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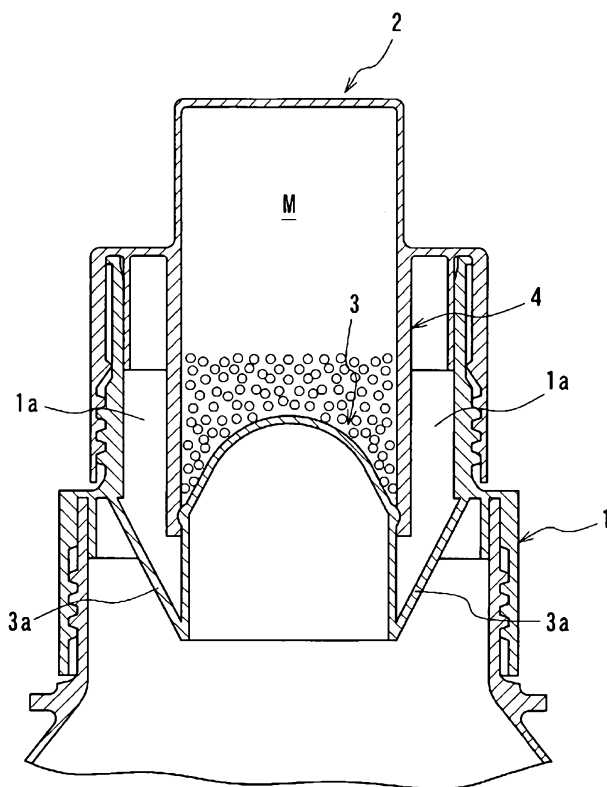
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(54) Title: BOTTLE CAP



(57) Abstract: A bottle cap includes a cylindrical body (1) to be attached to a mouth portion of a bottle, which provides a passage (1a) to communicate with an interior space of the bottle, and a lid body (2) detachably attached to the cylindrical body (1), for closing an outlet end of the passage (1a). The passage (1a) is provided with a dome-shaped bottom wall (3) having a peripheral portion that projects towards the outlet end of cylindrical body (1). The lid body (2) has a top wall and an inner wall adapted to fit with a peripheral portion of the bottom wall (3) to form a closed chamber (M) within the cap for storing an ingredient to be mixed with the content in the interior space of the bottle. The chamber (M) is opened when the lid body (2) is detached from the cylindrical body (1).

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BOTTLE CAP

TECHNICAL FIELD

[0001] The present invention relates to a bottle cap made of a synthetic resin, which is attached to a mouth portion of a container, such as a PET bottle, and which stores therein an ingredient to be mixed, upon opening of the bottle, with a liquid content in the bottle body.

BACKGROUND ART

[0002] Recently, with regard to bottles filled with soft drinks such as tea, fruit juice, healthy drink, mineral water, or the like, there are widely available on the market bottles equipped with a bottle cap having a chamber for storing an ingredient in the form of a powder, liquid or solid. When the bottle is opened, the ingredient is supplied from the chamber of the cap to the interior of the bottle body and mixed with the liquid content in the bottle body. Such a bottle cap is disclosed, for example, in Japanese Patent Publication JP-2003-2350A, and Japanese Utility Model Publication JP-50-18846Y2. This type of bottle cap is typically used in order to maintain the quality of the content as long as possible, by minimizing the adverse effects due to the external temperature, UV rays and/or oxidation.

[0003] Conventional bottle cap of this type is made of many components and it has been difficult to reduce the number of the components and lower the production cost. Moreover, the conventional bottle cap suffers from a problem that, when a lid for closing the ingredient-storing chamber is opened, the lid is allowed to fall into the bottle body together with the ingredient, thereby causing unpleasant appearance to customers or consumers as the case may be.

The above discussion of background art is included to explain the context of the present invention. It is not to be taken as an admission that any of the documents or other material referred to was published, known or part of the common general knowledge in Australia at the priority date of any one of the claims of this specification.

Throughout the description and claims of this specification, the word "comprise" and variations of that word, such as "comprising" and "comprises" are not intended to exclude other additives, steps or integers.

DISCLOSURE OF THE INVENTION

[0004] It is therefore a desirable outcome of the present inventors to provide an improved bottle cap which comprises as reduced number of components as possible, and

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which avoids falling of any component when the ingredient is supplied to the content in the bottle body.

