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

(11) **EP 3 666 678 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
29.06.2022 Bulletin 2022/26

(21) Application number: **18842930.2**

(22) Date of filing: **10.08.2018**

(51) International Patent Classification (IPC):
B65D 41/04 *(2006.01)* ***B65D 5/74*** *(2006.01)*
B65D 41/32 *(2006.01)* ***B65D 41/34*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65D 5/746; B65D 41/023; B65D 41/0414; B65D 41/0421; B65D 41/0428; B65D 41/325; B65D 41/3423

(86) International application number:
PCT/JP2018/030110

(87) International publication number:
WO 2019/031608 (14.02.2019 Gazette 2019/07)

(54) SPOUT STOPPER AND PACKAGING CONTAINER PROVIDED WITH SPOUT STOPPER

STOPFEN FÜR AUSGIESSTÜLLE UND VERPACKUNGSBEHÄLTER DAMIT

BOUCHON DE BEC VERSEUR ET RÉCIPIENT DE CONDITIONNEMENT POURVU D'UN BOUCHON DE BEC VERSEUR

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

(30) Priority: **10.08.2017 JP 2017155976**
26.07.2018 JP 2018140154
03.08.2018 JP 2018146726
07.08.2018 JP 2018148819

(43) Date of publication of application:
17.06.2020 Bulletin 2020/25

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Description

[Technical Field]

[0001] The present invention relates to a spout assembly and a packaging container having the spout assembly.

[Background Art]

[0002] Packaging containers having spout assemblies are widely used as containers for containing liquids or other contents. Such a spout assembly includes a spout welded to a container body and a cap to be threadably engaged with the spout.

[0003] JP 2016-011128 A describes a pour spout including a body made of a resin and welded to a paper container, and a screw cap made of a resin and detachable from the body. The body includes a spout having an outer periphery on which external threads are formed, a closure plate provided to the interior of the spout, and a pull ring provided to the closure plate. The screw cap includes a cylindrical part, a top plate and an inner ring. The cylindrical part has an inner surface on which internal threads are formed and is externally fitted to the spout of the body.

[0004] JP 2016-011128 A also describes that the pour spout can be produced by injection molding using a comparatively soft synthetic resin, such as polyethylene, as a material and that the gate for injecting the resin when molding the body is provided at a position of a die corresponding to the center of the closure plate.

[0005] WO 2016/017178 A1 relates to a spout assembly according to the preamble of claim 1.

[Summary of the Invention]

[Technical Problem]

[0006] The pour spout of JP 2016-011128 A is opened by inserting a finger into the pull ring provided to the spout, pulling the pull ring, and cutting and removing the closure plate from the spout. In the method of keeping sealing properties using the closure plate, opening is difficult depending on the size of the pull ring provided to the closure plate, or it takes time to pull out the pull ring.

[0007] The present invention aims to provide a spout assembly capable of ensuring high sealing properties with a structure in which the spout has no closure plate and to provide a packaging container having the spout assembly.

[0008] As a method of keeping sealing properties in the case of using a spout having no pull ring, the engagement between the spout and the threads of the cap may be designed to have high strength. However, increase in engagement strength between the spout and the threads raises another issue of requiring a larger force at the time of opening. If the container is made of paper, in particular, the need of applying a larger force (torque) to the container with the container being firmly held by hand raises an issue of involving difficulty at the time of opening.

[0009] The present invention aims to provide a spout assembly capable of preventing excessive force from being required during opening, while ensuring good sealing properties, with a structure in which the spout has no closure plate and to provide a packaging container having the spout assembly.

[0010] Pour spouts in which the body has no closure plate have been proposed. However, there is room for considering the position and the shape of the gate if closure plates are eliminated. If the position and the shape of the gate are not appropriately designed, flow of the resin material in the cavity becomes unstable. It is known that this unstable flow may cause residual stresses inside the products, leading to the occurrence of deformation, such as sink marks or warpage. In particular, products with large residual stresses tend to cause cracks due to ultrasonic welding at the position where the large residual stresses have occurred.

[0011] The present invention aims to provide a spout assembly capable of preventing the occurrence of residual stresses or the occurrence of deformation, such as sink marks or warpage, due to injection molding even when the spout assembly is structured to have a spout having no closure plate, and to provide a packaging container provided with the spout assembly.

[Solution to Problem]

[0012] The present invention relates to a spout assembly including a spout welded to a container body, and a cap threadably engaged with the spout. In the spout assembly, the cap includes a top plate, a side wall connected to an outer peripheral edge of the top plate and having an inner peripheral surface on which internal threads are formed, and an inner ring circumferentially provided to an inner surface of the top plate; the inner ring has an outer peripheral surface including, sequentially from the top plate, a first region having a first outer diameter, and a second region having a second outer diameter whose outermost diameter is smaller than the first outer diameter; the spout includes a side wall having an outer peripheral surface on which external threads are formed, the spout being made of a material having rigidity that is lower than that of the material for the cap; the side wall of the spout has an inner peripheral surface including, sequentially from an upper end facing away from the container body, a first region having a first inner diameter, and a second region having a second inner diameter whose innermost diameter is smaller than the first inner diameter. In a state in which the cap is threadably engaged with the spout, the first region of the inner ring is in close contact with the first region of the side wall of the spout throughout the circumference, the second region of the inner ring is in close contact with second region of the side wall of the spout throughout the circumference,

a predetermined part of the inner peripheral surface of the side wall of the cap is in close contact with a predetermined part of the outer peripheral surface of the side wall of the spout, and a space is formed between an area in which the first region of the inner ring is in close contact with the first region of the side wall of the spout and an area in which the second region of the inner ring is in close contact with the second region of the side wall of the spout.

[0013] It is preferred that the cap further includes a contact ring that is formed on the top plate and positioned between the side wall of the cap and the inner ring, and that the contact ring is in close contact with an upper end of the side wall of the spout in a state in which the cap is threadably engaged with the spout.

[0014] It is preferred that, in a process of placing the cap on the spout and rotating the cap in a closing direction: the first region of the inner ring pushes the side wall of the spout outward to closely contact the inner peripheral surface of the side wall of the spout, the second region of the inner ring thereafter pushes the side wall of the spout outward even more to contact the inner peripheral surface of the side wall of the spout, and the cap is thereafter brought into a state of being threadably engaged with the spout.

[0015] It is preferred that, in a state in which the cap has been disassembled from the spout, a difference between the first outer diameter of the inner ring and the first inner diameter of the side wall of the spout is larger than a difference between the second outer diameter of the inner ring and the second inner diameter of the side wall of the spout.

[0016] It is preferred that, in a state in which the cap has been disassembled from the spout, the difference between the first outer diameter of the inner ring and the first inner diameter of the side wall of the spout is 0.30 mm or more and 0.50 mm or less; the difference between the second outer diameter of the inner ring and the second inner diameter of the side wall of the spout is of 0.10 mm or more and 0.30 mm or less; and a difference between an inner diameter of the predetermined part of the inner peripheral surface of the side wall of the cap and an outer diameter of the predetermined part of the outer peripheral surface of the side wall of the spout is 0.20 mm.

[0017] It is preferred that a thickness of the inner ring in the first region is larger than a thickness of the side wall of the spout in the first region; and a thickness of the inner ring in the second region is smaller than a thickness of the side wall of the spout in the second region.

[0018] The cap may further include a band part and one or more flaps, the band part having a cylindrical shape and being mounted to the cap via a thin part that is provided to an end of the side wall of the cap, the end of the side wall facing away from the top plate, each of the one or more flaps having a first end continuously connected to an end of the band part, the end of the band part facing away from the thin part; the spout further may include a flange and a protrusion, the flange extending outward from an end edge of the side wall of the spout, the protrusion extending outward from an area between an external thread on the outer peripheral surface of the side wall of the spout and the flange; and in a state in which the cap is threadably engaged with the spout, the end of the band part facing away from the thin part may be in close contact with the flange, and each of the one or more flaps may be held in a gap between the protrusion and the flange, the flap being in a state of being bent at the first end continuously connected to the band part, with a second end of the flap being inclined and oriented toward the top plate.

[0019] The spout may further include a flange extending outward from an end edge of the side wall of the spout; a plurality of recesses arranged on a surface of the flange facing away from the side wall of the spout, the recesses being arranged concentrically with the side wall of the spout in plan view and defined by ribs; and a gate entrance protruding downward in the axial direction of the side wall of the spout from one of the recesses to a position not beyond the surface of the flange facing away from the side wall of the spout.

[0020] Another aspect of the present invention relates to a packaging container provided with the spout assembly described above.

[Advantageous Effects of the Invention]

[0021] The present invention aims to provide a spout assembly capable of ensuring good sealing properties with a structure in which the spout has no closure plate and to provide a packaging container having the spout assembly.

[0022] The present invention can achieve a spout assembly capable of preventing the increase in force required for opening the spout assembly, while ensuring good sealing properties, even with a structure in which the spout has no closure plate, and a packaging container provided with the spout assembly.

[0023] The present invention can achieve a spout assembly capable of preventing the occurrence of residual stresses or the occurrence of deformation, such as sink marks or warpage, due to injection molding even with a structure in which the spout has no closure plate, and a packaging container provided with the spout assembly.

[Brief Description of the Drawings]

[0024]

Fig. 1 is a set of cross-sectional views each illustrating a spout assembly according to a first embodiment.

Fig. 2 is a perspective view illustrating a packaging container provided with the spout assembly according to the first embodiment.

Fig. 3 is a set of diagrams each illustrating a process of threadably engaging a cap with a spout according

to the first embodiment.

Fig. 4 is a schematic diagram in which a cross section of a cap is superimposed upon a cross section of a spout.

Fig. 5 is a partial cross-sectional view illustrating a spout assembly according to a second embodiment.

Fig. 6 is an enlarged cross-sectional view illustrating the spout assembly according to the second embodiment.

Fig. 7 is an enlarged cross-sectional view illustrating the spout assembly according to the second embodiment.

Fig. 8 is a perspective view illustrating a packaging container provided with the spout assembly according to the second embodiment.

Fig. 9 is a set of diagrams each illustrating a process of mounting a cap to the spout assembly according to the second embodiment.

Fig. 10 is a set of diagrams each illustrating a cross section of a spout assembly according to a third embodiment.

Fig. 11 is a bottom view illustrating a spout according to the third embodiment.

Fig. 12 is a perspective view illustrating a packaging container provided with the spout assembly according to the third embodiment.

[Description of the Embodiments]

<First Embodiment>

(Structure of spout assembly)

[0025] A first embodiment of the present invention will be described. In the following description, the same or corresponding components in the embodiments are denoted by the same reference signs. Fig. 1 is a set of cross-sectional views each illustrating a spout assembly according to the first embodiment. Fig. 1(a) is a cross-sectional view illustrating a spout assembly and Fig. 1(b) is an enlarged view illustrating the area enclosed by the rectangle in Fig. 1(a). Fig. 2 is a perspective view illustrating a packaging container provided with the spout assembly according to the first embodiment. As shown in Figs. 1(a), 1(b) and 2, a spout assembly 1 includes a spout 3 welded to a container body 2, and a cap 4 to be threadably engaged with the spout 3. The cap 4 includes a top plate 5, a side wall 6, an inner ring 7 and a contact ring 8. The side wall 6 is connected to an outer peripheral edge of the top plate 5 and has an inner peripheral surface on which internal threads are formed. The inner ring 7 is circumferentially provided to the inner surface of the top plate 5. The contact ring 8 is provided between the side wall 6 of the top plate 5 and the inner ring 7. The inner ring 7 has an outer peripheral surface including, sequentially from the top plate 5, a first region 9 and a second region 10. The first region 9 has a first outer diameter. The second region 10 has a second outer diameter whose outermost diameter is smaller than the first outer diameter. The spout 3 includes a side wall 11 having an outer peripheral surface on which external threads 11a are formed. The side wall 11 of the spout 3 has an inner peripheral surface including, sequentially from the upper end facing away from the container body 2, a first region 12 and a second region 13. The first region 12 has a first inner diameter. The second region 13 has a second inner diameter whose innermost diameter is smaller than the first inner diameter.

[0026] As shown in Fig. 1(b), in a state in which the cap 4 is threadably engaged with the spout 3, the first region 9 of the inner ring 7 is in close contact with the first region 12 of the side wall 11 of the spout 3 throughout the circumference, and the second region 10 of the inner ring 7 is in close contact with the second region 13 of the side wall 11 of the spout 3 throughout the circumference.

[0027] In a state in which the cap 4 is threadably engaged with the spout 3, a predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 is in close contact with a predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3 throughout the circumference. The predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 is formed between a joint of the side wall 6 and the top plate 5, and an internal thread nearest to the top plate 5. The predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3 is formed between the upper end of the side wall 11 facing away from the container body 2 and an external thread 11a nearest to the upper end. In a state in which the cap 4 is threadably engaged with the spout 3, the contact ring 8 of the cap 4 is in close contact with the upper end of the side wall 11 of the spout 3.

[0028] Specifically, in a state in which the cap 4 is threadably engaged with the spout 3, the container body 2 is sealed by four close contacts. They are the close contact between the first region 9 of the inner ring 7 and the first region 12 of the side wall 11 of the spout 3, the close contact between the second region 10 of the inner ring 7 and the second region 13 of the side wall 11 of the spout 3, the close contact between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3, and the close contact between the contact ring 8 and the upper end of the side wall 11 of the spout 3.

[0029] In a state in which the cap 4 is threadably engaged with the spout 3, there is a space 16 between a region where the first region 9 of the inner ring 7 is in close contact with the first region 12 of the side wall 11 of the spout 3 and a region where the second region 10 of the inner ring 7 is in close contact with the second region 13 of the side wall 11 of the spout 3. Provision of the space 16 can provide two reliable close contact regions throughout the circumference, between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 3.

[0030] The spout 3 is made of a material whose rigidity is lower than the rigidity of the material for the cap 4. For example, the material for the spout 3 may be low density polyethylene or straight-chain low density polyethylene. The material for the cap 4 may be, for example, polypropylene. However, materials for the spout 3 and the cap 4 are not limited to these materials. When the spout 3 is made of a material whose rigidity (flexural modulus) is lower (smaller) than the rigidity of the material for the cap 4, it is preferred that the material for the spout 3 has a flexural modulus in the range of 100 MPa or more and 1,200 MPa or less and the material for the cap 4 has a flexural modulus in the range of 1,000 MPa or more and 2,100 MPa or less.

