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(54) BOTTLE CAP, CONTAINER AND CONTAINER CAP OPENING METHOD

(57) The present disclosure provides a bottle cap, a container (6) and a method for opening the container (6). The bottle cap includes a cap body (1) and a cap ring (2) which are connected. The cap body (1) is provided with an extension strip (11), a first end (11a) of the extension strip (11) is integrally connected to the cap body (1). The cap ring (2) is provided with an avoidance part (20) for the extension strip (11) to pass through and a U-shaped strip (21) encircling the extension strip (11), an opening (21a) of the U-shaped strip (21) is integrally connected to the avoidance part (20) and a bottom (21b) of the U-shaped strip (21) is integrally connected to a second end (11b) of the extension strip (11). The bottle cap of the present disclosure is always connected to the container (6) and will not be lost, so as to facilitate users to use and improve the recycling rate of the bottle cap.

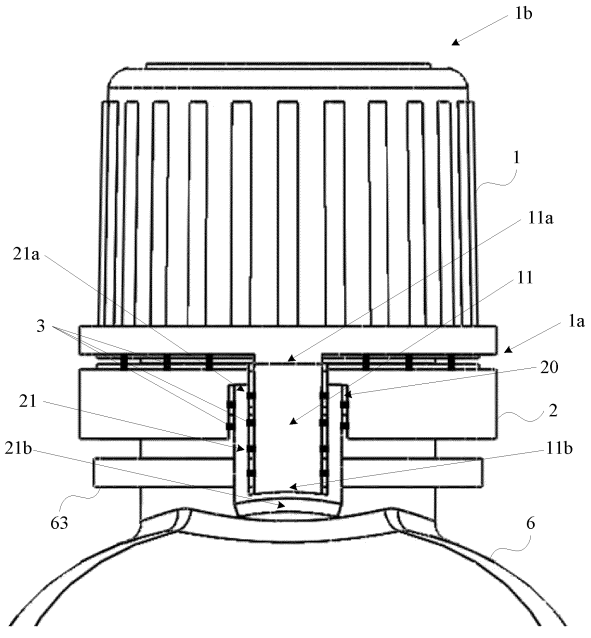

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of containers, and specifically to a bottle cap, a container, and a method for opening the container.

BACKGROUND

[0002] Containers, such as beverage bottles, include a bottle body and a bottle cap, and can be used to hold fluid products. A generic structure of a container is that: a mouth of the bottle body is provided with screw threads, a bottle ring is disposed under the screw threads, and the bottle cap includes a cap body and a cap ring which can be separated.

[0003] In an initial state, the cap body is screwed on the mouth, the cap ring is fixed on the bottle ring, and the cap body is connected to the cap ring by tiny plastic strips.

[0004] When opening the bottle cap, rotate the cap body to break the tiny plastic strips, take the cap body from the mouth, and the cap ring stays on the bottle ring, so that the cap body is separated from the cap ring. After use, screw the cap body back on the mouth. When using again, repeat the above actions, unscrew the cap body from the mouth, separate the cap body from the cap ring, and screw the cap body back again after use.

[0005] In the above containers, due to the separation of the cap body and the cap ring, the cap body is often not found after use. In addition, when recycling, due to the easy loss of the cap body, labor costs and other problems, it is very difficult to recycle the cap body alone, which causes resource waste and environmental pollution.

[0006] It is to be noted that the information described in the background above is intended only to enhance understanding of the context of the present disclosure and may include information that does not constitute prior art known to those of ordinary skill in the art.

SUMMARY

[0007] In view of the above, the present disclosure provides a bottle cap, a container and a method for opening the container. Wherein, the bottle cap includes a cap body and a cap ring which are connected, the bottle cap is always connected to the container during use and will not be lost, thereby facilitating users to use and enhancing the recycling rate of the bottle cap. In addition, the bottle cap has low manufacturing cost and can be applied to high-speed production lines.

[0008] One aspect of the present disclosure provides a bottle cap. The bottle cap includes a cap body and a cap ring which are connected. The cap body is provided with an extension strip, and a first end of the extension strip is integrally connected to the cap body. The cap ring is provided with an avoidance part for the extension strip to pass through and a U-shaped strip encircling the extension strip, an opening of the U-shaped strip is integrally connected to the avoidance part, and a bottom of the U-shaped strip is integrally connected to a second end of the extension strip. Wherein breakable connecting teeth are provided between the cap body and the cap ring, between side walls of the extension strip and the U-shaped strip, and between side walls of the U-shaped strip and the avoidance part.

[0009] In some embodiments, during an opening process of the bottle cap, as the cap body spirals up along a bottle mouth of a container, the cap ring is buckled to a limiting ring under the bottle mouth and rotates, the connecting teeth are broken, and the extension strip and the U-shaped strip are pulled apart until the cap body leaves the bottle mouth.

[0010] In some embodiments, a total length of the extension strip and the U-shaped strip when pulled apart is greater than a height of the bottle mouth.