[0005] The present invention provides a bottle cap, which comprises a cylindrical body to be attached to a mouth portion of a bottle, and providing a passage to communicate with an interior space of the bottle, and further comprising a lid body detachably attached to the cylindrical body, for closing an outlet end of the passage of the cylindrical body. The passage of the cylindrical body is provided with a dome-shaped bottom wall having a peripheral portion that projects towards the outlet end of cylindrical body. The lid body has a top wall and an inner wall adapted to surround and fit with a peripheral portion of the bottom wall, thereby forming a closed chamber within the cap for storing an ingredient to be mixed with a content in the interior space of the bottle, wherein said chamber is opened when the lid body is detached from the cylindrical body, wherein the dome-shaped bottom wall and said undercut are adapted to cooperatively result in a substantially uninterrupted slope for introduction of the ingredient to the interior space of the bottle upon opening of the chamber.

[0006] In the bottle cap configured as above, it is preferred that the dome shaped bottom wall has spokes for supporting and fixing the bottom wall to a side wall of the cylindrical body, while maintaining the passage so that the passage can communicate with the internal space of the bottle.

[0007] The closed chamber of the bottle cap according to the present invention serves to store the ingredient either alone or together with an inert gas.

[0008] It is preferred that the bottom wall is fitted with the inner wall by an undercut.

[0009] The bottle cap according to the present invention has a simple two parts structure, comprised of a cylindrical body for sealing the mouth portion of a bottle and forming a ingredient storing chamber in cooperation with the dome shaped bottom wall, and a lid body for covering the cylindrical body. Moreover, since the ingredient is supplied through a gap between the cylindrical body and the lid body into the interior space of the bottle and mixed with the content therein, the risk of any one component falling into the interior space of the bottle can be positively avoided upon opening of the ingredient-storing chamber.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention will be more specifically described below with reference to the attached drawings.

[0011] FIG. 1 is a sectional view of a bottle cap according to a Preferred embodiment of the present invention.

[0012] FIG. 2 is a bottom view of the bottle cap of FIG. 1 depicting the major components of the bottle cap.

[0013] FIG. 3 is an explanatory view showing the ingredient as being added to, and mixed with the content in the bottle.

[0014] FIG. 4 is an explanatory view showing how to pour the mixture from the bottle.

5 [0015] FIG. 5 is an explanatory view showing how to charge the ingredient into the ingredient-storing chamber of the bottle cap.

[0016] FIG. 6 is a sectional view of a bottle cap according to another embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

10 [0017] In the drawings, reference numeral 1 denotes a cylindrical body of a bottle cap according to the present invention, which is threadedly attached to the mouth portion of a bottle. The cylindrical portion 1 has passages 1a communicating with the interior space of the bottle, when the cap is attached to the bottle.

15 [0018] Reference numeral 2 denotes a lid body of the bottle cap, which is detachably attached to the cylindrical body 1 in appropriate manner, e.g., by a thread connection or by an undercut. When the lid body 2 is attached to the cylindrical body, the lid body 2 closes the outlet ends of the passages 1a of cylindrical body 1. Reference numeral 3 denotes a dome-shaped bottom wall provided at the center of the passages 1a in the cylindrical body 1. The bottom wall 3 has a peripheral region that projects toward the outlet end of cylindrical body 1. As shown in FIG. 2, the bottom wall 3 is fixed to the inner wall of the cylindrical body 1 via supporting spokes 3a, which not only support the bottom wall 3, but also maintain the passages 1a.

25 [0019] Reference numeral 4 denotes a cylindrical inner wall integrally constructed with the lid body 2. The inner wall 4 has an undercut to be fittingly engaged with the peripheral region of the bottom wall 3, such that a closed chamber M is formed within the lid body 2, for storing an ingredient to be added to the liquid content within the bottle body.

30 [0020] Before the bottle is deliberately opened, the liquid content in the bottle body and the ingredient to be added to the liquid content for mixture are strictly separated from each other, so as to stably maintain the quality of the

ingredient.