[0031] The side wall 11 of the spout 3 has a lower end edge which is provided with a flange 17 extending outward. The flange 17 serves as a joint between the container body 2 and the spout 3 mounted to the container body 2.

(Process of threadably engaging the cap with the spout)

[0032] Referring to Figs. 3 and 4, the following description explains a process of threadably engaging the cap 4 with the spout 3 and a sealed state of the container 2. Figs. 3(a) to 3(d) are diagrams each illustrating a process of threadably engaging a cap with a spout according to the first embodiment. Figs. 3(a) to 3(d) are enlarged views each illustrating the area enclosed by the rectangle in Fig. 1(a). Fig. 4 is a schematic diagram in which a cross section of a cap is superimposed upon a cross section of a spout. Fig. 4 is a schematic diagram corresponding to the area enclosed by the rectangle in Fig. 1(a). In Fig. 4, the cross sections of a cap and a spout are superimposed with each other in a state in which the cap has been disassembled from the spout. For ease of understanding, the cross section of the cap 4 is hatched and the cross section of the spout 3 is not hatched.

[0033] To threadably engage the cap 4 with the spout 3, first, as shown in Fig. 3(a), the upper end of the side wall 11 of the spout 3 is inserted into the cap 4 so as to be located radially inside the side wall 6. When the cap 4 is placed on the spout 3 and rotated in the closing direction, the upper end of the side wall 11 of the spout 3 is partially inserted between the side wall 6 of the cap 4 and the inner ring 7. In this case, the first region 9 of the inner ring 7 is not in contact with the inner peripheral surface of the side wall 11 of the spout 3. Also, there is no contact between the second region 10 of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 3, between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3, or between the contact ring 8 and the upper end of the side wall 11 of the spout 3.

[0034] After that, as shown in Fig. 3(b), when the cap 4 is further rotated in the closing direction, the first region 9 of the inner ring 7 pushes the side wall 11 of the spout 3 outward and contacts the inner peripheral surface of the side wall 11 of the spout 3. In this case, there is no contact between the second region 10 of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 3, between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3, or between the contact ring 8 and the upper end of the side wall 11 of the spout 3.

[0035] As shown in Fig. 4, the first outer diameter of the first region 9 of the inner ring 7 is larger than the inner diameter of a region in the inner peripheral surface of the side wall 11 of the spout 3, as shown in Fig. 3(b), with which the first region 9 of the inner ring 7 contacts. As mentioned above, the spout 3 is made of a material whose rigidity is lower than the rigidity of the material for the cap 4. Therefore, when inserting the inner ring 7 into the spout 3, the first region 9 of the inner ring 7 pushes the inner peripheral surface of the side wall 11 of the spout 3 outward, with which the first region 9 of the inner ring 7 is in contact.

[0036] After that, as shown in Fig. 3(c), when the cap 4 is further rotated in the closing direction, the second region 10 of the inner ring 7 pushes the side wall 11 of the spout 3 outward and contacts the inner peripheral surface of the side wall 11 of the spout 3. Also, the first region 9 of the inner ring 7 further pushes the side wall 11 of the spout 3 outward. In this case, there is no contact between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3, and between the contact ring 8 and the upper end of the side wall 11 of the spout 3.

[0037] As shown in Fig. 4, the second outer diameter of the second region 10 of the inner ring 7 is larger than the inner diameter of a region in the inner peripheral surface of the side wall 11 of the spout 3, as shown in Fig. 3(c), with which the second region 10 of the inner ring 7 contacts. As mentioned above, the spout 3 is made of a material whose rigidity is lower than the rigidity of the material for the cap 4. Therefore, when inserting the inner ring 7 into the spout 3, the second region 10 of the inner ring 7 pushes the inner peripheral surface of the side wall 11 of the spout 3 outward, with which the second region 10 of the inner ring 7 is in contact.

[0038] After that, as shown in Fig. 3(d), when the cap 4 is further rotated in the closing direction, the cap 4 is brought into a state of being threadably engaged with the spout 3. Specifically, the first region 9 of the inner ring 7 is brought into a state of closely contacting the first region 12 of the side wall 6 of the spout 3 throughout the circumference, the second region 10 of the inner ring 7 is brought into a state of closely contacting the second region 13 of the side wall 11 of the spout 3 throughout the circumference, the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 is brought

into a state of closely contacting the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3, and the contact ring 8 is brought into a state of closely contacting the upper end of the side wall 11 of the spout 3. It should be noted that Fig. 3(d) is the same as Fig. 1(b).

[0039] The first region 9 of the inner ring 7 pushes the side wall 11 of the spout 3 outward in the states shown in both Figs. 3(b) and 3(c) and then closely contacts the first region 12 of the side wall 11 of the spout 3 throughout the circumference in the state shown in Fig. 3(d). The second region 10 of the inner ring 7 is not in contact with the inner peripheral surface of the side wall 11 of the spout 3 in the state shown in Fig. 3(b), but pushes the side wall 11 of the spout 3 outward in the state shown in Fig. 3(c) and then contacts the second region 13 of the side wall 11 of the spout 3 throughout the circumference in the state shown in Fig. 3(d). Thus, as shown in Fig. 4, in the state in which the cap 4 has been disassembled from the spout 3, the difference between the first outer diameter of the first region 9 of the inner ring 7 and the first inner diameter of the first region 12 of the side wall 11 of the spout 3 is larger than the difference between the second outer diameter of the second region 10 of the inner ring 7 and the second inner diameter of the second region 13 of the side wall 11 of the spout 3. With this configuration, while the first and second regions 9 and 10 of the inner ring 7 are ensured to contact the inner peripheral surface of the side wall 11 of the spout 3, the pressure exerted is balanced between the two-location pressure of the first region 9 against the inner peripheral surface of the side wall 11 of the spout 3 and the one-location pressure of the second region 10 against the side wall 11 of the spout 3.

[0040] When the difference between the first outer diameter of the inner ring 7 and the first inner diameter of the side wall 11 of the spout 3 is larger than the difference between the second outer diameter of the inner ring 7 and the second inner diameter of the side wall 11 of the spout 3, it is preferred that these differences are each in the range of 0.10 mm or more and 0. 50 mm or less. As an example, the difference between the first outer diameter and the first inner diameter may be in the range of 0.30 mm or more and 0.50 mm or less, and the difference between the second outer diameter and the second inner diameter may be in the range of 0.10 mm or more and 0.30 mm or less, while the difference between the inner diameter of the predetermined part 14 and the outer diameter of the predetermined part 15 may be 0.20 mm. When the differences between the first outer diameter and the first inner diameter and between the second outer diameter and the second inner diameter are designed to be in the above ranges, higher sealing properties may be ensured. It should be note that the inner diameter and the outer diameter mentioned above refer to an inner diameter and an outer diameter in a diameter direction.

[0041] In a state in which the cap 4 is threadably engaged with the spout 3, if the outer peripheral surface of the inner ring 7 is in contact with the inner peripheral surface of the side wall 11 of the spout 3 via only one contact area having a predetermined length in the direction parallel to the center axis of the cap 4, there may be portions in this contact area where these surfaces are in contact and portions not in contact with each other. In other words, gaps may be formed in the contact area. These gaps may communicate each other to bring the container body 2 into an unsealed state.

[0042] According to the spout assembly 1 of the first embodiment, the first and second regions 9 and 10 of the inner ring 7 push the side wall 11 of the spout 3 outward and are respectively closely brought into contact with the first and second regions 12 and 13 of the side wall 11 of the spout 3 with the space 16 being sandwiched between these contacts. Thus, two reliable close contact areas can be provided between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the spout 3 throughout the circumference. Therefore, good sealing properties can be ensured with a structure in which no closure plate is provided to the spout 3.

[0043] Furthermore, according to the spout assembly 1 of the first embodiment, two reliable close contact areas can be provided between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the spout 3 throughout the circumference not only before opening of the spout assembly 1 but also after closing it following the opening.

[0044] Furthermore, even when the container body 2 that holds contents is dropped on the floor or the like, the spout assembly 1 reliably maintains the two close contact areas throughout the circumference with the space 16 being sandwiched therebetween. Therefore, even if the contents enter the space 16 via the first close contact area between the second region 10 of the inner ring 7 and the second region 13 of the side wall 11 of the spout 3, the spout assembly 1 still has the second close contact area between the first region 9 of the inner rig 7 and the first region 12 of the side wall 11 of the spout 3. Specifically, since close contact areas are doubly formed between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 3, the contents can be prevented from flowing out of the container body 2 via these close contact areas even with a structure in which the spout 3 has no closure plate.

[0045] In the process of threadably engaging the cap 4 with the spout 3, the first region 9 of the inner ring 7 closely contacts the first region 12 of the side wall 11 of the spout 3, and then the second region 10 of the inner ring 7 closely contacts the second region 13 of the side wall 11 of the spout 3. Thus, when forming the space 16, air is permitted to escape from the space 16 into the container body 2 and only a small amount of air stays inside the space 16. This realizes a packaging container provided with the spout assembly 1 exerting only small resistance when the cap 4 is tightened.

[0046] When high temperature contents have been

filled in the packaging container, the whole container may be sprayed with cooling water to cool the contents. In this case, the spray of cooling water may enter a gap between the cap 4 and the spout 3. According to the spout assembly 1 of the first embodiment, in a state in which the cap 4 is threadably engaged with the spout 3, the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 4 is in close contact with the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3 throughout the circumference. Therefore, the cooling water that has entered the gap between the cap 4 and the spout 3 cannot advance to the upper end or the interior of the spout 3 via the close contact area between the predetermined parts 14 and 15. As a result, the upper end or the interior of the spout 3 is prevented from being contaminated by the cooling water.

[0047] As shown in Fig. 1(b), a protrusion 18 and a groove 19 may further be provided to the upper end of the side wall 11 of the spout 3 to prevent dripping. The groove 19 may be formed on the flange 17 side outer peripheral surface of the protrusion 18. In the case of providing the protrusion 18 and the groove 19, the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 3 may preferably be formed between the groove 19 and the uppermost external thread 11a. Thus, the protrusion 18 and the groove 19 for preventing dripping are prevented from being sprayed with cooling water. Therefore, residue of the cooling water that would otherwise have adhered to the protrusion 18 and the groove 19 is prevented from being mixed into the contents when the contents are poured.

[0048] Furthermore, the inner diameter of the protrusion 18 may be made larger than that of the first region 12 of the side wall 11, and the outer diameter of the protrusion 18 may be made smaller than that of the predetermined part 15. Thus, gaps formed between the protrusion 18 and the predetermined part 14 of the cap 4 and between the protrusion 18 and the first region 9 can be ensured to be larger. Therefore, when the side wall 11 is pushed outward by the inner ring 7 in the process of the threadable engagement described above, the torque applied to the cap 4 is prevented from increasing due to the upper end of the side wall 11 abutting against the predetermined part 14 of the cap 4.

[0049] Provision of the groove 19 may enable bending of the protrusion 18 in the vicinity of the groove 19 when the upper end of the protrusion 18 abuts against the side wall 6 of the cap 4, top plate 15 or the like. This may prevent deterioration of sealing properties due to formation of a gap between the second region 10 of the inner ring 7 and the second region 13 of the side wall 11 by the protrusion 18 abutting against the side wall 6 of the cap 4, the top plate 15 or the like and thus by the side wall 6 being pushed inward toward the first region 9 of the inner ring 7 during the threadable engagement process.

[0050] In the structure of the above embodiment, the spout 3 is made of a material having a flexural modulus lower than that of the material for the cap 4 so that the rigidity of the side wall 11 is lower than that of the inner ring 7. Thus, good sealing properties are ensured with a structure in which the spout 3 has no closure plate. In addition to or in place of this structure, the thicknesses of the inner ring 7 and the side wall 11 in the radial direction may be suitably determined so that the rigidity of the side wall 11 will be lower than that of the inner ring 7. For example, the thickness of the inner ring 7 in the radial direction in the first region 9 may be made larger than the thickness of the side wall 11 in the radial direction in the first region 12. Furthermore, the thickness in the radial direction in the second region 10 may be made smaller than the thickness of the side wall 11 in the radial direction in the second region 13. By suitably determining the thicknesses, the rigidity of the first region 12 of the side wall 6 can be made lower than the rigidity of the first region 9 of the inner ring 7 even when the materials used for the spout 3 and the cap 4 respectively have flexural moduli of about the same level.

[0051] As described above, according to the spout assembly and the packaging container provided with the spout assembly of the present invention, good sealing properties can be ensured with a structure in which the spout has no closure plate. Furthermore, good sealing properties can be ensured not only before opening of the spout assembly 1 but also after closing it following opening, so that, when the packaging container is dropped, the contents are prevented from flowing out of the spout assembly.

[0052] To impart an anti-tamper function for clarifying whether the packaging container has been opened previously, a temper evident band may be provided to the lower end of the side wall of the cap. Known tamper evident bands may be used for this purpose.

<Second Embodiment>

(Spout assembly)

[0053] A second embodiment of the present invention will be described. Fig. 5 is a partial cross-sectional view illustrating a spout assembly according to the second embodiment. Figs. 6 and 7 are enlarged cross-sectional views respectively illustrating the area A and the area B enclosed by the rectangles in Fig. 5. Fig. 8 is a perspective view illustrating a packaging container provided with the spout assembly of the present embodiment.

[0054] As shown in Figs. 5 and 8, a spout assembly 101 includes a spout 103 welded to a container body 2, and a cap 104 to be threadably engaged with the spout 103. Figs. 5 to 8 each show a state in which the cap 104 has been assembled to the spout 103. The expression "a state in which the cap 104 has been assembled to the spout 103" refers to a state in which the cap 104 is threadably engaged with the spout 103 and movement in the height direction of the cap 104 has been restrained by a

protrusion 11b described later.

(Cap)

[0055] The cap 104 includes a top plate 5, a side wall 6, an inner ring 7 and a contact ring 8. The side wall 6 is connected to an outer peripheral edge of the top plate 5 and has an inner peripheral surface on which internal threads 6a are formed. The inner ring 7 has a cylindrical shape and is circumferentially provided to the top plate 5. The contact ring 8 is provided between the side wall 6 of the top plate 5 and the inner ring 7. The cap 104 has a lower end facing away from the top plate 5 of the side wall 6 and provided with a cylindrical band part 119 via a thin part 118. The band part 119 has a lower end facing away from the thin part 118 and provided with a flap 20 whose one end continues from the band part 119. The lower end of the band part 119 may be provided with one or more communication parts 119a for establishing communication between the interior and the exterior of the cap 104.