[0011] In some embodiments, when the opening process of the bottle cap is completed, the cap body is connected to the limiting ring through the extension strip, the U-shaped strip and the cap ring in turn.

[0012] In some embodiments, when the bottle cap is in an initial closed state, the cap body is tightened on a bottle mouth of a container, the cap ring is fastened on a limiting ring under the bottle mouth, and the extension strip and the U-shaped strip are locked on the avoidance part.

[0013] In some embodiments, the extension strip starts from an opening end of the cap body and extends in a direction away from a closed end of the cap body; the avoidance part is formed as a door shaped groove with a disconnected part at a top, the extension strip passes through the disconnected part of the door shaped groove, and the opening of the U-shaped strip is integrally connected to a lower end face of the disconnected part.

[0014] In some embodiments, the extension strip and the U-shaped strip are fully accommodated in the avoidance part, or the extension strip and the U-shaped strip are partially accommodated in the avoidance part.

[0015] In some embodiments, the cap body, the extension strip, the U-shaped strip, the cap ring and the connecting teeth are integrally injection molded.

[0016] A further aspect of the present disclosure provides a container including a bottle mouth provided with screw threads and a limiting ring disposed under the bottle mouth, wherein the container further includes the bottle cap according to any of the above embodiments. The cap body is screwed on the bottle mouth, and the screw threads are at least used to tighten the cap body when in an initial closed state and to provide a screw-up stroke for the cap body during an opening process. The cap ring is buckled on the limiting ring, and the limiting ring is used to fasten the cap ring when in the initial closed state and to always limit axial movement of the cap ring.

[0017] In some embodiments, the container further includes a clamping ring provided on a bottle neck of the container; when an outer diameter of the clamping

ring is greater than an outer diameter of the cap ring, both the extension strip and the U-shaped strip are in a stepped shape to avoid the clamping ring and extend toward a bottle body of the container.

[0018] A further aspect of the present disclosure provides a method for opening the container, the method includes a first stroke and a second stroke of continuously rotating the bottle body in a first clockwise direction; during the first stroke, as the cap body spirals up, the cap ring rotates and the connecting teeth are broken; during the second stroke, as the cap body spirals up, the cap ring rotates and the extension strip and the U-shaped strip are pulled apart until the cap body leaves the bottle mouth and is connected to the limiting ring through the cap ring.

[0019] Compared to the prior art, the present disclosure has at least the following beneficial effects.

[0020] The bottle cap of the present disclosure includes the cap body and the cap ring which are connected, the cap body and the cap ring are always connected together.

[0021] In the initial closed state, the cap ring is fastened on the limiting ring under the bottle mouth of the container, the cap body is tightened on the bottle mouth, and the cap body is locked on the cap ring by the vertical tiny connecting teeth, which ensures the stability of the bottle cap and avoids loosening of the bottle cap during transportation, storage, and so on.

[0022] In the initial closed state, the avoidance part breaks the initial continuity of the cap ring. However, the extension strip integrally connected with the cap body passes through the avoidance part of the cap ring and is wrapped by the U-shaped strip integrally connected with the avoidance part of the cap ring, furthermore the extension strip, the U-shaped strip and the avoidance part are locked together by horizontal tiny connecting teeth, so that the stability of the cap ring can be ensured. As a result, the cap ring is formed as a continuous ring structure and ensures that the extension strip and the U-shaped strip are tightly attached to the bottle mouth to avoid warping and deformation.

[0023] In the opening process, as the cap body spirals up, the cap ring is always buckled to the limiting ring and rotate, so that the connecting teeth are broken, and the extension strip and the U-shaped strip are pulled apart, making the cap body leave the bottle mouth smoothly.

[0024] When the opening process is completed, the cap body is still connected to the limiting ring through the cap ring to avoid falling and losing, and it is convenient to screw the cap body back to the bottle mouth after use.

[0025] The bottle cap of the present disclosure can always be connected with the container as long as it is assembled to the container, which not only facilitates the use, but also enhances the recycling rate of the bottle cap, realizes the recycling of resources, and protects the environment. In addition, the bottle cap has low manufacturing cost and high productivity, which makes it suitable for high-speed production lines.

[0026] It should be understood that the above general description and the detailed description that follows are exemplary and explanatory only and do not limit the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Accompanying drawings herein are incorporated into the specification and form a part of the specification. The accompanying drawings illustrate embodiments consistent with the present disclosure and are used in conjunction with the specification to explain the principles of the present disclosure. Obviously, the accompanying drawings described below are only some of the embodiments of the present disclosure, and other drawings may be obtained from these accompanying drawings by those of ordinary skill in the art without creative labor.

