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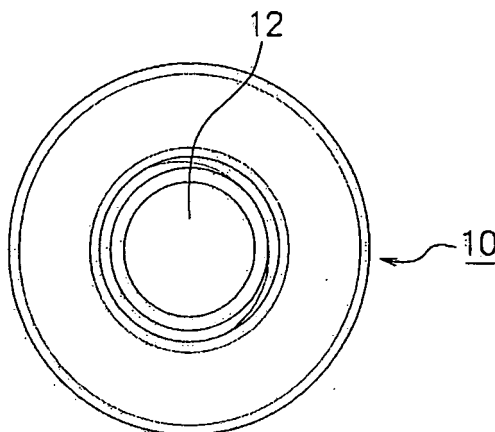
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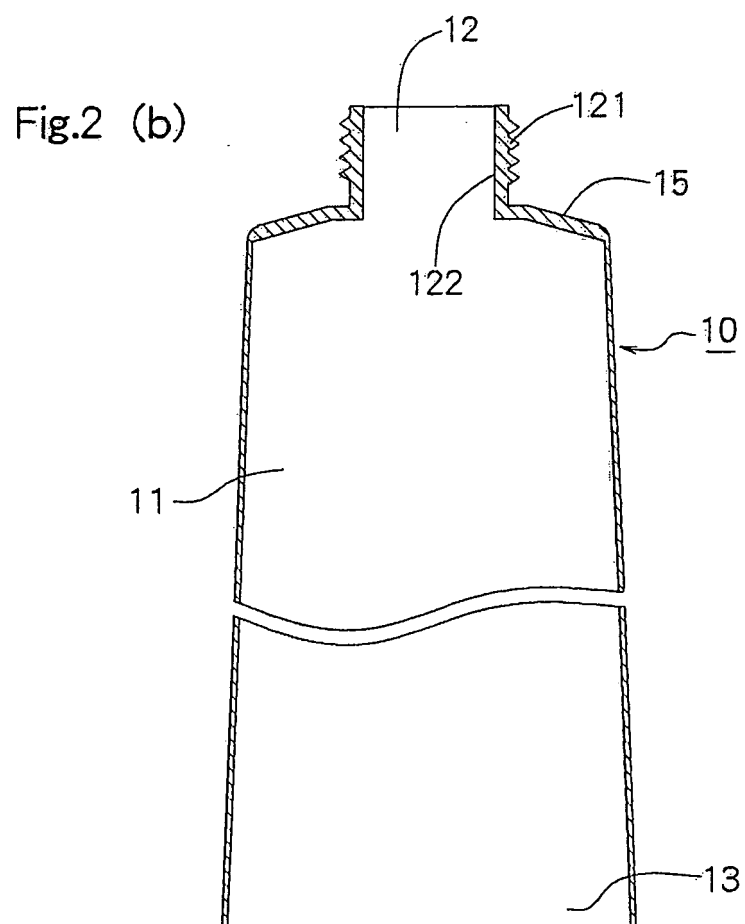
(54) **Double walled fluid-storing container**

(57) A fluid-storing container includes an inner container (10), an outer container (20) enclosing the inner container (10), a joined member (30) joining the inner container (10) and the outer container (20), and a valve member (40) for opening/shutting off a discharge open-

ing from the exterior. The joined member (30) joins the inner container (10) and the outer container (20) in such a way that that an inner space (50) is formed between the inner container (10) and the outer container (20), and a flow path enabling air to pass through between the exterior and the inner space (50) is formed.

Fig.2 (a)





Description

Background of the Invention

Field of the Invention

[0001] The present invention generally relates to a fluid-storing container for storing a fluid therein.

Description of the Related Art

[0002] With regard to this type of fluid-storing container, a fluid-storing container described in Japanese Patent Laid-open No. 2000-109103 or No. 2004-182319 is in the public domain.

[0003] The fluid-storing container described in Japanese Patent Laid-open No. 2000-109103 comprises an inner container for storing a fluid, and an outer container enclosing the inner container so that an air chamber is formed between the outer container and the inner container. This outer container comprises a valve member for preventing air inside the air chamber from flowing out to the exterior when a pressure is applied to the container.

[0004] The fluid-storing container described in Japanese Patent Laid-open No. 2004-192319 comprises an inner container for storing a fluid, and an outer container enclosing the inner container so that an inner space is formed between the outer container and the inner container. These inner container and outer container are connected with each other in a fluid discharge opening portion.

[0005] According to the fluid-storing container described in Japanese Patent Laid-open No. 2000-109103, because the outer container comprises the valve member, its configuration becomes complex.

[0006] According to the fluid-storing container described in Japanese Patent Laid-open No. 2004-192319, because the inner container and the outer container are connected with each other, manufacturing cost soars.

Summary of the Invention

[0007] Consequently, in at least one embodiment, an object of the present invention is to solve the above-mentioned problems and therefor to provide a fluid-storing container which enables to prevent an outer shape of the container from changing according to a fluid amount stored while its configuration is simple.

[0008] The present invention can be practiced in various ways including, but not limited to, embodiments described below, wherein numerals used in the drawings are used solely for the purpose of ease in understanding of the embodiments which should not be limited to the numerals. Further, in the present specification, different terms or names may be assigned to the same element, and in that case, one of the different terms or names may functionally or structurally overlap or include the other or be used interchangeably with the other.

[0009] In an embodiment, the present invention provides a tubular fluid-storing container comprising: (i) an inner container (e.g., 10, 10', 60, 60') having a fluid-storing portion (e.g., 11, 61) for storing a fluid, a neck opening portion (e.g., 12, 62), and a shoulder portion (e.g., 15, 65) around the neck opening portion; (ii) an outer container (e.g., 20, 70) being capable of elastically restoring its shape, enclosing the inner container, and having an outer opening portion (e.g., 22, 72) through which the neck opening portion of the inner container is inserted, wherein an inner space (e.g., 50, 50') is formed between the inner container and the outer container; and (iii) a joined member (e.g., 30, 30', 80, 80', 80'') having a fluid-discharge opening (e.g., 33, 83), being engaged with the neck opening portion of the inner container to connect the fluid-discharge opening and the neck opening portion, and pressing the outer opening portion against the shoulder portion of the inner container where an air path (e.g., 211, 711) is formed through which air passes between the inner space and the exterior.

[0010] The above embodiment further includes, but is not limited to, the following embodiments:

[0011] The joined member may comprise an inner joined portion (e.g., 31, 81) engaged with the neck opening portion of the inner container, and an outer joined portion (e.g., 32, 82) pressing the outer opening portion against the shoulder portion of the inner container.

[0012] The outer opening portion of the outer container may have at least one slit (e.g., 211, 711) constituting the air path. The outer opening portion of the outer container having the at least one slit may have an annular step (e.g., 27, 77) in contact with a surface of the shoulder portion of the inner container. The at least one slit may be comprised of two or more slits arranged at equal intervals. The slit may extend outward from an inner periphery of the outer opening portion to a position slightly outside the outer joined portion of the joined member to pass air through the slit.

[0013] The outer opening portion of the outer container may have an annular convex edge portion (e.g., 21, 71), with which the outer joined portion of the joined member is engaged. The outer opening portion including the annular convex edge portion of the outer container may have at least one slit (e.g., 211, 711) constituting the air path. The annular convex edge portion of the outer opening portion of the outer container may be fitted to a bottom (e.g., 112) of the neck opening portion.

[0014] The inner joined portion and the outer joined portion of the join member may be formed concentrically in an axial direction, wherein an inner wall (e.g., 311, 811) of the inner joined portion is engaged with the neck opening portion, and a lower end (e.g., 38, 88) of the outer joined portion presses the outer opening portion of the outer container.

[0015] The neck opening portion of the inner container may be provided with male threads (e.g., 311, 811), and the inner joined portion of the joined member is provided with female threads (e.g., 121, 621) with which the male

threads are engaged.

[0016] An end portion (e.g., 13) opposite to the neck opening portion of the inner container, and an end portion (e.g., 23) opposite to the outer opening portion of the outer container may be welded.

[0017] The neck opening portion of the inner container is provided with a valve member (e.g., 40) disposed inside the neck opening portion. The valve member may be deformed to open a passage of the fluid stored in the fluid-storing portion when a pressure inside the fluid-storing portion increases. The fluid-discharge opening of the joined member is provided with ribs (34, 64, 84) which support the valve member.

[0018] The joined member has a lid portion (e.g., 35) for closing the fluid-discharge opening.

[0019] In all of the aforesaid embodiments, any element used in an embodiment can interchangeably or additionally be used in another embodiment unless such a replacement is not feasible or causes adverse effect.

[0020] For purposes of summarizing the invention and the advantages achieved over the related art, certain objects and advantages of the invention have been described above. Of course, it is to be understood that not necessarily all such objects or advantages may be achieved in accordance with any particular embodiment of the invention. Thus, for example, those skilled in the art will recognize that the invention may be embodied or carried out in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objects or advantages as may be taught or suggested herein.

[0021] Further aspects, features and advantages of this invention will become apparent from the detailed description of the preferred embodiments which follow.

Brief Description of the Drawings

[0022] These and other features of this invention will now be described with reference to the drawings of preferred embodiments which are intended to illustrate and not to limit the invention. The drawings are oversimplified for illustrative purposes. The drawings are oversimplified for illustrative purposes.

[0023] FIG. 1 is a schematic view showing the fluid-storing container according to a first embodiment of the present invention by taking it apart to pieces.

[0024] FIGS. 2(a) and 2(b) are top view and cross sectional view, respectively, showing the inner container 10 in the fluid-storing container according to the first embodiment of the present invention.

[0025] FIGS. 3(a) and 3(b) are top view and cross sectional view, respectively, showing the outer container 20 in the fluid-storing container according to the first embodiment of the present invention.

[0026] FIGS. 4(a)-4(c) are front view, cross sectional view, and bottom view, respectively, showing the joined member 30 in the fluid-storing container according to the first embodiment of the present invention.

[0027] FIGS. 5(a)-5(c) are top view, side view, and cross sectional view, respectively, showing the valve member 40 in the fluid-storing container according to the first embodiment of the present invention.

5 **[0028]** FIG. 6 is a sectional side view showing the fluid-storing container according to the first embodiment of the present invention.

[0029] FIG. 7 is an enlarged sectional side view showing the vicinity of the discharge opening 33 in the fluid-storing container according to the first embodiment of the present invention.

10 **[0030]** FIG. 8 is an enlarged sectional side view showing the inner container 10, the outer container 20, and the joined member 30 in their joined state.

15 **[0031]** FIG. 9 is a sectional side view of the fluid-storing container when the container is compressed according to the first embodiment of the present invention.

[0032] FIG. 10 is a sectional side view of the fluid-storing container when pressure is released according to the first embodiment of the present invention.

20 **[0033]** FIG. 11 is a sectional side view of the fluid-storing container when the shape of the outer container is restored according to the first embodiment of the present invention.

25 **[0034]** FIGS. 12(a) and 12(b) are top view and cross sectional view, respectively, showing the inner container 60 in the fluid-storing container according to a second embodiment of the present invention.

30 **[0035]** FIG. 13 is an enlarged sectional side view showing the vicinity of the discharge opening 33 in the fluid-storing container according to the second embodiment of the present invention.

35 **[0036]** FIGS. 14(a) and 14(b) are top view and cross sectional view, respectively, showing the outer container 70 in the fluid-storing container according to a third embodiment of the present invention.

40 **[0037]** FIG. 15 is an enlarged sectional side view showing the vicinity of the discharge opening 33 in the fluid-storing container according to the third embodiment of the present invention.

[0038] FIG. 16 is an enlarged sectional side view showing the vicinity of the discharge opening 33 in the fluid-storing container according to a fourth embodiment of the present invention.

45 **[0039]** FIGS. 17(a)-17(c) are side view, cross sectional view, and bottom view, respectively, showing the joined member 80 in the fluid-storing container according to a fifth embodiment of the present invention.

50 **[0040]** FIG. 18 is an enlarged sectional side view showing the vicinity of the discharge opening 83 in the fluid-storing container according to the fifth embodiment of the present invention.

[0041] FIG. 19 is an enlarged sectional side view showing the vicinity of the discharge opening 83 in the fluid-storing container according to a sixth embodiment of the present invention.

[0042] FIG. 20 is an enlarged sectional side view showing the vicinity of the discharge opening 83 in the flu-

id-storing container according to a seventh embodiment of the present invention.

[0043] FIG. 21 is an enlarged sectional side view showing the vicinity of the discharge opening 83 in the fluid-storing container according to an eighth embodiment of the present invention.