[0056] The band part 119 serves as a tamper evidence band which is separable from the cap 104 by breaking of the thin part 118 at the time of opening. As an example, as shown in Fig. 7, the thin part 118 may be constituted by a plurality of ribs 118a circumferentially arranged at predetermined intervals on the inner peripheral surfaces of the side wall 6 of the cap 104 and the band part 119 and connecting the side wall 6 to the band part 119. Although the detail will be described later, the strength of the thin part 118 corresponding to the force required for opening the spout assembly may be suitably changed by controlling the thickness of the ribs 118a in the radial direction by forming a groove 6b (also termed a score cut) from the outer peripheral surface of the cap 104 toward the ribs 118a in the process of assembling the cap. As shown in Fig. 5, the groove 6b may be formed throughout the circumference.

[0057] The flap 20 serves as a member that abuts against a protrusion 11b, described later, and breaks the thin part 118 when opening the spout assembly to permit the band part 119 to remain at the spout 103 or the cap 104. One or more flaps 20 may be circumferentially provided to the lower end of the band part 119 at predetermined intervals. Provision of a plurality of flaps 20 can reduce (disperse) the reaction force at the time of assembling (setting) the cap 104 to the spout 103 before use by threading or by other methods.

[0058] The communication part 119a serves as a notch for dividing the band part 119 and as a hole for discharging cooling water from the gap between the cap 104 and the spout 103 that has entered therefrom. Cooling water is a liquid used for showering the container body 2 to cool high temperature contents that have been filled in the container body 2. By providing the communication part 119a, the upper end or the interior of the spout 103 is prevented from being polluted by the cooling water. It should be noted that the communication part 119a does not have to be necessarily provided.

(Spout)

[0059] The spout 103 includes a cylindrical side wall 11, a flange 17 extending outward from one end edge of the side wall 11, external threads 11a formed on the outer peripheral surface of the side wall 11, and a protrusion 11b protruding outward from an area between an external thread 11a on the outer peripheral surface of the side wall 11 and the flange 17.

[0060] The flange 17 serves as a joint when the spout 103 is mounted to the container body 2. As shown in Figs. 5 and 7, the flange 17 has a thickness which is made larger in the vicinity of the side wall 11 than in the remaining portion to enable adhesion to (close contact with) the band part 119. To join the flange 17 and the container body 2 together, a known technique, such as ultrasonic welding or adhesion, may be used.

[0061] The protrusion 11b is a portion that abuts against the flap 20 at the time of opening. The protrusion 11b may be continuously formed or may be intermittently formed at predetermined intervals, as long as it can be formed in the circumferential direction of the outer peripheral surface of the side wall 11 and can abut against the flap 20 to restrain the movement of the band part 119.

(About assembled state)

[0062] As shown in Figs. 5 to 7, in a state in which the cap 104 has been assembled to the spout 103, the outer peripheral surface of the inner ring 7 is in close contact with the inner peripheral surface of the side wall 11 of the spout 103. Also, the lower end of the band part 119 is in close contact with the flange 17. Furthermore, the flap 20 is held in a gap between the protrusion 11b and the flange 17 in a state of being bent at an end portion continuously connected to the band part 119, with the other end thereof being oriented to the top plate 5.

[0063] It is preferred that the adhesion strength between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 103 is at a level of not causing the contents liquid of the container body 2 to leak out from between the adhesion surfaces. Also, it is preferred that the adhesion between the band part 119 and the flange 17 induces friction therebetween that is at a level of not loosening the threadable engagement due to the assembled cap 104 being rotated by vibration or the like during the distribution process.

[0064] Thus, good sealing properties can be ensured with a structure in which the spout 103 has no closure plate, by bringing the outer peripheral surface of the inner ring 7 into close contact with the inner peripheral surface of the spout 103. Since the adhesion between the lower end of the band part 119 and the flange 17 produces friction between the cap 104 and the flange 17, threadable engagement of the assembled cap 104 is prevented

from loosening. Furthermore, since an end of the flap 20 is held in the gap between the protrusion 11b and the flange 17 and thus movement in the height direction of the cap 104 is restrained, decrease in adhesion strength is minimized between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the spout 103. Therefore, good sealing properties can be ensured with a structure in which the spout has no closure plate.

(Inner ring and shape of side wall)

[0065] To enhance adhesion strength between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 103 in the spout assembly 101, as shown in Fig. 6, the outer peripheral surface of the inner ring 7 includes, sequentially from the top plate 5, a first region 9 and a second region 10 throughout the circumference. The first region 9 has a first outer diameter and the second region 10 has a second outer diameter whose outermost diameter is smaller than the first diameter. Similarly, the inner peripheral surface of the side wall 11 of the spout 103 includes, sequentially from the upper end facing away from the container body 2, a first region 12 and a second region 13 throughout the circumference. The first region 12 has a first inner diameter and the second region 13 has a second inner diameter whose innermost diameter is smaller than the first inner diameter.

[0066] As shown in Figs. 5 and 6, in a state in which the cap 104 has been assembled to the spout 103, the first region 9 of the inner ring 7 can closely contact the first region 12 of the side wall 11 of the spout 103 throughout the circumference, and the second region 10 of the inner ring 7 can closely contact the second region 13 of the side wall 11 of the spout 103 throughout the circumference.

[0067] In a state in which the cap 104 has been assembled to the spout 103, the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 104 can also closely contact the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 103 throughout the circumference. In the inner peripheral surface of the side wall 6 of the cap 104, the predetermined part 14 corresponds to a portion between a joint of the side wall 6 and the top plate 5, and the top plate 5 side end of the inner threads 6a. The predetermined part 15 corresponds to a portion between the upper end of the side wall 11 facing away from the flange 17 and the upper end of the external threads 11a. In a state in which the cap 104 is threadably engaged with the spout 103, the contact ring 8 of the cap 104 is in close contact with the upper end of the side wall 11 of the spout 103.

[0068] Specifically, in a state in which the cap 104 has been assembled to the spout 103, four close contacts can be achieved between the cap 104 and the spout 103. They are the close contact between the first region 9 of the inner ring 7 and the first region 12 of the spout 103, the close contact between the second region 10 of the inner ring 7 and the second region 13 of the spout 103, the close contact between the predetermined part 14 of the cap 104 and the predetermined part 15 of the spout 103, and the close contact between the contact ring 8 and the upper end of the side wall 11 of the spout 103.

[0069] As shown in Fig. 6, the inner ring 7 and the side wall 11 of the spout 103 may be formed so that a space 16 is formed between an area in which the first region 9 of the inner ring 7 is in close contact with the first region 12 of the spout 103 and an area where the second region 10 of the inner ring 7 is in close contact with the second region 13 of the spout 103 In a state in which the cap 104 has been assembled to the spout 103. Formation of the space 16 can provide two reliable close contact areas between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 103 throughout the circumference.

[0070] To enhance the adhesion strength between the spout 103 and the cap 104, the spout 103 may be formed using a material whose rigidity is lower than that of the material for the cap 104. For example, the material for the spout 103 may be low density polyethylene or straight-chain low density polyethylene. The material for the cap 104 may be, for example, polypropylene. However, materials for the spout 103 and the cap 104 are not limited to these materials. When the spout 103 is made of a material whose rigidity (flexural modulus) is smaller than the rigidity of the material for the cap 104, it is preferred that the material for the spout 103 has a flexural modulus in the range of 100 MPa or more and 1,200 MPa or less and the material for the cap 104 has a flexural modulus in the range of 1,000 MPa or more and 2,100 MPa or less.

(Process of assembling the cap)

[0071] Referring to Fig. 9, a process of assembling the cap 104 to the spout 103 will be described. Figs. 9(a) to 9(d) are diagrams each illustrating a process of assembling a cap to a spout according to the present embodiment. Figs. 9(a) to 9(d) are enlarged views illustrating the areas A and B enclosed by the rectangles in Fig. 5.

[0072] As will be described later, the thin part 118 of the cap 104 is formed by providing the groove 6b after assembling the cap 104 to the spout 103. Although there are no structures corresponding to the thin part 118 and the band part 119 of the cap 104 in the process shown in Figs. 9(a) to 9(c), the part that would serve as the band part 119 after forming the groove 6b is indicated as a band part forming portion 119' for the sake of ease of understanding.

[0073] The following explanation will be given using a cap 104 provided with the first and second regions 9 and 10, and a spout 103 provided with the first and second regions 12 and 13. However, the shapes of the cap 104 and the spout 103 are not limited as long as the outer peripheral surface of the inner ring 7 closely contacts the

inner peripheral surface of the side wall 11 of the spout 103 in the threadably engaged state.

[0074] First of all, as shown in Fig. 9(a), the upper end of the side wall 11 of the spout 103 is inserted into the cap 104 so as to be located radially inside the side wall 6. The cap 104 is rotated in the closing direction. Then, the cap 104 moves downward, so that, at the lower end, the flap 20 starts to contact the protrusion 11b in a state of being bent at an end portion continuously connected to the band part forming portion 119'. Furthermore, a part of the upper end of the side wall 11 of the spout 103 is inserted between the side wall 6 of the cap 104 and the inner ring 7. In this case, the first region 9 of the inner ring 7 is not in contact with the inner peripheral surface of the side wall 11 of the spout 103. Also, there is no contact between the second region 10 of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 103, between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 104 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 103, or between the contact ring 8 and the upper end of the side wall 11 of the spout 103.

[0075] The cap 104 is further rotated in the closing direction. Then, as shown in Fig. 9(b), at the lower end of the side wall 6 of the cap 104, the flap 20 moves downward over the protrusion 11b. Also, the first region 9 of the inner ring 7 pushes the side wall 11 of the spout 103 outward so as to be in contact with the inner peripheral surface of the side wall 11 of the spout 103. In this case, there is no contact between the second region 10 of the inner ring 7 and the inner peripheral surface of the side wall 11 of the spout 103, between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 104 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 103, or between the contact ring 8 and the upper end of the side wall 11 of the spout 103. Also, in this case, the first region 9 of the inner ring 7 pushes the inner peripheral surface of the side wall 11 of the spout 103 outward, with which the first region 9 of the inner ring 7 is in contact.

[0076] The cap 104 is further rotated in the closing direction. Then, as shown in Fig. 9(c), at the lower end of the side wall 6 of the cap 104, the flap 20 moves downward even more over the protrusion 11b. Also, the second region 10 of the inner ring 7 pushes the side wall 11 of the spout 103 outward so as to be in contact with the inner peripheral surface of the side wall 11 of the spout 103. Furthermore, the first region 9 of the inner ring 7 pushes the side wall 11 of the spout 103 outward even more. In this case, there is no contact between the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 104 and the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 103, or between the contact ring 8 and the upper end of the side wall 11 of the spout 103. Also, in this case, the second region 10 of the inner ring 7 pushes the inner peripheral surface of the side wall 11 of the spout 103 outward, with which the second region 10 of the inner ring 7 is in contact.

[0077] After that, the cap 104 is further rotated in the closing direction and the lower end of the band part forming portion 119' is permitted to abut against the flange 17 for close contact therewith. Then, as shown in Fig. 9(d), at the lower end of the side wall 6 of the cap 104, the flap 20 clears the protrusion 11b in a state of being bent at an end portion continuously connected to the band part forming portion 119'. As a result, the cap 104 is brought into a state of being assembled to the spout 103. Thus, the flap 20 is held in the gap between the protrusion 11b and the flange 17 in a state of being bent at an end portion continuously connected to the band part 119, with the other end thereof being oriented to the top plate 5. It should be noted that Fig. 9(d) is the same as Fig. 7.

[0078] When the lower end of the band part forming portion 119' is permitted to abut against the flange 17 for close contact therewith, the center portion of the side wall 6 of the cap 104 in the height direction is instantaneously slightly bent inward. With this slight bending, the flap 20 inclines inward, i.e., inclines toward the gap between the protrusion 11b and the flange 17. Thus, the end of the flap 20 that has cleared the protrusion 11b is promptly held in the gap between the protrusion 11b and the flange 17. Accordingly, the flap 20 is prevented from being caught on the protrusion 11b and from not being held in the gap between the protrusion 11b and the flange 17.

[0079] Furthermore, the first region 9 of the inner ring 7 is brought into a state of closely contacting the first region 12 of the side wall 6 of the spout 103 throughout the circumference, the second region 10 of the inner ring 7 is brought into a state of closely contacting the second region 13 of the side wall 11 of the spout 103 throughout the circumference, the predetermined part 14 of the inner peripheral surface of the side wall 6 of the cap 104 is brought into a state of closely contacting the predetermined part 15 of the outer peripheral surface of the side wall 11 of the spout 103 throughout the circumference, and the contact ring 8 is brought into a state of closely contacting the upper end of the side wall 11 of the spout 103.

[0080] Then, a thin part 118 is formed in a state in which the lower end of the band part forming portion 119' of the cap 104 is in close contact with the flange 17. Specifically, as shown in Fig. 9(d), a plate-shaped score cutter 50 is externally abutted against the side wall 6 of the cap 104, which is in close contact with the flange 17, so as to be perpendicular to the height direction of the cap 104. Thus, a groove 6b is formed throughout the circumference with a predetermined depth from the outer peripheral surface of side wall 6. The depth of the groove 6b (i.e., the thickness of the rib 118a in the radial direction) can be controlled according to the force of breaking the thin part 118 in the process of opening the spout assembly described later.

[0081] In this case, since the lower end of the band

part forming portion 119' is in close contact with the flange 17, the cap 104 is prevented from moving or being deformed by the pressing force of the score cutter 50 abutted against the side wall 6. Thus, the groove 6b can be formed with stable depth and shape.

[0082] In a state in which the cap 104 has been assembled to the spout 103, a distance L between the end of the flap 20 and the protrusion 11b in the height direction of the cap 104 (see the diagram on the right of Fig. 9(d)) is preferred to be in the range of 0.1 mm or more and 0.3 mm or less. When the distance L is set to 0.1 mm or more, the flap 20 that has cleared the protrusion 11b is prevented from being caught on the protrusion 11b and thus from not being held in the gap between the protrusion 11b and the flange 17. When the distance L is set to 0.3 mm or less, if the cap 104 is loosened due to vibration or the like and rotated in the opening direction, the end of the flap 20 can be promptly brought into abutment against the protrusion 11b as long as the thin part 118 is not broken. Therefore, the amount of upward movement of the cap 104 can be minimized and adhesion between the inner ring 7 and the side wall 6 of the spout 103 can be maintained. Desirably, if the threadable engagement is loosened from the state in which the cap 104 is assembled to the spout 103, and the cap 104 is rotated in the opening direction and the end of the flap 20 is brought into contact with the protrusion 11b, it is preferred that, as long as the thin part 118 is not broken, contacts are achieved between the first region 9 of the inner ring 7 and the first region 12 of the side wall 11 of the spout 103 and between the second region 10 of the inner ring 7 and the second region 13 of the side wall 11 of the spout 103 to maintain good sealing properties.

