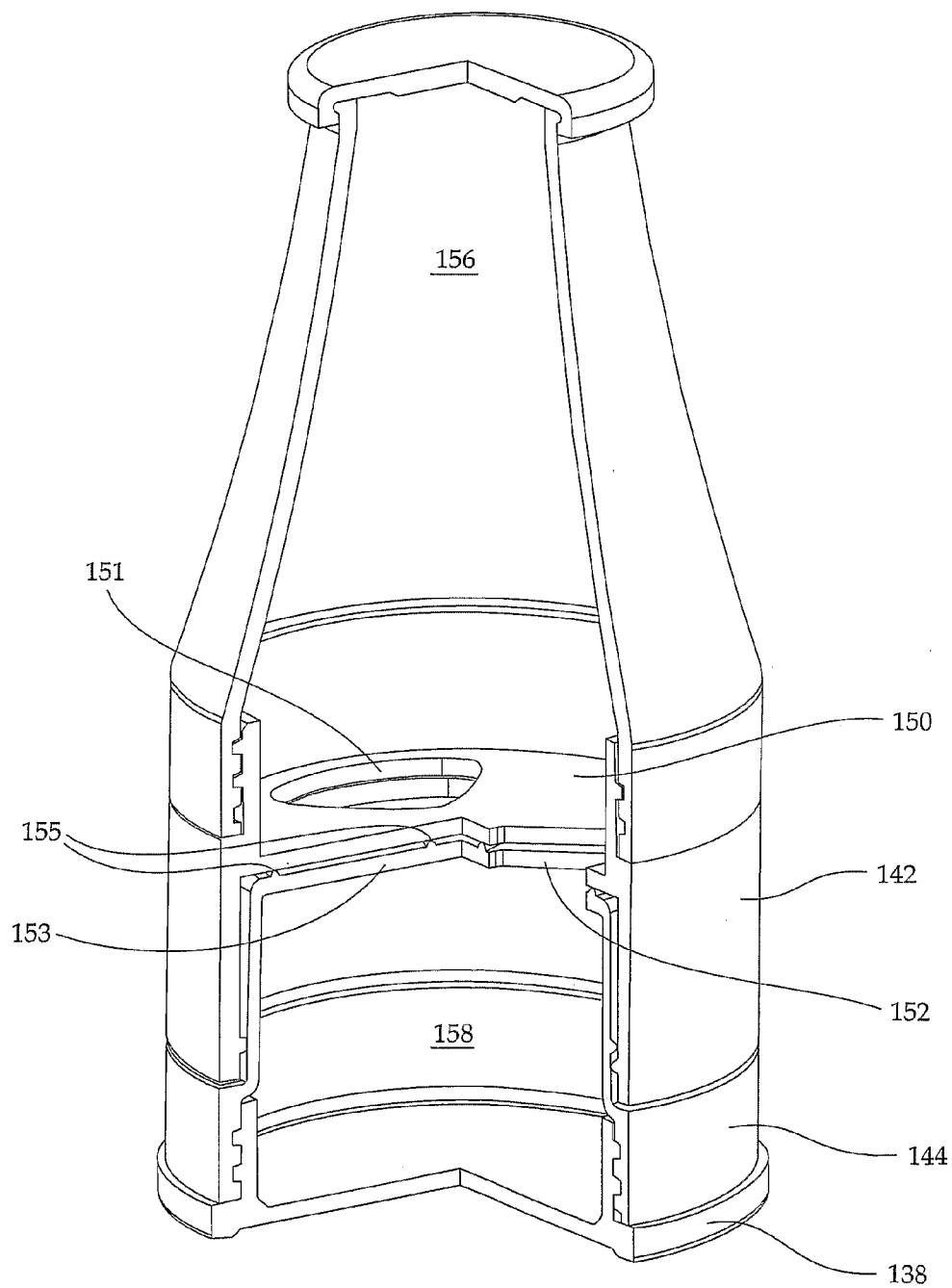


FIG. 10c

CONTAINER AND DIVIDER THEREFOR

FIELD OF THE INVENTION

[0001] The present invention relates to dividers for containers, in general and, in particular, to liquid containers, such as drinking bottles and baby bottles, and dividers therefor.