[0044] Explanation of symbols used in the drawings are as follows: 10: Inner container; 11: Fluid-storing portion; 12: Inner opening portion; 13: End portion; 20: Outer container; 21: Convex portion; 22: Outer opening portion; 23: End portion; 30: Joined member; 31: Inner joined portion; 32: Outer joined portion; 33: Discharge opening; 34: Rib portion; 35: Lid member; 40: Valve member; 41: Valve body; 42: Joined portion; 43: Mounted upright portion; 50: Inner space; 60: Inner container; 61: Fluid-storing portion; 62: Inner opening portion; 63: End portion; 64: Rib portion; 70: Outer member; 71: Convex portion; 72: Outer opening portion; 73: End portion; 80: Joined member; 81: Inner joined portion; 82: Outer joined portion; 83: Discharge opening; 84: Rib portion; 121: Male-screw portion; 122: Inner wall portion; 211: Cutout portion; 311: Female-screw portion; 351: Shutoff portion; 621: Male-screw portion; 622: Inner wall portion; 711: Cutout portion; 811: Female-screw portion; 851: Shutoff portion.

Detailed Description of the Preferred Embodiment

[0045] The present invention will be explained with respect to preferred embodiments and drawings. However, the preferred embodiments and drawings are not intended to limit the present invention.

[0046] FIG. 1 is a schematic view showing a fluid-storing container according to a first embodiment of the present invention by taking it apart to pieces.

[0047] This fluid-storing container is used as a container for beauty products for storing gels such as hair gels and cleansing gels, creams such as nourishing creams and cold creams or liquids such as skin lotions used in the cosmetic field. Additionally, this fluid-storing container also can be used as a container for general medicines, solvents or foods, etc. In this specification, high-viscosity liquids, semifluids, gels that solidifies to a jelly, and creams and regular liquids are all referred to as fluids.

[0048] This fluid-storing container is a tubular fluid-storing container having a fluid discharge opening at one end and comprises an inner container 10, an outer container 20 enclosing the inner container 10, a joined member 30 joining the inner container 10 and the outer container 20, and a valve member 40 for opening/shutting off the discharge opening from the exterior. In an embodiment, the valve member 40 is not installed when the fluid is viscous and is not apt to oxidation.

[0049] FIGS. 2(a) and 2(b) are explanatory views showing the inner container 10 in the fluid-storing container according to the first embodiment of the present invention. FIGS. 2(a)-(b) are a top view and sectional side view, respectively, showing the inner container 10.

[0050] The inner container 10 is preferably composed of a material having elastic resilience such as a single synthetic resin or lamination layers of synthetic resin and aluminum. The inner container may have a thickness of about 0.2 mm to about 1.0 mm (preferably about 0.3 mm to about 0.8 mm). However, in an embodiment, the inner container 10 is composed of a material which is not capable of restoring its shape (e.g., plastic characteristics) because the outer container 20 is capable of restoring its shape and when the outer container restores its shape, the pressure between the inner container and the outer container is lowered, thereby causing the inner container to slightly expand (so that the fluid at a fluid-discharge opening will be retracted, thereby preventing a leak). In that case, the inner container may have a thickness which is smaller than that of the outer container.

[0051] The shoulder portion 15 of the inner container 10 is thicker than the fluid-storing portion 11 in order to receive a corresponding portion of the outer container 20 and supports it when the joined member 30 presses the portion of the outer container 20. The inner opening portion 12 (the neck opening portion) is also thicker than the fluid-storing portion 11 in order to be engaged with the joined portion 30.

[0052] This inner container 10 has a fluid-storing portion 11 for storing a fluid. At one end of the inner container 10, an inner opening portion 12 for allowing the fluid to flow out is formed. Additionally, the inner container 10 comprises a male-screw portion 121 on the outer side of the inner opening portion 12, and an inner-wall portion on its inner side. The inner opening portion 12 and an opposite end portion 13 in the inner container 10 are formed open.

[0053] FIGS. 3(a) and 3(b) are explanatory views showing the outer container 20 in the fluid-storing container according to the first embodiment of the present invention. FIGS. 3(a)-(b) are a top view and sectional side view, respectively, showing the outer container 20.

[0054] The outer container 20 is preferably composed of a material having elastic resilience (capable of restoring its shape) such as a single synthetic resin or lamination layers of synthetic resin and aluminum. The outer container 20 may have a thickness which is equal to or greater than that of the inner container 10 so as to enhance self restorability. In this outer container 20, an outer opening portion which the inner opening portion in the inner container can go through when it encloses the inner container 10 is formed. Additionally, the outer container 20 comprises an annular convex portion 21 around the outer opening portion 22. Further, in this convex portion 21, four cutout portions 211 are formed. Additionally, the outer opening portion 22 and an opposite end portion 23 in the outer container are formed open.

[0055] The number of cutout portions (slits) 211 may vary depending on the embodiment and may be 1-20, preferably 3-8. The cutout may have a length of about 2 mm to about 7 mm, preferably about 3 mm to about 5 mm, and a width of about 1.0 mm to about 3 mm, pref-

erably about 1.5 mm to about 2 mm. The cutouts are partially covered by the joined member 30 (see FIG. 8), and in an embodiment, a portion of the cutout having a length of about 0.1 mm to about 2 mm, preferably about 0.3 mm to about 1.0 mm, may be uncovered to secure an air passage. In an embodiment, the configuration of the cutout may be determined so that air can pass through the cutout(s) with slight resistance. If air passage is controlled, it is possible to compress the inner container via air present in a gap between the inner container and the outer container and also to cause the inner container to slightly expand to prevent a leak. In this embodiment, the cutout portions 211 have an annular step 27 so as to secure an air path (a gap) between a surface of the shoulder portion 15 and a surface of the corresponding portion of the outer container 20 (see FIG. 8).

[0056] FIGS. 4(a)-(c) are explanatory view showing the joined member 30 in the fluid-storing container according to the first embodiment of the present invention. FIGS. 4 (a)-(c) are a front view, side view, and backside view, respectively, showing the joined member 30.

[0057] The joined member 30 comprises an inner joined portion 31 to be joined with the male-screw portion 121 in the inner container 10, an outer joined portion 32 to be joined with a convex portion 21 in the outer container 20, a discharge opening 33 for allowing a fluid having passed through the inner opening portion 12 and the outer opening portion 22 to discharge to the exterior, and plural rib portions 34 supporting the valve member 40 described in detail later. The valve member 40 may be press-fixed to the rib portions 34. The valve member 40 may be made of a resilient material such as polypropylene, polyethylene, or a resin mixed with rubber, so as to promote press-fitting.

[0058] Additionally, a lid member 35 having a shutoff portion 351 to be fitted in the discharge opening 33 is turnably attached to the joined member 30. The inner joined portion 31 in the joined member 30 comprises a female-screw portion 311 to be fitted in the male-screw portion 121 in the inner container 10. The outer joined portion 32 in the joined member 30 has a shape to be fitted in the convex portion 21 in the outer container 20. The convex portion 21 may have a thickness of about 0.5 mm to about 2.0 mm greater than that of the fluid-storing portion. The plural rib portions 34 in the joined member 30 are disposed in the vicinity of the discharge opening 33 at even intervals.

[0059] The female-screw member 30 and the male-screw portion 121 can be replaced with a convex-concave configuration such as snap fasteners or they can be press-fixed. When the inner joined portion 31 is engaged with the inner opening portion 12, an annular convex 39 provided at a bottom of the inner joined portion 31 is tightly attached to a top edge surface of the inner opening portion 12, thereby sealing a connection between the joined member and the inner container. In this embodiment, the outer joined portion 32 has small annular projections at a bottom surface 38 so as to securely

attach the outer opening portion 22 of the outer container to the shoulder portion 15 of the inner container.

[0060] FIGS. 5(a)-(c) are explanatory views showing the valve member 40 in the fluid-storing container according to the first embodiment of the present invention. FIGS. 5(a)-(c) are a top view, side view, and sectional side view, respectively, showing the valve member 40.

[0061] The valve member 40 is produced by injection molding, etc. using synthetic resin as a material. This valve member 40 comprises a valve body 41 having a shape corresponding to an inner wall 122 of the inner opening portion 12 in the inner container 10, a joined portion 42 mounted upright from the valve body 41, and a mounted upright portion 43 mounted upright from the valve body 41 in a direction opposite to the joined portion 42. The joined portion 42 in the valve member 40 is supported by the rib portions 34 in the joined member 30.

[0062] When the interior of the fluid-storing portion 11 in the inner container 10 is pressurized, the valve body 41 in the valve member 40 travels to an open position in which the inner opening portion 12 in the inner container 10 is separated from the inner wall portion 122, thereby opening the opening portion so as to enable a fluid to pass through the inner opening portion 12 to the exterior. When the interior of the fluid-storing portion 11 in the inner container 10 is not pressurized, the valve body 41 in the valve member 40 travels to a shutoff position in which the valve body 41 comes in contact with the inner wall portion 122 of the inner opening portion 12 in the inner container 10, thereby shutting off the opening portion so as to disable a fluid to pass through the inner opening portion 12 to the exterior. Consequently, it becomes possible to prevent air from flowing into the fluid-storing container from the exterior.

[0063] FIG. 6 is a sectional side view showing the fluid-storing container according to the first embodiment of the present invention in its assembled state. FIG. 7 is an enlarged sectional side view showing the vicinity of the discharge opening 33 in the fluid-storing container shown in FIG. 6. FIG. 8 is an enlarged sectional side view showing the inner container 10, the outer container 20, and the joined member 30 in their joined state.

[0064] This fluid-storing container is built by welding the inner opening portion 12 and the opposite end portion 13 in the inner container 10, and the outer opening portion 22 and the opposite end portion 23 in the outer container 20 together. Consequently, it becomes possible to reduce manufacturing cost of the fluid-storing container. The welding can be performed after filling the inner container with a fluid by heat sealing. However, the bottom of the inner container and the bottom of the outer container need not be welded together. The inner container can be bottomed and filled with a fluid before attaching the joined member 30 and the outer container 20. The outer container 20 can be sealed after being fixed between the joined member 30 and the inner container 10.

[0065] The joined member 30 joins the inner container 10 and the outer container 20 so that an inner space 50

can be formed between the inner container 10 and the outer container 20. Additionally, the joined member 30 joins the inner container 10 and the outer container 20 so that a flow path enabling air to pass through between the exterior and the inner space 50 can be formed. With the female-screw portion 311 in the joined member 30 being screwed into the male-screw portion 121 in the inner container 10, the joined member 30 is joined with the inner container 10. With the outer joined portion 32 in the joined member 10 being joined with the convex portion 21 in the outer container 20, the joined member 30 is joined with the outer container 20. Because the inner container 10, the outer container 20, and the joined member 30 are joined together in this manner, it becomes possible to facilitate manufacturing of the fluid-storing container while its configuration is simple.

[0066] The outer opening portion 12 of the outer container 20 is fixedly interposed between the joined member 30 and the shoulder portion 15 of the inner container 10, wherein the outer joined portion 32 presses the outer opening portion 12 of the outer container 20 in a way that the bottom 38 of the outer joined portion 32 is engaged with the convex portion 21.

[0067] The flow path enabling air to pass through between the exterior and the inner space 50 comprises the cutout portions 211 formed in the outer container 20. These cutout portions 211 are formed so that a minute amount of air can pass through between the exterior and the inner space 50. Through these cutout portions 211, a minute-amount of air passes through between the exterior and the inner space 50. An air passage is secured by an annular step 27 which may have a height of about 0.1 mm to about 0.5 mm. Consequently, air inflow from the exterior to the inner space 50 and air outflow from the inner space 50 to the exterior are regulated, and thus it becomes possible to prevent an outer shape of the fluid-storing container from changing according to a fluid amount stored while a configuration is simple.

[0068] FIGS. 9 to 11 are sectional side views of the fluid-storing container according to the first embodiment of the present invention. Of these views, FIG. 9 shows a state in which a pressure is applied to the fluid-storing container from the exterior of the fluid-storing container; FIG. 10 shows a state immediately after the pressure applied to the fluid-storing container from the exterior was removed; FIG. 11 shows a state after a while since the pressure applied to the fluid-storing container from the exterior was removed.

[0069] As shown in FIG. 9, when a pressure is applied to the fluid-storing container from the exterior, the interior of the fluid-storing portion 11 in the inner container 10 and the inner space 50 are pressurized. Because of this, the valve body 41 of the valve member 40 travels to an open position in which it is separated from the inner wall portion 122 of the inner opening portion 12 in the inner container 10; thereby opening the opening portion so as to enable a fluid to pass through between the inner opening portion 12 and the exterior; and a fluid stored inside

the fluid-storing portion 11 is discharged from the discharge opening 33. Additionally, air in the inner space 50 flows out to the exterior through the cutout portions 211, which serve as flow paths. Additionally, because the cutout portions 211 are formed so as to enable a minute amount of air to pass through between the exterior and the inner space 50, air outflow from the inner space 50 to the exterior can be limited to a small amount. Consequently, it becomes possible to apply an appropriate pressure to the fluid-storing portion 11 in the inner container for allowing a fluid to flow out.

[0070] As shown in FIG. 10, when a pressure applied to the fluid-storing container from the exterior is removed, the interior of the fluid-storing portion 11 is depressurized by the elastic resilience of the inner container 10. Because of this, the valve member 40 travels to a shutoff position in which it comes in contact with the inner wall portion 122 of the inner opening portion 12 in the inner container 10. At this time, the valve member 40 travels while bringing in a fluid remaining in the vicinity of the discharge opening 33. By this, it becomes possible to make a fluid amount remaining in the vicinity of the discharge opening 33 small. Additionally, when a pressure from the exterior to the fluid-storing container is removed, the inner space 50 is depressurized by the elastic resilience of the outer container 20. Because of this, air flows into the inner space 50 from the exterior through the cutout portions 211 as flow paths.

