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(54) CAP ASSEMBLY AND METHOD FOR ASSEMBLING SAME

(57) The present invention is related to a cap assembly which is put over a mouth of a bottle, and an assembly method thereof, and provides a cap assembly which prevents an occurrence of misunderstanding when opening a cap initially and has good usability, and a method for assembling thereof. There are included an inner stopper 40 and a cap 50, and the inner stopper 40 and the cap 50 are assembled in a state in which a lid section 421 is received in a receiving section 52 and a protrusion section 53 is positioned below the lid section 421, and the lid section 421 is arranged at a position which is inside the receiving section 52 and has a space between an inner surface of a shell section 51 and the lid section 421, so that an occurrence of misunderstanding by torque changing before the inner stopper is opened is prevented.

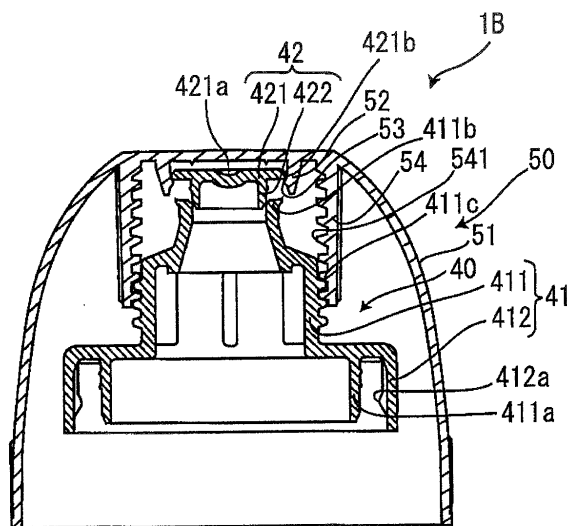


FIG. 6

Description

Technical Field

[0001] The present invention is related to a cap assembly which is put over a mouth of a bottle and a method for assembling of the cap assembly.

Background Art

[0002] Conventionally, there have been used many containers of configuration in which, for example, a mouth of a bottle filled with food having fluidity such as mayonnaise, jam and the like is closed with an inner stopper, a seal and the like, and then a cap is put thereon. In a case of such configuration, in order to take a content from a bottle, operations such as removing a cap at first, and after that, opening a pull-tab of an inner stopper, or removing a seal are required, and so, it is pointed out that it may be difficult for an elderly person to remove the pull-tab, or the content of the bottle may stick to a hand or scatter around when removing the seal, and so on, and thus, the usability is poor.

[0003] In order to improve this, in recent years, there has been proposed cap assemblies of configuration in which, when removing a cap initially, by rotating temporarily the cap in a direction opposite to a direction of removing to open an inner stopper and then rotating the cap in the direction of removing, it is possible to remove the cap in a state in which the inner stopper is opened (see, Patent Literatures 1, 2 and 3). According to the cap assemblies of the proposals, it is not required to open the inner stopper after removing the cap, and thus, the usability is much improved.

Prior Art Literatures

Patent Literatures

[0004]

Patent Literature 1: International Patent Publication Pamphlet No. WO/2007/126062.

Patent Literature 2: Japanese Laid-Open Patent Literature No. 2011-225220.

Patent Literature 3: Japanese Patent No. 4581034.

Abstract of the Invention

Technical Problem

[0005] In a case of the cap assemblies of the above-described proposals, when a cap is rotated in a direction of closing which is opposite to a direction of removing in order to open the cap initially, the rotating temporarily becomes heavy and then becomes light, and however, an inner stopper is not opened yet at this stage, and thus, it is required that the cap is further rotated in the same

direction to open the inner stopper, and then, the cap is now rotated in the direction of removing.

[0006] However, at a stage in which the rotating becomes light after the rotating temporarily becomes heavy while rotating the cap in the closing direction, there may be a case in which misunderstanding that the inner stopper has been opened occurs, and thus, it is required to eliminate such misunderstanding.

[0007] In view of the foregoing, it is an object of the present invention to provide a cap assembly which prevents an occurrence of the above-described misunderstanding when opening a cap initially and is easy to handle, and an assembly method thereof.

Solution to Problem

[0008] A cap assembly according to the present invention to obtain the above-described object includes:

an inner stopper that is put over a mouth of a bottle to close the mouth; and
a cap that is put over the mouth such that the cap covers the inner stopper,

wherein
the inner stopper includes:

a main body that includes a hollow section which has a hollow shape having an upper opening and a lower opening and communicating with the mouth of the bottle, and whose lower end section is inserted to the mouth of the bottle, and a holding section which holds an upper end section of the bottle in cooperation with the lower end section of the hollow section after the insertion has been executed; and
a lid body that includes a lid section which spreads above the hollow section such that the lid section covers the hollow section, and a junction section which is junctioned circumferentially to an upper end edge of the hollow section and closes an opening on an upper end of the hollow section together with the lid section, and that is a component integrated with the main body, closes the mouth of the bottle together with the main body, and receives pressing from above to have the junction section broken so as to become a part separate from the main body,

the cap includes:

a shell section that is formed to be hollow while opening downward and is put over the mouth of the bottle while covering the inner stopper;
a receiving section that protrudes downward from an inner side upper surface of the shell section, has a lower opening section, and receives the lid section in an inside to surround an edge of the lid section; and
a protrusion section that protrudes inward from an inner circumference surface of the receiving section,

interferes with the edge of the lid section to cause the lid section to expand the receiving section when the cap and the inner stopper are assembled, causes the receiving section to return to an original shape when the lid section comes to a side of an upper surface of the shell section so as to be positioned below the lid section, and supports the lid section after the junction section is broken, and the cap is coupled with the inner stopper in a state in which the cap receives the lid section in the receiving section, the protrusion section is positioned below the lid section, and the lid section is arranged at a position which is inside the receiving section and has a space between the lid section and the inner surface of the shell section.

[0009] Since, in the cap assembly according to the present invention, the inner stopper and the cap respectively include the above-described configurations, and the cap is coupled with the inner stopper in a state in which the cap receives the lid section in the receiving section, the protrusion section is positioned below the lid section, and the lid section is arranged at a position which is inside the receiving section and has a space between the inner surface of the shell section and the lid section, the cap assembly according to the present invention does not have behaviors that cause a user to misunderstand like becoming temporarily heavy and then becoming light as the conventional cases when opening the inner stopper with the cap, and thus, the cap assembly according to the present invention has a configuration which is easy to handle.

[0010] Here, in the cap assembly according to the present invention, it is preferable that the inner stopper includes a screw thread which circles helically on an outer circumference surface of the hollow section, and the cap includes a screwing section which protrudes in a cylindrical shape and downward from the inner side upper surface of the shell section, and has a lower opening section, and on whose inner circumference surface a screw thread to be screwed to the screw thread of the inner stopper is formed.

[0011] In a case of this configuration, it is possible to assemble the inner stopper and the cap independently of a bottle.

[0012] Or, in the cap assembly according to the present invention, it is acceptable that the cap includes on an inner surface of the shell section a screw thread to be screwed to a screw thread formed in the bottle.

[0013] In addition, in the cap assembly according to the present invention, it is preferable that an upper end surface surrounding the upper opening and being oriented upward of the hollow section has a gradient rising outward.

[0014] In a case of this configuration, when a bottle is inclined to pour a content in the bottle and then the bottle is stood up, the content is cut well, and thus, it is prevented that the content drips inadvertently.

[0015] In addition, a method for assembling according to the present invention is a method for assembling of assembling the inner stopper and the cap included in the cap assembly according to the present invention, and includes putting the cap over the inner stopper, and causing the receiving section to receive the lid section up to a position in which the protrusion section goes beyond the lid section to be positioned below the lid section and the space between the lid section and the inner surface of the shell section becomes relatively narrow, and thereafter, moving the cap upward relatively to the inner stopper in a range in which a state in which the protrusion section is positioned below the lid section is maintained, so as to expand the space between the lid section and the inner surface of the shell section.

[0016] According to the method for assembling, it is possible to make an arrangement in which the space between the lid section of the inner stopper and the inner surface of the shell section of the cap is securely expanded, and even in a case in which the cap is inadvertently pressed before opening, it is avoided that a force is applied to the lid section of the inner stopper, and thus, it is prevented that the inner stopper is inadvertently opened.

Advantageous Effects of Invention

[0017] According to the above present invention, misunderstanding that the inner stopper has been opened even though the inner stopper has not been opened yet when removing the cap initially is prevented, and thus, the usability is improved.

Brief Description of the Drawings

[0018]

[FIG. 1] FIG. 1 is a vertical sectional view of a cap assembly of a comparative example.

[FIG. 2] FIG. 2 is a view illustrating behaviors at the time of opening by a consumer as to the comparative example illustrated in FIG. 1.

[FIG. 3] FIG. 3 is a view illustrating behaviors at the time of opening by an user as to the comparative example illustrated in FIG. 1.

[FIG. 4] FIG. 4 is a view illustrating behaviors at the time of opening by an user as to the comparative example illustrated in FIG. 1.

[FIG. 5] FIG. 5 is a view illustrating torque changes when a cap is rotated temporarily in a direction of closing in order to open the cap initially in the comparative example illustrated in FIG. 1 to FIG. 4.

[FIG. 6] FIG. 6 is a vertical sectional view of a cap assembly of a first embodiment according to the present invention.

[FIG. 7] FIG. 7 is a partially enlarged sectional view of a cap included in the cap assembly of the first embodiment.

[FIG. 8] FIG. 8 is a partially enlarged sectional view illustrating a portion of the cap assembly of the first embodiment in a state in which a lid section of an inner stopper is received in a receiving section of the cap.

[FIG. 9] FIG. 9 is a partially enlarged sectional view illustrating a portion of an edge of the lid section in a section in which the lid section is sectioned horizontally in a state in which the lid section of the inner stopper enters the receiving section of the cap.

[FIG. 10] FIG. 10 is an explanatory view of a method for assembling of assembling the cap to the inner stopper in the cap assembly of the first embodiment.

[FIG. 11] FIG. 11 is an explanatory view of the method for assembling of assembling the cap to the inner stopper in the cap assembly of the first embodiment.

[FIG. 12] FIG. 12 is an explanatory view of the method for assembling of assembling the cap to the inner stopper in the cap assembly of the first embodiment.

[FIG. 13] FIG. 13 is an explanatory view of the method for assembling of assembling the cap to the inner stopper in the cap assembly of the first embodiment.

[FIG. 14] FIG. 14 is an explanatory view of a scene in which the cap assembly of the first embodiment is capped to a bottle.

[FIG. 15] FIG. 15 is an explanatory view of a scene in which the cap assembly of the first embodiment is capped to a bottle.

[FIG. 16] FIG. 16 is an explanatory view of a scene in which the cap is opened initially.

[FIG. 17] FIG. 17 is an explanatory view of a scene in which the cap is opened initially.

[FIG. 18] FIG. 18 is a view illustrating torque changes when the cap is rotated temporarily in a direction of closing in order to open the cap initially in the first embodiment.

[FIG. 19] FIG. 19 is a vertical sectional view of a cap assembly of a second embodiment according to the present invention.

[FIG. 20] FIG. 20 is an explanatory view of a scene in which a cap is opened initially in the cap assembly of the second embodiment.

[FIG. 21] FIG. 21 is an explanatory view of a scene in which the cap is opened initially in the cap assembly of the second embodiment.

Best Mode for Carrying out the Invention

[0019] In the following, a comparative example which is compared to the present invention will be explained firstly, and next, embodiments according to the present invention will be explained.

[0020] FIG. 1 is a vertical sectional view of a cap assembly of a comparative example.

[0021] A cap assembly 1A of the comparative example illustrated in this FIG. 1 includes an inner stopper 10 and a cap 20.

[0022] The inner stopper 10 is a component which is

put over a mouth 31 of a bottle 30 to close the mouth 31. In addition, the cap 20 is a component which is put over the mouth 31 of the bottle 30 upon the inner stopper 10 such that the cap 20 covers the inner stopper 10.