FIG. 1 is a front view of a bottle cap in an embodiment of the present disclosure;

FIG. 2 is a section view of the bottle cap in an embodiment of the present disclosure;

FIG. 3 is a schematic view of the bottle cap after its connecting teeth broken in an embodiment of the present disclosure;

FIG. 4 is a schematic view of a cap body of the bottle cap spiraling up in an embodiment of the present disclosure;

FIG. 5 is a schematic view of the cap body of the bottle cap leaving a bottle mouth in an embodiment of the present disclosure;

FIG. 6 is a front view of a bottle cap in another embodiment of the present disclosure;

FIG. 7 is a section view of a bottle cap in another embodiment of the present disclosure;

FIG. 8 is a flow chart of a method for opening a container in an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0028] Example embodiments will now be fully described with reference to the accompanying drawings. The example embodiments can be implemented in various forms and should not be construed as limited to the embodiments described here. Rather, these embodiments are provided to make the present disclosure comprehensive and complete, and to transmit the conception of the example embodiments comprehensively to those skilled in the art.

[0029] The accompanying drawings are only schematic illustrations of the present disclosure and are not necessarily to scale. The same reference symbols in the accompanying drawings indicate the same or similar structures, so their repeated descriptions will be omitted.

[0030] In addition, the process shown in the accompanying drawings is only an exemplary illustration and it

is not necessary to include all steps. For example, some steps may be broken down, and some steps may be combined or partially combined. Terms "first", "second" and the like used in the specific description do not indicate any order, number or importance, but are merely used to distinguish the different components. It should be noted that, in the absence of conflict, embodiments of the present disclosure and features in different embodiments may be combined with each other.

[0031] Furthermore, in order to clearly show the structure of the bottle cap and the relation between the bottle cap and the container, the accompanying drawings only show the bottle cap and the bottle mouth of the container, which should not be taken as a limitation on the scope of protection of the present disclosure. The present disclosure provides a separate bottle cap, a container containing the bottle cap, and a method for opening the container.

[0032] FIG. 1 shows a front view structure of a bottle cap in an embodiment, with reference to FIG. 1, the bottle cap provided by the present embodiment includes a cap body 1 and a cap ring 2 which are connected. The cap body 1 is provided with an extension strip 11, and a first end 11a of the extension strip 11 is integrally connected to the cap body 1. The cap ring 2 is provided with an avoidance part 20 for the extension strip 11 to pass through and a U-shaped strip 21 encircling the extension strip 11, an opening 21a of the U-shaped strip 21 is integrally connected to the avoidance part 20, and a bottom 21b of the U-shaped strip 21 is integrally connected to a second end 11b of the extension strip 11. Wherein breakable connecting teeth 3 are provided between the cap body 1 and the cap ring 2, between side walls of the extension strip 11 and the U-shaped strip 21, and between side walls of the U-shaped strip 21 and the avoidance part 20.

[0033] The bottle cap described above includes the cap body 1 and the cap ring 2 which are connected, and the cap body 1 and the cap ring 2 are always connected together.

[0034] FIG. 2 shows a sectional structure of the bottle cap in an embodiment, with reference to FIGS. 1 and 2, in an initial closed state, the cap body 1 is tightened on a bottle mouth 61 of a container 6, the cap ring 2 is fastened on a limiting ring 62 under the bottle mouth 61, and the extension strip 11 and the U-shaped strip 21 are locked on the avoidance part 20.

[0035] Since the cap ring 2 is fastened on the limiting ring 62, the cap body 1 is tightened on the bottle mouth 61, and the cap body 1 is locked on the cap ring 2 by the vertical tiny connecting teeth 3, the stability of the bottle cap can be ensured, thereby avoiding loosening of the bottle cap during transportation, storage, and so on.

[0036] To some extent, the avoidance part 20 breaks the initial continuity of the cap ring 2. However, the extension strip 11 integrally connected with the cap body 1 passes through the avoidance part 20 of the cap ring 2 and is wrapped by the U-shaped strip 21 integrally connected with the avoidance part 20 of the cap ring 2, and the extension strip 11, the U-shaped strip 21 and the avoidance part 20 are locked together by horizontal tiny connecting teeth 3, so that the stability of the cap ring 2 can be ensured. As a result, the cap ring 2 is formed as a continuous ring structure. Furthermore, the connecting teeth 3 formed between the extension strip 11, the U-shaped strip 21 and the avoidance part 20 ensures that the extension strip 11 and the U-shaped strip 21 are tightly adhered to the bottle mouth 61 to avoid warping and deformation.

[0037] FIG. 3 shows a structure of the bottle cap after its connecting teeth broken in an embodiment, FIG. 4 shows a structure of the cap body of the bottle cap spiraling up in the embodiment, FIG. 5 shows a structure of the cap body of the bottle cap leaving the bottle mouth in the embodiment. With reference to FIGS. 1 to 5, during an opening process of the bottle cap, as the cap body 1 spirals up along the bottle mouth 61 of the container 6, the cap ring 2 is buckled to a limiting ring 62 under the bottle mouth 61 and rotates, the connecting teeth 3 are broken, and the extension strip 11 and the U-shaped strip 21 are pulled apart until the cap body 1 leaves the bottle mouth 61.