[0071] As shown in FIG. 11, after a while since a pressure applied to the fluid-storing container from the exterior was removed, the valve member 40 completely shuts off the opening portion so as to disable a fluid to pass through between the inner opening portion 12 and the exterior. Because of this, it becomes possible to prevent air from flowing into the fluid-storing container from the exterior. Additionally, air from the exterior flows into the inner space 50, and an external shape of the outer container 20 is restored.

[0072] Other embodiments of the present invention are described based on drawings attached. Additionally, for the portions identical to those of the first embodiment described above, detailed descriptions are omitted by marking them with the same symbols.

[0073] FIGS. 12(a) and (b) are explanatory view showing an inner container 60 in the fluid-storing container according to a second embodiment of the present invention. FIGS. 12 (a)-(b) are a top view, and sectional side view, respectively, showing the inner container 60 in the fluid-storing container according to the second embodiment of the present invention.

[0074] Although the fluid-storing container according to the first embodiment of the present invention comprises the inner container 10, the fluid-storing container according to the second embodiment of the present invention comprises the inner container 60 in place of the inner container 10.

[0075] This inner container 60 has a fluid-storing portion 61 for storing a fluid. An inner opening portion 62 for

allowing a fluid to flow out is formed at one end of the inner container 60. Additionally, the inner container 60 comprises a male-screw portion 621 on the outer side of the inner opening portion 62, and an inner wall portion 622 on its inner side. Further, the inner container 60 comprises plural rib portions 64 on the inner wall portion 622 of the inner opening portion 62. These plural rib portions 64 are for supporting a mounted upright portion 43 in the valve member 40. These rib portions 64 are disposed in the inner wall portion 622 at even intervals. Additionally, the inner opening portion 62 and an opposite end portion 63 in the inner container 60 are formed open. Similarly to the fluid-storing container in the first embodiment, the inner opening portion 62 and the opposite end portion 63 in the inner container 60 are welded with an outer opening portion 22 and an opposite end portion 23 in an outer container 20.

[0076] The joined member 30' is configured to fix the valve member 40 in association with the rib portions 64. In this embodiment, the valve member 40 need not be fixedly attached to the rib portions 34 by press fitting, for example. The outer container 20 is fixed between the shoulder portion 65 of the inner container 60 and the joined member 30'.

[0077] According to the fluid-storing container according to the second embodiment of the present invention, a joined portion 42 in the valve member 40 is supported by rib portions 34 in a joined member 30, and the mounted upright portion 43 in the valve member 40 is supported by the rib portions 64 in the inner container 60. Because of it, the valve member 40 is stably fixed, and thus it becomes possible to open/shut off the discharge opening of the valve member 40 more appropriately.

[0078] Additionally, the valve member 40 may be slidably supported between the rib portions 34 and the rib portions 64. In this case, the valve member 40 travels upward when the interior of the fluid-storing portion 11 is pressurized; the valve member 40 travels downward when pressurization to the interior of the fluid-storing portion 11 is removed. Because of this, a fluid having passed through the valve member 40 and flowed out to the vicinity of the discharge opening can be brought back in as the valve member 40 travels downward. By this, it becomes possible to control fluid accumulation in the vicinity of the discharge opening. Additionally, in this case as well, the valve member 40 is stably fixed, and thus it becomes possible to open/shut off the discharge opening of the valve member 40 more appropriately.

[0079] FIGS. 14(a) and (b) are explanatory views showing an outer container 70 in the fluid-storing container according to a third embodiment of the present invention. FIGS. 14 (a)-(b) are a top view, and sectional side view, respectively, showing the outer container 70 in the fluid-storing container according to the third embodiment of the present invention. FIG. 15 is an enlarged sectional side view showing the vicinity of a discharge opening 33 in the fluid-storing container according to the third embodiment of the present invention.

[0080] Although the fluid-storing container according to the first embodiment of the present invention comprises the outer container 20, the fluid-storing container according to the third embodiment of the present invention comprises the outer container 70 in place of the outer container 20.

[0081] In this outer container 70, an outer opening portion 72, which an inner opening portion 12 in an inner container 10 can go through when it encloses the inner container 10, is formed. Additionally, the outer container 70 comprises an annular convex portion 71 around the outer opening portion 72. Further, in this convex portion 71, four cutout portions 711 and an inner-container joined portion 712 are formed. Additionally, the outer opening portion 72 and an opposite end portion 73 of the outer container 70 are formed open. Similarly to the fluid-storing container according to the first embodiment, the inner opening portion 12 and an opposite end 13 in an inner container 10', and the outer opening portion 72 and an opposite end portion 73 in the outer container 70 are welded. The outer opening portion 72 also has an annular step 77 to secure an air passage.

[0082] According to the fluid-storing container according to the third embodiment of the present invention, with the inner-container joined portion 712 of the outer container 70 being engaged with a bottom 112 of the inner opening portion 12 in the inner container 10', the inner container 10' and the outer container 70 are joined together in the inner opening portion 12 and the outer opening portion 72. Because of this, as compared with the fluid-storing container according to the first embodiment in which the inner container 10' and the outer container 20 are not joined together in the inner opening portion 12 and the outer opening portion 22, in the fluid-storing container according to the third embodiment in which the inner container 10' and the outer container 70 are joined together in the inner opening portion 12 and the outer opening portion 72, it becomes possible to regulate air inflow from the exterior into an inner space 50' or air outflow from the inner space 50' to the exterior more appropriately.

[0083] FIG. 16 is an enlarged sectional side view showing the vicinity of a discharge opening 33 in a fluid-storing container according to a fourth embodiment of the present invention.

[0084] Although the fluid-storing container according to the first embodiment of the present invention comprises the inner container 10 and the outer container 20, the fluid-storing container according to the fourth embodiment of the present invention comprises an inner container 60' according to the second embodiment in place of the inner container 10, and an outer container 70 in the fluid-storing container according to the third embodiment in place of the outer container 20.

[0085] According to the fluid-storing container according to the fourth embodiment of the present invention, a joined portion 42 in a valve member 40 is supported by rib portions 34 in a joined member 30', and a mounted

upright portion 43 in the valve member 40 is supported by rib portions 64. Additionally, with an inner joined portion 712 in the outer container 70 being engaged with the bottom 112 of an inner opening portion 62 in the inner container 60', the inner container 60' and the outer container 70 are joined together in the inner opening portion 62 and an outer opening portion 72. Because of this, the valve member 40 is stably fixed, and it becomes possible to open/shut off a discharge opening of the valve member 40 more appropriately, and thus it becomes possible to regulate air inflow from the exterior to an inner space 50 and air outflow from the inner space 50' more appropriately.

[0086] FIGS. 17(a)-(c) are explanatory views showing a joined member 80 in a fluid-storing container according to a fifth embodiment of the present invention. FIGS. 17 (a)-(c) are a side view, sectional side view, and backside view, respectively, showing the joined member 80. FIG. 18 is an enlarged sectional side view showing the vicinity of a discharge opening 83 in the fluid-storing container according to the fifth embodiment of the present invention.

[0087] Although the fluid-storing container according to the first embodiment of the present invention comprises the joined member 30, the fluid-storing container according to the fifth embodiment of the present invention comprises the joined member 80 in place of the joined member 30.

[0088] This joined member 80 comprises an inner joined portion 81 to be joined with a male-screw portion 121 in an inner container 10, an outer joined portion 82 to be joined with a convex portion 21 in an outer container 20, a discharge opening 83 for allowing a fluid having passed through an inner opening portion 12 and an outer opening portion 22 to discharge to the exterior, and plural rib portions 84 supporting a valve member 40. The periphery of the discharge opening 83 in the joined member 80 is formed so that its section slants smoothly. The joined member 80 also has an annular step 89 to securely seal a connection between a top edge surface of the inner opening portion of the inner container 10 and a top surface of the inner joined portion 81 of the joined member 80. A bottom surface 88 of the outer joined portion 82 also has an annular projection(s).

[0089] According to the fluid-storing container according to the fifth embodiment of the present invention, because the periphery of the discharge opening 83 of the joined member 80 has the above-mentioned shape, it becomes possible to allow a fluid to discharge more easily.

[0090] FIG. 19 is an enlarged sectional side view showing the vicinity of a discharge opening 83 in a fluid-storing container according to a sixth embodiment of the present invention.

[0091] Although the fluid-storing container according to the first embodiment of the present invention comprise the inner container 10 and the joined member 30, the fluid-storing container according to the sixth embodiment

of the present invention comprises an inner container 60 in the fluid-storing container according to the second embodiment in place of the inner container 10, and a joined member 80' in the fluid-storing container according to the fifth embodiment in place of the joined member 40. The joined member 80' is configured to fix the valve member 40 in association with the rib portions 64.

[0092] According to the fluid-storing container according to the sixth embodiment of the present invention, a joined portion 42 in a valve member 40 is supported by rib portions 84 in the joined member 80, and a mounted upright portion 43 in the valve member 40 is supported by rib portions 64 in the inner container 60. Additionally, the periphery of a discharge opening 83 in the joined member 80 is formed so that its section slants smoothly. Because of this, the valve member 40 is stably fixed, and thus it becomes possible to open/shut off a discharge opening of the valve member 40 more appropriately, and it becomes possible to allow a fluid to discharge more easily.

[0093] FIG. 20 is an enlarged sectional side view showing the vicinity of a discharge opening 83 in a fluid-storing container according to the seventh embodiment of the present invention.

[0094] Although the fluid-storing container according to the first embodiment of the present invention comprises the outer container 20 and the joined member 30, the fluid-storing container according to the seventh embodiment of the present invention comprises an outer container 70 in the fluid-storing container according to the third embodiment in place of the outer container 20, and a joined member 80" in the fluid-storing container according to the fifth embodiment in place of the joined member 30. The inner joined portion 81' of the joined member 80" is shorter than the outer joined portion 82 in order to accommodate the inner-container joined portion of the inner container 10' which is engaged with the convex portion 71 of the outer container 70.

[0095] According to the fluid-storing container according to the seventh embodiment of the present invention, with the inner-container joined portion 712 of the outer container 70 being engaged with the bottom 112 of an inner opening portion 12 of an inner container 10', the inner container 10' and the outer container 70 are joined in the inner opening portion 12 and an outer opening portion 72. Additionally, the periphery of a discharge opening 83 in the joined member 80 is formed so that its section slants smoothly. Because of this, it becomes possible to regulate air inflow from the exterior to an inner space 50' and air outflow from the inner space 50' to the exterior more appropriately and it becomes possible to allow a fluid to discharge more easily.

[0096] FIG. 21 is an enlarged sectional side view showing the vicinity of a discharge opening 83 in a fluid-storing container according to the eighth embodiment of the present invention.

[0097] Although the fluid-storing container according to the first embodiment of the present invention comprises

es the inner container 10, the outer container 20 and the joined member 30, the fluid-storing container according to the eighth embodiment of the present invention comprises an inner container 60' in the fluid-storing container according to the second embodiment in place of the inner container 10, an outer container 70 in the fluid-storing container according to the third embodiment in place of the outer container 20 and a joined member 80' in the fluid-storing container according to the fifth embodiment in place of the joined member 30.

[0098] According to the fluid-storing container according to the eighth embodiment of the present invention, a joined portion 42 in a valve member 40 is supported by rib portions 84 in the joined member 80', and a mounted upright portion 43 in the valve member 40 is supported by rib portions 64 in the inner container 60'. Additionally, with the mounted upright portion 43 in the valve member 40 being engaged with the periphery of an inner opening portion 62 in the inner container 60', the inner container 60' and the outer container 70 are joined in the inner opening portion 62 and an outer opening portion 72. Further, the periphery of a discharge opening 83 in the joined member 80' is formed so that its section slants smoothly. Because of this, the valve member 40 is stably fixed, and it becomes possible to open/shut off a discharge opening of the valve member 40 more appropriately, and thus it becomes possible to regulate air inflow from the exterior to an inner space 50' and air outflow from the inner space 50' to the exterior more appropriately, and it becomes possible to allow a fluid to discharge more easily.

[0099] Additionally, although any one of fluid-storing containers in the above-mentioned embodiments comprise the valve member 40, in place of the valve member 40, a member having a configuration making it possible for a fluid to pass through when the interior of the fluid-storing portion 11, 61 is pressurized, and making it impossible for a fluid to pass through when the interior of the fluid-storing portion 11, 61 is not pressurized may be provided. Additionally, a configuration needs not have the valve member 40.

[0100] Additionally, although the fluid-storing containers in the above-mentioned embodiments have the inner container 10, 10', 60, 60' having elastic resilience, an inner container composed of a soft material not having elastic resilience may be provided.

[0101] It is preferable that the valve member 40 in the above-mentioned embodiments is composed of a material using a resin such as polyethylene and polypropylene, synthetic rubber such as silicon rubber, or a mixture of the foregoing.