[0021] To open the bottle, first of all, the thread connection between the cylindrical body 1 and the lid body 2 is released so that the latter is displaced upwards. Then, as shown in FIG. 3, the fitting connection between the inner wall 4 and the bottom wall 3 at its peripheral region is released, so as to form a gap between the two previously fitting members.

[0022] Since the bottom wall 3 has a dome-like shape with the peripheral region projecting toward the outlet end of the cylindrical body, as shown in the figures, the ingredient stored in the chamber M is allowed to rapidly fall down along the slope of the bottom wall 3, as soon as the gap is formed between the inner wall 4 and the bottom wall 3. Thus, no residue of the ingredient is left in the previously closed chamber M, i.e., all the volume of the ingredient that had been stored in the chamber M is allowed to completely fall down into the interior space of the bottle.

[0023] After it has been confirmed that all the ingredient has fallen down, the lid body 2 is again threadedly connected with the cylindrical body 1 tightly, so as to allow an intensive shaking of the bottle body until the ingredient is fully mixed with the liquid content to give a uniform mixture.

[0024] Then, as shown in FIG. 4, the cylindrical body 2 together with the lid body 3 is removed from the mouth portion of the bottle. It is now possible to pour from the bottle the uniform mixture obtained by dissolving the ingredient to the liquid content.

[0025] To fill a predetermined volume of the ingredient into the ingredient-storage chamber M for a new bottle, the lid body 2 is inverted as shown in FIG. 5, so that the ingredient can be charged into a cavity defined by the inner wall 4 and the top wall. Then, while maintaining the lid body 2 in the illustrated orientation, the peripheral region of the dome-shaped bottom wall 3 is fitted with the inner wall 4 of the lid body 2.

[0026] It is possible to fill the ingredient storage space M with an inert gas to prevent oxidation of the ingredient. Whether the ingredient is stored a solid, powder or liquid may be determined as appropriate, and the ingredient can be readily introduced into the space regardless of its selected physical form.

[0027] In the particular example illustrated above, the dome-shaped bottom wall 3 is fixed to the sidewall of the cylindrical body 1 via four supporting spokes 3a. It is of course that the number of supporting spokes 3a is not limited to four but may be more than four or fewer than four as needed, as long as the supporting arms do not interfere with the passage of the ingredient.

5 The components of the bottle cap may be made of a polypropylene resin, but the material is not limited to any specific one.

[0028] Another embodiment of the bottle cap according to the present invention is shown in FIG. 6. In this embodiment, the top surface of the lid body 2 covers the edge of the mouth of cylindrical body 1 and seals it by sandwiching the edge from both inside and outside. In addition, a virgin ring 5 is provided for the joining section between the cylindrical body 1 and the lid body 2, and another virgin ring 6 is provided for the joining section between the cylindrical body 1 and the mouth portion of the bottle, so as to allow detection or

10 prevention of fraudulent opening of the bottle, if any.

[0029] It will be appreciated from the foregoing description that the present invention provides an ingredient-containing bottle cap of a two-parts structure with minimized number of components, and serves to positively avoid falling of any component when the ingredient is added to the liquid content in the bottle for

15 mixture.

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CLAIMS

1. A bottle cap comprising a cylindrical body to be attached to a mouth portion of a bottle, and providing a passage to communicate with an interior space of the bottle, and further comprising a lid body detachably attached to the cylindrical body, for closing an outlet end of the passage of the cylindrical body, wherein:

the passage of the cylindrical body is provided with a dome-shaped bottom wall having a peripheral portion that projects towards the outlet end of cylindrical body, and

the lid body has a top wall and an inner wall adapted to surround and fit with a peripheral portion of the bottom wall, thereby forming a closed chamber within the cap for storing an ingredient to be mixed with a content in the interior space of the bottle, said chamber being opened when the lid body is detached from the cylindrical body,

wherein the dome-shaped bottom wall and said undercut are adapted to cooperatively result in a substantially uninterrupted slope for introduction of the ingredient to the interior space of the bottle upon opening of the chamber.

2. The bottle cap according to Claim 1, wherein the bottom wall has spokes for supporting said bottom wall by extending and joining to a side wall of the cylindrical body, while maintaining said passage in communication with the interior space of the bottle.

3. The bottle cap according to Claim 1 or claim 2, wherein said closed chamber serves to store said ingredient either alone or together with an inert gas.