BACKGROUND OF THE INVENTION

[0002] At present, drinking bottles are known which contain a single compartment in which the liquid to be drunk may be stored until drunk. A dispensing means, such as a nipple in a baby bottle, or a cap in a soft drink bottle, may be provided to close the container before and between drinks.

[0003] If it is desired to add formula or a second component, such as alcohol or a mixer, to the liquid in the bottle, the bottle must be opened and the additional component carefully poured in through the neck.

[0004] In order to simplify mixing of formula and other liquids in baby bottles and other such containers, there have been proposed liquid containers defining two compartments, one for each component. These containers generally include a sealing wall between the two compartments, which can be opened when flow communication is desired between the two compartments. These bottles are specially constructed with the sealing wall, and are inconvenient to use as a regular bottle for drinking a single liquid. In addition, these bottles are relatively expensive to manufacture.

[0005] Accordingly, there is a long felt need for a drinking bottle or other liquid container which can be used either as a conventional container for a single liquid or as a two compartment container, and it would be very desirable to have an inexpensive and easily portable means for converting the bottle between a two compartment container and a single compartment container, on demand.

SUMMARY OF THE INVENTION

[0006] There is provided according to the present invention a divider device adapted and configured for at least partial insertion into a container, particularly a liquid container, having at least one opening, and preferably a top and a bottom opening, each opening having an independent associated closure member. The divider device can be coupled to the container, and includes a dividing member for sealing engagement with an interior surface of the container, which serves to divide the container into two separable compartments. The divider device further includes an externally accessible operable portion coupled to the divider member, the operable portion being adapted and configured to be closed by a closure member, possibly the closure member associated with the opening in which the divider device is disposed.

[0007] According to one embodiment of the invention, the divider member is arranged for reciprocating axial motion within the container, from a sealing position wherein the divider member engages the internal wall of the container, to a position where the divider member disengages from the walls of the container so as to provide flow communication throughout the container through the divider device.

[0008] According to an alternative embodiment of the invention, the divider member includes two portions arranged for relative pivoting motion within the container, from a sealing position wherein the two portions of the divider member overlap to substantially seal one portion of the container from another portion of the container, to a position where the two

portions of the divider member only partially overlap, so as to provide flow communication throughout the container through the divider device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention will be further understood and appreciated from the following detailed description taken in conjunction with the drawings in which:

[0010] FIG. 1 is a schematic illustration of a divider device for a liquid container constructed and operative in accordance with one embodiment of the present invention;

[0011] FIG. 2 is a partially cut away schematic illustration of a liquid container constructed and operative in accordance with one embodiment of the present invention in a conventional one-compartment configuration;

[0012] FIG. 3 is a partially cut away side view illustration of the liquid container of FIG. 2, in a closed, two compartment configuration;

[0013] FIGS. 4a and 4b are exploded side view and partial sectional view illustrations, respectively, of the container of FIG. 2;

[0014] FIG. 5 illustrates the container of FIG. 3 with the divider in an open orientation permitting flow communication;

[0015] FIGS. 6a and 6b are partially cut away and exploded view, respectively, of a liquid container constructed and operative in accordance with another embodiment of the present invention in a one-compartment configuration;

[0016] FIGS. 7a and 7b are exploded side and partial sectional illustrations, respectively, of the liquid container of FIG. 6a, in a two compartment configuration;

[0017] FIGS. 8a and 8b illustrate the container of FIG. 7a with the divider in a closed orientation and an open orientation, respectively; and

[0018] FIGS. 9a, 9b and 9c are schematic illustrations of a container constructed and operative in accordance with another embodiment of the present invention; and

[0019] FIGS. 10a, 10b and 10c are schematic illustrations of a container constructed and operative in accordance with a further embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0020] The present invention relates to a multifunctional container, typically a liquid container, such as a baby bottle, having two operating modes—a first mode being as a conventional, single compartment container having at least one open end with an associated end closure, and the second mode being as a two-compartment container, wherein at least part of a divider device is inserted through an open end, disposed inside and coupled to the liquid container, and closed with a closure member. According to a preferred embodiment of the invention, the divider closure member is the end closure associated with the open end of the container. The end closure may be a rigid member, or a flexible member through which the divider can be gripped.