[0102] Although the inner container 60, 60' in the above-mentioned embodiments comprises five rib portions 34 as shown in FIG. 12, plural rib portions 34 other than five may be provided. Additionally, it is preferable that these rib portions 34 are three or more and are disposed at even intervals.

[0103] In the outer containers 20, 70 in the above-mentioned embodiments, although four cutout portions are

formed respectively as shown in FIG. 3 and FIG. 14, a singular or plural cutout portions other than four may be formed.

[0104] The fluid-storing containers in the above-mentioned embodiments have a configuration changing a fluid discharge amount according to a pressure applied from the exterior. With this configuration, for example, by decreasing a pressure from the exterior of the fluid-storing container, it is also possible to allow a fluid stored inside the fluid-storing container 11 or 61 to discharge drop by drop; or by increasing a pressure from the exterior of the fluid-storing container, it is possible to allow a fluid to discharge in a large amount.

[0105] The present invention includes the above mentioned embodiments and other various embodiments including the following:

[0106] 1) A tubular fluid-storing container having a fluid discharge opening at one end, which is characterized by comprising (i) an internal container having a fluid-storing portion for storing a fluid and an inner opening portion for allowing a fluid to flow out formed at its end, (ii) an outer container composed of a material having elastic resilience, which encloses the inner container and in which an outer opening portion that the inner opening portion in the inner container can go through is formed, and (iii) a joined member, which joins the inner container and the outer container in such a way that an inner space is formed between the inner container and the outer container as well as a flow path enabling air to pass through between the exterior and the inner space is formed.

[0107] . 2) In 1), the joined member comprises an inner joined portion to be joined with the inner container and an outer joined portion to be joined with the outer container.

[0108] 3) In 2), the outer container comprises an annular convex portion in the vicinity of the outer opening portion, and the outer joined portion in the joined member is fitted into the convex portion in the outer container.

[0109] 4) In 2) or 3), the inner container comprises a screw portion in the vicinity of the periphery of the inner opening portion, and the inner joined portion in the joined member comprises a screw portion to be screwed together with the screw portion in the inner container.

[0110] 5) In any one of 2) to 4), an end portion opposite to the inner opening of the inner container and an end portion opposite to the outer opening portion of the outer container are welded.

[0111] 6) In any one of 1) to 5), the inner opening portion in the inner container comprises a valve member.

[0112] According to 1), because it comprises the joined member, which joins the inner container and the outer container in such a way that an inner space is formed between the inner container and the outer container as well as a flow path enabling air to pass through between the exterior and the inner space is formed, it becomes possible to prevent an outer shape of the container from changing according to a fluid amount stored while its configuration is simple.

[0113] According to 2), because the joined member comprises an inner joined portion to be joined with the inner container and an outer joined portion to be joined with the outer container, it becomes possible to facilitate manufacturing of a fluid-storing container.

[0114] According to 3), because the outer container comprises an annular convex portion in the vicinity of the outer opening portion, and the outer joined portion in the joined member is fitted into the convex portion in the outer container, it becomes possible to facilitate manufacturing of a fluid-storing container while its configuration is simple.

[0115] According to 4), because the inner container comprises a screw portion in the vicinity of the periphery of the inner opening portion, and the inner joined portion in the joined member comprises a screw portion to be screwed together with the screw portion in the inner container, it becomes possible to facilitate manufacturing of a fluid-storing container while its configuration is simple.

[0116] According to 5), because an end portion opposite to the inner opening portion of the inner container and an end portion opposite to the outer opening portion of the outer container are welded, it becomes possible to reduce manufacturing cost.

[0117] According to 6), because the inner opening portion in the inner container comprises a valve member, it becomes possible to prevent air from flowing into the container from the exterior.

[0118] The present application claims priority to Japanese Patent Application No. 2004-246473, filed August 26, 2004, the disclosure of which is incorporated herein by reference in its entirety.

[0119] It will be understood by those of skill in the art that numerous and various modifications can be made without departing from the spirit of the present invention. Therefore, it should be clearly understood that the forms of the present invention are illustrative only and are not intended to limit the scope of the present invention.

Claims

1. A tubular fluid-storing container comprising:

an internal container having a fluid-storing portion for storing a fluid, a neck opening portion, and a shoulder portion around the neck opening portion;
 an outer container being capable of elastically restoring its shape, enclosing the inner container, and having an outer opening portion through which the neck opening portion of the inner container is inserted, wherein an inner space is formed between the inner container and the outer container; and
 a joined member having a fluid-discharge opening, being engaged with the neck opening portion of the inner container to connect the flu-

id-discharge opening and the neck opening portion, and pressing the outer opening portion against the shoulder portion of the inner container where an air path is formed through which air passes between the inner space and the exterior.

2. The tubular fluid-storing container according to Claim 1, wherein the joined member comprises an inner joined portion engaged with the neck opening portion of the inner container, and an outer joined portion pressing the outer opening portion against the shoulder portion of the inner container.

3. The tubular fluid-storing container according to Claim 2, wherein the outer opening portion of the outer container has at least one slit constituting the air path.

4. The tubular fluid-storing container according to Claim 3, wherein the outer opening portion of the outer container having the at least one slit has an annular step in contact with a surface of the shoulder portion of the inner container.

5. The tubular fluid-storing container according to Claim 3, wherein the at least one slit is comprised of two or more slits arranged at equal intervals.

6. The tubular fluid-storing container according to Claim 3, wherein the slit extends outward from an inner periphery of the outer opening portion to a position slightly outside the outer joined portion of the joined member to pass air through the slit.

7. The tubular fluid-storing container according to Claim 2, wherein the outer opening portion of the outer container has an annular convex edge portion, with which the outer joined portion of the joined member is engaged.

8. The tubular fluid-storing container according to Claim 7, wherein the outer opening portion including the annular convex edge portion of the outer container has at least one slit constituting the air path.

9. The tubular fluid-storing container according to Claim 7, wherein the annular convex edge portion of the outer opening portion of the outer container is fitted to a bottom of the neck opening portion.

10. The tubular fluid-storing container according to Claim 2, wherein the inner joined portion and the outer joined portion of the joined member are formed concentrically in an axial direction, wherein an inner wall of the inner joined portion is engaged with the neck opening portion, and a lower end of the outer joined portion presses the outer opening portion of

the outer container.

11. The tubular fluid-storing container according to Claim 2, wherein the outer opening portion of the outer container has an annular convex edge portion, with which the outer joined portion of the joined member is engaged. 5
12. The tubular fluid-storing container according to Claim 2, wherein the neck opening portion of the inner container is provided with male threads, and the inner joined portion of the joined member is provided with female threads with which the male threads are engaged. 10
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13. The tubular fluid-storing container according to Claim 1, wherein an end portion opposite to the neck opening portion of the inner container, and an end portion opposite to the outer opening portion of the outer container are welded. 20
14. The tubular fluid-storing container according to Claim 1, wherein the neck opening portion of the inner container is provided with a valve member disposed inside the neck opening portion. 25
15. The tubular fluid-storing container according to Claim 14, wherein the valve member is deformed to open a passage of the fluid stored in the fluid-storing portion when a pressure inside the fluid-storing portion increases. 30
16. The tubular fluid-storing container according to Claim 14, wherein the fluid-discharge opening of the joined member is provided with ribs which support the valve member. 35
17. The tubular fluid-storing container according to Claim 1, wherein the joined member has a lid portion for closing the fluid-discharge opening. 40

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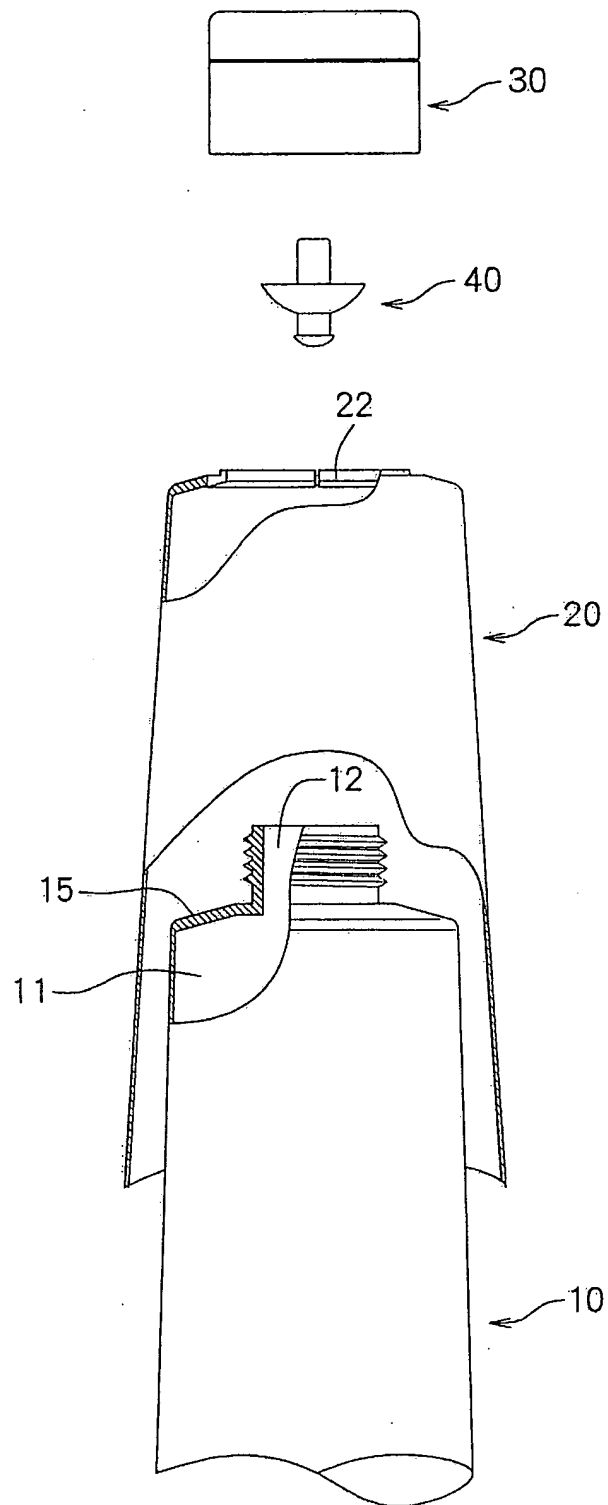
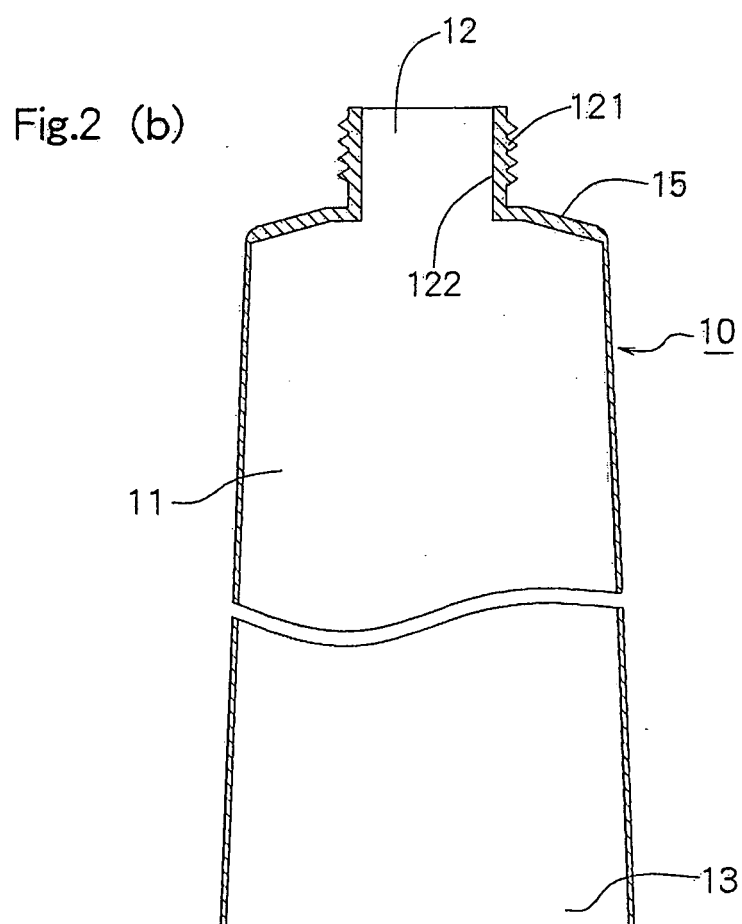
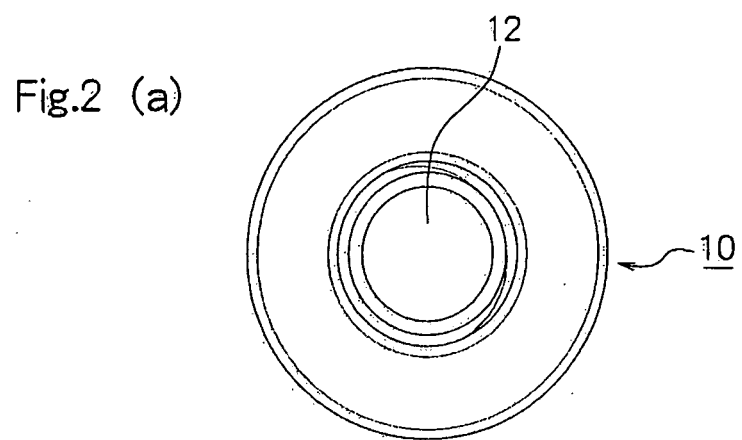