[0083] In the spout assembly 101, the force of preventing loosening of the threadable engagement and maintaining sealing properties (friction between the band part 119 and the flange 17) can be controlled by adjusting the tightening torque applied in the process of assembling the cap.

(Opening process)

[0084] When opening the closed spout assembly 101, first, the assembled cap 104 is rotated in the opening direction. With the rotation, the cap 104 is moved upward relative to the spout 103. When the cap 104 is moved upward by the distance L, the end of the flap 20 is brought into abutment against the protrusion 11b to restrain the upward movement of the band part 119.

[0085] When the cap 104 is further rotated in the opening direction and moved upward, the thin part 118 between the band part 119 whose movement has been restrained and the side wall 6 of the cap 104 is pulled in the vertical direction and broken. As a result, the band part 119 is separated from the lower end of the side wall 6. With the band part 119 separated, when the cap 104 is further rotated in the opening direction and disassembled from the spout 103, the spout assembly 101 can be opened.

[0086] The magnitude of the force (torque) applied to the cap 104 at the time of opening the spout assembly by breaking the thin part 118 depends on the thickness of the thin part 118 in the radial direction. Accordingly, the force (torque) can be controlled by adjusting the thickness of the groove 6b formed by the score cutter 50. The magnitude of the force in this case is preferred to be a strength not breaking the thin part 118 with the tightening torque applied during the cap assembling process.

[0087] The spout assembly 101 ensures good sealing properties by preventing loosening using friction between the band part 119 and the flange 17. Accordingly, torque overcoming the friction is required to be instantaneously applied only when starting opening, but no larger force is required in the rotation thereafter. Thus, force required for opening is prevented from increasing.

<Third Embodiment>

(Spout assembly)

[0088] A third embodiment of the present invention will be described. Fig. 10 is a set of diagrams each illustrating a cross section of a spout assembly according to the third embodiment. Fig. 11 is a bottom view illustrating a spout. Fig. 12 is a perspective view illustrating a packaging container provided with the spout assembly according to the third embodiment. It should be noted that Fig. 10 are cross sections taken along the line B-B' of Fig. 11.

[0089] As shown in Figs. 10 and 12, a spout assembly 201 includes a spout 203 that is mounted to a container body 2 by ultrasonic welding, and a cap 204 that is assembled to the spout 203 and capable of hermetically closing the spout 203. As an example, the cap 204 can be threadably engaged with the spout 203.

(Cap)

[0090] As an example, the cap 204 includes a top plate 5, a side wall 6, an inner ring 7 and a contact ring 8. The side wall 6 is connected to the outer peripheral edge of the top plate 5 and has an inner peripheral surface on which internal threads 6a are formed. The inner ring 7 has a cylindrical shape and is circumferentially provided to the top plate 5. The contact ring 8 is provided between the side wall 6 of the top plate 5 and the inner ring 7.

(Spout)

[0091] The spout 203 includes a side wall 11 having a cylindrical shape and a flange 17 extending outward from an end edge of the side wall 11. The side wall 11 has an outer peripheral surface on which, as an example, external threads 11a are formed. The spout 203 can be produced by injection molding using a resin material described later. The flange 17 serves as a joint when the spout 203 is mounted to the container body 2.

[0092] As shown in Figs. 10 and 11, the flange 17 has a surface facing away from the side wall 11, on which a plurality of recesses 219 are formed. These recesses 219 are arranged concentrically with the side wall 11 in plan view, being defined by ribs 218. As shown in Fig. 10, for example, each recess 219 may have a cross section having a dome-shaped top surface and spreading toward a surface of the flange 17 facing away from the side wall 11. The spreading surface may have a spreading angle θ (see Fig. 10) in the range of 50° or more and 70°or less. With this angle, vibration during ultrasonic welding described later can be suitably absorbed.

[0093] From one of the recesses 219, a gate entrance 220 is protruded. The gate entrance 220 protrudes in the axial direction of the side wall 11 to a position not beyond the surface of the flange 17 facing away from the side wall 11. As an example, the gate entrance 220 is formed into a cylindrical shape. The gate entrance 220 refers to the gate of the cavity into which the flow of a molten resin material is directed at the time of injection molding.

[0094] As an example, the spout 203 and the container body 2 can be welded to each other by placing an ultrasonic horn (not shown) on the container body 2 where an anvil (not shown) as a receiver inserted into the container body 2 overlaps with the flange 17 of the spout 203, and generating ultrasonic vibration. The vibration generated then is transferred from the flange 17 to the side wall 11, however, part of the vibration is absorbed by the recesses 219 and the ribs 218. Therefore, parts of the spout 203 are prevented from being deformed by the vibration.

[0095] The die used for injection-molding the spout 203 is provided with a gate at a position corresponding to a recess 219 so that the gate entrance 220 can be formed protruding from the recess 219. Also, flow of a resin material directed to the cavity via the gate can be simultaneously filled in portions of the cavity corresponding to the side wall 11 and the flange 17. Thus, the resin material can be uniformly filled in the cavity and therefore the occurrence of residual stresses or deformation, such as sink marks or warpage, can be reduced or prevented. Consequently, the occurrence of cracking due to ultrasonic welding can be reduced or prevented.

[0096] By providing the gate in the axial direction of the side wall 11, the gate entrance 220 can be formed protruding in the axial direction of the side wall 11. Moreover, the flow of the resin material passing through the gate can be linearly directed in the axial direction of the side wall 11. Thus, the flow of the resin material in the cavity can be stabilized even more and therefore the occurrence of residual stresses or deformation, such as sink marks or warpage, can be reduced or prevented.

[0097] By permitting the gate entrance 220 to protrude from the recess 219, the end of the gate entrance 220 in which the resin material is unlikely to be uniformly filled can be formed at a position away from the flange 17 that forms a vibration propagation path. Thus, in the occurrence of residual stresses at the end of the gate entrance 220, the influence of the force can be reduced and the occurrence of cracking can be reduced or prevented.

[0098] Since the occurrence of cracking due to ultrasonic welding can be reduced or prevented, the spout 203 enables welding with higher energy than usual. Consequently, weld strength can be increased or the time required for welding can be shortened.

[0099] Although detailed explanation is omitted, as in the spout assembly 1, the inner ring 7 of the cap 204 and the side wall 11 of the spout 203 are formed such that the outer peripheral surface of the inner ring 7 is brought into close contact with the inner peripheral surface of the side wall 11, in a state in which the cap 204 has been assembled to the spout 203. The close contact between the outer peripheral surface of the inner ring 7 and the inner peripheral surface of the spout 203 can ensure good sealing properties with a structure in which the spout 203 has no closure plate.

[0100] For example, the material for the spout 203 may be low density polyethylene or straight-chain low density polyethylene. The material for the cap 204 may be, for example, polypropylene. However, materials for the spout 203 and the cap 204 are not limited to these materials. To enhance adhesion strength between the spout 203 and the cap 204, the spout 203 may be formed using a material whose rigidity is lower than that of the material for the cap 204. When the spout 203 is made of a material whose rigidity (flexural modulus) is smaller than the rigidity of the material for the cap 204, it is preferred that the material for the spout 203 has a flexural modulus in the range of 100 MPa or more and 1,200 MPa or less and the material for the cap 204 has a flexural modulus in the range of 1,000 MPa or more and 2,100 MPa or less.

[0101] The embodiments described above have features that they can be suitably combined. For example, the ribs 218, the recesses 219 and the gate entrance 220 of the spout 203 may be formed in the spout 103 of the spout assembly 101.

[Industrial Applicability]

[0102] The spout assembly and the packaging container having the spout assembly according to the present invention can be suitably applied, for example, to spout assemblies provided to packaging containers holding contents, such as liquid, or to packaging containers having spout assemblies.

[Reference Signs List]

[0103]

1, 101, 201	Spout assembly
2	Container body
3, 103, 203	Spout
4, 104, 204	Cap
5	Top plate
6	Side wall

6a	Internal thread
6b	Groove
7	Inner ring
8	Contact ring
9	First region
10	Second region
11	Side wall
11a	External thread
11b	Protrusion
12	First region
13	Second region
14	Predetermined part
15	Predetermined part
16	Space
17	Flange
18	Protrusion
19	Groove
118	Thin part
118a	Rib
119	Band part
119a	Communication part
20	Flap
50	Score cutter
218	Rib
219	Recess
220	Gate entrance

Claims

1. A spout assembly (1; 101; 201) comprising a spout (3; 103; 203) welded to a container body (2), and a cap (4; 104; 204) to be threadably engaged with the spout (3; 103; 203), wherein

the cap (4; 104; 204) includes a top plate (5), a side wall (6) connected to an outer peripheral edge of the top plate (5) and having an inner peripheral surface on which internal threads (6a) are formed, and an inner ring (7) circumferentially provided to an inner surface of the top plate (5);
the inner ring (7) has an outer peripheral surface including, sequentially from the top plate (5), a first region (9) having a first outer diameter, and a second region (10) having a second outer diameter whose outermost diameter is smaller than the first outer diameter;
the spout (3; 103; 203) includes a side wall (11) having an outer peripheral surface on which external threads are formed, the spout (3; 103; 203) being made of a material having rigidity that is lower than that of the material for the cap (4; 104; 204); and
the side wall (11) of the spout (3; 103; 203) has an inner peripheral surface including, sequentially from an upper end facing away from the container body (2), a first region (9) having a first inner diameter, and a second region (10) having a second inner diameter whose innermost diameter is smaller than the first inner diameter;
characterized in that,
in a state in which the cap (4; 104; 204) is threadably engaged with the spout (3; 103; 203),

the first region (9) of the inner ring (7) is in close contact with the first region (9) of the side wall (11) of the spout (3; 103; 203) throughout the circumference,
the second region (10) of the inner ring (7) is in close contact with second region (10) of the side wall (11) of the spout (3; 103; 203) throughout the circumference,
a predetermined part (14) of the inner peripheral surface of the side wall (6) of the cap (4; 104; 204) is in close contact with a predetermined part (15) of the outer peripheral surface of the side wall (11) of the spout (3; 103; 203), and
a space (16) is formed between an area in which the first region (9) of the inner ring (7) is in close contact with the first region (9) of the side wall (11) of the spout (3; 103; 203) and an area in which the second region (10) of the inner ring (7) is in close contact with the second region (10) of the side wall (11) of the spout (3; 103; 203).

2. The spout assembly (1; 101; 201) according to claim 1, wherein

the cap (4; 104; 204) further includes a contact ring (8) that is formed on the top plate (5) and positioned between the side wall (6) of the cap (4; 104; 204) and the inner ring (7); and
the contact ring (8) is in close contact with an upper end of the side wall (11) of the spout (3; 103; 203) in a state in which the cap (4; 104; 204) is threadably engaged with the spout (3; 103; 203).

3. The spout assembly (1; 101; 201) according to claim 2, **characterized in that**, in a process of placing the cap (4; 104; 204) on the spout (3; 103; 203) and rotating the cap (4; 104; 204) in a closing direction,

the first region (9) of the inner ring (7) pushes the side wall (11) of the spout (3; 103; 203) outward to closely contact the inner peripheral surface of the side wall (11) of the spout (3; 103; 203);
the second region (10) of the inner ring (7) thereafter pushes the side wall (11) of the spout (3; 103; 203) outward even more to contact the inner peripheral surface of the side wall (11) of the spout (3; 103; 203); and

the cap (4; 104; 204) is thereafter brought into a state of being threadably engaged with the spout (3; 103; 203).

4. The spout assembly (1; 101; 201) according to any one of claims 1 to 3, **characterized in that**, in a state in which the cap (4; 104; 204) has been disassembled from the spout (3; 103; 203),
a difference between the first outer diameter of the inner ring (7) and the first inner diameter of the side wall (11) of the spout (3; 103; 203) is larger than a difference between the second outer diameter of the inner ring (7) and the second inner diameter of the side wall (11) of the spout (3; 103; 203).

5. The spout assembly (1; 101; 201) according to claim 4, wherein, in a state in which the cap (4; 104; 204) has been disassembled from the spout (3; 103; 203),

a difference between the first outer diameter of the inner ring (7) and the first inner diameter of the side wall (11) of the spout (3; 103; 203) is 0.30 mm or more and 0.50 mm or less;
a difference between the second outer diameter of the inner ring (7) and the second inner diameter of the side wall (11) of the spout (3; 103; 203) is 0.10 mm or more and 0.30 mm or less; and
a difference between an inner diameter of the predetermined part (14) of the inner peripheral surface of the side wall (6) of the cap (4; 104; 204) and an outer diameter of the predetermined part (15) of the outer peripheral surface of the side wall (11) of the spout (3; 103; 203) is 0.20 mm.

6. The spout assembly (1; 101; 201) according to any one of claims 1 to 5, wherein

a thickness of the inner ring (7) in the first region (9) is larger than a thickness of the side wall (11) of the spout (3; 103; 203) in the first region (9); and
a thickness of the inner ring (7) in the second region (10) is smaller than a thickness of the side wall (11) of the spout (3; 103; 203) in the second region (10).

7. The spout assembly (1; 101; 201) according to any one of claims 1 to 6, wherein

the cap (4; 104; 204) further includes a band part (119) and one or more flaps (20), the band part (119) having a cylindrical shape and being mounted to the cap (4; 104; 204) via a thin part (118) that is provided to an end of the side wall (6) of the cap (4; 104; 204), the end of the side wall (6) facing away from the top plate (5), each of the one or more flaps (20) having a first end continuously connected to an end of the band part (119), the end of the band part (119) facing away from the thin part (118);
the spout (3; 103; 203) further includes a flange (17) and a protrusion (11b), the flange (17) extending outward from an end edge of the side wall (11) of the spout (3; 103; 203), the protrusion (11b) extending outward from an area between an external thread on the outer peripheral surface of the side wall (11) of the spout (3; 103; 203) and the flange (17); and
in a state in which the cap (4; 104; 204) is threadably engaged with the spout (3; 103; 203),

the end of the band part (119) facing away from the thin part (118) is in close contact with the flange (17), and
each of the one or more flaps (20) is held in a gap between the protrusion (11b) and the flange (17), the flap being in a state of being bent at the first end continuously connected to the band part (119), with a second end of the flap (20) being inclined and oriented toward the top plate (5).