[0021] The present invention further relates to a divider for containers, most particularly liquid containers, having at least one, and preferably two openings. Each of the openings has its own closure member, such as a sealing cap or dispensing means covered with a sealing cap. The divider permits the container to be quickly and easily converted from a single compartment container to a dual compartment container and back. The divider is inserted into an opening in the container,

thereby sealing that opening, and is sealed, itself, preferably by the cap associated with that opening. Where the container has two openings, the cap on one opening is adapted to be removable from the container so the divider can be inserted into the bottom of the container. The removed cap or dispensing means then can be used to close and seal the open side of the divider. Preferably, the divider seals the bottom end of the container instead of the closure member which, in turn, may seal the divider. Alternatively, another closure member, such as a dispensing unit (e.g., a nipple holder or spout or reciprocating closure).

[0022] The container of the invention is particularly suitable for use with at least one liquid, which can be mixed selectively with another liquid or with a solid stored in a separate compartment. However, it can alternatively be utilized for two solid components of a mixture, if desired.

[0023] Referring now to FIG. 1, there is shown a divider device 1 constructed and operative in accordance with one embodiment of the invention. The divider device 1 includes a body 2 coupled to a dividing wall 3 which is adapted and constructed for releasable sealing engagement with the interior surface of the walls of the container. Sealing elements 7 may be provided around dividing wall 3 for sealing engagement with the container walls. Flow communication apertures 6 are provided through or around the dividing wall.

[0024] An externally operable portion 4 is coupled to the dividing wall 3 to permit reciprocal relative motion between the divider device and a container in which it is disposed, between a sealed position, wherein the flow communication apertures are sealed and the dividing wall defines two separate compartments in the container, and an unsealed position, wherein the flow communication apertures are open and flow communication is provided around or through the sealing wall between the two compartments. In the illustrated embodiment, externally operable portion 4 is coupled to the dividing wall 3 by means of an apertured ring 5 defining a plurality of flow communication apertures 6, or by a plurality of web elements having spaces between them.

[0025] Container coupling means 8 are provided on the divider device for coupling the divider device to a container, as are cap coupling means 9, such as screw threads, for coupling the cap of the container to the divider device. In the embodiment of FIG. 1, the container coupling means 8 include a threaded recess 11 defined between the externally operable portion 4 and the body 2. Threaded recess 11 is sized and configured to receive and engage the opening of a bottle or other container. In this embodiment, the cap coupling means 9 includes a downwardly depending skirt having screw threads about its periphery. Alternatively, the container coupling means and the cap coupling means may have any desired shape, as long as the divider device can be removably coupled to the container opening, and the cap of the container can be used to close the divider device.

[0026] Referring now to FIG. 2, there is shown a schematic illustration of a container 10 constructed and operative in accordance with one embodiment of the present invention in a conventional one-compartment configuration. Container 10 includes a container body 12 defining a first opening 14, and a cap 16, as known, for closing the first opening 14. Cap 16 may be any conventional cap, a collar for retaining a spout or nipple for a baby bottle, a drinking spout of a sport bottle, as shown in the illustrated embodiment, or other dispensing device.

[0027] According to this embodiment of the present invention, the container defines a lower portion 19 of larger diameter than the upper portion. The lower portion 19 of the container defines a bottom opening 20 which is generally closed and sealed by a bottom closure member, here a bottom cap 22. Bottom cap 22 may include internal screw threads 24 which are complementary to external screw threads 26 on the container body 12. Bottom cap 22 is preferably rigid.