Fig.1



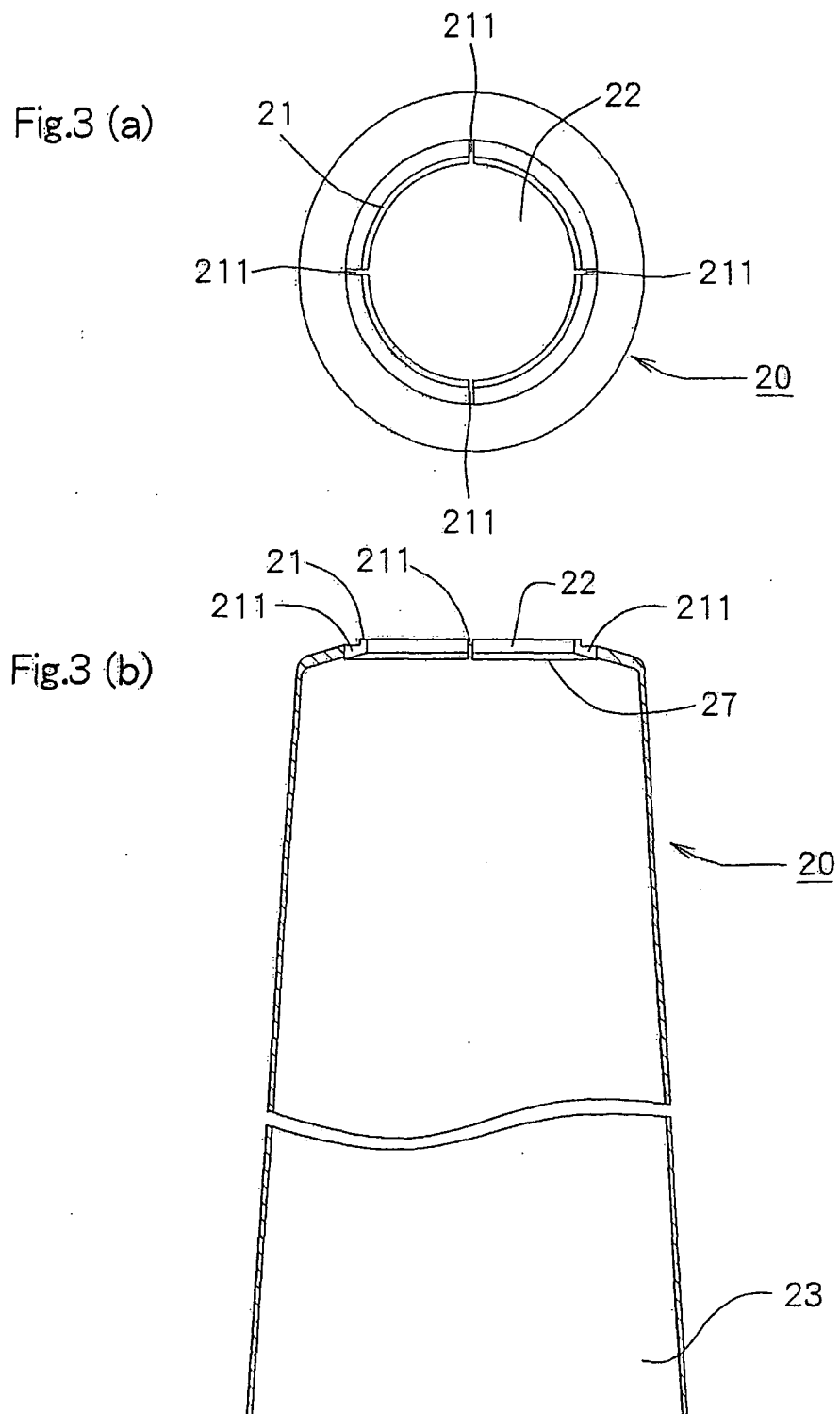


Fig.4 (a)

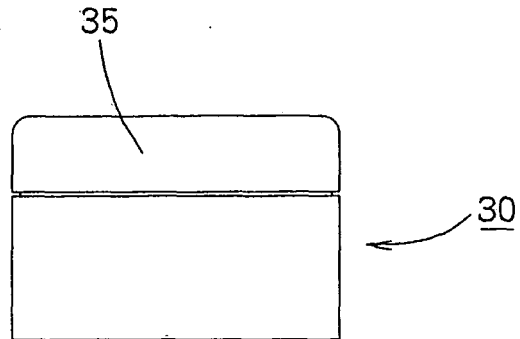


Fig.4 (b)

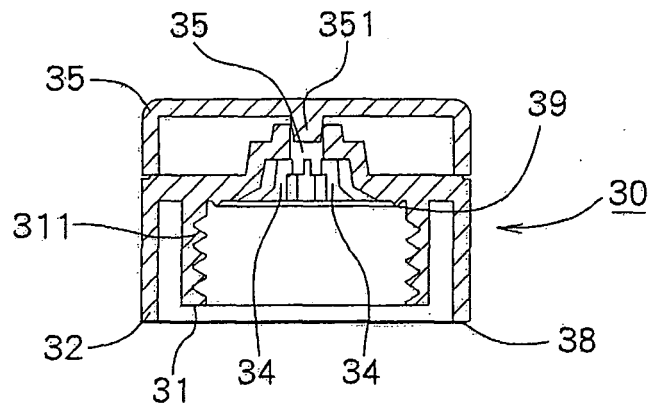
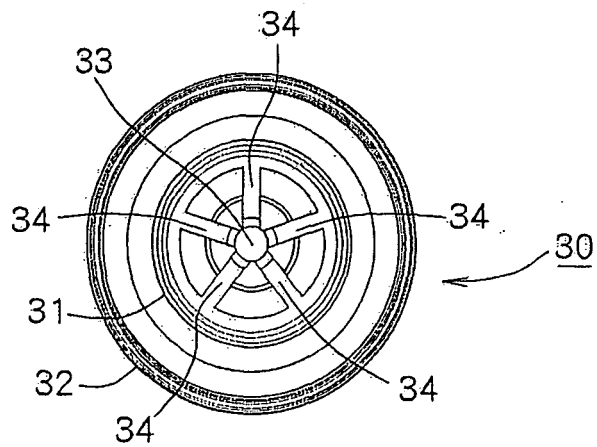
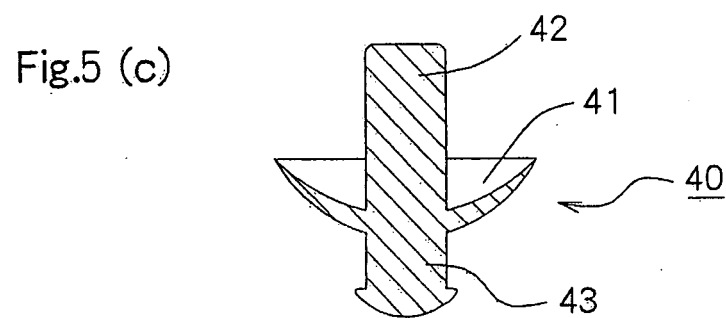
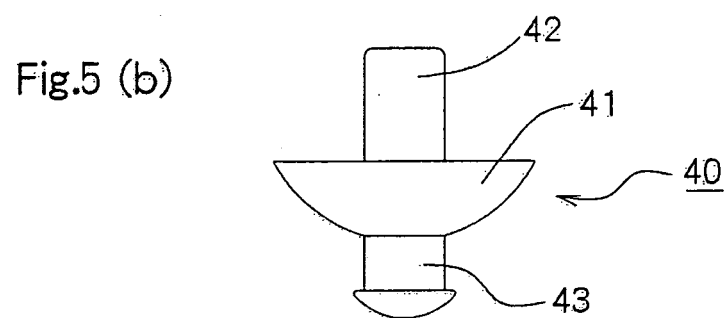
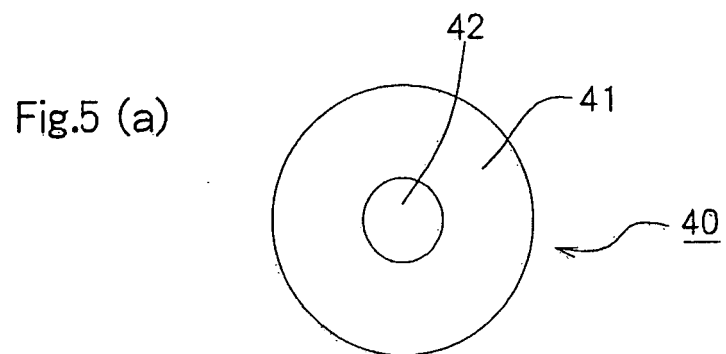


Fig.4 (c)