5 [0023] This FIG. 1 illustrates a state in which the inner stopper 20 is already capped to the mouth 31 of the bottle 30, the cap 20 is put upon the inner stopper 10 and is in a predetermined relation with respect to the inner stopper 10.

10 [0024] The inner stopper 10 includes a main body 11 and a lid body 12.

[0025] The main body 11 includes a hollow section 111 and a holding section 112. Of them, the hollow section 111 has a hollow shape which has an upper opening and a lower opening, and communicates with the mouth 31 of the bottle 30, and a lower end section 111a of the hollow section 111 is inserted to the mouth 31 of the bottle 30.

15 [0026] In addition, the holding section 112 included in the main body 11 plays a role of receiving an insertion of an upper end section 32 of the bottle 30 to hold the upper end section 32 of the bottle 30 in cooperation with the lower end section 111a of the hollow section 111 which lower end section 111a is inserted to the mouth 31 of the bottle 30. The holding section 112 has a configuration in which a rib 112a is formed to protrude inward in the holding section 112, and the rib 112a enters a depressed section 33 of the bottle 30 so that the holding section 112 firmly holds the upper end section 32 of the bottle 30 and is not removed from the mouth 31 of the bottle 30.

20 [0027] In addition, the lid body 12 included in the inner stopper 10 includes a lid section 121 and a junction section 122. Of them, the lid section 121 is a portion which spreads in a plate shape and above the hollow section 111 such that the lid section 121 covers the hollow section 111. In addition, the junction section 122 is junctioned circumferentially to an upper end edge 111b of the hollow section 111, and closes an opening on an upper end of the hollow section 111 together with the lid section 121. The main body 11 and the lid body 12 which are included in the inner stopper 10 are integrally formed as a single component, and however, the junction section 122 is easily broken when the lid section 121 is pressed from above, and when the junction section 122 is broken, the lid body 12 becomes a part separate from the main body 11. This point will be described later.

25 [0028] In order to secure a safety margin ratio such that the junction section 122 is not inadvertently broken, it is devised such that a recess 121a is formed on an upper surface of the lid section 121 so that the lid section 121 is made to have a shape of being away from an upper surface of the cap 20, and even if a force is applied to the upper surface of the cap 20 and the upper surface is depressed, the force is not applied to the lid section 121.

30 [0029] In addition, the cap 20 included in the cap assembly 1A of the comparative example includes a shell section 21, a receiving section 22 and a protrusion sec-

tion 23.

[0030] The shell section 21 is a portion which is formed to be hollow while opening downward, and is put over the mouth 31 of the bottle 30 upon the inner stopper 10 while covering the inner stopper 10. A female screw thread 211 which is screwed to a male screw thread 34 provided in the bottle 30 is formed on an inner circumference surface of the shell section 21, and the cap 20 is rotated to be attached or removed.

[0031] In addition, the receiving section 22 is a portion which protrudes downward from an inner side upper surface of the shell section 22, has a lower opening section, and receives the lid section 121 of the main body 11 in an inside thereof to surround an edge 121b of the lid section 121.

[0032] Further, the protrusion section 23 is a portion which has a shape of rib protruding inward from an inner circumference surface of the receiving section 22. As described later, the protrusion section 23 protrudes up to a position where the protrusion section 23 interferes with the edge 121b of the lid section 121.

[0033] In order to attach the cap assembly 1A having the configuration illustrated in this FIG. 1 to the bottle 30, after the bottle 30 is filled with a content, the upper end section 32 of the bottle 30 is held between a lower end section of the hollow section 11 of the inner stopper 10 and the holding section 112. In other words, the inner stopper 10 is capped to the bottle 30. After this capping, the cap 20 is put thereover and rotated, and the cap 20 is attached such that the protrusion section 23 of the cap 20 comes to a position immediately above the lid section 121 of the inner stopper 20, as illustrated in FIG. 1. Then, shrink wrap packaging and the like are performed, and the cap 20 becomes a state in which the cap 20 is not rotated inadvertently from the position illustrated in this FIG. 1.

[0034] FIG. 2 to FIG. 4 are views illustrating behaviors at the time of opening by a consumer as to the comparative example illustrated in FIG. 1

[0035] After delivered to a consumer in the state illustrated in FIG. 1, when the consumer is going to open the cap initially, after the consumer removes the shrink wrap at first, the consumer rotates the cap in a direction of closing further. Then, the cap 20 moves in a direction indicated by arrow A illustrated in FIG. 2, and the lid section 121 moves and comes upper than the protrusion section 23 while the edge 121b of the lid section 121 of the inner stopper 10 interferes with the protrusion section 23 of the cap 20 to expand the receiving section 22 elastically, as illustrated in FIG. 2. Then, the interference between the edge 121b of the lid section 121 and the protrusion section 23 of the cap 20 is released and the receiving section 22 returns to an original shape, and the protrusion section 23 of the cap 20 comes below the edge 121b of the lid section 121.

[0036] When the cap 20 is further rotated in the direction of closing so that the cap 20 is further moved in the direction of arrow A, the cap 20 presses the lid section

121, and the junction section 122 is broken, as illustrated in FIG. 3. When the cap 20 is rotated in the direction of closing and becomes the state illustrated in FIG. 3, the cap 20 becomes not further rotating in the direction of closing, and then, the cap 20 is now rotated in a direction of opening. Then, as illustrated in FIG. 4, the lid section 12 is removed from the bottle 30 together with the cap 20 while only the lid section 12 of the inner stopper 10 is separated from the main body 11 and remains entering the receiving section 22 of the cap 20. Since the protrusion section 23 is formed in the cap 20, the lid section 20 thereafter remains entering the receiving section 22 of the cap 20.

[0037] In the case of the comparative example illustrated in these FIG. 1 to FIG. 4, it is possible to open the inner stopper 10 by rotating temporarily the cap 20 in the direction of closing when opening the cap 20 initially, such an action to open an inner stopper after opening a cap is not required, and thus, the usability is much improved.

[0038] FIG. 5 is a view illustrating torque changes when the cap 20 is rotated temporarily in a direction of closing in order to open the cap 20 initially in the comparative example illustrated in FIG. 1 to FIG. 4.

[0039] When the shrink wrap is removed and the cap 20 is rotated in the direction of closing, the cap 20 moves in a direction indicated by arrow A illustrated in FIG. 2, the edge 121b of the lid section 121 of the inner stopper 10 interferes with the protrusion section 23 of the cap 20 to expand the receiving section. At this moment, as illustrated in region a of FIG. 5, a force (torque) to rotate the cap 20 increases. When the cap 20 is further rotated in the direction of closing, the lid section 121 moves and comes upper than the lid section 23 and the torque temporarily decreases (region b). When the cap is further rotated in the direction of closing, the cap 20 now presses the lid section 121, and when the cap 20 is furthermore rotated in the direction of closing, the junction section 122 is broken while the torque is increasing (region c). Then, the cap 20 becomes not rotating in the direction of closing, and then, the cap 20 is now rotated in the direction of opening, so that the cap 20 is removed.

[0040] Here, as seen from this FIG. 5, in the case of the above-described cap assembly 1A of the comparative example, when the cap 20 is rotated in the direction of closing in order to open the inner stopper 10, there is a peak P of the torque before the cap abuts against the lid section 121 of the inner stopper. For this reason, a consumer who is not familiar to handling a bottle to which the cap assembly 1A is attached may misunderstand that the inner stopper 10 has been opened based on that the peak P of the torque has passed, and at this point, the consumer accordingly rotates the cap 20 in the direction of opening, and then the consumer notices that the inner stopper 10 has not been opened yet after opening the cap 20. Even if noticing that the inner stopper 10 has not been opened yet after opening the cap 20, such an inexperienced consumer may not notice that the inner stopper 10 is not opened before proceeding up to region c,

and thus, a complaint as a defective product may be raised.

[0041] Based on the above explanations of the comparative example, embodiments according to the present invention will be explained next.

[0042] FIG. 6 is a vertical sectional view of a cap assembly of a first embodiment according to the present invention.

[0043] A cap assembly 1B of the first embodiment includes an inner stopper 40 and a cap 50.

[0044] The inner stopper 40 is a component which is put over a mouth 61 of a bottle 60 to close the mouth 61 (see FIG. 14). In addition, the cap 50 is a component which is put over the mouth 61 of the bottle 60 upon the inner stopper 40 such that the cap 50 covers the inner stopper 40.

[0045] The inner stopper 40 includes a main body 41 and a lid body 42.

[0046] The main body 41 includes a hollow section 411 and a holding section 412. Of them, the hollow section 411 has a hollow shape which has an upper opening and a lower opening and communicates with the mouth 61 of the bottle 60, and at the time of capping, a lower end section 411a thereof is inserted to the mouth 61 of the bottle 60 (see FIG. 15).

[0047] In addition, a male screw thread 411c which circles helically on an outer circumference surface of the hollow section 411 and is screwed to a female screw thread 541 of the cap 50 is formed on the outer circumference surface in the hollow section 411.

[0048] In addition, the holding section 412 included in the main body 41 plays a role of receiving an insertion of an upper end section 62 of the bottle 60 to hold the upper end section 62 of the bottle 60 in cooperation with the lower end section 411 of the hollow section 411 which lower end section 411a is inserted to the mouth of the bottle 60. The holding section 412 has a configuration in which a rib 412a is formed in the holding section 412, and the rib 412a enters a depressed section 63 (see FIG. 14) of the bottle 60 so that the holding section 412 firmly holds the upper end section 62 of the bottle 60 and is not removed from the mouth 61 of the bottle 60.

[0049] In addition, the lid body 42 included in the inner stopper 40 includes a lid section 421 and a junction section 422. Of them, the lid section 421 is a portion which spreads in a plate shape above the hollow section 411 such that the lid section 421 covers the hollow section 411. In addition, the junction section 422 is junctioned circumferentially to an upper end edge 411b of the hollow section 411, and closes an opening on an upper end of the hollow section 411 together with the lid section 421. The main body 41 and the lid body 42 which are included in the hollow section 40 are integrally formed as a single component, and however, the junction section 422 is considerably easily broken when the lid section 421 is pressed from above. When the junction section 422 is broken, the lid body 42 becomes a part separate from the main body 41.

[0050] In order to secure a safety margin ratio as large as possible such that the junction section 422 is not broken inadvertently, it is devised such that a recess 421a is formed on an upper surface of the lid section 421 so that the lid section 421 is made to be away as much as possible from an upper surface of the cap 50, and thus, even if a force is applied to the upper surface of the cap 50 and the upper surface is depressed, the force is not applied to the lid section 421.

[0051] The cap 50 includes a shell section 51, a receiving section 52, a protrusion section 53, a screwing section 54 which are illustrated in FIG. 6, and further, hooks 55 (see FIG. 7).

[0052] The shell section 51 is a portion which is formed to be hollow while opening downward, and is put over the mouth 61 (see FIG. 15) of the bottle 60 upon the inner stopper 40 while covering the inner stopper 40.

[0053] In addition, the receiving section 52 is a portion which protrudes downward from an inner side upper surface of the shell section 51, has a lower opening section, and receives the lid section 421 of the main body 41 in an inside thereof to surround an edge 421b of the lid section 421.

[0054] Further, the protrusion section 53 is a portion which has a rib shape protruding inward from an inner circumference surface of the receiving section 52. The protrusion section 53 protrudes up to a position in which the protrusion section 53 interferes with the edge 421b of the lid section 421 when the cap 50 and the inner stopper 40 are assembled.

[0055] In addition, the screwing section 54 has a shape which protrudes in a cylindrical shape and downward from an inner side upper surface of the shell section 51 and opens downward. The female screw thread 541 which is screwed to the male screw thread 411c formed on the outer circumference surface of the hollow section 411 of the inner stopper 40 is formed on an inner circumference surface of the screwing section 54. In other words, in the above-described comparative example, the cap 20 is opened or closed with respect to the bottle 30, and in contrast, in the case of the cap assembly 1B of the first embodiment, it is configured such that the cap 50 is opened or closed with respect to the inner stopper 40 in terms of directly.