[0028] FIG. 3 is a partially cut-away schematic view of the container 10 of FIG. 2, in a two compartment configuration. Exploded views of this configuration are shown in FIGS. 4a and 4b. As can be seen in FIG. 3, a divider device 30 has been inserted into the bottom opening 20 of body 12, thereby sealing the bottom opening. Bottom cap 22 sealingly engages the outer opening of divider device 30. Divider device 30 includes a dividing wall 32 which sealingly engages the inner walls 18 of body 12. Divider device 30 includes an operable portion 34 coupled to dividing wall 32 for moving the dividing wall between a sealed position illustrated in FIG. 3 and an unsealed position illustrated in FIG. 5. In this embodiment, operable portion 34 is externally accessible although, alternatively, an operable portion may be provided which is not externally accessible.

[0029] It will be appreciated that, in the sealed position shown in FIG. 3, the container defines two separate compartments, an upper compartment 33 defined by walls 18 of body 12 and the upper surface of wall 32, and a lower compartment 35 defined by the lower surface of divider device 30, walls 18' and the bottom cap 20. According to this embodiment of the invention, the dividing wall 32 is arranged for longitudinal reciprocating motion within the liquid container, from a sealing position wherein the dividing wall sealingly engages the internal wall 18 of the container, to a position where the dividing wall is positioned in larger diameter portion 19 of body 12 and no longer sealingly engages walls 18 of the container, so as to permit flow communication around the dividing wall between upper compartment 33 and lower compartment 35 of the liquid container. Appropriate sealing elements 37, 37' are preferably provided around dividing wall 32 for sealing engagement with the container walls 18'. Flow communication apertures 39 are provided through or around the dividing wall.

[0030] In the illustrated embodiment, divider device 30 includes both internal screw threads 36 and external screw threads 38. The internal screw threads 36 are arranged to engage the external screw threads 26 of body 12, while external screw threads 38 serve to engage the internal screw threads 24 of the bottom cap 22.

[0031] Referring now to FIG. 4b, it can be seen that container 10 defines a larger diameter portion 19 and a bottom opening 20 having a bottom cap 22. The outside surface of the lower portion of body 12 of container 10 defines external screw threads 26, complementary to internal screw threads 24 in bottom cap 22. In this embodiment, sealing element 37 includes an upper sealing bead about the circumference of the sealing wall 32. Sealing wall 32 is coupled to body 33 of divider 30 by an apertured sleeve 43 having apertures 39. Sealing bead 37 is adapted and configured for sealing engagement with internal walls 18' of container 10. Apertures 37' are provided around sleeve 43 beneath sealing bead 37 to permit flow communication between the two compartments when the divider device is in an open, non-sealing position, as shown in FIG. 5.

[0032] It will be appreciated that bottom cap 22 is configured and adapted to sealingly engage the bottom opening 20 of the container by screw threads 26. Bottom cap 22 is also configured and adapted to sealingly engage the bottom, open end of divider device 30, for example by screw threads 38 on divider device 30. Preferably, operable portion 34 defines internal screw threads 36 which are complementary to the external screw threads 26 on container 10.

[0033] Divider device 30 further includes a depending skirt 40 extending downwardly from the operable portion 34. Skirt 40 further defines the lower walls of lower compartment 35 formed by the lower surface of the divider device and the internal walls 18' of body 12. Preferably, skirt 40 includes screw threads 38 which are complementary to the inner screw threads 24 of bottom cap 22.

[0034] It will be appreciated that, alternatively, a cap may be configured and adapted for being sealingly mounted on the upper opening of container 10, [or] AND? a dispensing device may be coupled to the bottom opening 20 of the divider device for dispensing through the divider.

[0035] Operation of the divider device of the embodiment of FIG. 2 will now be described with reference to FIGS. 2 to 5. In conventional use as a one compartment container, as shown in FIG. 2, the bottom opening 20 is closed and sealed by bottom cap 22. The container can be filled with liquid or powder which can be drunk or otherwise dispensed through top opening 14, as desired.