[0038] Specifically, during the opening process, the cap body 1 is continuously rotated in an opening direction, for example in a counterclockwise direction R. Due to the action of the connecting teeth 3, the extension strip 11 and the U-shaped strip 21, the cap ring 2 is driven by the cap body 1 and at the same time the cap ring 2 is restricted from axial movement by the limiting ring 62. Therefore, as the cap body 1 spirals up, the cap ring 2 is always buckled to the limiting ring 62 and rotated accordingly.

[0039] When the cap body 1 is moved up a certain distance, due to the force between the cap body 1 and the cap ring 2, the connecting teeth 3 are broken as shown in FIG. 3. As a result of the breakage of the connecting teeth 3, the extension strip 11 and the U-shaped strip 21 are slightly warped to facilitate the extension strip 11 and U-shaped strip 21 being gradually pulled apart.

[0040] As the cap body 1 continues to move up, as shown in FIG. 4, the extension strip 11 and the U-shaped strip 21 will be pulled apart in a height direction Y to ensure that the cap body 1 continues to spiral up along the screw threads of the bottle mouth 61. The design of the extension strip 11 and the U-shaped strip 21 needs to ensure that a total length of the two when pulled apart is greater than a height of the bottle mouth 61, so that the cap body 1 can leave the bottle mouth 61 successfully.

[0041] As shown in FIGS. 1 and 4, in the present disclosure, touching ends of the extension strip 11 and the U-shaped strip 21 (i.e., the second end 11b of the extension strip 11 and the bottom 21b of the U-shaped strip 21) are integrally connected, non-contacting ends of the two (i.e., the first end 11a of the extension strip 11 and the opening 21a of the U-shaped strip 21) are integrally connected to the cap body 1 and the cap ring 2, respec-

tively, and the U-shaped strip 21 encircles the extension strip 11. Therefore, on the one hand, self-length of extension strip 11 and U-shaped strip 21 can be fully utilized to make the total length of extension strip 11 and U-shaped strip 21 after being pulled apart is close to (slightly less than) the sum of their own lengths. On the other hand, the extension strip 11 and the U-shaped strip 21 do not take up too much space at the closed state, so as to make the bottle cap stable and almost not increase the overall volume of the bottle cap.

[0042] Continuing to rotate the cap body 1, the cap body 1 can leave from the bottle mouth 61 as shown in FIG. 5. In the state of completing the opening process, the cap body 1 is connected to the limiting ring 62 through the extension strip 11, the U-shaped strip 21 and the cap ring 2 in turn, which can avoid the cap body 1 from falling and being lost, and it is convenient to screw the cap body 1 back to the bottle mouth 61 after use.

[0043] When the opening process is completed, due to existence and connection of the extension strip 11 and the U-shaped strip 21, the cap body 1 will leave the bottle mouth 61 for a certain distance (the distance of the cap body 1 leaving the bottle mouth 61 is slightly less than the total length of the extension strip 11 and the U-shaped strip 21 after being pulled apart). In this way, users can easily drink the beverage contained in the container 6 from the bottle mouth 61, the use of the bottle mouth 61 will not be affected since the cap body 1 is too close to the bottle mouth. Furthermore, and the extension strip 11 and the U-shaped strip 21 have a certain strength, which will not cause the cap body 1 to shake randomly, and can realize that the cap body 1 stays in the vicinity of the bottle mouth 61 at a suitable distance under the opening state.

[0044] After use, the cap body 1 can be screwed back to the bottle mouth 61. When the cap body 1 is screwed on tightly, the extension strip 11 will be stowed in the U-shaped strip 21 and the extension strip 11 and the U-shaped strip 21 will be returned to the avoidance part 20 of the cap ring 2 as shown in FIG. 3.

[0045] The bottle cap described above can always be connected to the container 6 as long as it is assembled to the container 6, which is not only convenient to use, but also enhances the recycling rate of the bottle cap, realizes the recycling of resources and protects the environment.

[0046] Moreover, components of the bottle cap, i.e., the cap body 1, the extension strip 11, the U-shaped strip 21, the cap ring 2 and the connecting teeth 3 are integrally injection molded to form the bottle cap, which is able to reduce the injection cost of the bottle cap, facilitate demoulding, avoid jamming, improve the production efficiency, and facilitate the capping of the bottle cap to the bottle mouth of the container, which is suitable for the high-speed production line. In addition, the injection material can be plastic, so that the formed extension strip 11 and U-shaped strip 21 have a certain degree of flexibility and are easy to be pulled apart. At the same time, the extension strip 11 and the U-shaped strip 21 have a certain degree of strength, so as to be able to support the cap body 1 in the opening state.

[0047] In one embodiment, as shown in FIGS. 1 and 5, the extension strip 11 starts from an opening end 1a of the cap body 1 and extends in a direction away from a closed end 1b of the cap body 1; the avoidance part 20 is formed as a door-shaped groove (i.e. formed as a "Π" structure) with a disconnected part at a top, the extension strip 11 passes through the disconnected part of the door shaped groove, and the opening 21a of the U-shaped strip 21 is integrally connected to a lower end face of the disconnected part.