[0056] FIG. 7 is a partially enlarged sectional view of a cap included in the cap assembly 1B of the first embodiment illustrated in FIG. 6.

[0057] In addition, FIG. 8 is a partially enlarged sectional view illustrating a portion of the cap assembly 1B of the first embodiment illustrated in FIG. 6 in a state in which the lid section 42 of the inner stopper 40 is received in the receiving section 52 of the cap 50.

[0058] In the case of the cap assembly 1B of the first embodiment, as illustrated in FIG. 6 and FIG. 8, the lid section 421 of the inner stopper 40 enters a space upper than the protrusion section 53 in the receiving section 52 of the cap 50. However, there is formed a space between an inner surface of an upper section of the shell section

51 and the lid section 422 such that the space is opened to an extent in which even if a force is applied to the shell section 51 from above and the shell section 51 is depressed slightly, the force is not applied to the lid section 421.

[0059] In addition, as illustrated in FIG. 7, the hooks 55 protruding inward are formed in a portion immediately above the protrusion section 53 and inside the receiving section 50 of the cap 50. The hooks 55 are formed at plural locations with spaces with respect to a circumferential direction, respectively.

[0060] FIG. 9 is a partially enlarged sectional view illustrating a portion of an edge 421b of the lid section 421 in a section in which the lid section 421 is sectioned horizontally in a state in which the lid section of the inner stopper enters the receiving section of the cap.

[0061] As illustrated in this FIG. 9, there are included rotation preventing protrusions 421d which are formed circumferentially in a circumferential direction on a circumference surface 421c of the lid section 421 of the inner stopper 40 in large numbers. The rotation preventing protrusions 421d engage with the hooks 55 to prevent a positional relation between the cap 50 and the inner stopper 40 from being deviated from a predetermined relation.

[0062] FIG. 10 to FIG. 13 are explanatory views of a method for assembling of assembling the cap to the inner stopper in the cap assembly of the first embodiment which have been explained with reference to FIG. 6 to FIG. 9.

[0063] At first, as illustrated in FIG. 10, the inner stopper 40 is placed on a jig 70 which agrees with a shape of the inner stopper 40. Ribs 411e are formed on an inner circumference surface of the hollow section 411 in the inner stopper 40, and the ribs 411e are fitted in depressions (not illustrated in the drawings) of the jig 70 to prevent rotation.

[0064] Next, as illustrated in FIG. 11, the cap 50 is put on, and with the cap 50 being fixed, the jig 70 is moved up in a direction of arrow U while being rotated in a direction of arrow R1 as illustrated in FIG. 12. Since the inner stopper 40 is prevented from rotating with respect to the jig 70, the inner stopper 40 rotates together with the jig 70, and the male screw thread 411c of the inner stopper 40 is screwed to the female screw thread 541 of the screwing section 54 of the cap 50. Then, the edge 421b of the lid section 421 of the inner stopper 40 interferes with the protrusion 53 (see FIG. 7) formed on the inner circumference surface of the receiving section 52 of the cap 50, and thus, the receiving section 52 is expanded elastically by the lid section 421 of the inner stopper 40, and when the lid section 421 goes beyond the protrusion section 53 and comes to a side of the upper surface of the shell section 51, the receiving section 52 returns to an original shape. With this, the protrusion section 53 plays a role in which the protrusion section 53 is positioned below the lid section 421, and as described later, even after the junction section 422 is broken, the

protrusion section 53 supports the lid section 421 to keep the lid section 421 in an inside of the receiving section 52.

[0065] When the lid section 421 rides on the protrusion section 53, the receiving section 52 is expanded and the torque to rotate the jig 70 increases, and when the lid section 421 goes beyond the protrusion section 53, the torque quickly decreases. Accordingly, by monitoring the torque, it is possible to detect that the lid section 421 has gone beyond the protrusion section 53. Or, instead of monitoring the torque, by using a rotation angle in the direction of arrow R1 or a movement amount in the direction of arrow U of the jig 70, it may be detected that the lid section 421 has gone beyond the protrusion section 53.

[0066] Here, only by rotating the jig 70 and the inner stopper 40 in the direction of arrow R1 illustrated in FIG. 12, it is difficult to hold the lid section 421 at a position beyond the protrusion section 53 and immediately above the protrusion section 53, and thus, the lid section 421 results in going upward excessively in the receiving section 52.

[0067] Then next, as illustrated in FIG. 13, the jig 70 is moved downward in a direction of arrow D while the jig 70 is now inversely rotated in a direction of arrow R2, so that the lid section 421 is positioned immediately above the protrusion section 53. Since the torque to rotate the jig 70 begins to increase when the lid section 421 abuts against the protrusion section 53, it is possible to detect that the lid section 421 comes down up to immediately above the protrusion section 53 by monitoring the torque. Or, it may be detected that the lid section 421 reaches immediately above the protrusion section 53 by using a rotation angle in the direction of arrow R2, an amount of moving down in the direction of arrow D or the like.

[0068] In the cap assembly 1B of the first embodiment, through such assembling procedures described above, the cap 50 and the inner stopper 40 are coupled with each other in a state in which the cap 50 receives the lid section 421 in the receiving section 52 and the protrusion section 53 is positioned below the lid section 421, and the lid section 421 is arranged at a position which is in the inside of the receiving section 52 and has a space between the lid section 421 and the inner surface of the shell section 51.

[0069] Here, in the state in which the lid section 421 is immediately above the protrusion section 53, as illustrated in FIG. 9, the rotation preventing protrusions 421d engage with the hooks 55, and thus, the inner stopper 40 and the cap 50 are not rotated inadvertently by such a degree as a vibration at the time of transportation, and thus, the positional relation thereof is maintained.

[0070] Incidentally, as illustrated in FIG. 7 and FIG. 8, the hooks 55 for rotation prevention are provided only in a portion immediately above the protrusion section 53, and not provided in a portion further above in the receiving section 52. This is because, when the cap 50 is closed again, after delivered to a consumer and the cap 50 is opened together with the lid body 42 of the inner stopper

40, if the rotation preventing protrusions 421d remain engaging with the hooks 55, closing the cap 50 results in becoming heavy, and thus, when the cap 50 is closed again, the lid section 421 moves to an upper area where the hooks 55 are not provided, and thus, it is possible to close the cap 50 with a small force.

[0071] Incidentally, the example in which the jig 70 and the inner stopper 40 are rotated and moved vertically has been explained in here, and however, a jig (not illustrated in the drawings) to hold the cap 50 may be rotated or moved vertically with the inner stopper 40 being fixed.

[0072] As described above, in the cap assembly 1B of the first embodiment, the inner stopper 40 and the cap 50 are assembled before being capped to a bottle. In other words, assembling of the cap assembly 1B may be performed at a side of a manufacturer of the cap assembly 1B. The assembling of the inner stopper 40 and the cap 50 is required to be performed under a substantially high precision control. The respect that the assembling may be performed at a side of a manufacturer of the cap assembly 1B accordingly does not put a burden of manufacturing facilities on a side of manufacturer which fills the bottle 30 with a content and caps the bottle 30 from a technical viewpoint for the assembling, and thus, the first embodiment is preferable also in this respect.

[0073] Next, a scene in which the cap assembly is capped to a bottle will be explained.

[0074] FIG. 14 and FIG. 15 are explanatory views of a scene in which the cap assembly of the first embodiment is capped to a bottle.

[0075] The bottle 60 is filled with a content, and, as illustrated in FIG. 14, the cap assembly 1B is pressed down, for example, with a flat plate 80 being put thereon, while the state in which the inner stopper 40 and the cap 50 are coupled with each other is maintained. Then, as illustrated in FIG. 15, the upper end section 62 of the bottle 60 enters between the lower end section 411a of the hollow section 41 of the inner stopper 40 and the holding section 412, the rib 412a formed in the holding section 412 enters the depressed section 63 of the bottle 60, and thus, the inner stopper 40 is firmly fixed to the mouth 61 of the bottle 60.

[0076] After the cap assembly 1B is capped to the bottle 60, shrink wrap packaging is performed.

[0077] FIG. 16 and FIG. 17 are explanatory views of a scene in which the cap is opened initially.

[0078] A product is delivered to a consumer, in the state illustrated in FIG. 15.

[0079] After the consumer opens the shrink wrap, the consumer temporarily rotates the cap 50 in the direction of closing. Then, as illustrated in FIG. 16, the cap 50 presses down the lid section 42 of the inner stopper 40, and with this, the junction section 421b is broken. Then, when the cap 50 is rotated in the direction of opening, as illustrated in FIG. 17, the cap 50 is removed while the lid section 421 of the inner stopper 40 is kept in the receiving section 52 of the cap 50. At this moment, the mouth of the inner stopper 40 is in a state of opened already.

[0080] Incidentally, the upper end surface 411d being oriented upward and surrounding the upper opening of the inner stopper 40 is formed to be a surface which has a gradient rising outward, as illustrated in FIG. 8. The upper end surface 411d having the gradient rising outward has an effect that when the bottle 60 is inclined to pour a content thereof and then is stood up, the content is cut well, and thus, it is prevented that the content drips inadvertently.

[0081] FIG. 18 is a view illustrating torque changes when the cap 50 is rotated temporarily in the direction of closing in order to open the cap 50 initially in the first embodiment illustrated in FIG. 6 to FIG. 17. This FIG. 18 is a view which is compared to FIG. 5 in the above-described comparative example.

[0082] In the case of the cap assembly 1B of the first embodiment, the peak P of the torque illustrated in FIG. 5 is passed when the inner stopper 40 and the cap 50 are assembled, and in the state in which the inner stopper 40 and the cap 50 have been assembled, the lid section 421 of the inner stopper 40 is inside the receiving section 52 of the cap 50 and on a side of the upper surface of the cap 50 than the protrusion section 53. Accordingly, the peak P of the torque illustrated in FIG. 5 does not appear at a stage in which the cap 50 is opened initially, and it is when the cap 50 presses the lid section 421 that the force (torque) to rotate the cap 50 increases. For this reason, there is avoided such an occurrence that a consumer who is trying to open the inner stopper 40 and remove the cap 50 is caused to misunderstand that the inner stopper 40 has been opened, thereby providing the consumer with a feeling of safety, and thus, a cap assembly having good usability is obtained.

[0083] Next, a cap assembly of a second embodiment according to the present invention will be explained. Since the cap assembly of the second embodiment may be easily understood when being compared to the above-described comparative example, elements corresponding to the respective elements of the cap assembly 1A according to the comparative example will be illustrated while denoted with reference signs same as those denoted in the drawings (FIG. 1 to FIG. 4) of the cap assembly 1A of the comparative example even if there are some slight differences as to shapes and the like, and only differences will be explained.

[0084] FIG. 19 is a vertical sectional view of a cap assembly of the second embodiment according to the present invention.

[0085] In a cap assembly 1C of the second embodiment, a cap 20 is coupled with an inner stopper 10 in a state in which the cap 20 receives a lid section 121 in a receiving section 22 and a protrusion section 23 is positioned below the lid section 121, and the lid section 121 is arranged at a position which is in an inside of the receiving section 22 and has a space between an inner surface of a shell section 21 and the lid section 121.

[0086] In order to obtain this, in the case of the cap assembly 1C of the second embodiment illustrated in

FIG. 19, a size of the receiving section 22 is determined such that a sufficiently wide space is secured between the lid section 121 and the shell section 21 even when the lid section 121 is received upper than the protrusion section 23 in the receiving section 22.