[0036] When it is desired to use the container as a two compartment container, bottom cap 22 is removed from the body 12 and divider device 30 is inserted into the bottom opening 20 of the container 10, as shown in FIG. 3. Divider device 30 is screwed into place until sealing bead 37 sealingly engages inner wall 18 of container 10 and sealing bead 37' sealingly engages the inner wall 18' of the larger diameter portion 19. In this position, dividing wall 32 provides a divider or seal between the two compartments, one above and one below the dividing wall. While divider device 30 is in the sealed position of FIG. 3, the lower compartment 35 can be filled with powder or liquid, and bottom cap 22 can be screwed into place on the external screw threads of depending skirt 40, thereby sealing the lower compartment. Liquid or another desired component can then be poured into the upper compartment 33 through the top opening, as known, and the top opening can be sealed by its own cap 16.

[0037] When it is desired to mix the two components, the user rotates the operable portion 34 of the divider device 30 relative to the container body 12 about the screw threads 26, as shown in FIG. 5. As the divider device 30 rotates about the body 12, the dividing wall 32 disengages from the inner wall 18 of the container and moves into the larger diameter portion 19 of the container, so that flow communication is permitted between the upper and lower compartments through apertures 39 in the divider device.

[0038] If desired, conventional means can be provided to prevent inadvertent removal of the divider device from the container by over-rotation. For example, as seen in FIG. 5, an internal annular rib 31 may be provided in the container wall 18', serving as a temporary stop member. Rotation of the operable portion to open the flow passage will cause seal member 37' of the divider device to abut the internal rib 31 and require greater force to force the operable portion past the annular rib. Preferably, the internal rib will have a cross section permitting easy insertion of the divider device but which requires a relatively large force to permit removal.

[0039] It will be appreciated that alternative combinations of narrowing and widening of the space around the dividing wall may be utilized. For example, instead of a larger diameter portion in the container body, an internal flange may be provided in a container body. In this case, the divider may include a reciprocating dividing wall coupled to an operable portion, for moving the dividing wall between a sealed and an unsealed orientation. An example of a container utilizing such a structure is shown in FIG. 9a, described in detail below.

[0040] According to another alternative embodiment of the invention, the divider device does not move longitudinally within the container. Rather, the divider device includes two portions arranged for relative pivoting motion, from a sealing position wherein the two portions of the divider member overlap to substantially seal one portion of the liquid container from another portion of the container, to a position where the two portions of the divider member only partially overlap, so as to provide flow communication throughout the liquid container through the gaps in the divider device.

[0041] Referring now to FIGS. 6a and 6b, there are shown respective assembled and exploded illustrations of a multifunctional container 50 constructed and operative in accordance with one embodiment of the present invention operating according to this principle, in a one-compartment configuration. Container 50 includes a container body 52 having a substantially constant diameter, and defining a first opening 54, and a cap 56 for closing the first opening 54. As in the embodiment of FIG. 2, cap 56 may be any conventional cap, a collar for retaining a spout or nipple for a baby bottle, a drinking spout of a sport bottle, or other dispensing device.

[0042] The lower portion of the container body 52 defines a bottom opening 58 which is generally closed and sealed by a bottom closure member, here a bottom cap 60. Bottom cap 60 may include internal screw threads 62 which are complementary to external screw threads 64 on the container body 52.

[0043] An apertured sealing web 70 having at least one, and preferably several apertures 72 is integrally formed with or sealingly affixed to container body 52. In this embodiment, sealing web 70 is essentially an internal wall of the container body 52. In the single compartment embodiment illustrated in FIG. 6a, there is free flow communication throughout the container body through apertures 72 in sealing web 70.