8. The spout assembly (1; 101; 201) according to claim 7, wherein, in a state in which the threadable engagement between the cap (4; 104; 204) and the spout (3; 103; 203) is loosened and the second end of the flap (20) is in contact with the protrusion (11b),

the first region (9) of the inner ring (7) is in close contact with the first region (9) of the side wall (11) of the spout (3; 103; 203) throughout the circumference;
the second region (10) of the inner ring (7) is in close contact with the second region (10) of the side wall (11) of the spout (3; 103; 203) throughout the circumference;
a predetermined part (14) of the inner peripheral surface of the side wall (6) of the cap (4; 104; 204) is in close contact with a predetermined part (15) of the outer peripheral surface of the side wall (11) of the spout (3; 103; 203) throughout the circumference; and
a space (16) is formed between an area in which the first region (9) of the inner ring (7) is in close contact with the first region (9) of the side wall (11) of the spout (3; 103; 203) and an area in which the second region (10) of the inner ring (7) is in close contact with the second region (10) of the side wall (11) of the spout (3; 103; 203).

9. The spout assembly (1; 101; 201) according to claim 7 or 8, wherein the end of the band part (119) facing away from the thin part (118) includes one or more

communication parts (119a) establishing communication between interior and exterior of the cap (4; 104; 204).

10. The spout assembly (1; 101; 201) according to any one of claims 7 to 9, wherein, in a state in which the cap (4; 104; 204) is threadably engaged with the spout (3; 103; 203), a distance between the second end of the flap and the protrusion (11b) in a height direction of the cap (4; 104; 204) is 0.1 mm or more and 0.3 mm or less.

11. The spout assembly (1; 101; 201) according to any one of claims 1 to 10, wherein the spout (3; 103; 203) further includes:

a flange (17) extending outward from an end edge of the side wall (11) of the spout (3; 103; 203);
a plurality of recesses (219) arranged on a surface of the flange (17) facing away from the side wall (11) of the spout (3; 103; 203), the recesses (219) being arranged concentrically with the side wall (11) of the spout (3; 103; 203) in plan view and defined by ribs; and
a gate entrance (220) protruding in the axial direction of the side wall (11) of the spout (3; 103; 203) from one of the recesses (219) to a position not beyond the surface of the flange (17) facing away from the side wall (11) of the spout (3; 103; 203).

12. A packaging container provided with the spout assembly (1; 101; 201) according to any one of claims 1 to 11.

Patentansprüche

1. Ausgussbaugruppe (1; 101; 201), die einen Ausguss (3; 103; 203), der an einen Behälterkörper (2) geschweißt ist, und eine Kappe (4; 104; 204) aufweist, die schraubbar mit dem Ausguss (3; 103; 203) in Eingriff zu bringen ist, wobei

die Kappe (4; 104; 204) eine Oberplatte (5), eine Seitenwand (6), die mit einer Außenumfangskante der Oberplatte (5) verbunden ist und eine Innenumfangsfläche hat, an der Innengewinde (6a) ausgebildet sind, und einen Innenring (7) umfasst, der umfänglich an einer Innenfläche der Oberplatte (5) vorgesehen ist;
der Innenring (7) eine Außenumfangsfläche hat, die der Reihe nach von der Oberplatte (5) einen ersten Bereich (9), der einen ersten Außendurchmesser hat, und einen zweiten Bereich (10) umfasst, der einen zweiten Außendurchmesser hat, dessen äußerster Durchmesser kleiner ist als der erste Außendurchmesser;
der Ausguss (3; 103; 203) eine Seitenwand (11) umfasst, die eine Außenumfangsfläche hat, an der Außengewinde ausgebildet sind, wobei der Ausguss (3; 103; 203) aus einem Material gefertigt ist, das eine Steifigkeit hat, die niedriger ist als die des Materials für die Kappe (4; 104; 204); und
die Seitenwand (11) des Ausgusses (3; 103; 203) eine Innenumfangsfläche hat, die der Reihe nach von einem oberen Ende, das von dem Behälterkörper (2) weg zeigt, einen ersten Bereich (9), der einen ersten Innendurchmesser hat, und einen zweiten Bereich (10) umfasst, der einen zweiten Innendurchmesser hat, dessen innerster Durchmesser kleiner ist als der erste Innendurchmesser;
dadurch gekennzeichnet, dass
in einem Zustand, bei dem die Kappe (4; 104; 204) schraubbar mit dem Ausguss (3; 103; 203) in Eingriff ist,

der erste Bereich (9) des Innenrings (7) über den gesamten Umfang in enger Berührung mit dem ersten Bereich (9) der Seitenwand (11) des Ausgusses (3; 103; 203) ist,
der zweite Bereich (10) des Innenrings (7) über den gesamten Umfang in enger Berührung mit dem zweiten Bereich (10) der Seitenwand (11) des Ausgusses (3; 103; 203) ist,
ein vorbestimmter Teil (14) der Innenumfangsfläche der Seitenwand (6) der Kappe (4; 104; 204) in enger Berührung mit einem vorbestimmten Teil (15) der Außenumfangsfläche der Seitenfläche (11) des Ausgusses (3; 103; 203) ist, und
ein Raum (16) zwischen einem Gebiet, in dem der erste Bereich (9) des Innenrings (7) in enger Berührung mit dem ersten Bereich (9) der Seitenwand (11) des Ausgusses (3; 103; 203) ist, und einem Gebiet ausgebildet ist, in dem der zweite Bereich (10) des Innenrings (7) in enger Berührung mit dem zweiten Bereich (10) der Seitenwand (11) des Ausgusses (3; 103; 203) ist.

2. Ausgussbaugruppe (1; 101; 201) gemäß Anspruch 1, wobei

die Kappe (4; 104; 204) ferner einen Berührring (8) umfasst, der an der Oberplatte (5) ausgebildet ist und zwischen der Seitenwand (6) der Kappe (4; 104; 204) und dem Innenring (7) positioniert ist; und
der Berührring (8) in einem Zustand, bei dem die Kappe (4; 104; 204) schraubbar mit dem Ausguss (3; 103; 203) in Eingriff ist, in enger

Berührung mit einem oberen Ende der Seitenwand (11) des Ausgusses (3; 103; 203) ist.

3. Ausgussbaugruppe (1; 101; 201) gemäß Anspruch 2, **dadurch gekennzeichnet, dass** bei einem Vorgang eines Aufsetzens der Kappe (4; 104; 204) auf den Ausguss (3; 103; 203) und eines Drehens der Kappe (4; 104; 204) in einer Schließrichtung,

der erste Bereich (9) des Innenrings (7) die Seitenwand (11) des Ausgusses (3; 103; 203) auswärts drückt, sodass er die Innenumfangsfläche der Seitenwand (11) des Ausgusses (3; 103; 203) eng berührt;
der zweite Bereich (10) des Innenrings (7) danach die Seitenwand (11) des Ausgusses (3; 103; 203) noch weiter auswärts drückt, sodass er die Innenumfangsfläche der Seitenwand (11) des Ausgusses (3; 103; 203) berührt, und
die Kappe (4; 104; 204) danach in einen Zustand gebracht wird, bei dem sie schraubbar mit dem Ausguss (3; 103; 203) in Eingriff ist.

4. Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** einem Zustand, bei dem die Kappe (4; 104; 204) von dem Ausguss (3; 103; 203) abgebaut worden ist,
eine Differenz zwischen dem ersten Außendurchmesser des Innenrings (7) und dem ersten Innendurchmesser der Seitenwand (11) des Ausgusses (3; 103; 203) größer ist als eine Differenz zwischen dem zweiten Außendurchmesser des Innenrings (7) und dem zweiten Innendurchmesser der Seitenwand (11) des Ausgusses (3; 103; 203).

5. Ausgussbaugruppe (1; 101; 201) gemäß Anspruch 4, wobei in einem Zustand, bei dem die Kappe (4; 104; 204) von dem Ausguss (3; 103; 203) abgebaut worden ist,

eine Differenz zwischen dem ersten Außendurchmesser des Innenrings (7) und dem ersten Innendurchmesser der Seitenwand (11) des Ausgusses (3; 103; 203) 0,30 mm oder mehr und 0,50 mm oder weniger ist;
eine Differenz zwischen dem zweiten Außendurchmesser des Innenrings (7) und dem zweiten Innendurchmesser der Seitenwand (11) des Ausgusses (3; 103; 203) 0,10 mm oder mehr und 0,30 mm oder weniger ist; und
eine Differenz zwischen einem Innendurchmesser des vorbestimmten Teils (14) der Innenumfangsfläche der Seitenwand (6) der Kappe (4; 104; 204) und einem Außendurchmesser des vorbestimmten Teils (15) der Außenumfangsfläche der Seitenwand (11) des Ausgusses (3; 103; 203) 0,20 mm ist.

6. Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 1 bis 5, wobei

eine Dicke des Innenrings (7) in dem ersten Bereich (9) größer ist als eine Dicke der Seitenwand (11) des Ausgusses (3; 103; 203) in dem ersten Bereich (9); und
eine Dicke des Innenrings (7) in dem zweiten Bereich (10) kleiner ist als eine Dicke der Seitenwand (11) des Ausgusses (3; 103; 203) in dem zweiten Bereich (10).

7. Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 1 bis 6, wobei

die Kappe (4; 104; 204) ferner einen Bundteil (119) und eine oder mehrere Lasche/n (20) umfasst, wobei der Bundteil (119) eine zylindrische Form hat und mittels eines dünnen Teils (118) an der Kappe (4; 104; 204) montiert ist, der an einem Ende der Seitenwand (6) der Kappe (4; 104; 204) vorgesehen ist, wobei das Ende der Seitenwand (6) von der Oberplatte (5) weg zeigt, wobei eine jede der einen oder mehreren Lasche/n (20) ein erstes Ende hat, das durchgängig mit einem Ende des Bundteils (119) verbunden ist, wobei das Ende des Bundteils (119) von dem dünnen Teil (118) weg zeigt;
der Ausguss (3; 103; 203) ferner einen Flansch (17) und einen Vorsprung (11b) umfasst, wobei der Flansch (17) sich auswärts von einer Endkante der Seitenwand (11) des Ausgusses (3; 103; 203) erstreckt, wobei der Vorsprung (11b) sich auswärts von einem Gebiet zwischen einem Außengewinde an der Außenumfangsfläche der Seitenwand (11) des Ausgusses (3; 103; 203) und dem Flansch (17) erstreckt; und
in einem Zustand, bei dem die Kappe (4; 104; 204) schraubbar mit dem Ausguss (3; 103; 203) in Eingriff ist,

das Ende des Bundteils (119), das von dem dünnen Teil (118) weg zeigt, in enger Berührung mit dem Flansch (17) ist, und
eine jede der einen oder mehreren Lasche/n (20) in einer Lücke zwischen dem Vorsprung (11b) und dem Flansch (17) gehalten ist, wobei die Lasche in einem Zustand ist, bei dem sie an dem ersten Ende gebogen ist, das durchgängig mit dem Bundteil (119) verbunden ist, wobei ein zweites Ende der Lasche (20) geneigt ist und in Richtung der Oberplatte (5) orientiert ist.

8. Ausgussbaugruppe (1; 101; 201) gemäß Anspruch 7, wobei in einem Zustand, bei dem der schraubbare Eingriff zwischen der Kappe (4; 104; 204) und dem

Ausguss (3; 103; 203) gelöst ist und das zweite Ende der Lasche (20) in Berührung mit dem Vorsprung (11b) ist,

der erste Bereich (9) des Innenrings (7) über den gesamten Umfang in enger Berührung mit dem ersten Bereich (9) der Seitenwand (11) des Ausgusses (3; 103; 203) ist;
der zweite Bereich (10) des Innenrings (7) über den gesamten Umfang in enger Berührung mit dem zweiten Bereich (10) der Seitenwand (11) des Ausgusses (3; 103; 203) ist;
ein vorbestimmter Teil (14) der Innenumfangsfläche der Seitenwand (6) der Kappe (4; 104; 204) über den gesamten Umfang in enger Berührung mit einem vorbestimmten Teil (15) der Außenumfangsfläche der Seitenwand (11) des Ausgusses (3; 103; 203) ist; und
ein Raum (16) zwischen einem Gebiet, in dem der erste Bereich (9) des Innenrings (7) in enger Berührung mit dem ersten Bereich (9) der Seitenwand (11) des Ausgusses (3; 103; 203) ist, und einem Gebiet ausgebildet ist, in dem der zweite Bereich (10) des Innenrings (7) in enger Berührung mit dem zweiten Bereich (10) der Seitenwand (11) des Ausgusses (3; 103; 203) ist.

9. Ausgussbaugruppe (1; 101; 201) gemäß Anspruch 7 oder 8, wobei das Ende des Bundteils (119) das von dem dünnen Teil (118) weg zeigt, einen oder mehrere Verbindungsteil/e (119a) umfasst, der/die eine Verbindung zwischen einem Inneren und einem Äußeren der Kappe (4; 104; 204) herstellt/en.

10. Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 7 bis 9, wobei in einem Zustand, bei dem die Kappe (4; 104; 204) schraubbar mit dem Ausguss (3; 103; 203) in Eingriff ist, eine Entfernung zwischen dem zweiten Ende der Lasche und dem Vorsprung (11b) in einer Höhenrichtung der Kappe (4; 104; 204) 0,1 mm oder mehr und 0,3 mm oder weniger ist.

11. Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 1 bis 10, wobei der Ausguss (3; 103; 203) ferner umfasst:

einen Flansch (17), der sich auswärts von einer Endkante der Seitenwand (11) des Ausgusses (3; 103; 203) erstreckt;
eine Vielzahl Vertiefungen (219), die an einer Fläche des Flansches (17) angeordnet sind, die von der Seitenwand (11) des Ausgusses (3; 103; 203) weg zeigt, wobei die Vertiefungen (219) in einer Draufsicht konzentrisch mit der Seitenwand (11) des Ausgusses (3; 103; 203) angeordnet und durch Rippen definiert sind; und
einen Angusseintritt (220), der in der Axialrichtung der Seitenwand (11) des Ausgusses (3; 103; 203) von einer der Vertiefungen (219) zu einer Position nicht über die Fläche des Flansches (17) hinaus vorsteht, die von der Seitenwand (11) des Ausgusses (3; 103; 203) weg zeigt.