[0087] In the cap assembly 1C of the second embodiment, in order to assemble the inner stopper 10 and the cap 20, similarly to the comparative example, there are used such procedures that after the bottle 30 is filled with a content and is capped with the inner stopper 10, and then the cap 20 is attached. In order to attach the cap 20 to the inner stopper 10 which has been capped, a real bottle 30 is used instead of the jig 70 illustrated in FIG. 10 to FIG. 13, and there is used the method for assembling explained with reference to FIG. 10 to FIG. 13, that is, a method for assembling in which after the lid section 121 is moved up to the side of the upper surface of the lid section 21 where the lid section 121 goes beyond the protrusion section 23 in the receiving section 22, the cap 20 is then inversely rotated so that the lid section 121 is positioned immediately above the protrusion section 23.

[0088] When the cap assembly 1C is assembled as illustrated in FIG. 19, it is packaged together with the bottle 30 by shrink wrap packaging, and with this, the cap 20 may not be rotated and becomes a state in which a position thereof with respect to the inner stopper 10 is fixed.

[0089] FIG. 20 and FIG. 21 are explanatory views of a scene in which the cap is opened initially in the cap assembly 1C of the second embodiment.

[0090] A product is to be delivered to a consumer, in the state illustrated in FIG. 19.

[0091] After opening the shrink wrap, the consumer temporarily rotates the cap 20 in the direction of closing. Then, as illustrated in FIG. 20, the cap 20 presses down the lid section 12 of the inner stopper 10, and with this, the junction section 121b is broken. Then, when the cap 20 is rotated in the direction of opening, as illustrated in FIG. 21, the cap 20 is removed while the lid section 121 of the inner stopper 10 is kept in the receiving section 22 of the cap 20. At this moment, the mouth of the inner stopper 10 is in a state of already opened.

[0092] Also in the case of the cap assembly 1C of the second embodiment, similarly to the cap assembly 1B of the above-described first embodiment, the peak P of the torque illustrated in FIG. 5 is passed when the inner stopper 10 and the cap 20 are assembled, and in the state in which the inner stopper 10 and the cap 20 have been assembled, the lid section 121 of the inner stopper 10 is inside the receiving section 22 of the cap 20 and on the side of the upper surface of the cap 20 than the protrusion section 23. Accordingly, at the stage when the cap is initially opened, the peak P of the torque illustrated in FIG. 5 does not appear, and it is when the cap 20 presses the lid section 121 that the force (torque) to rotate the cap 20 increases. For this reason, there is avoided such an occurrence that a consumer who is going to open the inner stopper 10 and remove the cap 20 is caused to

misunderstand that the inner stopper 10 has been opened, thereby providing the consumer with a feeling of safety, and thus, a cap assembly having good usability is obtained.

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Reference Signs List

[0093]

- | | |
|----|-------------------------------------|
| 10 | 1A, 1B, 1C Cap assembly |
| | 10, 40 Inner stopper |
| | 11, 41 Main body |
| | 12, 42 Lid body |
| | 20, 50 Cap |
| 15 | 21, 51 Shell section |
| | 22, 52 Receiving section |
| | 23, 53 Protrusion section |
| | 30, 60 Bottle |
| | 31, 61 Mouth |
| 20 | 32, 62 Upper end section |
| | 34, 411c Male screw thread |
| | 112a, 412a, 411e Rib |
| | 54 Screwing section |
| | 55 Hook |
| 25 | 63 Depressed section |
| | 70 Jig |
| | 80 Plate |
| | 111, 411 Hollow section |
| | 112, 412 Holding section |
| 30 | 111a, 411a Lower end section |
| | 111b, 411b Upper end section |
| | 121, 421 Lid section |
| | 121b, 421b Edge |
| | 122, 422 Junction section |
| 35 | 121a, 421a Recess |
| | 411d Upper end surface |
| | 421b Junction section |
| | 421c Circumference surface |
| | 421d Rotation preventing protrusion |
| 40 | 541 Female screw thread |

Claims

- | | |
|----|---|
| 45 | 1. A cap assembly comprising: |
| | an inner stopper that is put over a mouth of a bottle to close the mouth; and |
| | a cap that is put over the mouth such that the cap covers the inner stopper, |
| 50 | |
| | wherein |
| | the inner stopper comprises: |
| 55 | a main body that includes a hollow section which has a hollow shape having an upper opening and a lower opening and communicating with the mouth of the bottle, and whose lower end |

section is inserted to the mouth of the bottle, and a holding section which holds an upper end section of the bottle in cooperation with the lower end section of the hollow section after the insertion has been executed; and

a lid body that includes a lid section which spreads above the hollow section such that the lid section covers the hollow section, and a junction section which is junctioned circumferentially to an upper end edge of the hollow section and closes an opening on an upper end of the hollow section together with the lid section, and that is a component integrated with the main body, closes the mouth of the bottle together with the main body, and receives pressing from above to have the junction section broken so as to become a part separate from the main body,

the cap comprises:

a shell section that is formed to be hollow while opening downward and is put over the mouth of the bottle while covering the inner stopper;

a receiving section that protrudes downward from an inner side upper surface of the shell section, has a lower opening section, and receives the lid section in an inside to surround an edge of the lid section; and

a protrusion section that protrudes inward from an inner circumference surface of the receiving section, interferes with the edge of the lid section to cause the lid section to expand the receiving section when the cap and the inner stopper are assembled, causes the receiving section to return to an original shape when the lid section comes to a side of an upper surface of the shell section so as to be positioned below the lid section, and supports the lid section after the junction section is broken, and

the cap is coupled with the inner stopper in a state in which the cap receives the lid section in the receiving section, the protrusion section is positioned below the lid section, and the lid section is arranged at a position which is inside the receiving section and has a space between the lid section and the inner surface of the shell section.

2. The cap assembly according to claim 1, wherein the inner stopper includes a screw thread which circles helically on an outer circumference surface of the hollow section, and the cap includes a screwing section which protrudes in a cylindrical shape and downward from the inner side upper surface of the shell section, and has a lower opening section, and on whose inner circumference surface a screw thread to be screwed to the screw thread of the inner stopper is formed.

3. The cap assembly according to claim 1, wherein the cap includes on an inner surface of the shell section a screw thread to be screwed to a screw thread formed in the bottle.

4. The cap assembly according to claims 1 to 3, wherein an upper end surface surrounding the upper opening and being oriented upward of the hollow section has a gradient rising outward.

5. A method for assembling of assembling a cap assembly, wherein, the cap assembly comprises:

an inner stopper that is put over a mouth of a bottle to close the mouth; and a cap that is put over the mouth such that the cap covers the inner stopper,

the inner stopper comprises:

a main body that includes a hollow section which has a hollow shape having an upper opening and a lower opening and communicating with the mouth of the bottle, and whose lower end section is inserted to the mouth of the bottle, and a holding section which holds an upper end section of the bottle in cooperation with the lower end section of the hollow section after the insertion has been executed; and a lid body that includes a lid section which spreads above the hollow section such that the lid section covers the hollow section, and a junction section which is junctioned circumferentially to an upper end edge of the hollow section and closes an opening on an upper end of the hollow section together with the lid section, and that is a component integrated with the main body, closes the mouth of the bottle together with the main body, and receives pressing from above to have the junction section broken so as to become a part separate from the main body,

the cap comprises:

a shell section that is formed to be hollow while opening downward and is put over the mouth of the bottle while covering the inner stopper; a receiving section that protrudes downward from an inner side upper surface of the shell section, has a lower opening section, and receives the lid section in an inside to surround an edge of the lid section; and a protrusion section that protrudes inward from an inner circumference surface of the receiving section, interferes with the edge of the lid section to cause the lid section to expand the receiving section when the cap and the inner stopper are

assembled, causes the receiving section to return to an original shape when the lid section comes to a side of an upper surface of the shell section so as to be positioned below the lid section, and supports the lid section after the junction section is broken, and
the method for assembling is a method for assembling of assembling the inner stopper and the cap, and the method for assembling comprises:

putting the cap over the inner stopper, and causing the receiving section to receive the lid section up to a position in which the protrusion section goes beyond the lid section to be positioned below the lid section and the space between the lid section and the inner surface of the shell section becomes relatively narrow; and

moving the cap upward relatively to the inner stopper in a range in which a state in which the protrusion section is positioned below the lid section is maintained, so as to expand the space between the lid section and the inner surface of the shell section.

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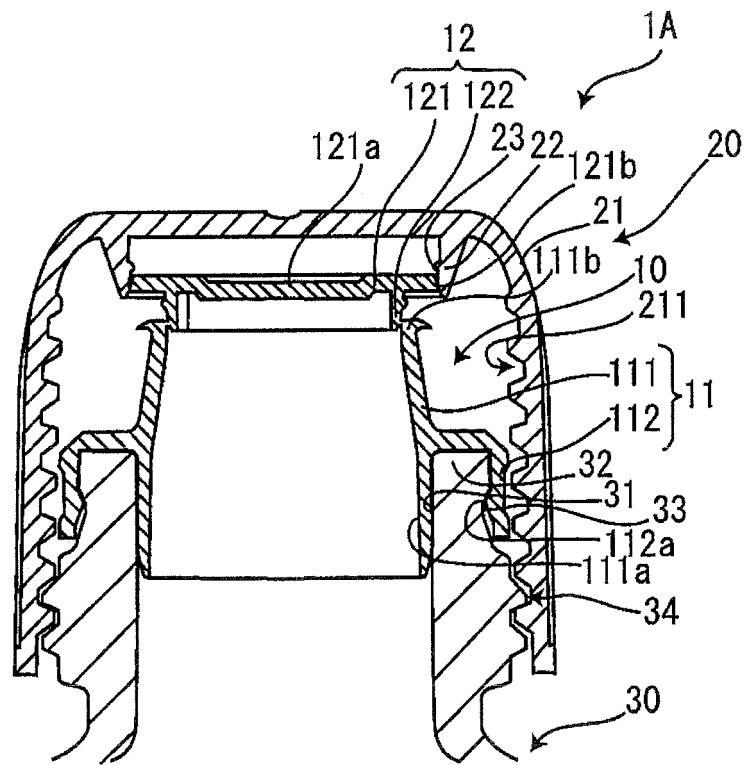