[0044] FIGS. 7a and 7b are respective exploded and partially cut-away schematic views of the container 50 of FIG. 6a, in a two compartment configuration. Multifunctional container 50 further includes a divider device 80. Divider device 80 includes an apertured dividing wall 82 and a plurality of sealing elements 83 which sealingly engage the sealing web 70 in body 52. Divider device 80 also includes an operable portion 84 coupled to dividing wall 82 for moving the dividing wall between a sealed position (illustrated in FIG. 8a, described below) wherein apertures 72 of sealing web 70 are out of registration with apertures 85 of dividing wall 82, and an unsealed position (illustrated in FIG. 8b, described below), wherein apertures 72 of sealing web 70 are in registration with apertures 85 of dividing wall 82, permitting flow communication through the web and throughout the container.

[0045] As can be seen in FIG. 8a, divider device 80 has been inserted into the container body 52 through the bottom opening 58 of body 52. Bottom cap 60 sealingly engages the outer opening of divider device 80. In the closed orientation, dividing wall 82 sealingly engages the lower surface of sealing web 70 in body 52. Apertures 72 of sealing web 70 are out of registration with apertures 85 of dividing wall 82, so that

flow communication is prevented through the walls. It will be appreciated that, in the sealed position shown in FIG. 8a, the container defines two separate compartments, an upper compartment 90 defined by container body 52 and the upper surface of sealing web 70, and a lower compartment 92 defined by the lower surface of dividing wall 82, the internal walls 94 of the divider device, and the bottom cap 60.

[0046] Divider device 80 includes an operable portion 84 coupled to dividing wall 82 for rotating the divider device and the dividing wall between the sealed position illustrated in FIG. 8a and the unsealed position illustrated in FIG. 8b. In this embodiment, operable portion 84 is coupleable to bottom cap 60 for rotation relative to body 52, and cap 60 essentially covers the operable portion 84. Preferably, bottom cap 60 is a flexible cap and squeezing the cap permits a user to grasp, indirectly, operable portion 84 so as to rotate divider device 80.

[0047] In the unsealed position of FIG. 8b, divider device 80 or body 52 has been rotated until apertures 85 in dividing wall 82 are aligned with apertures 72 in sealing web 70. In this position, there is flow communication through the apertures between the upper compartment 90 and the lower compartment 92.

[0048] It will be appreciated that a container utilizing this principle can also be designed with an externally accessible operable portion. One example of such a container is shown in FIGS. 10a and 10b, described below.

[0049] Referring now to FIGS. 9a and 9b, there are shown schematic illustrations of a container 100 constructed and operative in accordance with another embodiment of the present invention. Container 100 includes a container body 102 of substantially constant diameter, having a single opening 104. A removable cap 106 is provided for selectably sealing opening 104. Cap 106 may be any conventional cap (as illustrated in FIG. 9a), a collar for retaining a spout or nipple for a baby bottle (as illustrated in FIG. 9c), a drinking spout of a sport bottle, or any other closure or dispensing device. An internal flange 108 is provided inside container body 102.

[0050] Multifunctional container 100 of this embodiment can be used as a single compartment container, as shown in FIG. 9a, for storing and/or dispensing a single liquid or solid. Container 100 also includes a divider device 110. FIGS. 9b and 9c illustrate the container 100 of FIG. 9a, in two two-compartment configurations, with divider device 110 inserted in container body 102 through opening 104, so as to seal opening 104. Cap 106 sealingly engages the outer opening of divider device 110.

[0051] In the illustrated embodiment, container body 102 includes both internal screw threads 120 and external screw threads 122. The internal screw threads 120 are arranged to engage the external screw threads 124 of divider device 110, while external screw threads 122 serve to engage the internal screw threads 126 of the cap 106.

[0052] Divider device 110 includes a dividing wall 112 which sealingly engages the inner flange 108 of body 102. Divider device 110 includes an operable portion 114 coupled to dividing wall 112 for moving the dividing wall between a sealed position, wherein it sealingly engages flange 108 (illustrated in FIG. 9b) and an unsealed position, where the dividing wall 112 is spaced from flange 108 (illustrated in FIG. 9c).