4. The bottle cap according to any one of the preceding claims, wherein said bottom wall is fitted with the inner wall by an undercut.

5. A bottle cap, substantially as hereinbefore described with reference to any one of the accompanying drawings.

FIG. 1

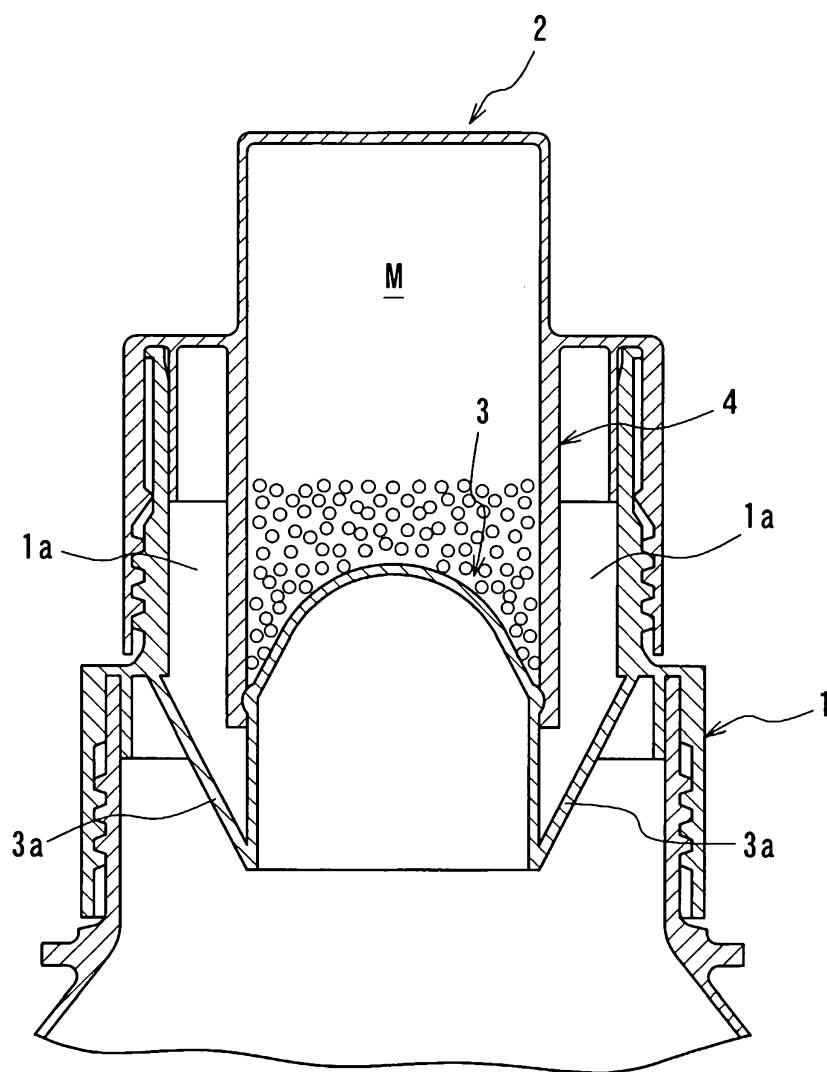


FIG. 2

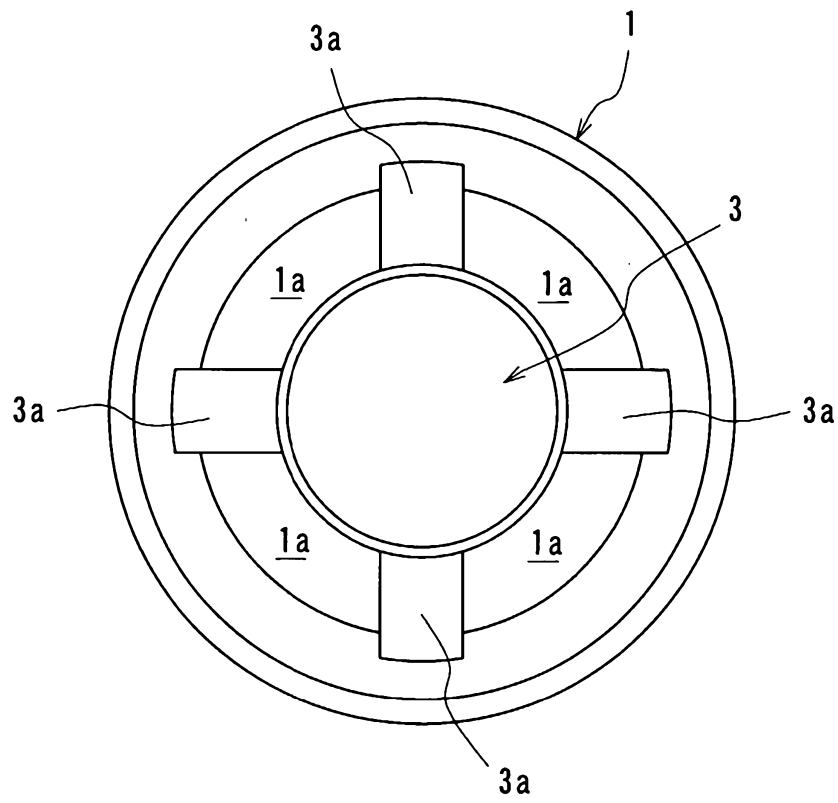