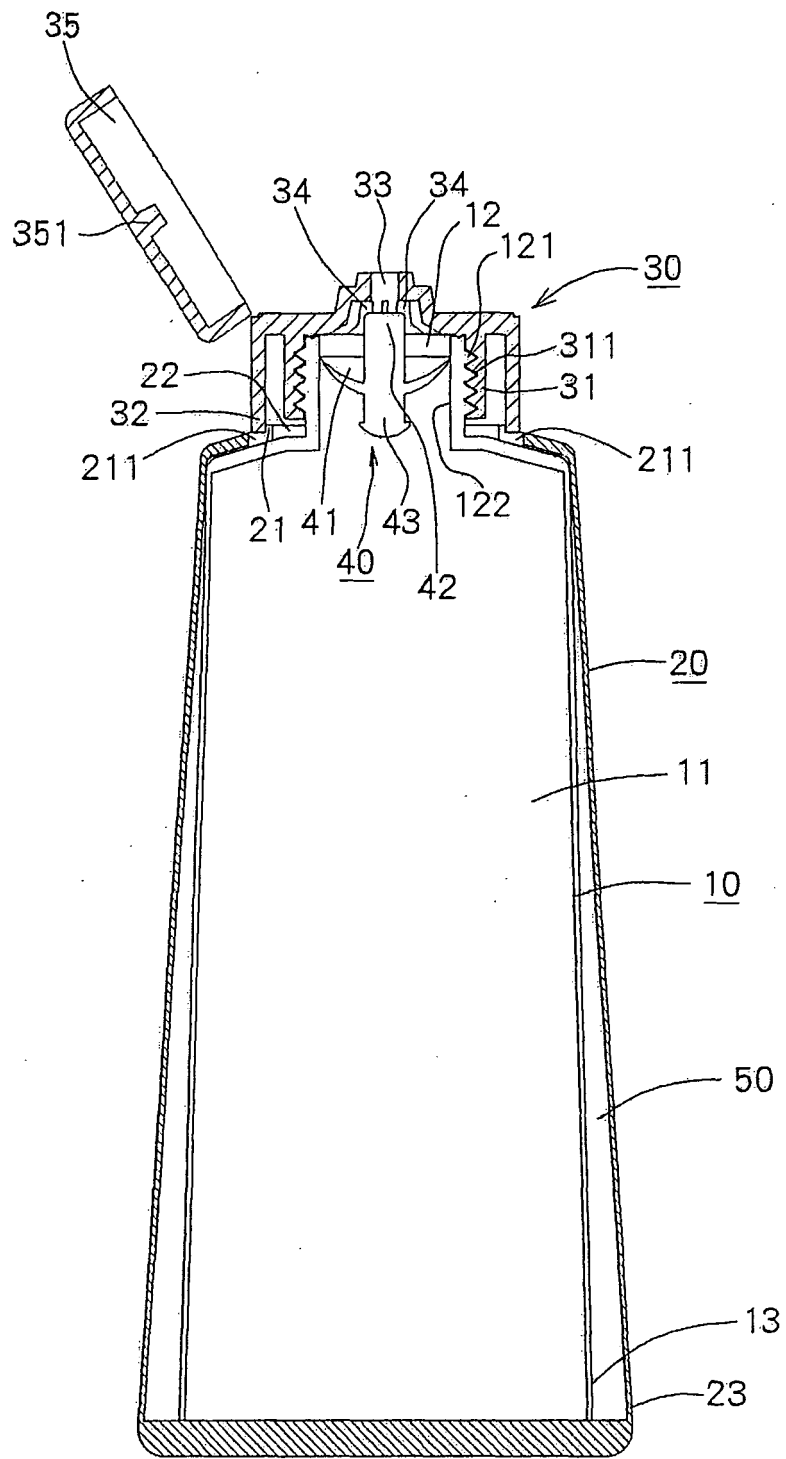


Fig.6

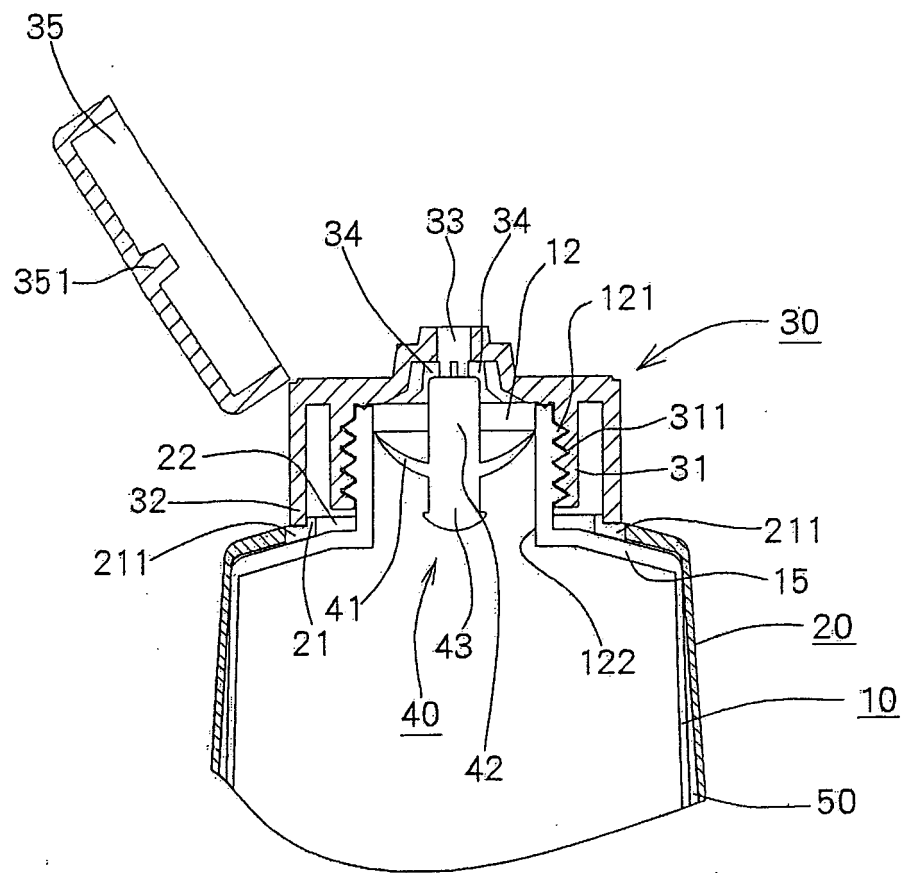


Fig.7

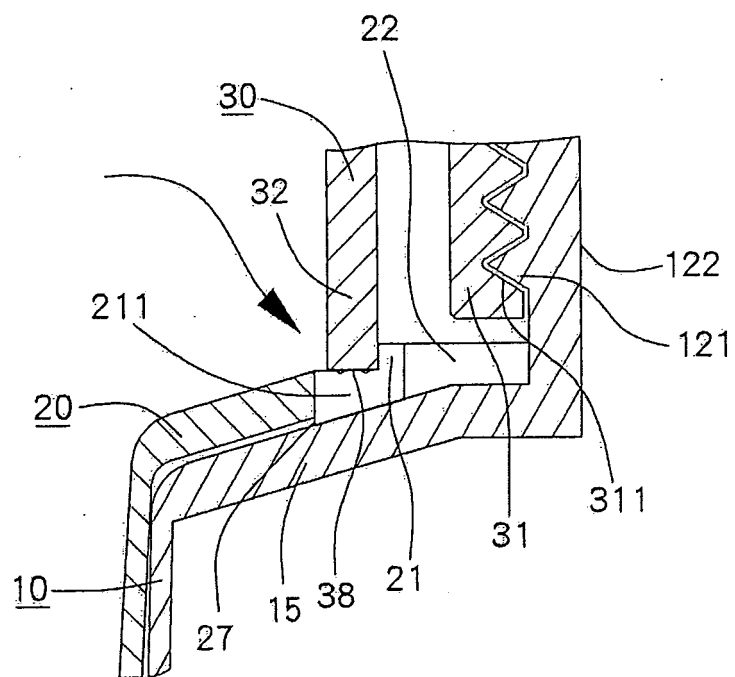


Fig.8

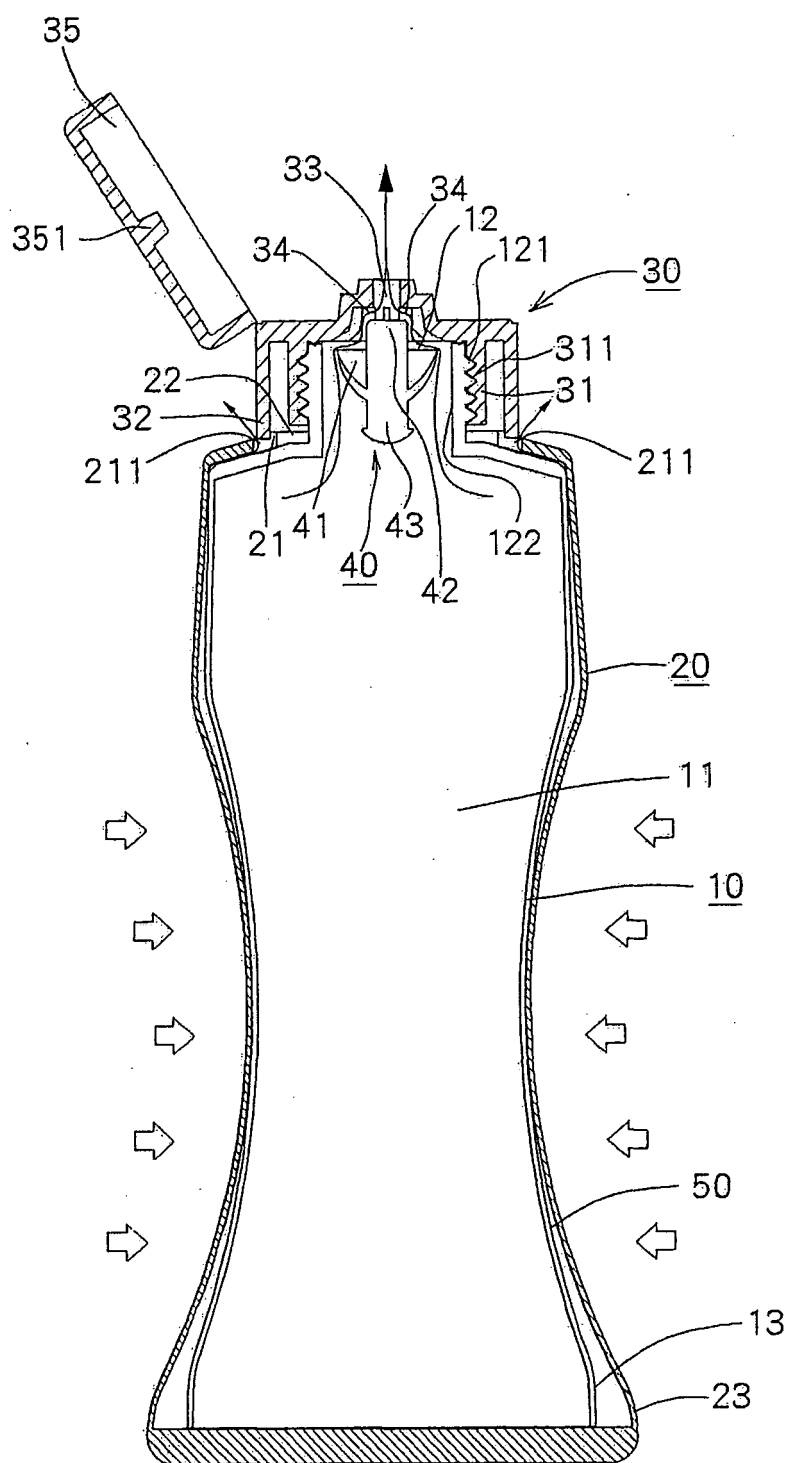


Fig.9

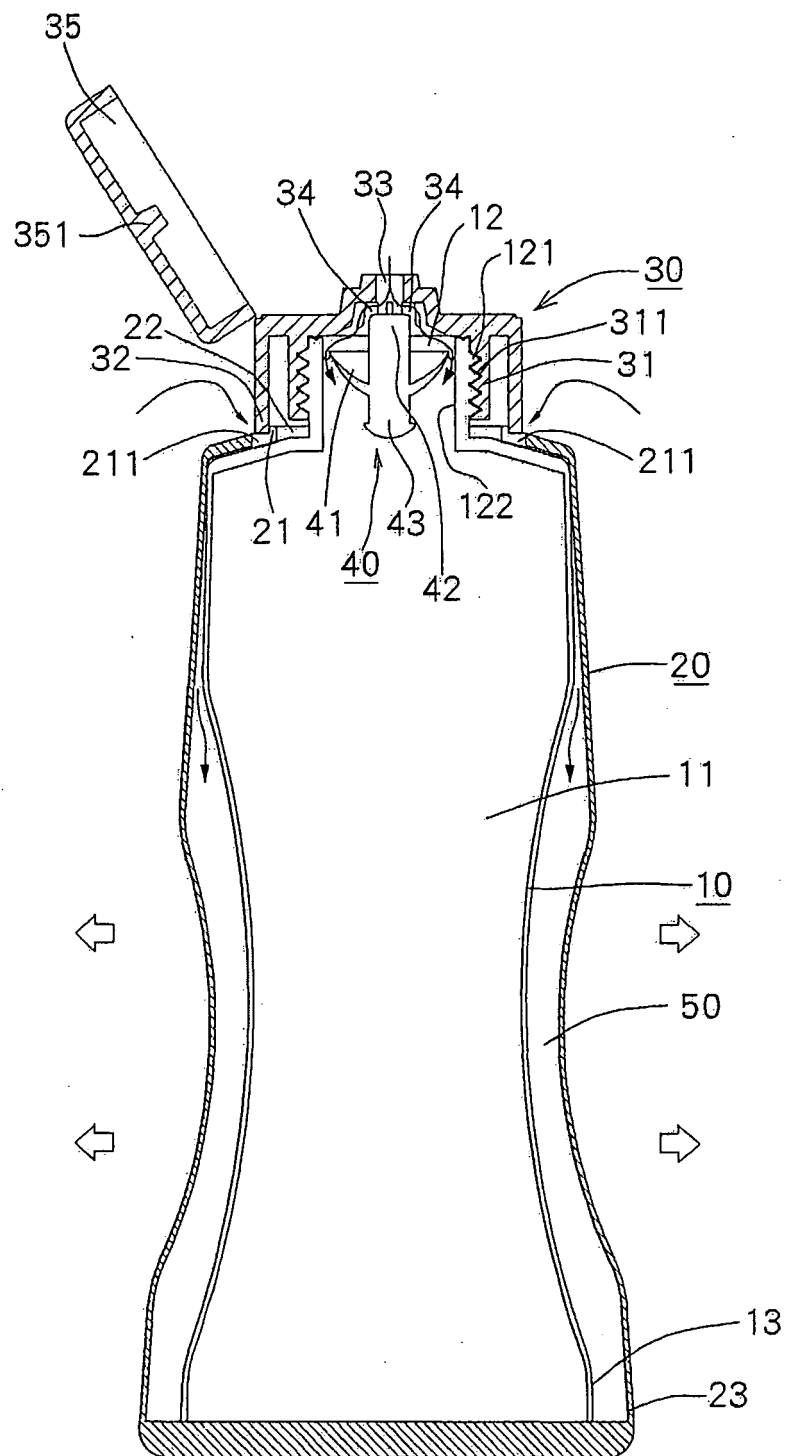


Fig.10

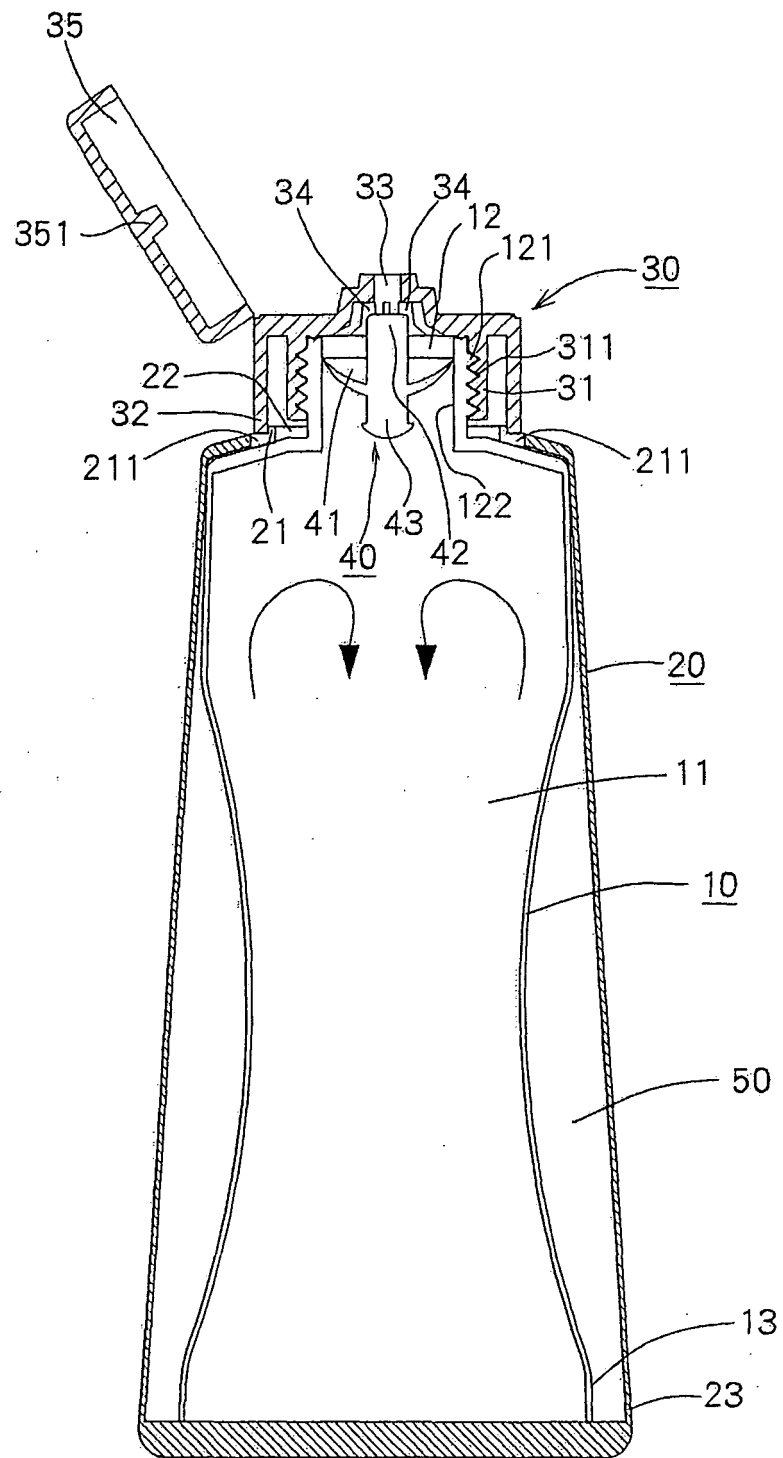