[0053] In the sealed position shown in FIG. 9b, the container 100 defines two separate compartments, an upper com-

partment 113 defined by divider device 110 and the upper surface of the sealing wall 112, and a lower compartment 115 defined by the walls of container body 102 and the lower surface of sealing wall 112. Appropriate sealing elements 117, 117' may be provided around dividing wall 112 to ensure a tight seal between sealing wall 112 and flange 108 and the inner wall of container body 102. Flow communication apertures 119 are provided through or around the dividing wall.

[0054] According to this embodiment of the invention, the dividing wall 112 is arranged for longitudinal reciprocating motion within the liquid container, from this sealing position wherein the dividing wall sealingly engages the internal flange 108 of the container, to the position illustrated in FIG. 9b. In this position, the dividing wall 112 is distanced from inner flange 108, so as to permit flow communication around the dividing wall between upper compartment 113 and lower compartment 115 of the container, through flow apertures 119. As can be seen, in this illustration, cap 106 has been replaced on the divider device by a dispensing element, i.e., a nipple holder 128, for example to permit dispensing of a mixed liquid, such as baby formula, from inside the container.

[0055] Yet another embodiment of the invention is shown in FIGS. 10a, 10b and 10c, illustrating a container 130 with a container body 131 having a top opening 132 and a bottom opening 134. A top cap 136 is provided to releasably seal top opening 132, and a bottom cap 138 is provided to removably seal bottom opening 134. Container 130 is illustrated as a single compartment container in FIG. 10a.

[0056] A divider device 140, seen in FIG. 10b, is provided having two parts 142 and 144, coupled to one another, as by complementary annular protrusions 146, 148. Divider device 140 is arranged for insertion into container 130. Each portion of divider device 140 includes an apertured dividing wall 150, 152, defining a plurality of apertures 151, 153. A plurality of sealing elements 155 are disposed therebetween. Either or both parts 142 and 144 of divider device 140 also includes an operable portion 154 coupled to its dividing wall 150 or 152 for moving one part of the dividing wall relative to the other part of the dividing wall, between a sealed position and an unsealed position.

[0057] The sealed position of container 130 is illustrated in FIG. 10b. In this position, apertures 151 of dividing wall 150 are out of registration with apertures 153 of dividing wall 152, thereby defining an upper compartment 156 and a lower compartment 158 in container 130.

[0058] When it is desired to mix components in upper compartment 156 and a lower compartment 158, operable portion 154 of one or both parts 142, 144 of divider device 140 are rotated relative to one another to an unsealed position, shown in FIG. 10c. In this position, apertures 151 of dividing wall 150 are in registration with apertures 153 of dividing wall 152, permitting flow communication between compartments 156 and 158 through the dividing walls and throughout the container.

[0059] It is a particular feature of the invention that the divider device of the invention can be utilized with any liquid container having at least a top opening, and preferably a top and a bottom opening, each having its own individual seal or cap. Thus, the divider can be used in vented and non-vented baby bottles, in soft drink bottles where it is desired to add alcohol or other flavoring, or in any other container, particularly a liquid container, for which it is desirable to convert it from a single compartment container to a two compartment container, and the reverse.

[0060] It will be appreciated that, while the above examples indicate that the closure member of the opening in the container is used to close the divider, when it is inside the container

[0061] While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made. It will further be appreciated that the invention is not limited to what has been described hereinabove merely by way of example. Rather, the invention is limited solely by the claims which follow.

1. A divider device for use with a container having at least one opening, each such opening having an associated cap, the divider device comprising:

a dividing wall for releasable sealing engagement with an interior wall of the container and for dividing the container into two separate compartments, a first compartment above said dividing wall and a second compartment below said dividing wall; and

an operable portion coupled to said dividing wall for moving said dividing wall between a sealed position, separating said first and second compartments, and an unsealed position, defining a flow passage permitting flow communication between said first and second compartments;

said operable portion including means for engaging a closure member, so as to close said operable portion;

said divider device being removably coupleable to the container when at least partly disposed inside the container.

2. A divider device according to claim 1, wherein said at least one opening includes a top and a bottom opening, each with an associated cap.