FIG. 1

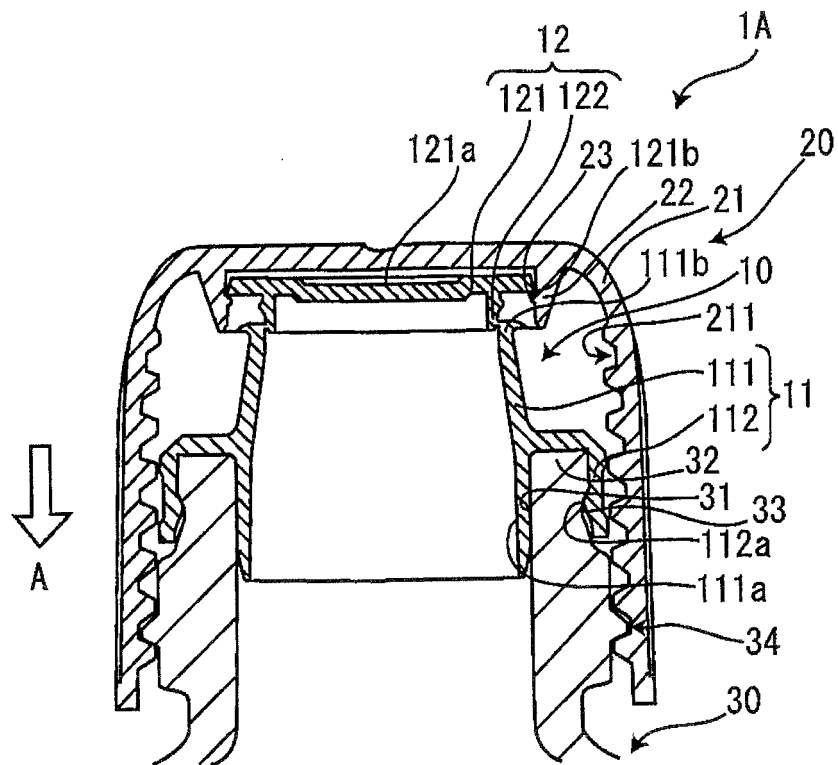


FIG. 2

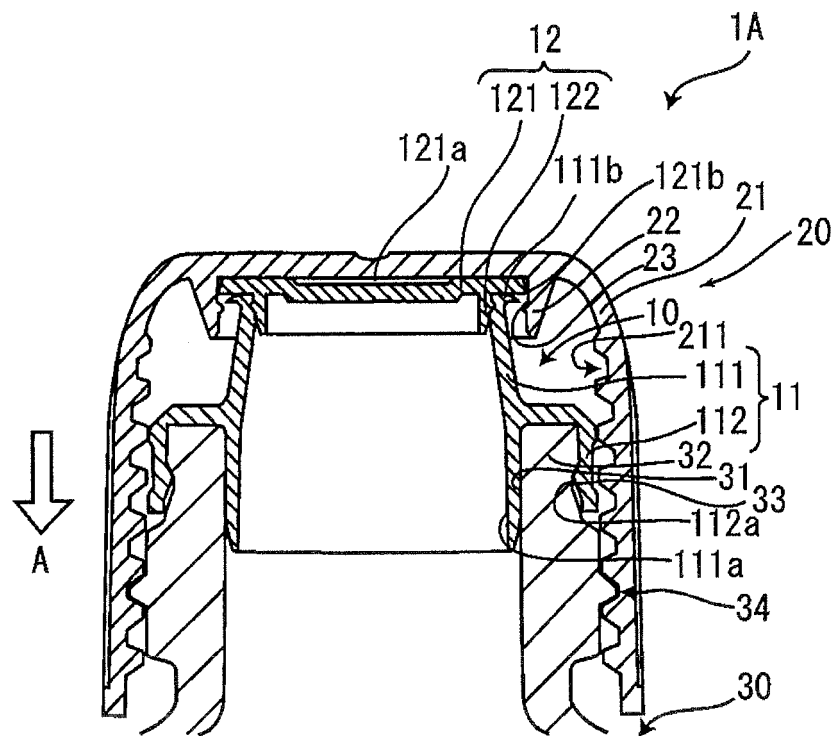


FIG. 3

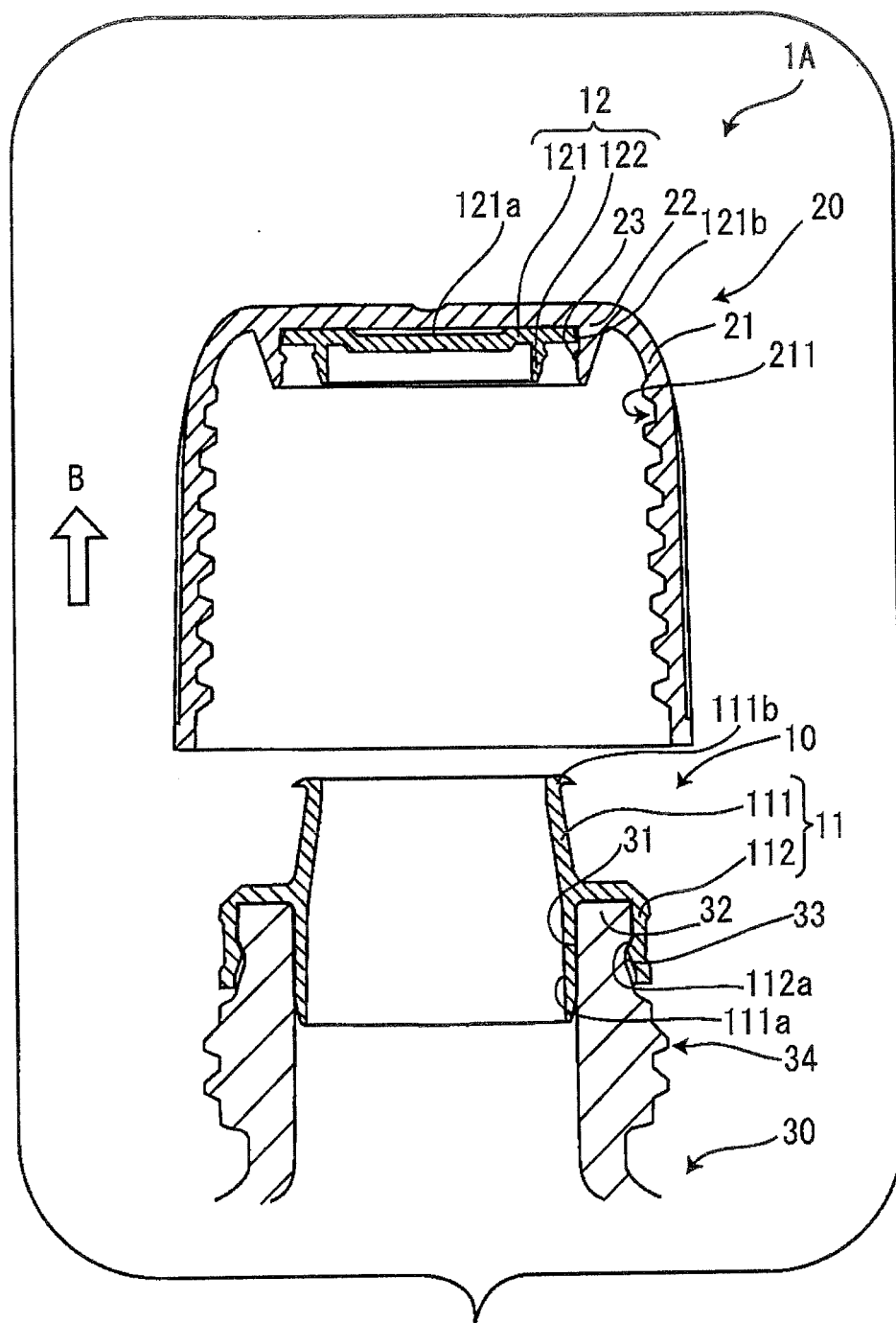


FIG. 4

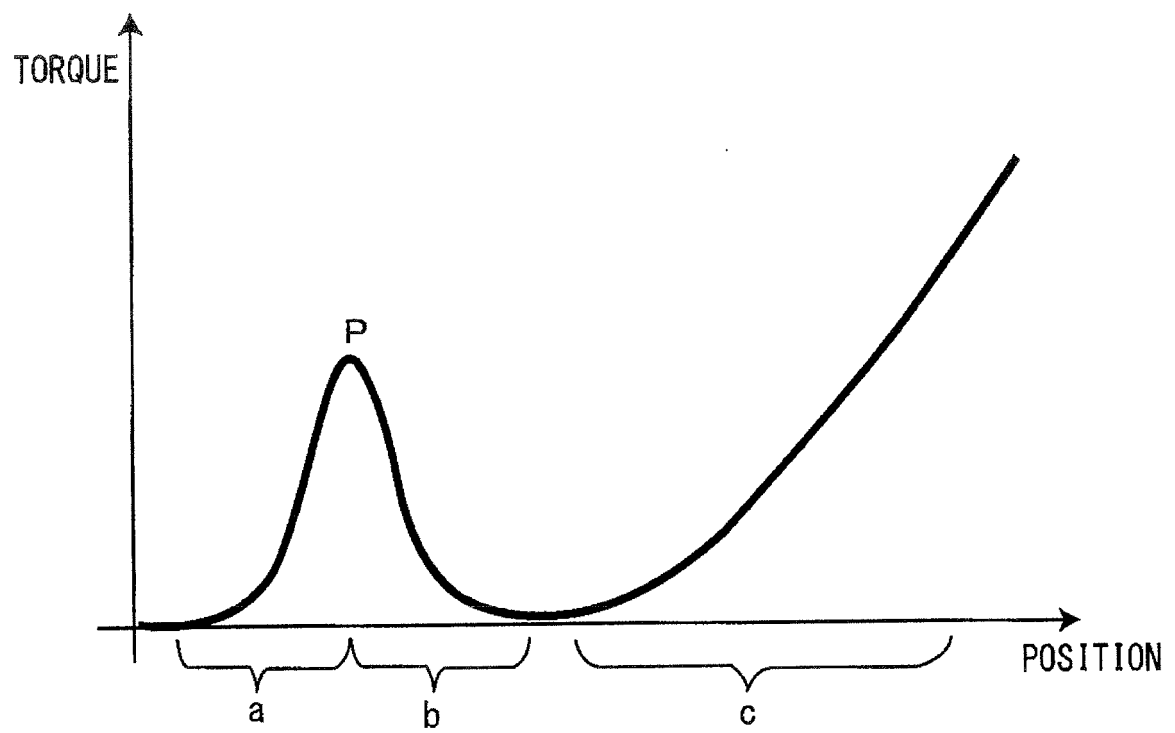


FIG. 5

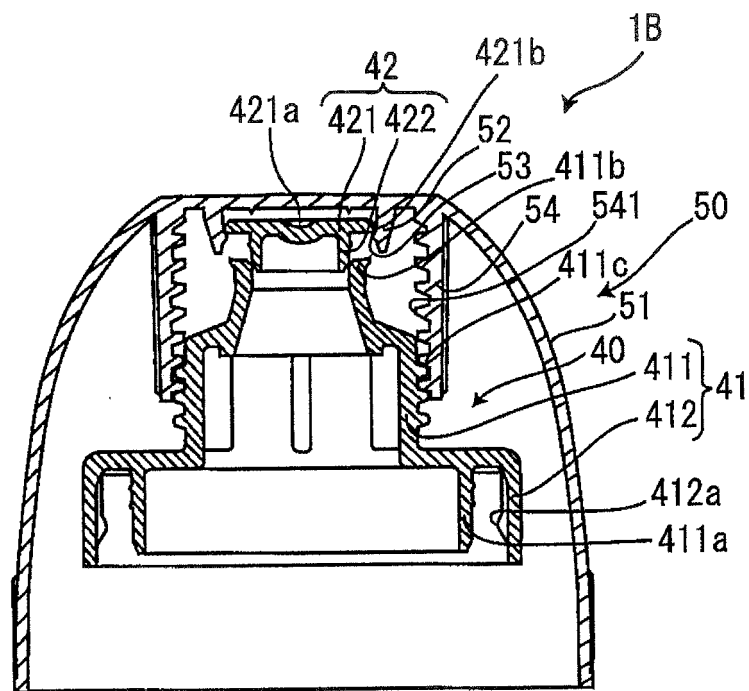


FIG. 6

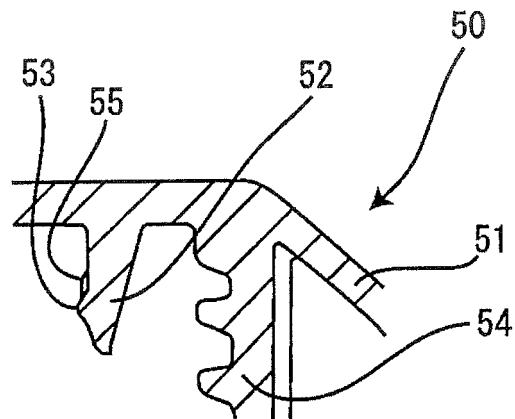


FIG. 7

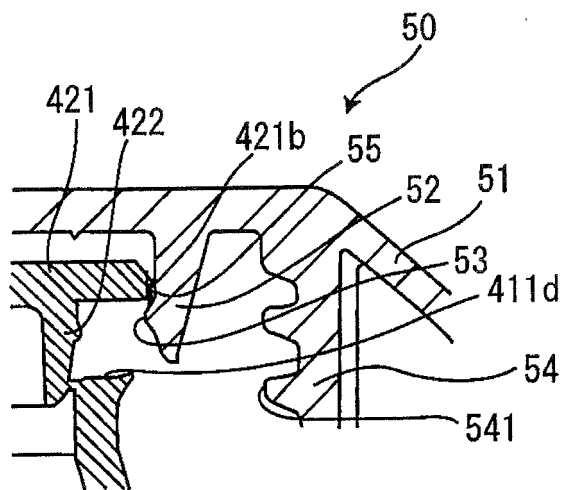


FIG. 8

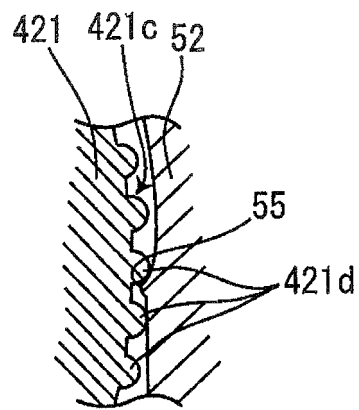


FIG. 9

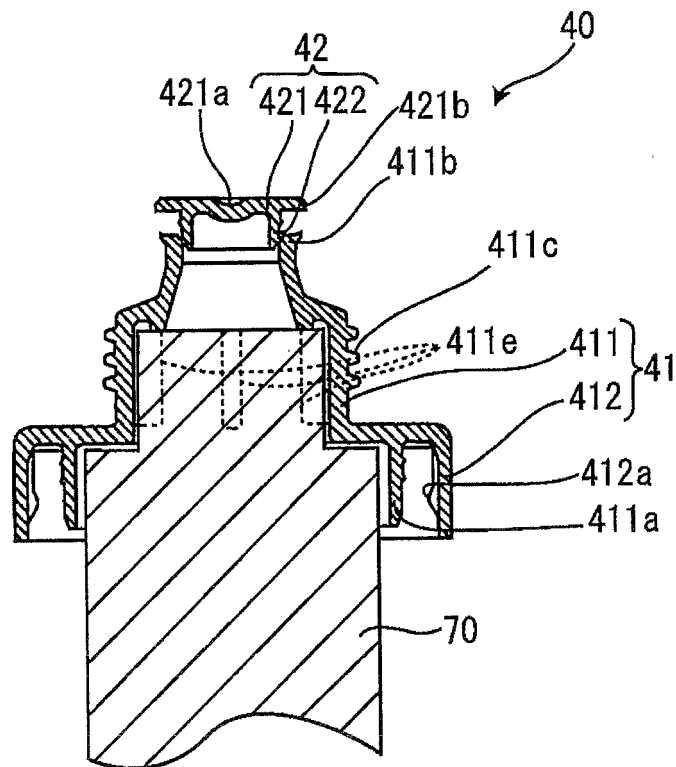


FIG. 10

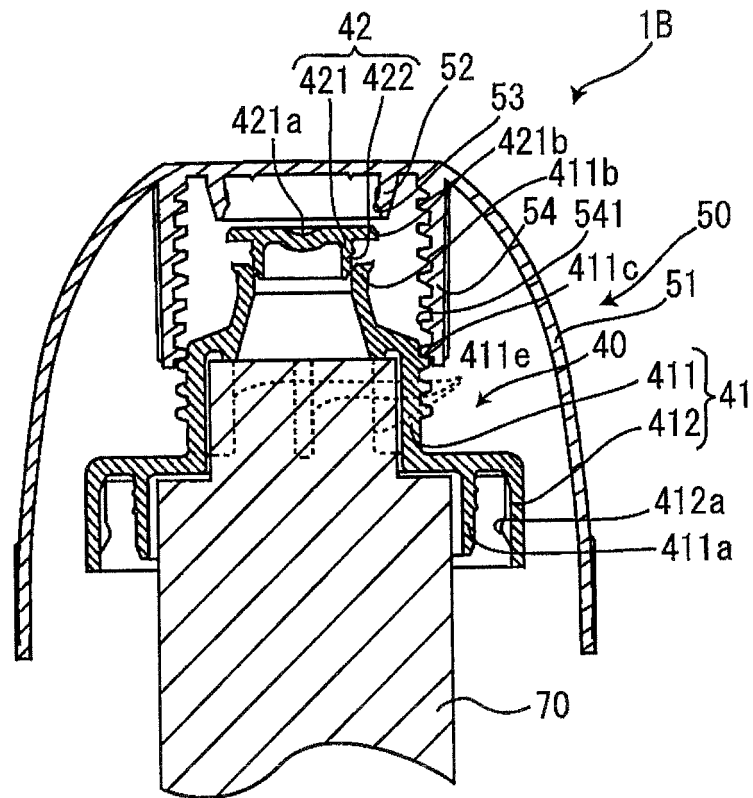


FIG. 11

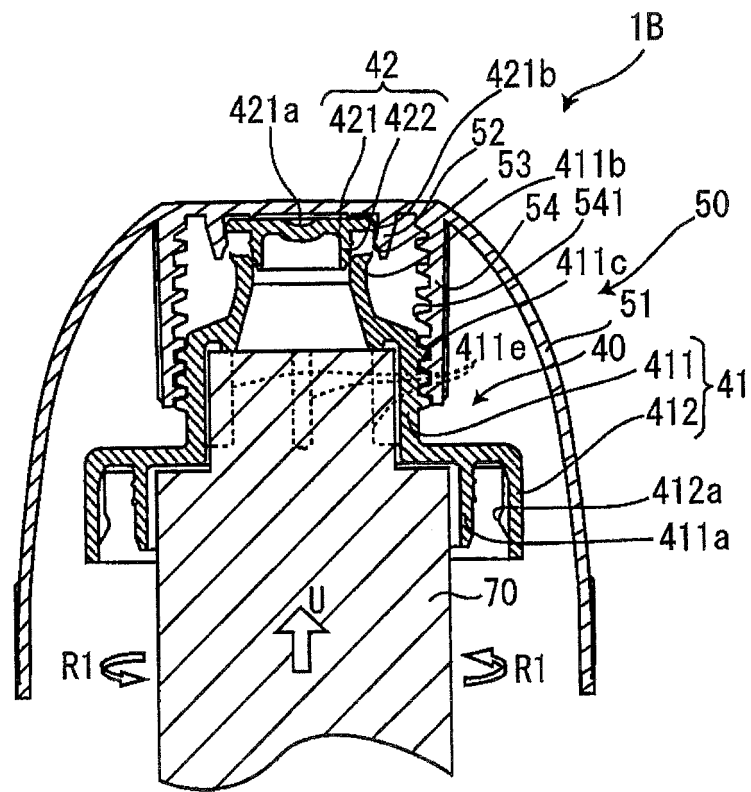


FIG. 12

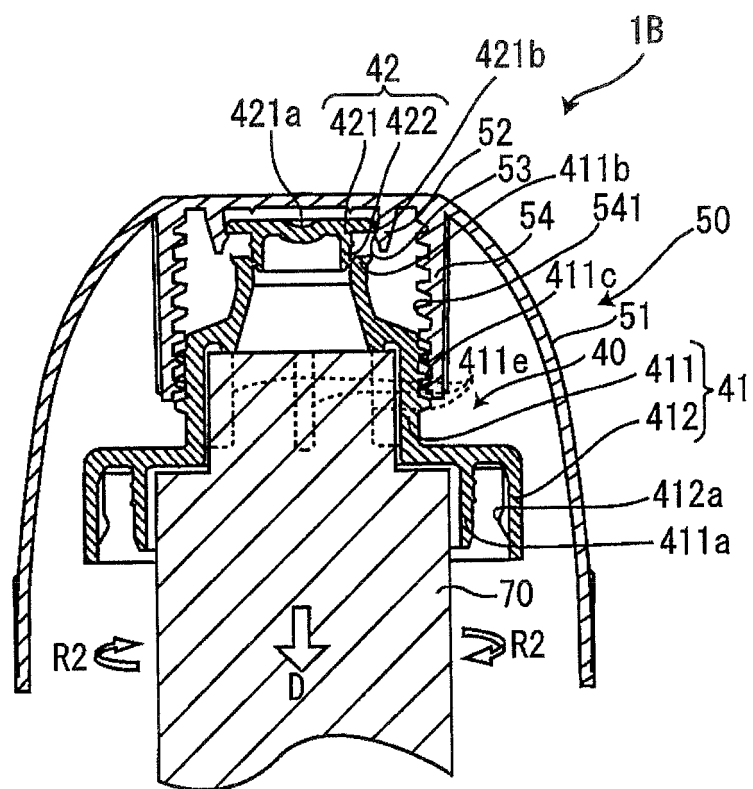


FIG. 13

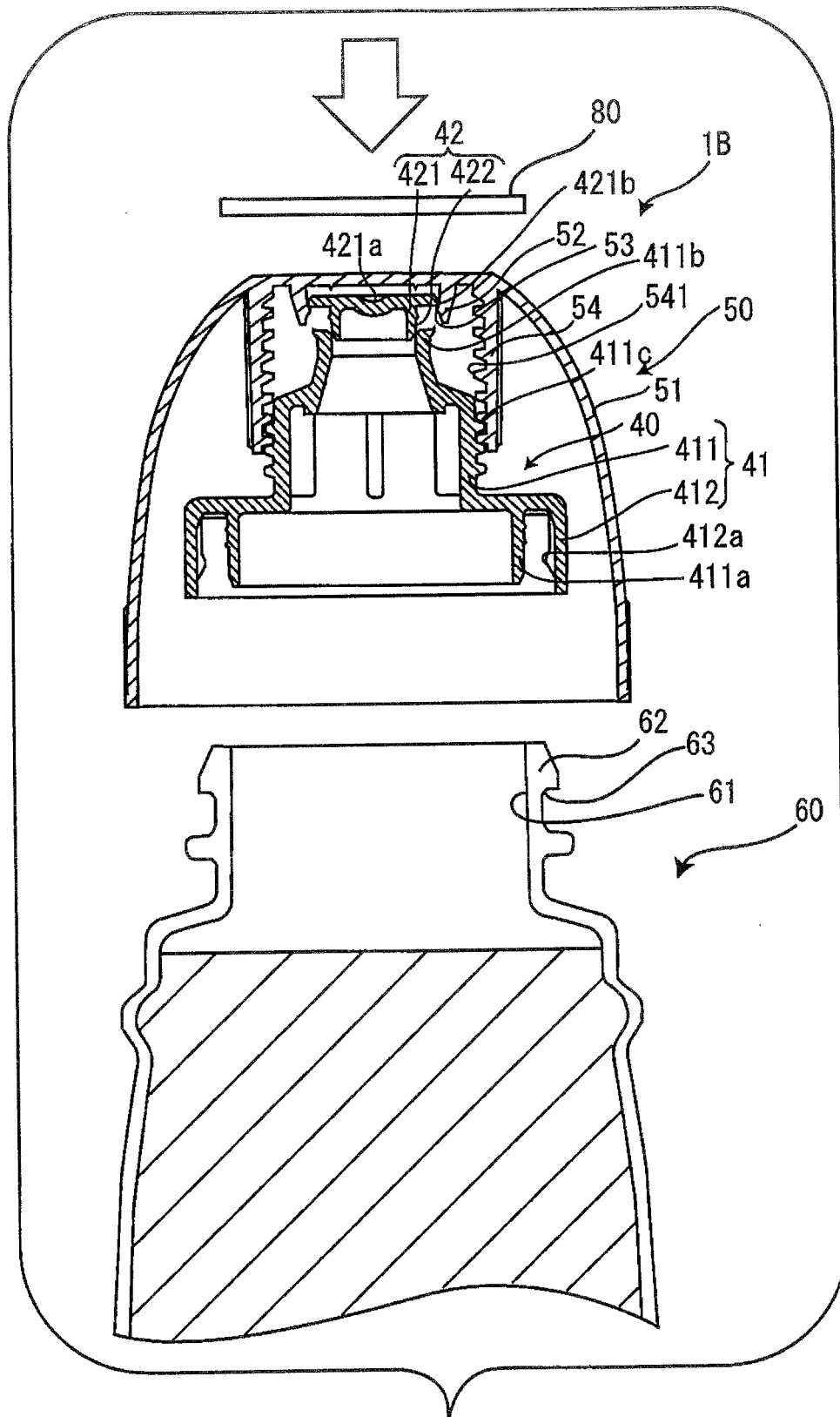


FIG. 14

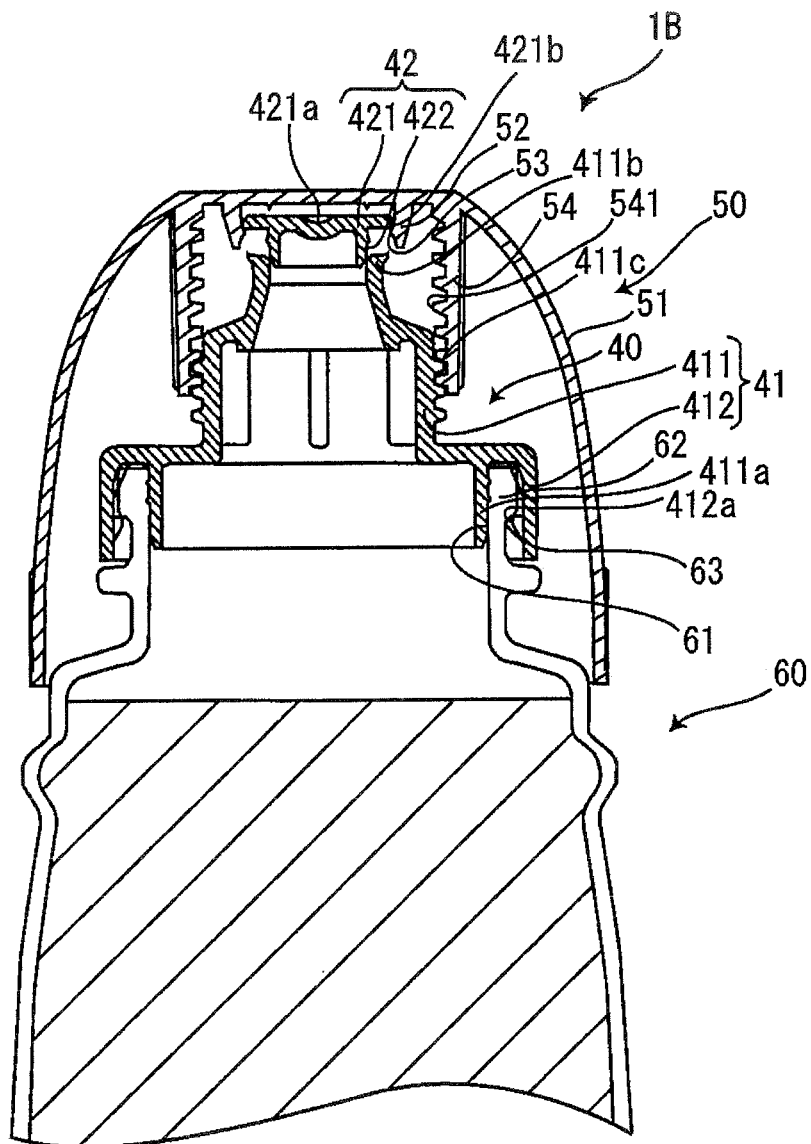


FIG. 15

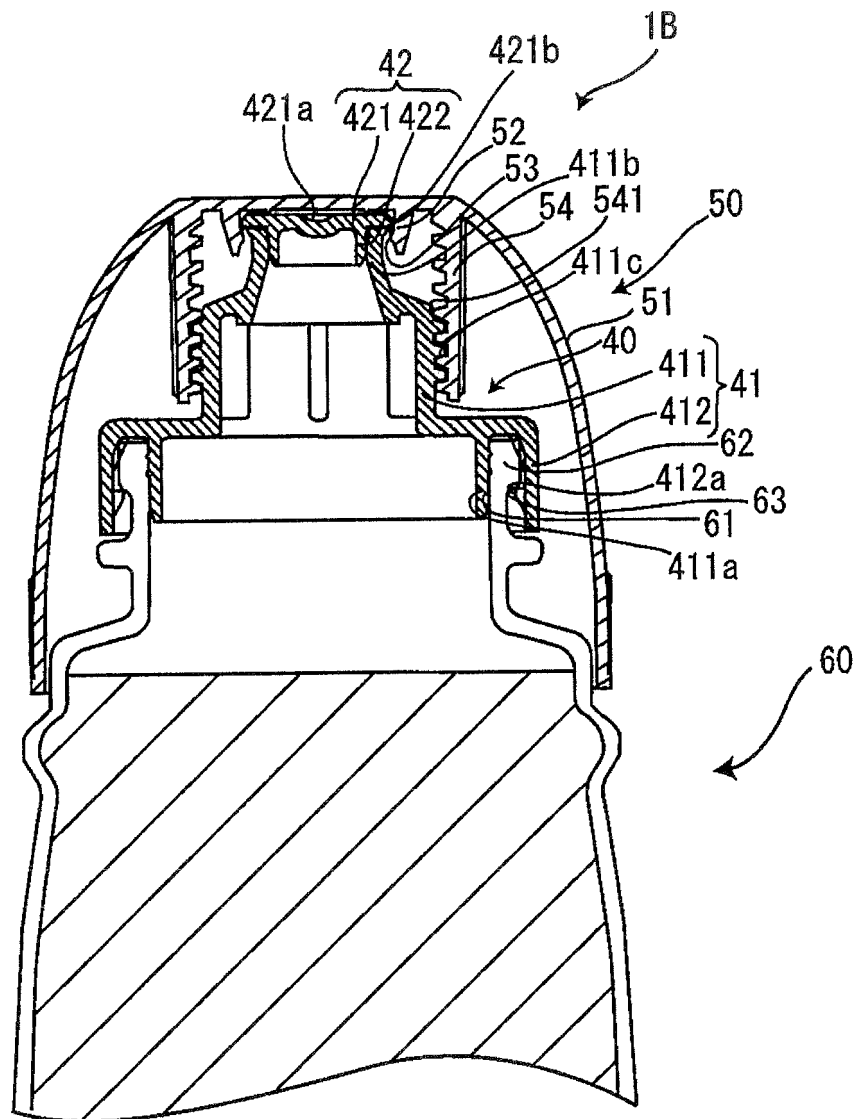


FIG. 16

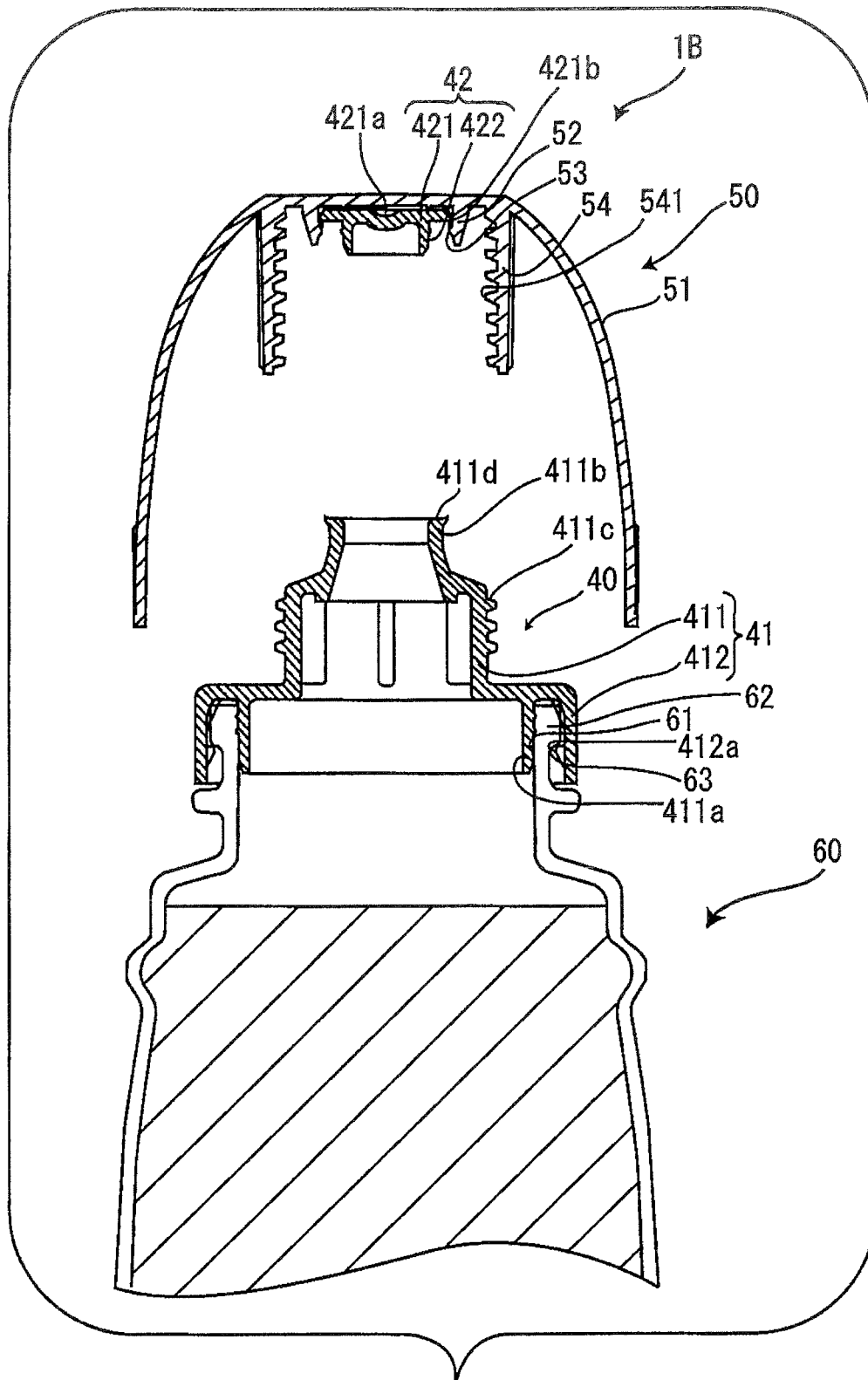


FIG. 17

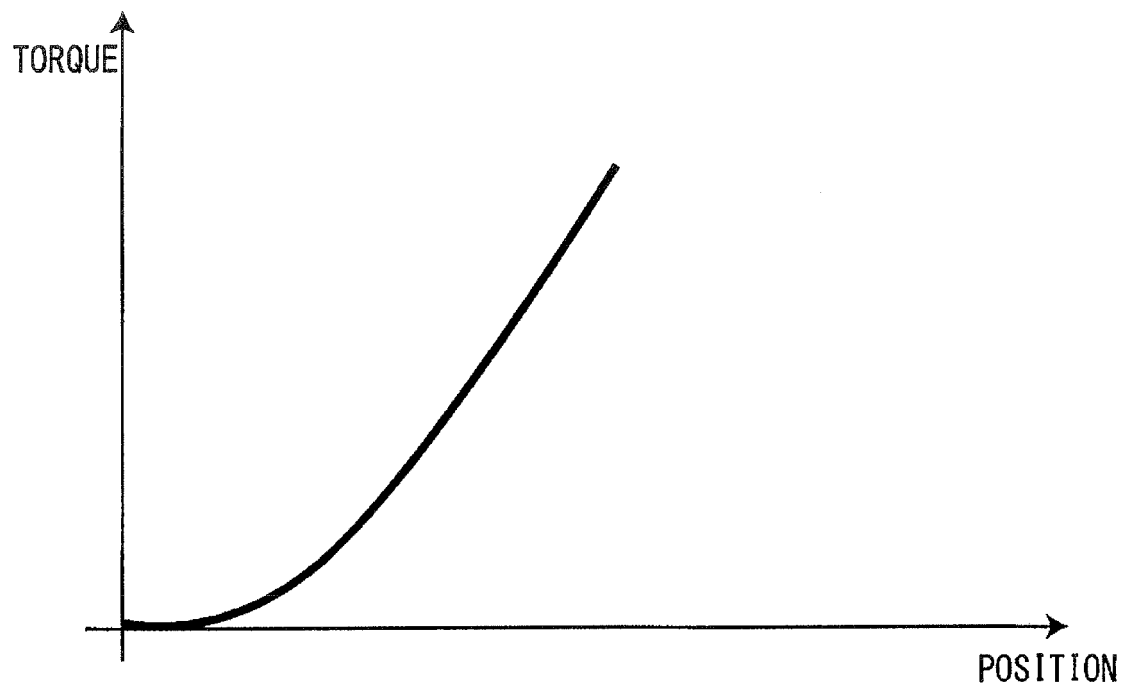


FIG. 18

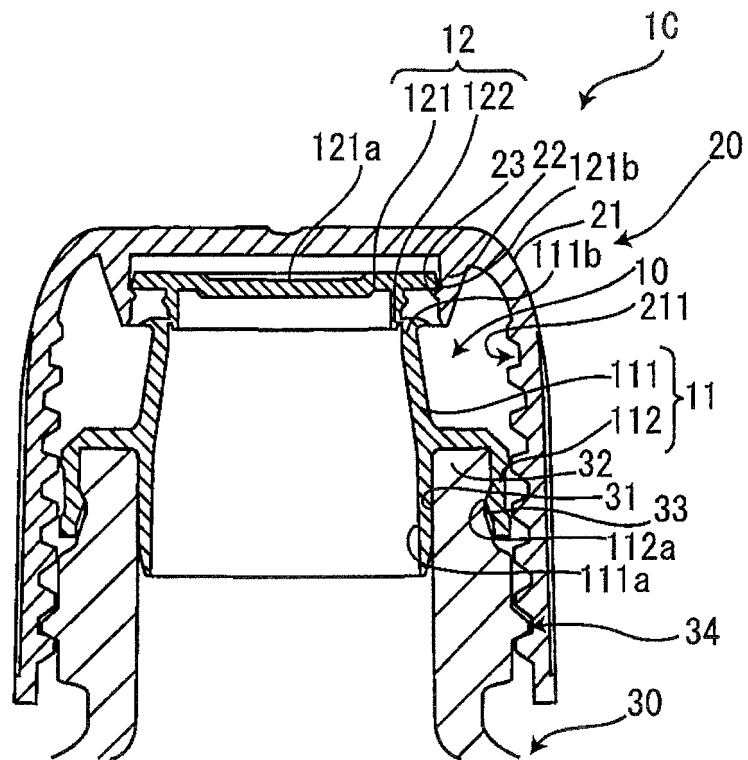


FIG. 19

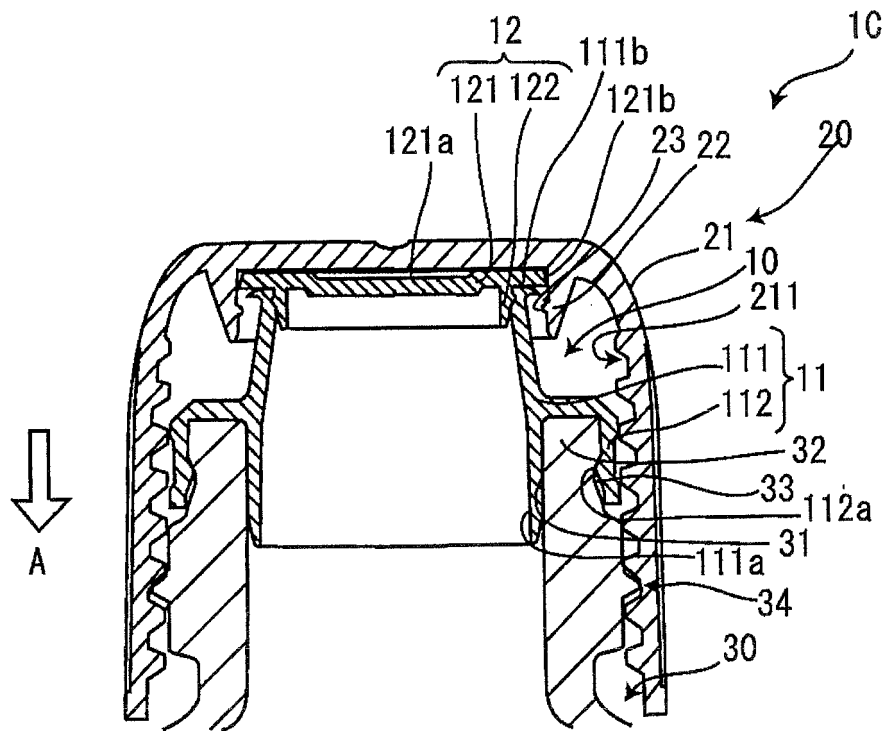
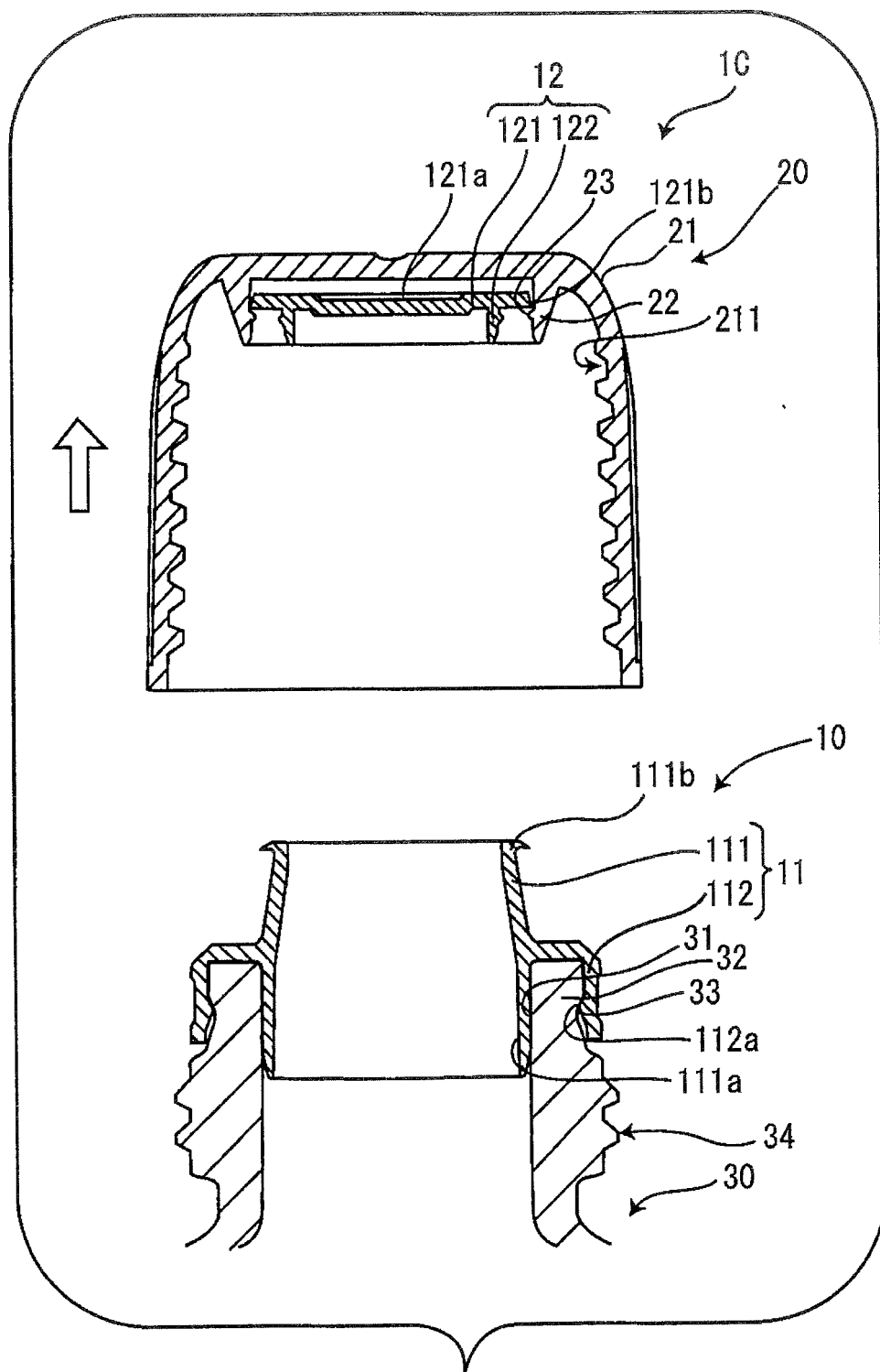


FIG. 20



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/069154

A. CLASSIFICATION OF SUBJECT MATTER