Fig.11

Fig.12 (a)

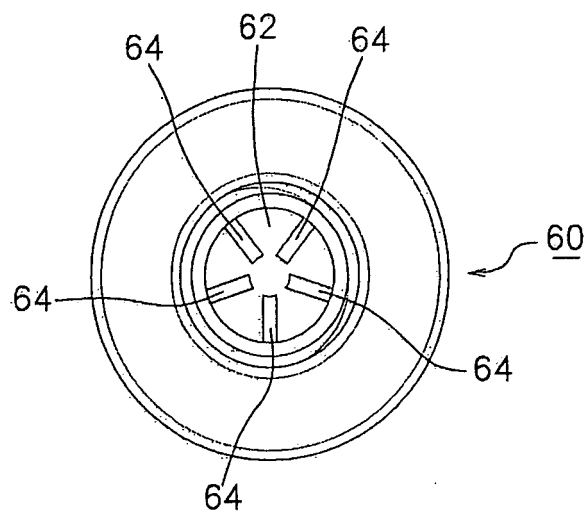
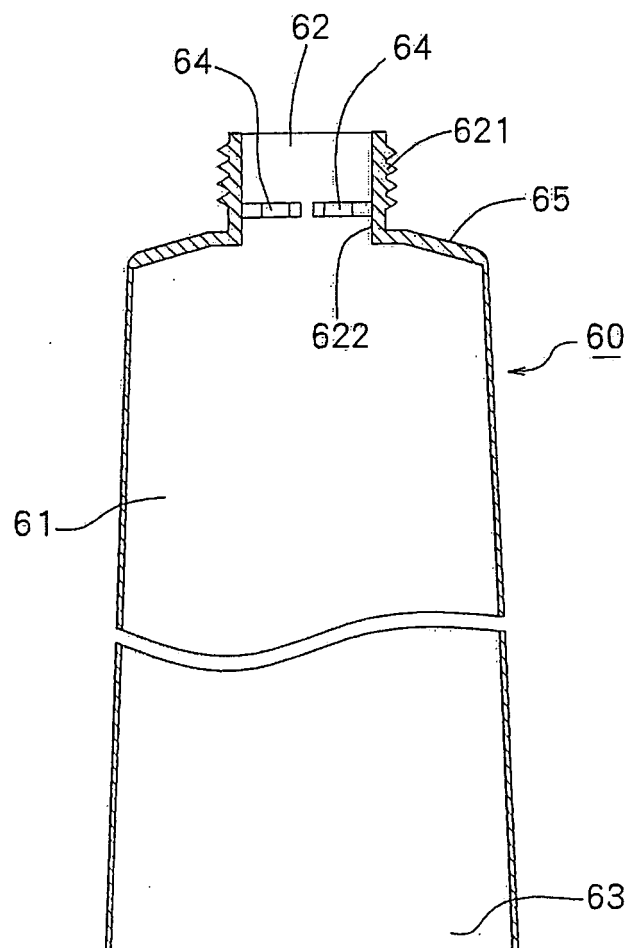


Fig.12 (b)



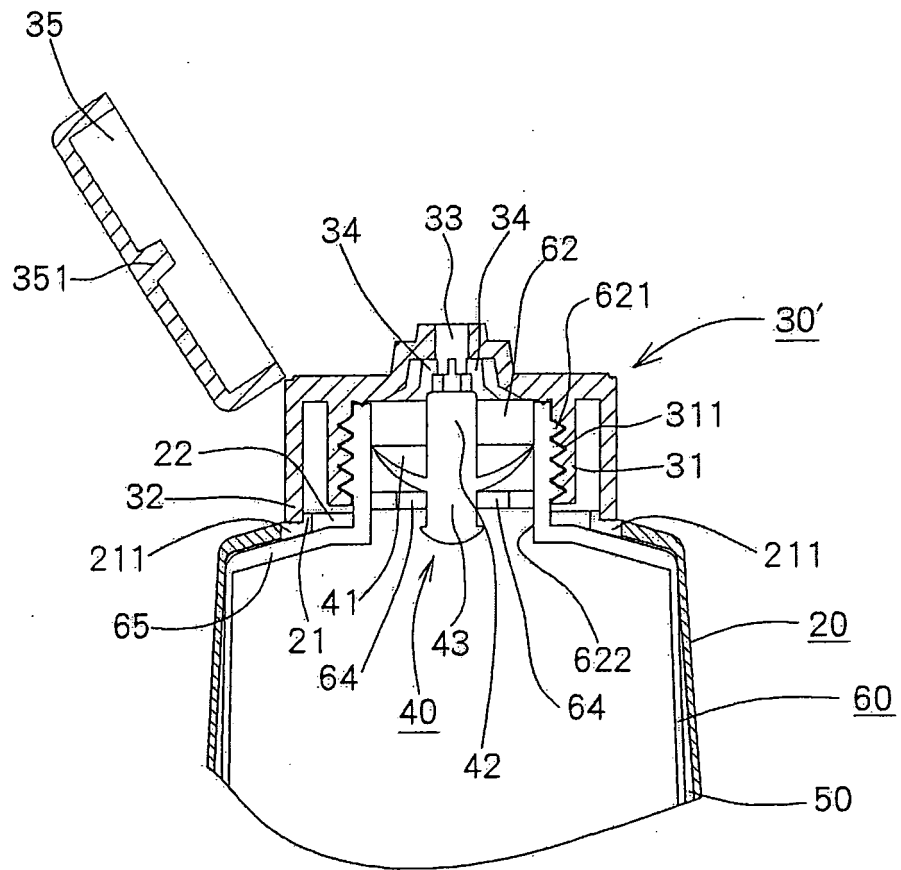


Fig.13

Fig.14 (a)

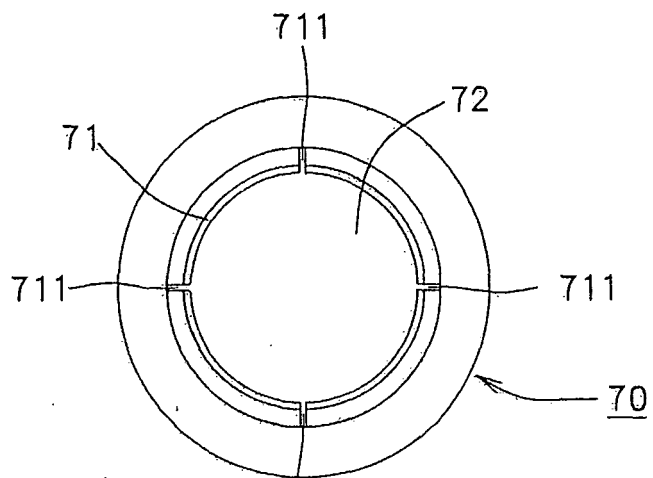
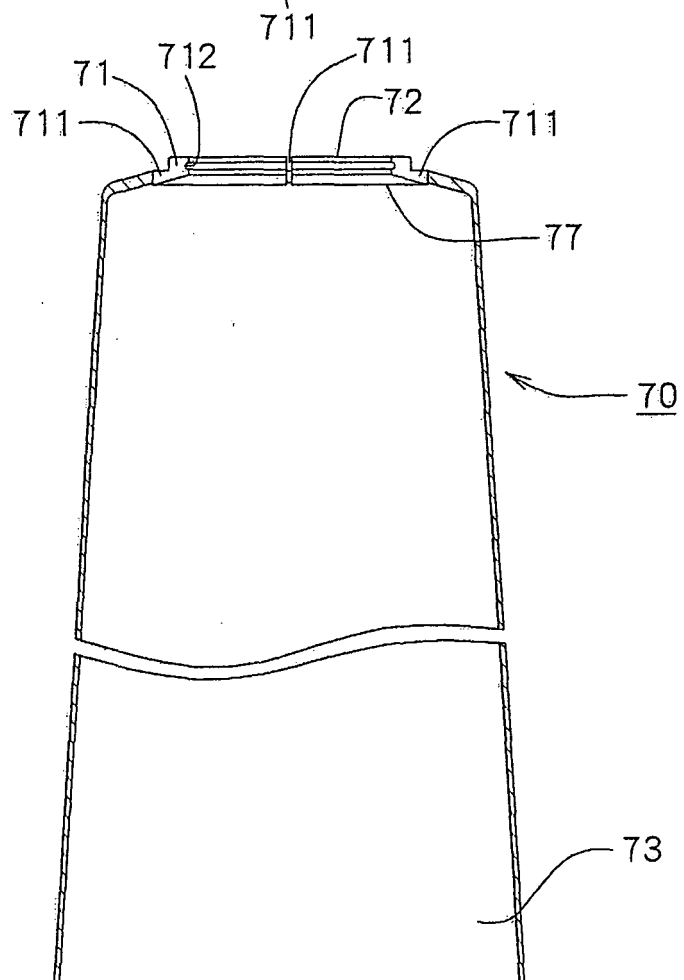


Fig.14 (b)