3. The divider device according to claim 1, wherein said operable portion is externally accessible.

4. The divider device according to claim 1, wherein said closure member is the cap associated with the opening.

5. The divider device of claim 1, wherein said flow passage is defined through said dividing wall.

6. The divider device according to claim 1, wherein said flow passage is defined around said dividing wall.

7. The divider device according to claim 1, further comprising:

a container having an opening with an associated cap; wherein said divider device is adapted and configured for replacing said associated cap and closing said opening.

8. The container according to claim 7, wherein said closure member is the cap associated with the opening.

9. The container according to claim 7, further comprising means for preventing inadvertent removal of the divider device from the container.

10. The container according to claim 9, wherein said means for preventing inadvertent removal includes an internal annular rib in the container wall disposed between the container opening and a location of sealing engagement of said dividing wall.

11. The container according to claim 7, wherein said divider member is arranged for reciprocating axial motion within the container, from a sealing position wherein the divider member engages the internal wall of the container, to a position where the divider member disengages from the walls of the container so as to provide flow communication throughout the container through the divider device.

12. The container according to claim 7, wherein said divider member includes two portions arranged for relative

pivoting motion within the container, from a sealing position wherein the two portions of said divider member overlap to substantially seal one portion of the container from another portion of the container, to a position where said two portions of the divider member only partially overlap, so as to provide flow communication throughout the container through the divider device.

13. A container having a top opening with an associated cover, the liquid container comprising:

a bottom opening;

a bottom closure member for closing said bottom opening; and

a divider device for replacing said bottom closure member and closing said bottom opening, said divider including: a dividing member for sealing engagement with an interior wall of the container and for dividing the container into two separable compartments;

an externally accessible operable portion coupled to said dividing member, for moving said dividing wall between a sealed position, separating said first and second compartments, and an unsealed position, defining a flow passage permitting flow communication between said first and second compartments, said operable portion including container coupling means for sealingly engaging said bottom opening; and

means for sealingly engaging said bottom closure member.

14. The divider device according to claim 13, further comprising means for preventing inadvertent removal of the divider device from the container.

15. A multifunctional container comprising:

a container having an opening with an associated cap;

a divider device arranged to be removably disposed inside and coupled to said opening of said container;

said container adapted and configured to alternate between a first mode, wherein said divider device is outside of said container and said cap removably closes said opening, for use as a single compartment container; and

a second mode, wherein said divider device is removably disposed inside said opening of said container and said cap removably closes said divider device, to form a two-compartment container.

16. The multifunctional container according to claim 15, wherein:

in said first mode, the container is adapted for dispensing one material from inside the container; and

in said second mode, said divider is unsealed and a flow passage is provided between said two compartments for mixing materials in said two compartments before dispensing.

17. The multifunctional container according to claim 16, wherein said divider device includes means for alternating, in said second mode, between permitting flow communication between said two compartments and preventing flow communication between said two compartments.

18. A method for forming a multifunctional container, the method comprising:

providing a container having an opening with an associated cap;

said container being adapted and configured for use as a single compartment container;

providing a divider device adapted and configured for at least partial removable insertion into the container, said divider device having a dividing wall for releasable sealing engagement with an interior wall of the container

and for dividing the container into two separable compartments, a first compartment above said dividing wall and a second compartment below said dividing wall; coupling an operable portion to said dividing wall for moving said dividing wall between a sealed position, separating said first and second compartments, and an unsealed position, defining a flow passage permitting flow communication between said first and second compartments; and

providing a closure member for said operable portion.

19. The multifunctional container according to claim **15**, wherein said divider device comprises:

a dividing wall for releasable sealing engagement with an interior wall of the container and for dividing the con-

tainer into two separate compartments, a first compartment above said dividing wall and a second compartment below said dividing wall; and

an operable portion coupled to said dividing wall for moving said dividing wall between a sealed position, separating said first and second compartments, and an unsealed position, defining a flow passage permitting flow communication between said first and second compartments;

said operable portion including means for engaging a closure member, so as to close said operable portion.

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