[0048] As shown in FIG. 1, the extension strip 11 and the U-shaped strip 21 are partially accommodated in the avoidance part 20. FIG. 6 shows a front view structure of a bottle cap in another embodiment, as shown in FIG. 6, the extension strip 11 and the U-shaped strip 21 are fully accommodated in the avoidance part 20. The extension strip 11 and the U-shaped strip 21 are fully or partially accommodated in the avoidance part 20, depending on the total length required for the extension strip 11 and U-shaped strip 21 to be pulled apart. When applied to containers having different mouth heights, the length of the extension strip 11 may be from 1 cm to 50 cm or even longer.

[0049] In the bottle cap described above, the cap ring 2 is not a 360° continuous ring and is provided with an opening; the U-shaped strip 21 is formed at the opening and extends downward over the lower edge of the cover ring 2, and the bottom of U-shaped strip 21 is connected to the extension strip 11 of cap body 1. In this way, the bottle cap can be pulled up to a large extent, that is, the bottle cap can be pulled up to the height of the sum of the length of the extension strip 11 and the length of the U-shaped strip 21. In addition, through the breakable connecting teeth 3, the cap ring 2 forms a continuous structure close to 360°, and at the same time, the bottle cap and the bottle body are integrally connected after opening.

[0050] Through the connecting teeth 3, the cap ring 2 maintains the ring structure, which can make the cap ring 2 resistant to extrusion and impact. During transportation, the cap ring 2 can be stacked together without distortion. After transporting to the destination, the cap ring 2 can then be easily separated, and be transferred through a conveyor belt to the working place where the cap ring 2 fitted with the bottle body. The overall structure of the bottle cap is simple, tightly designed, sturdy and durable, capable of high-speed injection molding, easy to transport, rolling freely, without twisting and deformation, thereby meeting the production requirements of the filling line, and satisfying the production efficiency of the filling line.

[0051] Embodiments of the present disclosure also provide a container including the bottle cap described in any of the above embodiments. The features and principles of the bottle cap described in any of the above embodiments can be applied to the following container

embodiments. In the following container embodiments, what has been clarified, including the features and principles of the bottle cap, and the assembly relation between the bottle cap and the container, will not be repeated.

[0052] As shown in FIGS. 1 to 6, the container 6 includes the bottle mouth 61 provided with screw threads and the restriction ring 62 disposed under the bottle mouth 61, the cap body 1 is screwed on the bottle mouth 61, the screw threads on the bottle mouth 61 are at least used to tighten the cap body 1 when in the initial closed state and to provide a screw-up stroke for the cap body 1 during the opening process (as well as, to provide a screw-down stroke for the cap body 1 during closing); the cap ring 2 is buckled on the limiting ring 62, and the limiting ring 62 is used to fasten the cap ring 2 when in the initial closed state and to always limit axial movement of the cap ring 2.

[0053] In the initial closed state, the cap body 1 is tightened to the bottle mouth 61, the cap ring 2 is fastened to the restriction ring 62, and the cap body 1 and the cap ring 2 are locked by the vertical tiny connecting teeth 3, which ensures the stability of the bottle cap and avoids the bottle cap from loosening during the transportation of the container 6. Furthermore, in the initial closed state, the extension strip 11 integrally connected with the cap body 1 passes through the avoidance part 20 of the cap ring 2 and is wrapped by the U-shaped strip 21 integrally connected with the avoidance part 20 of the cap ring 2, and the extension strip 11, the U-shaped strip 21 and the avoidance part 20 are locked together by the horizontal tiny connecting teeth 3. As a result, the stability of the cap ring 2 is ensured, and the extension strip 11 and the U-shaped strip 21 are tightly adhered to the bottle mouth 61 to avoid warping and deformation. In the opening process, as the cap body 1 spirals up along the bottle mouth 61, the cap ring 2 is always buckled to the limiting ring 62 and rotated accordingly; therefore, the connecting teeth 3 are broken, and the extension strip 11 and the U-shaped strip 21 are pulled apart, making the cap body 1 leave the bottle mouth 61 successfully. In the state of completing the opening process, the cap body 1 is still connected to the limiting ring 62 through the extension strip 11, the U-shaped strip 21 and the cap ring 2, thereby avoiding dropping and losing, and facilitating the cap body 1 to be screwed back to the bottle mouth 61 after use.

[0054] The above-described container 6 can ensure that the bottle cap is always attached to the container 6, which not only facilitates the use, but also enhances the recycling rate of the bottle cap, realizes the recycling of resources and protects the environment. Moreover, the components of the bottle cap, i.e., the cap body 1, the extension strip 11, the U-shaped strip 21, the cap ring 2 and the connecting teeth 3 are integrally injection molded, which is suitable for high-speed production lines; and the bottle cap can be conveniently capped to the bottle mouth of the container 6, which improves the overall production efficiency of the container 6.