12. Verpackungsbehälter, der mit der Ausgussbaugruppe (1; 101; 201) gemäß einem der Ansprüche 1 bis 11 vorgesehen ist.

Revendications

1. Ensemble de bec verseur (1 ; 101 ; 201) comprenant un bec verseur (3 ; 103 ; 203) soudé à un corps de récipient (2) et un capuchon (4 ; 104 ; 204) destiné à être mis en prise par filetage avec le bec verseur (3 ; 103 ; 203), dans lequel :

le capuchon (4 ; 104 ; 204) comprend une plaque supérieure (5), une paroi latérale (6) raccordée à un bord périphérique externe de la plaque supérieure (5) et ayant une surface périphérique interne sur laquelle les filetages internes (6a) sont formés, et une bague interne (7) prévue, de manière circonférentielle, sur une surface interne de la plaque supérieure (5) ;
la bague interne (7) a une surface périphérique externe comprenant, de manière séquentielle à partir de la plaque supérieure (5), une première région (9) ayant un premier diamètre externe, et une seconde région (10) ayant un second diamètre externe dont le diamètre le plus à l'extérieur est inférieur au premier diamètre externe ;
le bec verseur (3 ; 103 ; 203) comprend une paroi latérale (11) ayant une surface périphérique externe sur laquelle des filetages externes sont formés, le bec verseur (3 ; 103 ; 203) étant réalisé avec un matériau présentant une rigidité qui est inférieure à celle du matériau pour le capuchon (4 ; 104 ; 204) ; et
la paroi latérale (11) du bec verseur (3 ; 103 ; 203) a une surface périphérique interne comprenant, de manière séquentielle à partir d'une extrémité supérieure orientée à l'opposé du corps de récipient (2), une première région (9) ayant un premier diamètre interne, et une seconde région (10) ayant un second diamètre interne dont le diamètre le plus à l'intérieur est inférieur au premier diamètre interne ;
caractérisé en ce que :

dans un état dans lequel le capuchon (4 ; 104 ; 204) est mis en prise par filetage avec le bec verseur (3 ; 103 ; 203),
la première région (9) de la bague interne

(7) est en contact immédiat avec la première région (9) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) sur toute la circonférence,
la seconde région (10) de la bague interne (7) est en contact immédiat avec la seconde région (10) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) sur toute la circonférence,
une partie (14) prédéterminée de la surface périphérique interne de la paroi latérale (6) du capuchon (4 ; 104 ; 204) est en contact immédiat avec une partie (15) prédéterminée de la surface périphérique externe de la paroi latérale (11) du bec verseur (3 ; 103 ; 203), et
un espace (16) est formé entre une zone dans laquelle la première région (9) de la bague interne (7) est en contact immédiat avec la première région (9) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) et une zone dans laquelle la seconde région (10) de la bague interne (7) est en contact immédiat avec la seconde région (10) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203).

2. Ensemble de bec verseur (1 ; 101 ; 201) selon la revendication 1, dans lequel :

le capuchon (4 ; 104 ; 204) comprend en outre une bague de contact (8) qui est formée sur la plaque supérieure (5) et positionnée entre la paroi latérale (6) du capuchon (4 ; 104 ; 204) et la bague interne (7) ; et
la bague de contact (8) est en contact immédiat avec une extrémité supérieure de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) dans un état dans lequel le capuchon (4 ; 104 ; 204) est mis en prise, par filetage, avec le bec verseur (3 ; 103 ; 203) .

3. Ensemble de bec verseur (1 ; 101 ; 201) selon la revendication 2, **caractérisé en ce que**, lors d'un processus de mise en place du capuchon (4 ; 104 ; 204) sur le bec verseur (3 ; 103 ; 203) et de la rotation du capuchon (4 ; 104 ; 204) dans une direction de fermeture,

la première région (9) de la bague interne (7) pousse la paroi latérale (11) du bec verseur (3 ; 103 ; 203) vers l'extérieur pour être en contact immédiat avec la surface périphérique interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) ;
la seconde région (10) de la bague interne (7) pousse ensuite la paroi latérale (11) du bec verseur (3 ; 103 ; 203) vers l'extérieur encore plus pour être en contact avec la surface périphérique interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) ; et
le capuchon (4 ; 104 ; 204) est ensuite amené dans un état dans lequel il est mis en prise, par filetage, avec le bec verseur (3 ; 103 ; 203).

4. Ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que**, dans un état dans lequel le capuchon (4 ; 104 ; 204) a été démonté du bec verseur (3 ; 103 ; 203),
une différence entre le premier diamètre externe de la bague interne (7) et le premier diamètre interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) est supérieure à une différence entre le second diamètre externe de la bague interne (7) et le second diamètre interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203).

5. Ensemble de bec verseur (1 ; 101 ; 201) selon la revendication 4, dans un état dans lequel le capuchon (4 ; 104 ; 204) a été démonté du bec verseur (3 ; 103 ; 203),

une différence entre le premier diamètre externe de la bague interne (7) et le premier diamètre interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) est de 0,30 mm ou plus et de 0,50 mm ou moins ;
une différence entre le second diamètre externe de la bague interne (7) et le second diamètre interne de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) est de 0,10 mm ou plus et de 0,30 mm ou moins ; et
une différence entre un diamètre interne de la partie (14) prédéterminée de la surface périphérique interne de la paroi latérale (6) du capuchon (4 ; 104 ; 204) et un diamètre externe de la partie (15) prédéterminée de la surface périphérique externe de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) est de 0,20 mm.

6. Ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 1 à 5, dans lequel :

une épaisseur de la bague interne (7) dans la première région (9) est supérieure à une épaisseur de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) dans la première région (9) ; et
une épaisseur de la bague interne (7) dans la seconde région (10) est inférieure à une épaisseur de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) dans la seconde région (10).

7. Ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 1 à 6, dans lequel :

le capuchon (4 ; 104 ; 204) comprend en outre une partie de bande (119) et un ou plusieurs rabats (20), la partie de bande (119) ayant une forme cylindrique et étant montée sur le capuchon (4 ; 104 ; 204) via une partie fine (118) qui est prévue sur une extrémité de la paroi latérale (6) du capuchon (4 ; 104 ; 204), l'extrémité de la paroi latérale (6) étant orientée à l'opposé de la plaque supérieure (5), chacun des un ou plusieurs rabats (20) ayant une première extrémité raccordée, de manière continue, à une extrémité de la partie de bande (119), l'extrémité de la partie de bande (119) étant orientée à l'opposé de la partie fine (118) ;
le bec verseur (3 ; 103 ; 203) comprend en outre une bride (17) et une saillie (11b), la bride (17) s'étendant vers l'extérieur à partir d'un bord d'extrémité de la paroi latérale (11) du bec verseur (3 ; 103 ; 203), la saillie (11b) s'étendant vers l'extérieur à partir d'une zone entre un filetage externe sur la surface périphérique externe de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) et la bride (17) ; et
dans un état dans lequel le capuchon (4 ; 104 ; 204) est mis en prise, par filetage, avec le bec verseur (3 ; 103 ; 203),
l'extrémité de la partie de bande (119) qui est orientée à l'opposé de la partie fine (118) est en contact immédiat avec la bride (17), et
chacun des un ou plusieurs rabats (20) est maintenu dans un interstice entre la saillie (11b) et la bride (17), le rabat étant dans un état dans lequel il est plié au niveau de la première extrémité raccordée, de manière continue, à la partie de bande (119), avec une seconde extrémité du rabat (20) qui est inclinée et orientée vers la plaque supérieure (5).

8. Ensemble de bec verseur (1 ; 101 ; 201) selon la revendication 7, dans lequel, dans un état dans lequel la mise en prise filetée entre le capuchon (4 ; 104 ; 204) et le bec verseur (3 ; 103 ; 203) est desserrée et la seconde extrémité du rabat (20) est en contact avec la saillie (11b),

la première région (9) de la bague interne (7) est en contact immédiat avec la première région (9) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) tout le long de la circonférence ;
la seconde région (10) de la bague interne (7) est en contact immédiat avec la seconde région (10) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) tout le long de la circonférence ;
une partie (14) prédéterminée de la surface périphérique interne de la paroi latérale (6) du capuchon (4 ; 104 ; 204) est en contact immédiat avec une partie (15) prédéterminée de la surface périphérique externe de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) tout le long de la circonférence ; et
un espace (16) est formé entre une zone dans laquelle la première région (9) de la bague interne (7) est en contact immédiat avec la première région (9) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) et une zone dans laquelle la seconde région (10) de la bague interne (7) est en contact immédiat avec la seconde région (10) de la paroi latérale (11) du bec verseur (3 ; 103 ; 203).

9. Ensemble de bec verseur (1 ; 101 ; 201) selon la revendication 7 ou 8, dans lequel l'extrémité de la partie de bande (119) orientée à l'opposé de la partie fine (118) comprend une ou plusieurs parties de communication (119a) établissant la communication entre l'intérieur et l'extérieur du capuchon (4 ; 104 ; 204).

10. Ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 7 à 9, dans lequel, dans un état dans lequel le capuchon (4 ; 104 ; 204) est mis en prise, par filetage, avec le bec verseur (3 ; 103 ; 203), une distance entre la seconde extrémité du rabat et la saillie (11b) dans une direction de hauteur du capuchon (4 ; 104 ; 204) est de 0,1 mm ou plus et de 0,3 mm ou moins.

11. Ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 1 à 10, dans lequel le bec verseur (3 ; 103 ; 203) comprend en outre :

une bride (17) s'étendant vers l'extérieur à partir d'un bord d'extrémité de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) ;
une pluralité d'évidements (219) agencés sur une surface de la bride (17) orientée à l'opposé de la paroi latérale (11) du bec verseur (3 ; 103 ; 203), les évidements (219) étant agencés de manière concentrique avec la paroi latérale (11) du bec verseur (3 ; 103 ; 203) sur une vue en plan et définis par des nervures ; et
une entrée de porte (220) faisant saillie dans la direction axiale de la paroi latérale (11) du bec verseur (3 ; 103 ; 203) à partir de l'un des évidements (219) jusqu'à une position non au-delà de la surface de la bride (17) orientée à l'opposé de la paroi latérale (11) du bec verseur (3 ; 103 ; 203).

12. Récipient de conditionnement prévu avec l'ensemble de bec verseur (1 ; 101 ; 201) selon l'une quelconque des revendications 1 à 11.