FIG. 3

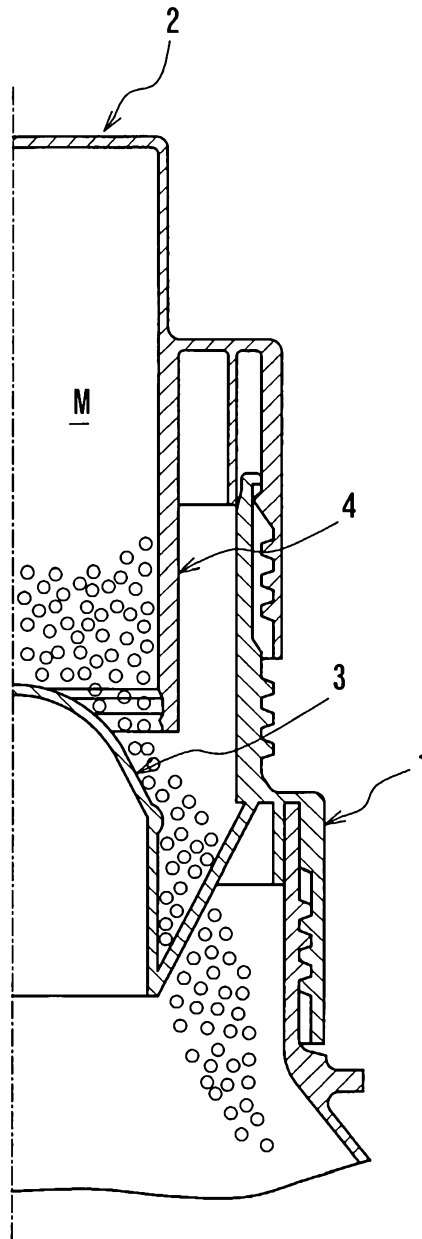


FIG. 4

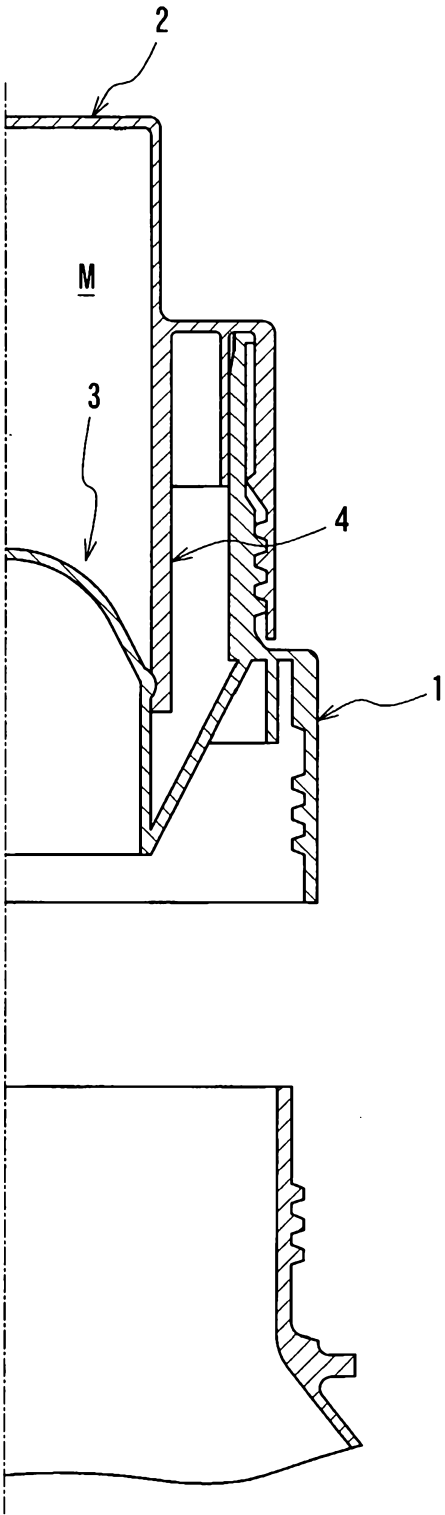


FIG. 5

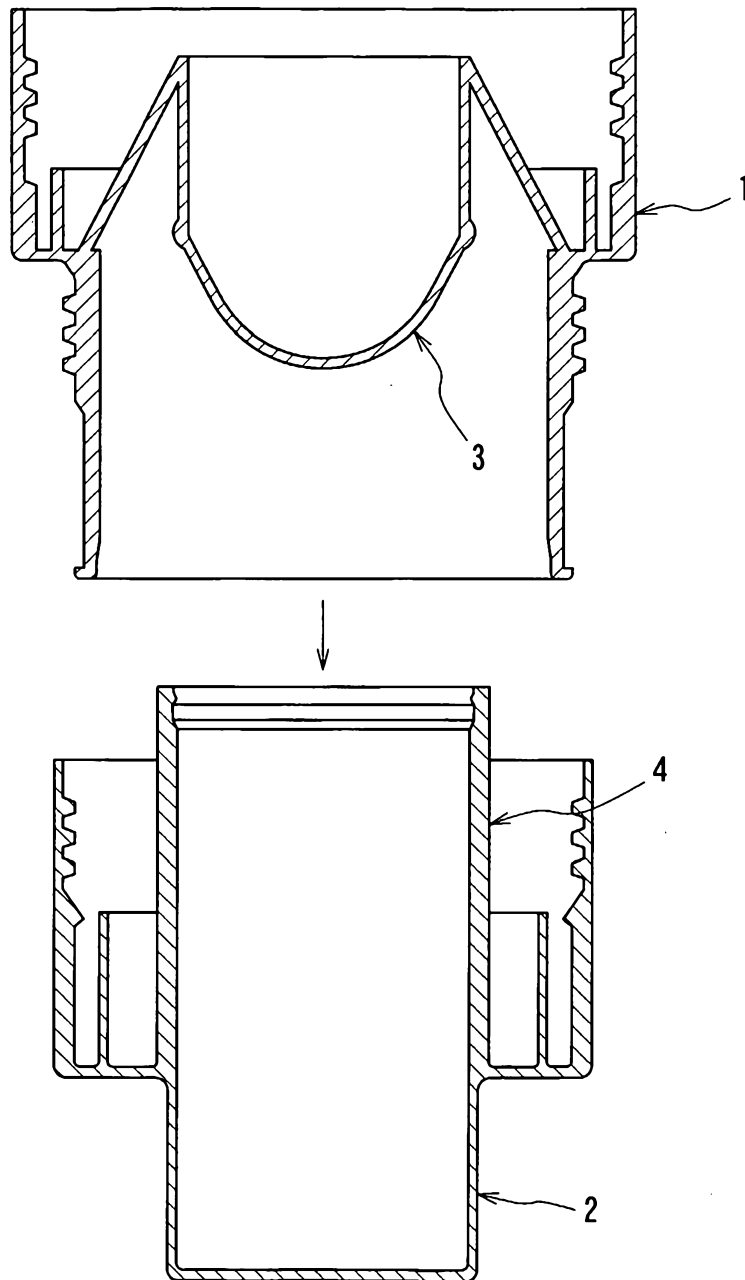


FIG. 6