B65D51/20(2006.01)i, B65D47/36(2006.01)i, B67B3/20(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D51/20, B65D47/36, B67B3/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2013
Kokai Jitsuyo Shinan Koho	1971-2013	Toroku Jitsuyo Shinan Koho	1994-2013

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 4581034 B1 (Seiko Corp.),	1, 3
Y	17 November 2010 (17.11.2010),	2, 4
A	paragraphs [0074] to [0083]; fig. 8 to 9 (Family: none)	5
Y	JP 2011-235898 A (Yoshino Kogyosho Co., Ltd.),	2
	24 November 2011 (24.11.2011),	
	paragraphs [0010] to [0027]; all drawings (Family: none)	
Y	JP 2011-225220 A (Tokan Kogyo Co., Ltd.),	4
	10 November 2011 (10.11.2011),	
	paragraph [0021]; fig. 2 (Family: none)	

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
12 September, 2013 (12.09.13)Date of mailing of the international search report
24 September, 2013 (24.09.13)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/069154

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2012-224375 A (Tokan Kogyo Co., Ltd.), 15 November 2012 (15.11.2012), paragraph [0028]; fig. 2 (Family: none)	4
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 175406/1978 (Laid-open No. 90561/1980) (Kamaya Kagaku Kogyo Co., Ltd.), 23 June 1980 (23.06.1980), specification, page 3, lines 12 to 19; page 6, line 3 to page 7, line 7; page 8, lines 8 to 15; fig. 1 to 3 (Family: none)	1