[0055] In addition, the container 6 may also be provided with a clamping ring 63 at its bottle neck, and the clamping ring 63 can help the container 6 to be filled in the production line (the production line is provided with a mechanical gripper that can catch the container 6 by the clamping ring 63) and improve the stability and efficiency when conveying and capping.

[0056] In the embodiment shown in FIGS. 1 to 6, an outer diameter of the clamping ring 63 is less than an outer diameter of the cap ring 2. In some embodiments, the outer diameter of the clamping ring may also be greater than or equal to the outer diameter of the cap ring, therefore the mechanical gripper can more easily catch the container 6 by the clamping ring 63. FIG. 7 shows a cross-sectional structure of a bottle cap in another embodiment, and with reference to FIG. 7, the outer diameter of the bottle clamp ring 63 in this embodiment is greater than the outer diameter of the cap ring 2. At this point, both the extension strip 11 and the U-shaped strip 21 are in a stepped shape to avoid the clamping ring 63 and extend toward the bottle body.

[0057] Embodiments of the present disclosure also provide a method for opening the container, applied to the container described in the above embodiments. The features and principles of the bottle cap described in any of the above embodiments, and the features and principles of the container described in the above embodiments, can be applied to the following embodiments of the method for opening the container. In the following embodiments, what has been clarified, including the features and principles of the bottle cap and the container, will not be repeated.

[0058] FIG. 8 shows main steps of the method for opening the container in an embodiment, with reference to FIG. 8, the method for opening the container includes a first stroke S810 and a second stroke S820 of continuously rotating the bottle body in a first clockwise direction. During the first stroke S810, rotate the bottle body in the first clockwise direction, the cap ring is rotated accordingly and the connecting teeth are broken when the cap body spirals up. During the second stroke S820, continuing to rotate the bottle body in the first clockwise direction, as the cap body spirals up, the cap ring is rotated accordingly and the extension strip and the U-shaped strip are pulled apart until the cap body leaves the bottle mouth and is connected to the limiting ring through the cap ring.

[0059] The cooperating relation between the bottle cap and the container during the opening process is shown in FIGS. 1 to 5.

[0060] As shown in FIGS. 1 and 2, in the initial closed state, the cap body 1 is screwed to the bottle mouth 61 of the container 6, the cap ring 2 is fastened to the restriction ring 62 under the bottle mouth 61, and the cap body 1 and the cap ring 2 are locked by the vertical tiny connecting teeth 3, which ensures the stability of the bottle cap. Furthermore, the extension strip 11 integrally connected with the cap body 1 passes through the avoidance part 20 of the cap ring 2 and is wrapped by the U-shaped strip 21

integrally connected with the avoidance part 20 of the cap ring 2, and the extension strip 11, the U-shaped strip 21 and the avoidance part 20 are locked together by the horizontal tiny connecting teeth 3, which further enhances the stability of the bottle cap and ensures that the extension strip 11 and the U-shaped strip 21 are tightly adhered to the bottle mouth 61, avoiding warping and deformation.

[0061] With reference to the state of the connecting teeth 3 being broken shown in FIG. 3. When rotate the cap body 1 in the first clockwise direction (i.e., the counterclockwise direction R), the cap ring 2 is buckled on the limiting ring 62 and rotated accordingly; when the cap body 1 moves up a certain distance, due to the force between the cap body 1 and the cap ring 2, the connecting teeth 3 are broken and the extension strip 11 and the U-shaped strip 21 are slightly warped.

[0062] With reference to the state of the cap body 1 spiraling up shown in FIG. 4. As the cap body 1 continues to move up, the cap ring 2 remains buckled on the limiting ring 62 and rotated accordingly, so that the extension strip 11 is pulled apart from the U-shaped strip 21, ensuring that the cap body 1 continues to spiral up along the screw threads of the bottle mouth 61 until the cap body 1 is removed from the bottle mouth 61.

[0063] With reference to the state of the cap body 1 leaving the bottle mouth 61 shown in FIG. 5. When the opening process is completed, the cap body 1 is still connected to the limiting ring 62 through the extension strip 11, the U-shaped strip 21 and the cap ring 2, so that to avoid dropping and losing, to maintain the opening state of the cap body 1, and to facilitate the cap body 1 to be screwed back to the bottle mouth 61 after use.

[0064] Thus, the bottle cap can be opened smoothly by continuously rotating the cap body 1 in the first clockwise direction, and the cap body 1 can be easily put back on after use.

[0065] In summary, the present disclosure provides the bottle cap, the container and the method for opening the container. The bottle cap includes the cap body and the cap ring which are connected, the bottle cap is always connected to the container during use and will not be lost, thereby facilitating users to use and enhancing the recycling rate of the bottle cap. In addition, the bottle cap has low manufacturing cost and high production efficiency and can be applied to high-speed production lines.