Fig.1

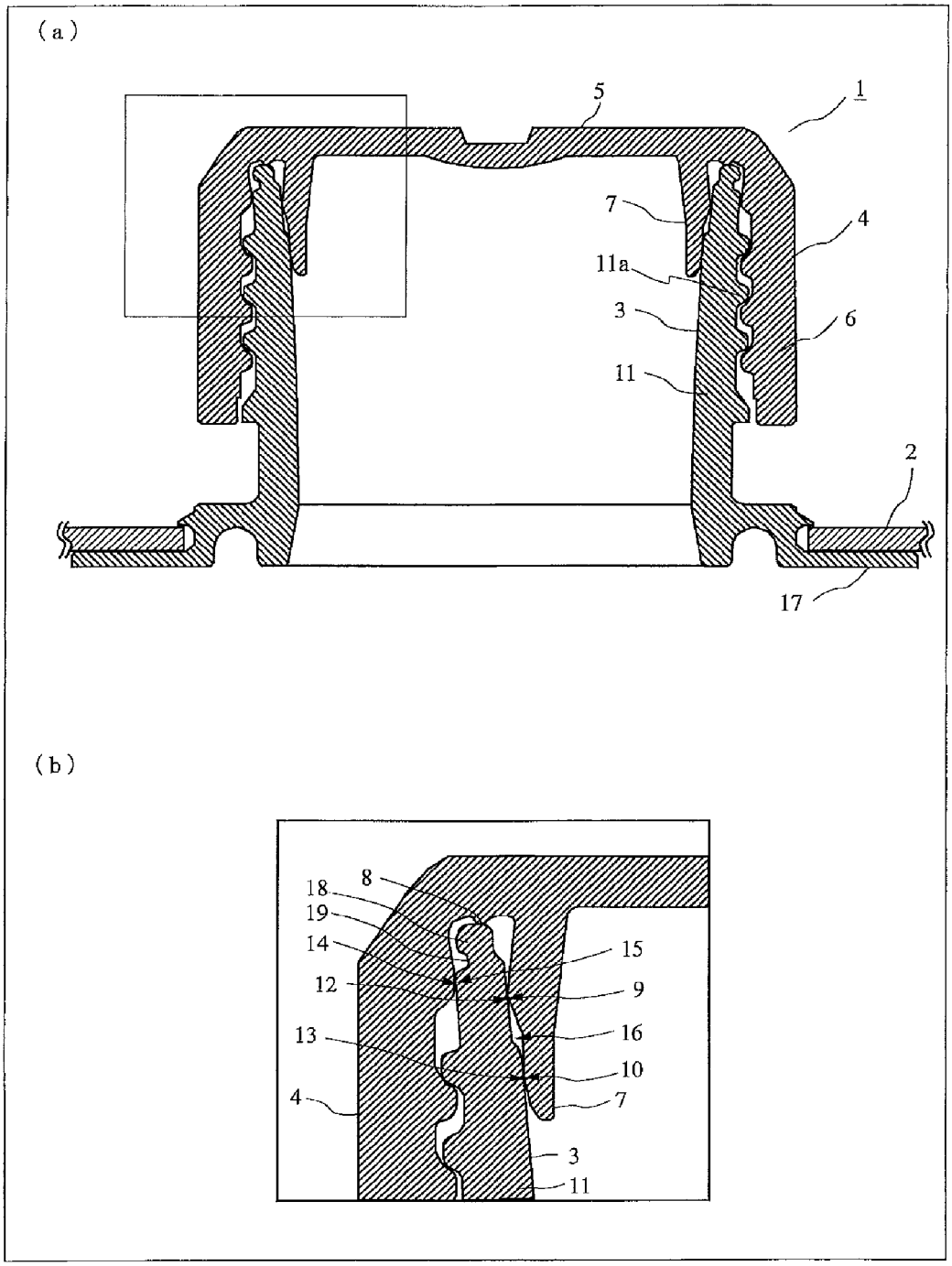


Fig.2

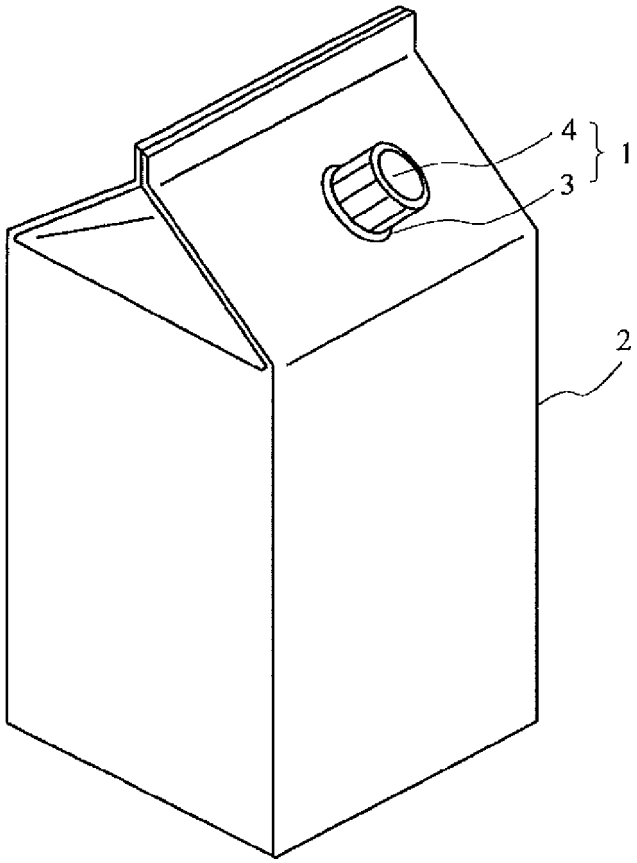


Fig.3

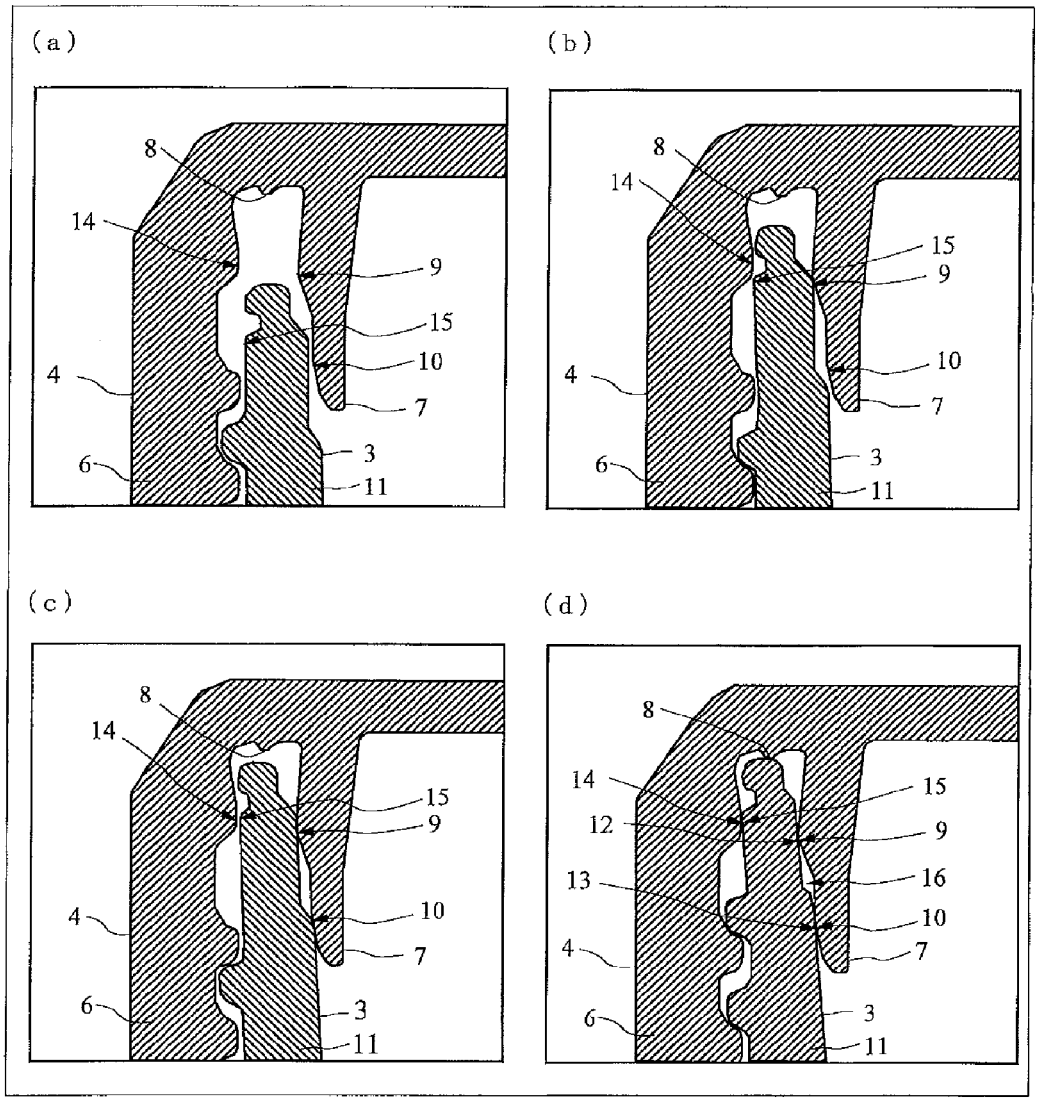

(a)
8
14
9
15
10
7
4
6
3
11
(b)
8
14
15
9
10
7
4
6
3
11
(c)
8
14
15
9
10
7
4
6
3
11
(d)
8
14
15
12
9
13
16
10
7
4
6
3
11

Fig.4

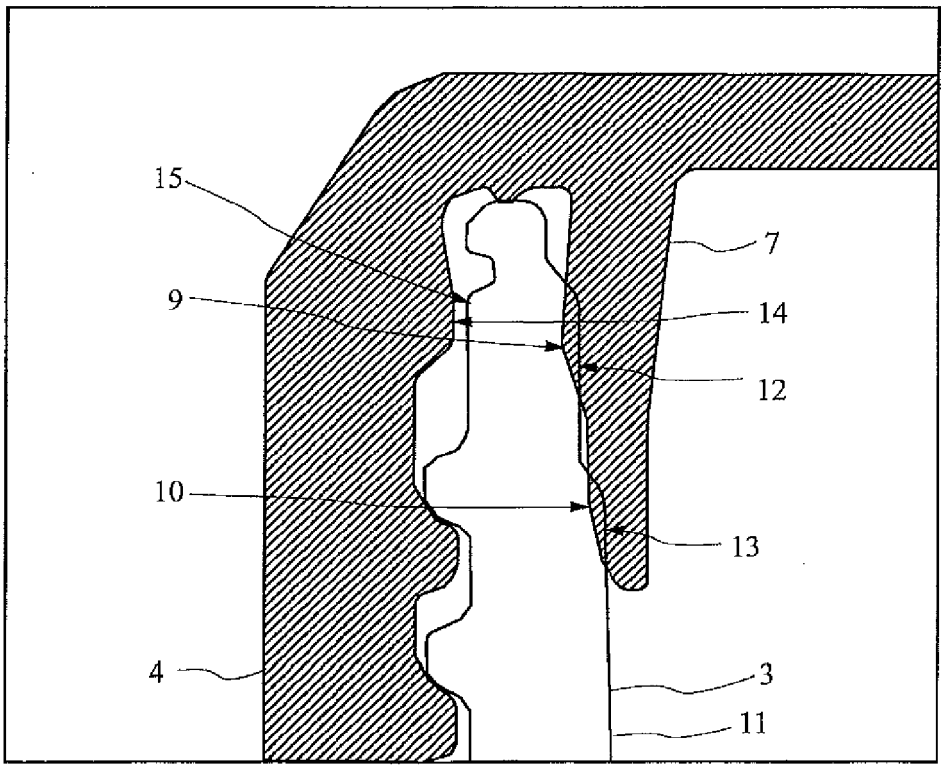

15
9
10
4
7
14
12
13
3
11

Fig.5

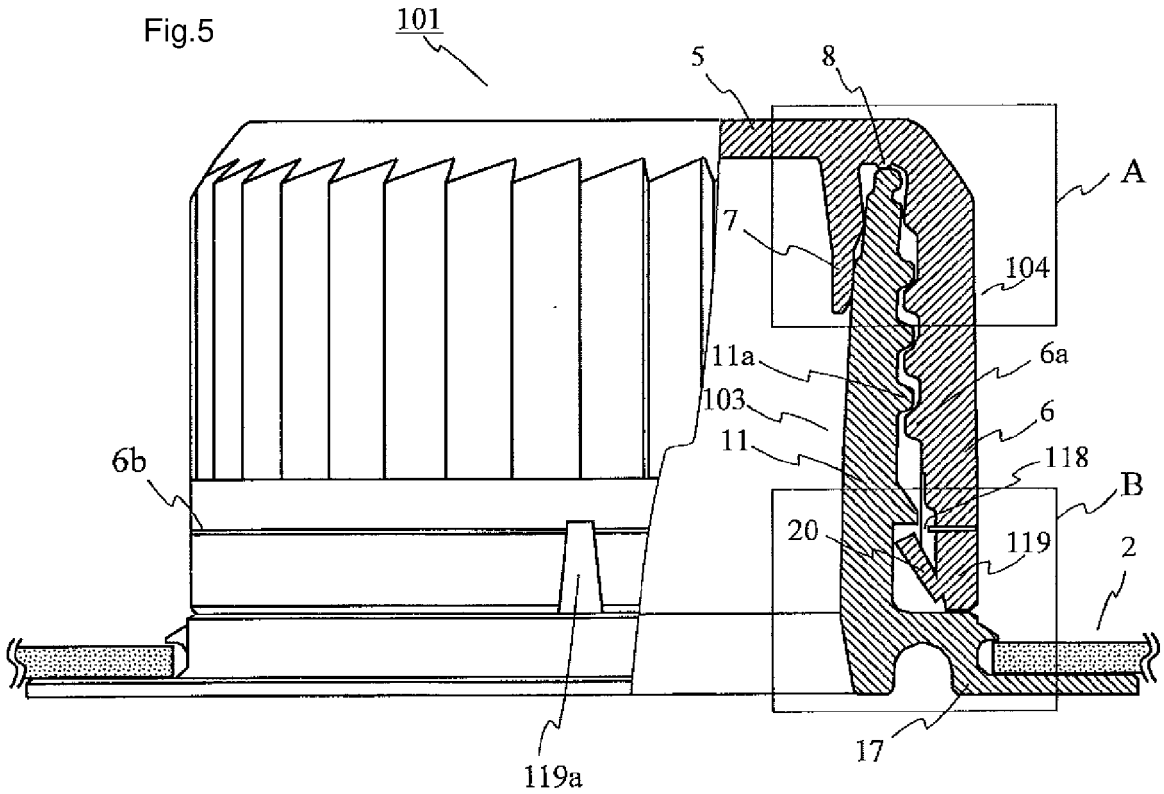
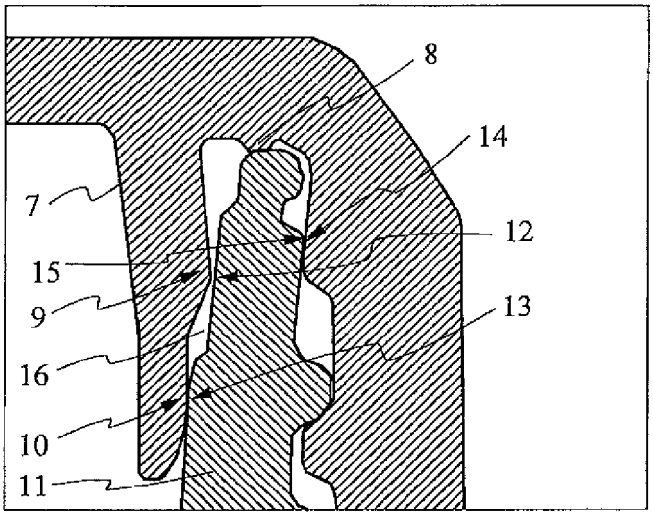
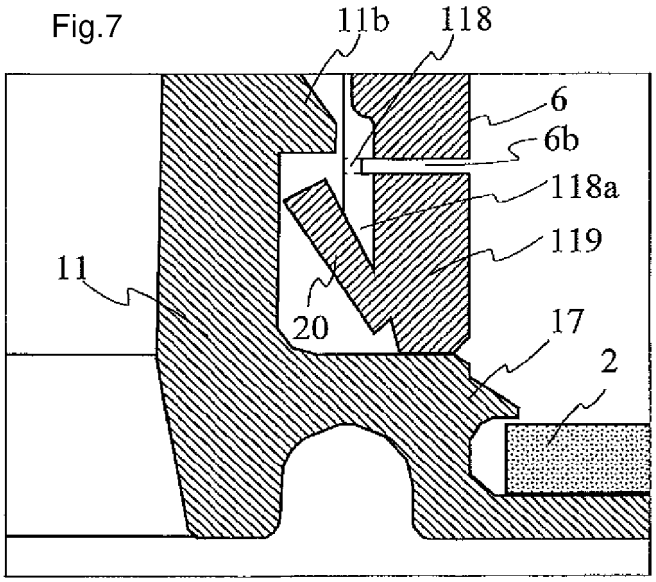