E,X	JP 2013-147264 A (Tokan Kogyo Co., Ltd.), 01 August 2013 (01.08.2013), paragraphs [0008] to [0017]; fig. 6 to 21 (Family: none)	1-5
E,X E,A	JP 2013-147265 A (Tokan Kogyo Co., Ltd.), 01 August 2013 (01.08.2013), paragraphs [0005] to [0019], [0041] to [0078] (Family: none)	1-2, 4-5 3
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 50413/1974 (Laid-open No. 140854/1975) (Yoshizo HONMA), 20 November 1975 (20.11.1975), specification, page 2, lines 4 to 10; page 3, lines 7 to 19; page 4, lines 8 to 15; page 5, lines 2 to 10; all drawings (Family: none)	1
A	US 4526279 A (AUTOMATIC LIQUID PACKAGING, INC.), 02 July 1985 (02.07.1985), entire text; all drawings & JP 60-99859 A	1

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/069154

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Document 1 (JP 4581034 B1 (Seiko Corp.), 17 November 2010 (17.11.2010), paragraphs [0074] to [0083]; fig. 8 to 9) discloses a cap assembly in which a cap receives a lid portion of an inside stopper into a receiving portion, a protruding portion of the cap is located below the lid portion, wherein the cap and a bottle are screwed to each other.

Therefore, the inventions of claims 1 and 3 cannot be considered to be novel in the light of the invention disclosed in the document 1, and have no special technical feature.

Consequently, the following two invention groups are involved in claims.
(Continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/069154

Continuation of Box No.III of continuation of first sheet (2)

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Meanwhile, the inventions of claims 1 and 3 having no special technical feature are classified into invention 1.

(Invention 1) Claims 1-4: A cap assembly, wherein a cap and an inside stopper are screwed to each other.

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(Invention 2) Claim 5: An assembling method for a cap assembly comprising: an inside stopper provided with a lid portion; and a cap provided with a protruding portion.

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Form PCT/ISA/210 (extra sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2007126062 A [0004]
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