[0066] The above is a further detailed description of the present disclosure in combination with specific preferred embodiments, and it cannot be concluded that the specific implementation of the present disclosure is limited to these descriptions. For a person of ordinary skill in the art to which the present disclosure belongs, on the premise of not departing from the concept of the present disclosure, a number of simple deductions or substitutions can be made, which should be regarded as falling within the scope of protection of the present disclosure.

Claims

1. A bottle cap comprising a cap body and a cap ring which are connected;

   wherein the cap body is provided with an extension strip, and a first end of the extension strip is integrally connected to the cap body;
   wherein the cap ring is provided with an avoidance part for the extension strip to pass through and a U-shaped strip encircling the extension strip, an opening of the U-shaped strip is integrally connected to the avoidance part, and a bottom of the U-shaped strip is integrally connected to a second end of the extension strip;
   wherein breakable connecting teeth are provided between the cap body and the cap ring, between side walls of the extension strip and the U-shaped strip, and between side walls of the U-shaped strip and the avoidance part.

2. The bottle cap according to claim 1, wherein during an opening process of the bottle cap, as the cap body spirals up along a bottle mouth of a container, the cap ring is buckled to a limiting ring under the bottle mouth and rotates, the connecting teeth are broken, and the extension strip and the U-shaped strip are pulled apart until the cap body leaves the bottle mouth.

3. The bottle cap according to claim 2, wherein a total length of the extension strip and the U-shaped strip when pulled apart is greater than a height of the bottle mouth.

4. The bottle cap according to claim 2, wherein when the opening process of the bottle cap is completed, the cap body is connected to the limiting ring through the extension strip, the U-shaped strip and the cap ring in turn.

5. The bottle cap according to claim 1, wherein when the bottle cap is in an initial closed state, the cap body is tightened on a bottle mouth of a container, the cap ring is fastened on a limiting ring under the bottle mouth, and the extension strip and the U-shaped strip are locked on the avoidance part.

6. The bottle cap according to claim 1, wherein the extension strip starts from an opening end of the cap body and extends in a direction away from a closed end of the cap body;
   wherein the avoidance part is formed as a door-shaped groove with a disconnected part at a top, the extension strip passes through the disconnected part of the door-shaped groove, and the opening of the U-shaped strip is integrally connected to a lower end face of the disconnected part.

7. The bottle cap according to claim 6, wherein the extension strip and the U-shaped strip are fully accommodated in the avoidance part, or the extension strip and the U-shaped strip are partially accommodated in the avoidance part.

8. The bottle cap according to claim 1, wherein the cap body, the extension strip, the U-shaped strip, the cap ring and the connecting teeth are integrally injection molded.

9. A container comprising a bottle mouth provided with screw threads and a limiting ring disposed under the bottle mouth, wherein the container further comprises the bottle cap according to any one of claims 1-8;

wherein the cap body is screwed on the bottle mouth, the screw threads are at least used to tighten the cap body when in an initial closed state and to provide a screw-up stroke for the cap body during an opening process;
wherein the cap ring is buckled on the limiting ring, the limiting ring is used to fasten the cap ring when in the initial closed state and to always limit axial movement of the cap ring.

10. The container according to claim 9 further comprising a clamping ring provided on a bottle neck of the container;
wherein when an outer diameter of the clamping ring is greater than an outer diameter of the cap ring, both the extension strip and the U-shaped strip are in a stepped shape to avoid the clamping ring and extend toward a bottle body of the container.

11. A method for opening a container, applied on the container according to claim 9 or 10, wherein the method comprises a first stroke and a second stroke of continuously rotating the bottle body in a first clockwise direction;

wherein during the first stroke, as the cap body spirals up, the cap ring rotates and the connecting teeth are broken;
wherein during the second stroke, as the cap body spirals up, the cap ring rotates and the extension strip and the U-shaped strip are pulled apart until the cap body leaves the bottle mouth and is connected to the limiting ring through the cap ring.