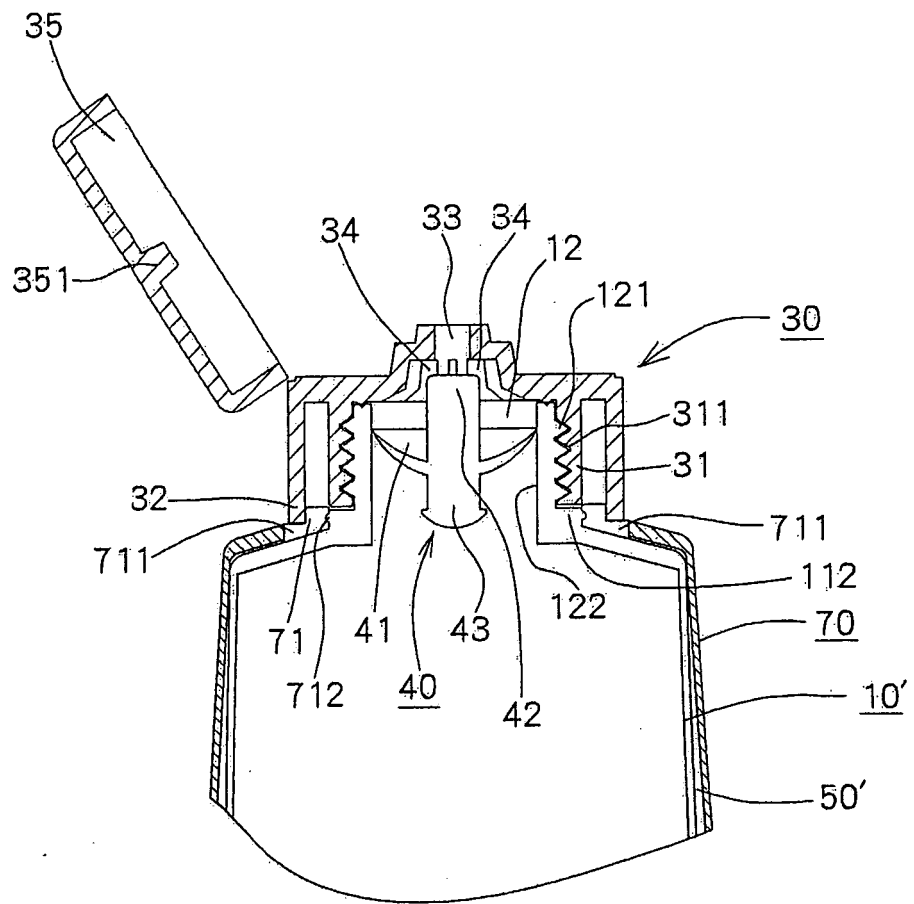


Fig.15

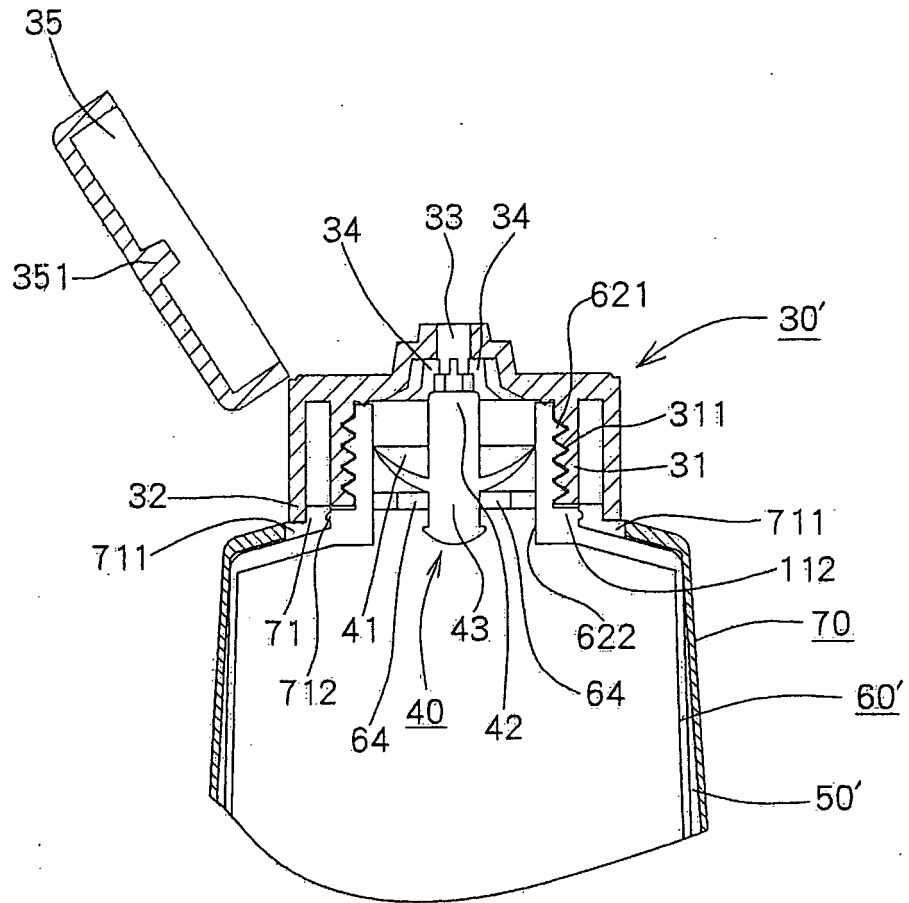


Fig.16

Fig.17 (a)

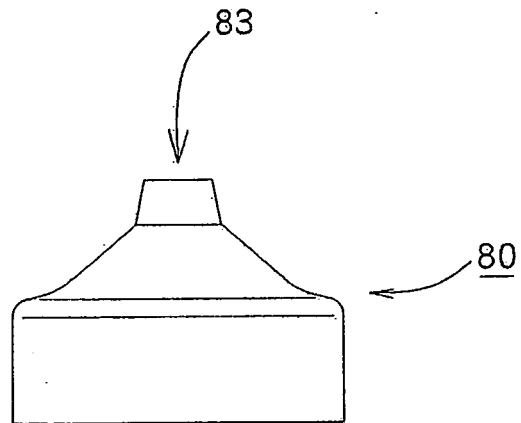


Fig.17 (b)

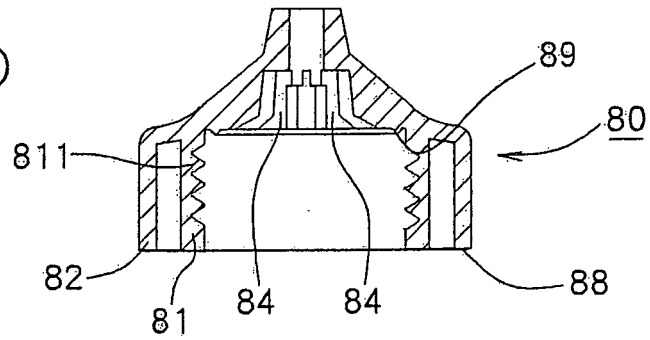
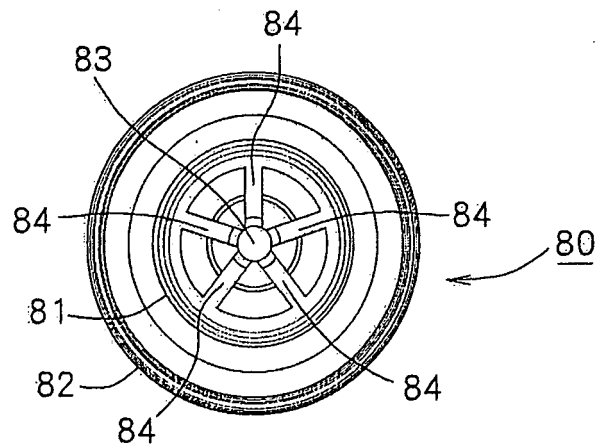


Fig.17 (c)



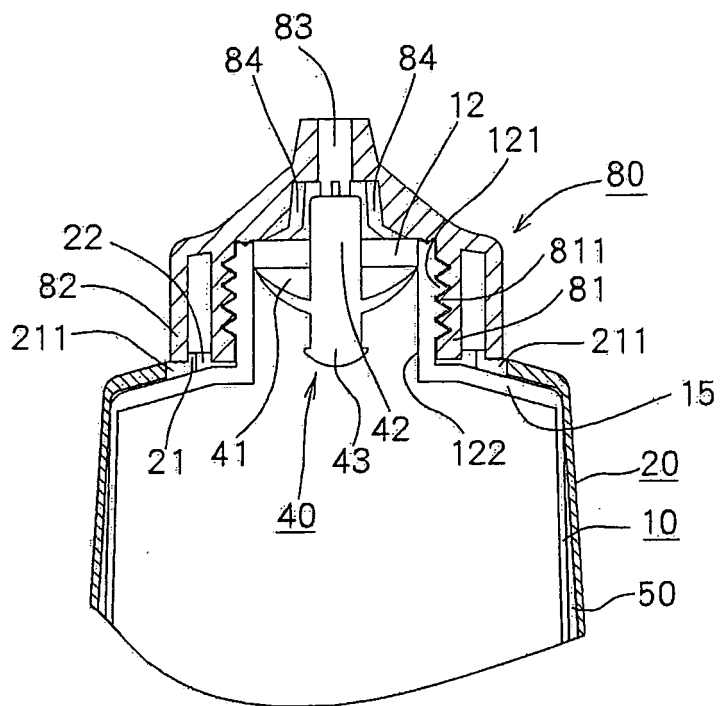


Fig.18

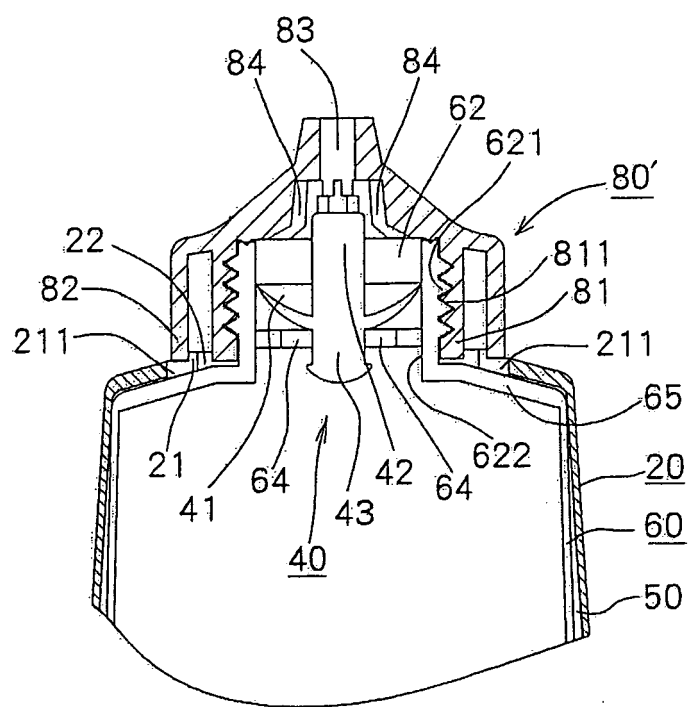


Fig.19

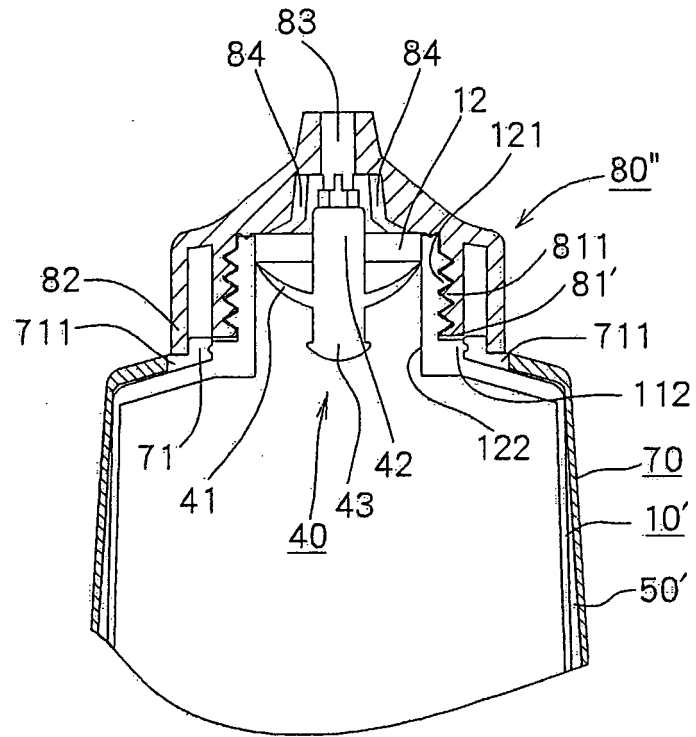


Fig.20

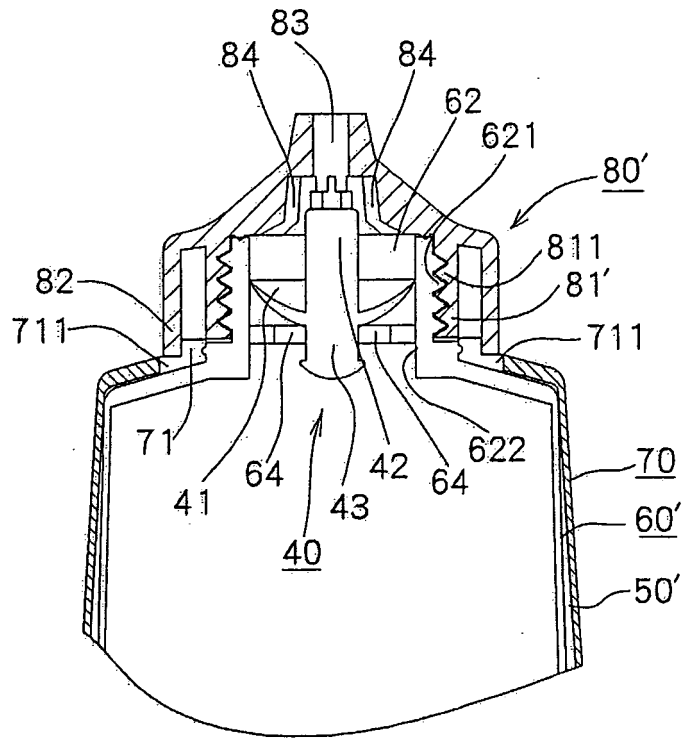


Fig.21



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 44 7193

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	FR 2 844 773 A (BOUMNSO JEROME) 26 March 2004 (2004-03-26) * page 7, line 27 - page 8, line 26; figure 1 *	1-17	B65D83/00
A	US 2003/226856 A1 (NAKAMURA HIROYUKI ET AL) 11 December 2003 (2003-12-11) * page 4, paragraph 67 - page 5, paragraph 69; figure 3 *	1-17	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 December 2005	Examiner Derrien, Y
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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06-12-2005

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