101
5
8
A
7
104
11a
6a
103
6
11
118
6b
B
20
119
2
17
119a

Fig.6



ENLARGED VIEW OF AREA A

Fig.7



ENLARGED VIEW OF AREA B

Fig.8

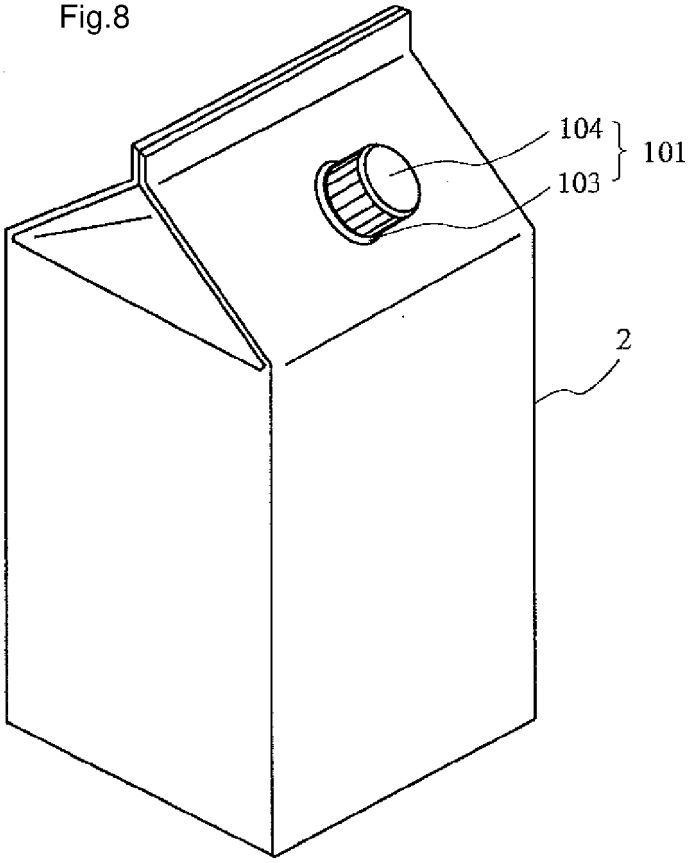


FIG.9

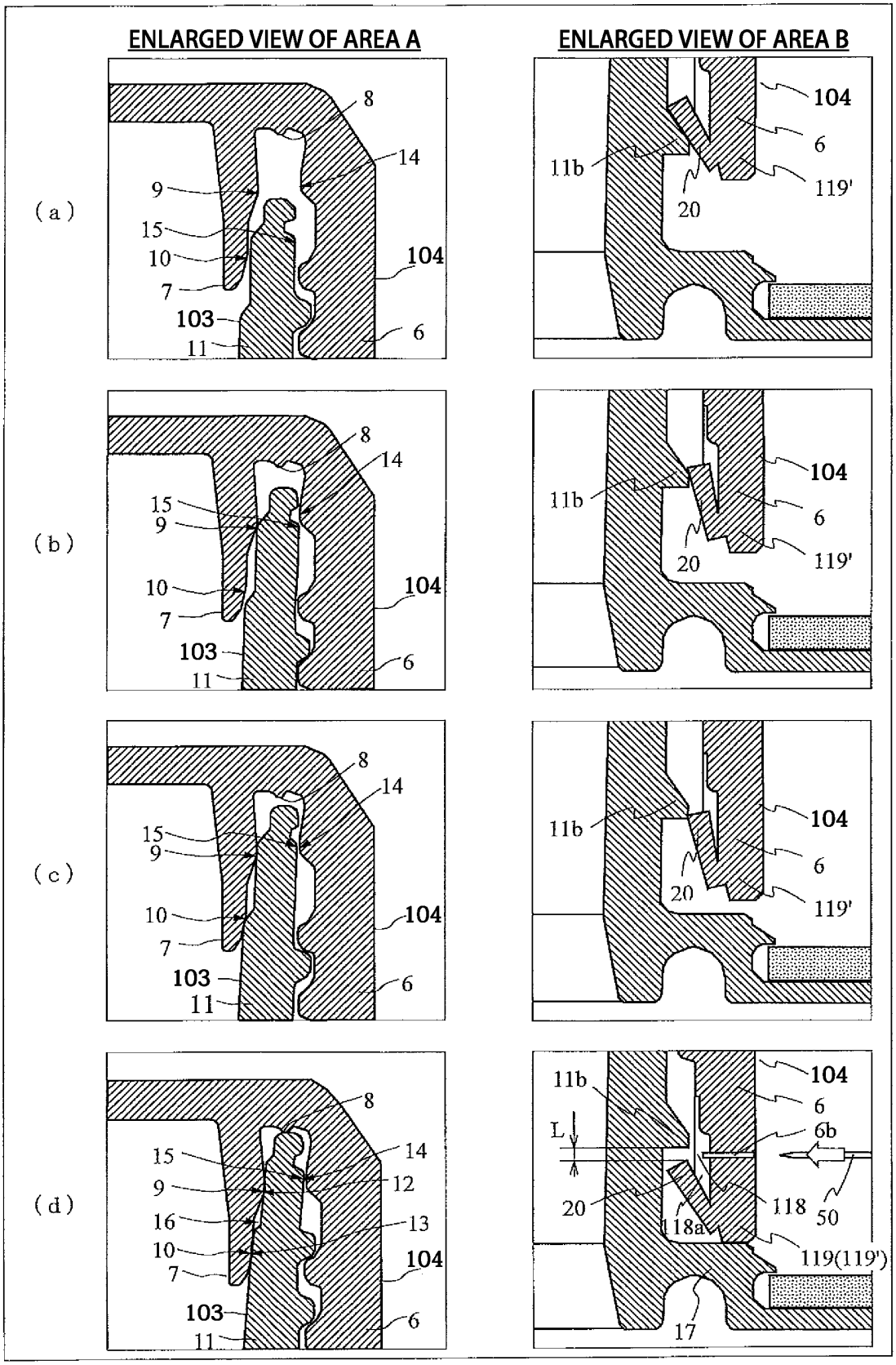

ENLARGED VIEW OF AREA A
ENLARGED VIEW OF AREA B
(a)
(b)
(c)
(d)
8
14
9
15
10
7
103
11
104
6
11b
L
20
119'
12
16
13
6b
50
118
118a
119(119')
17

Fig.10

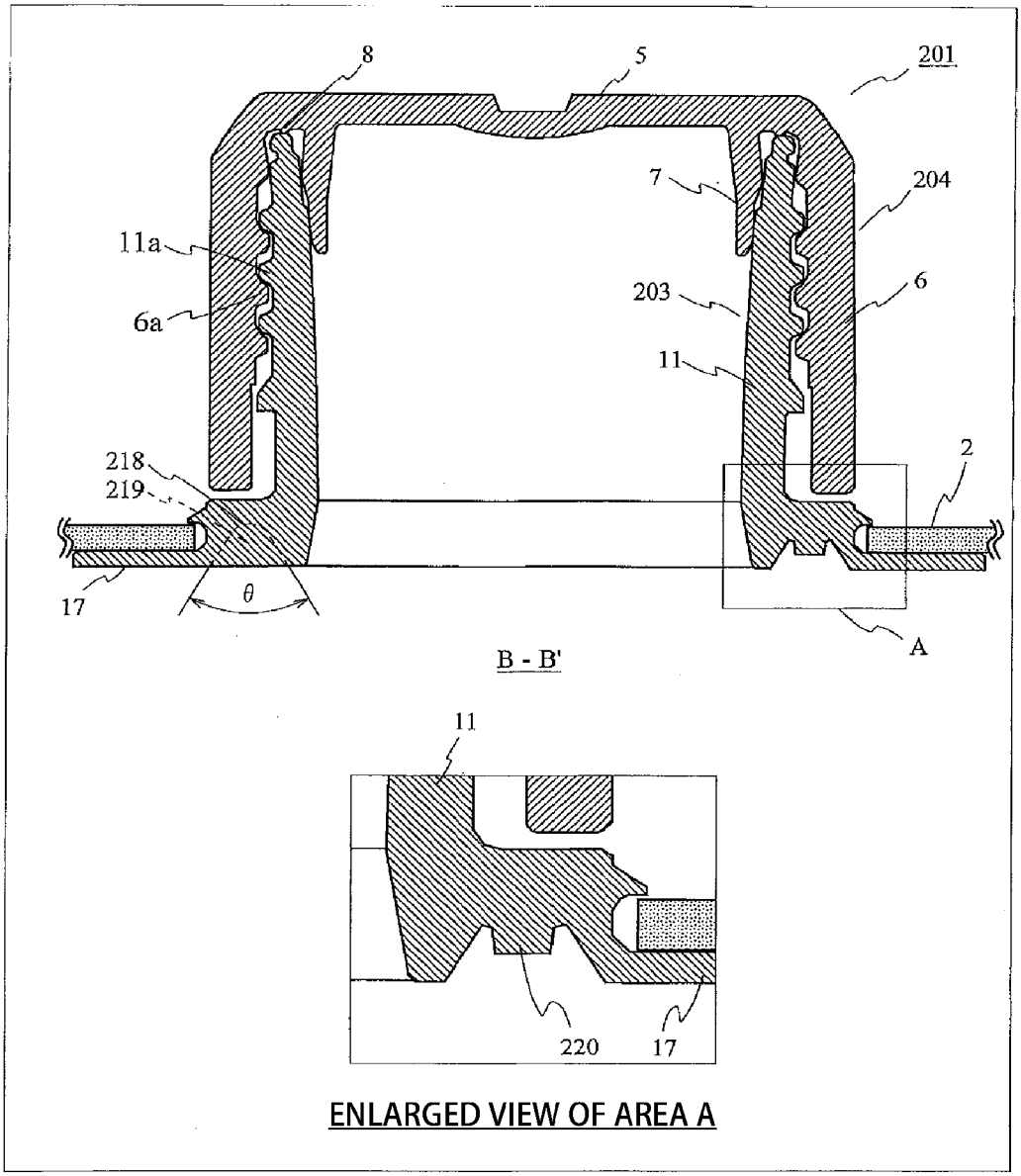

8
5
201
7
204
11a
6a
203
6
11
218
219
2
17
θ
A
B - B'
11
220
17
ENLARGED VIEW OF AREA A

Fig.11

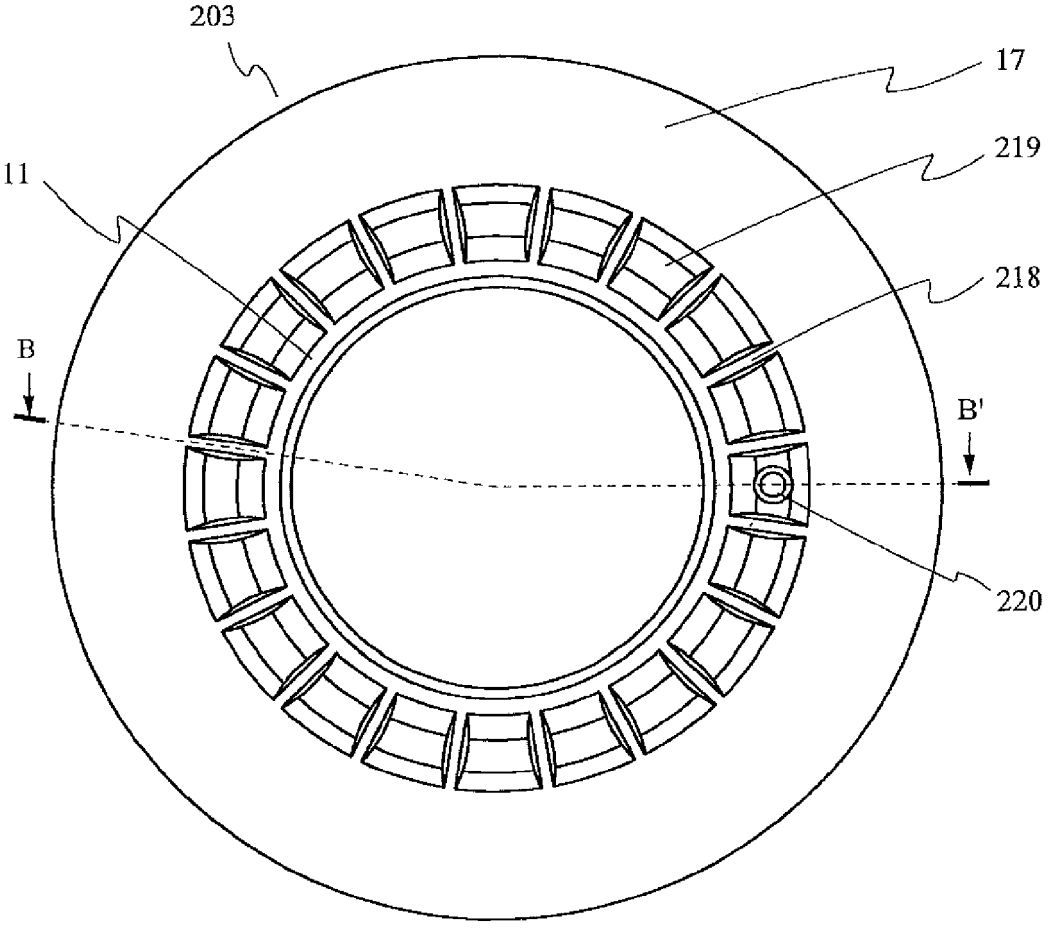
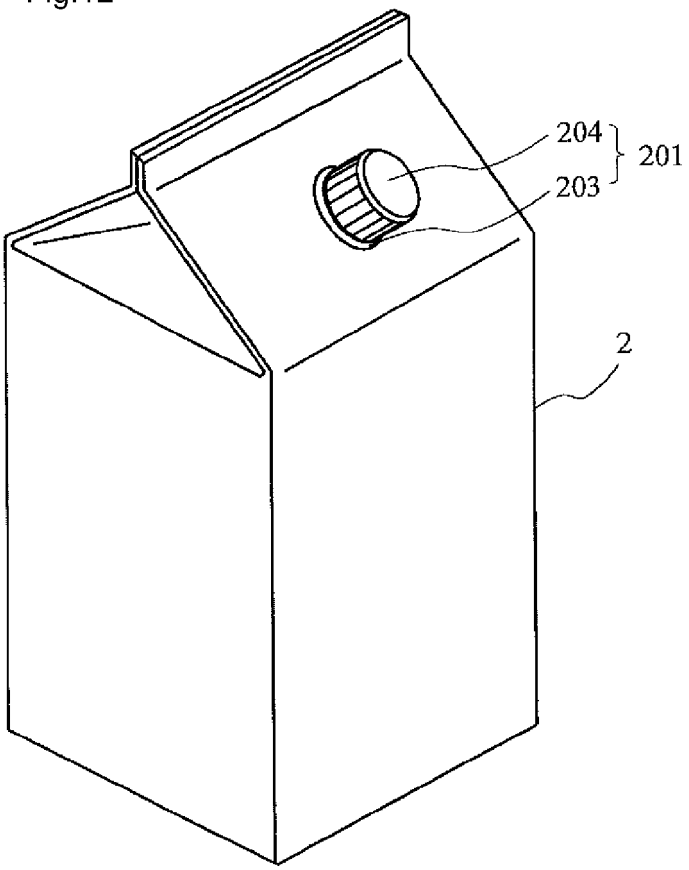


Fig.12



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2016011128 A **[0003] [0004] [0006]**
- WO 2016017178 A1 **[0005]**