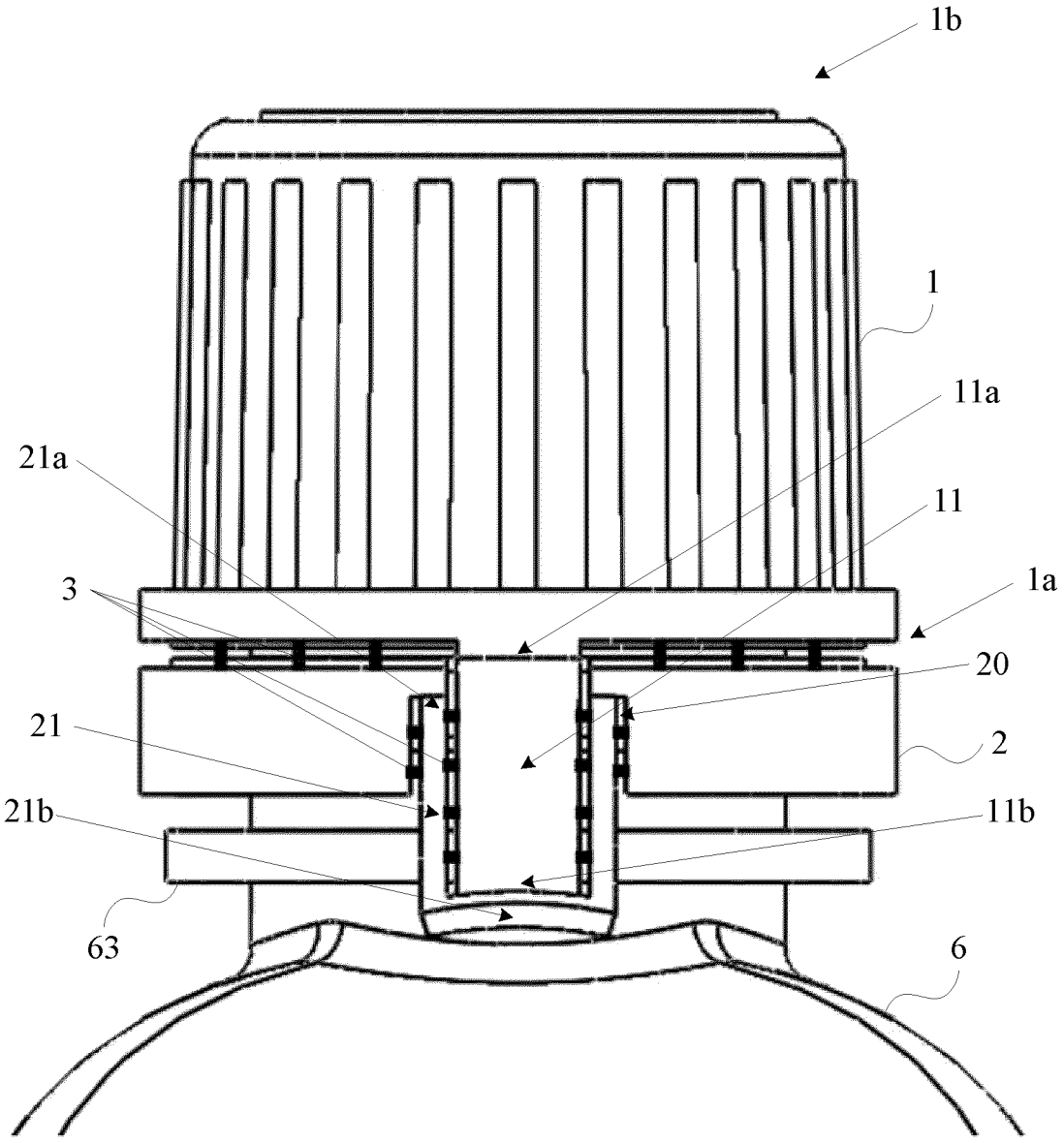

FIG. 1

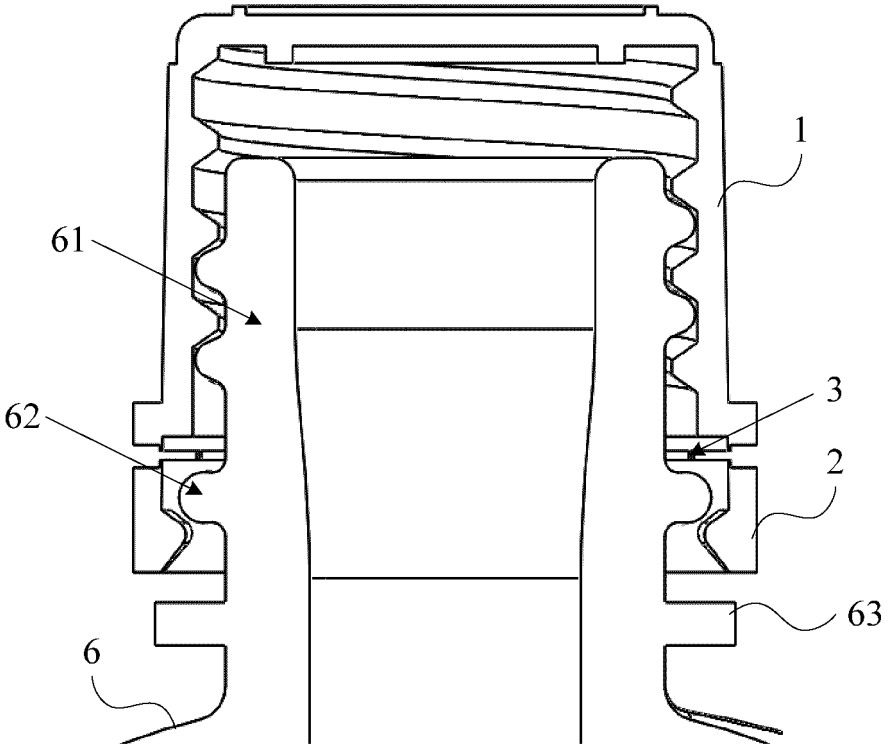

FIG. 2

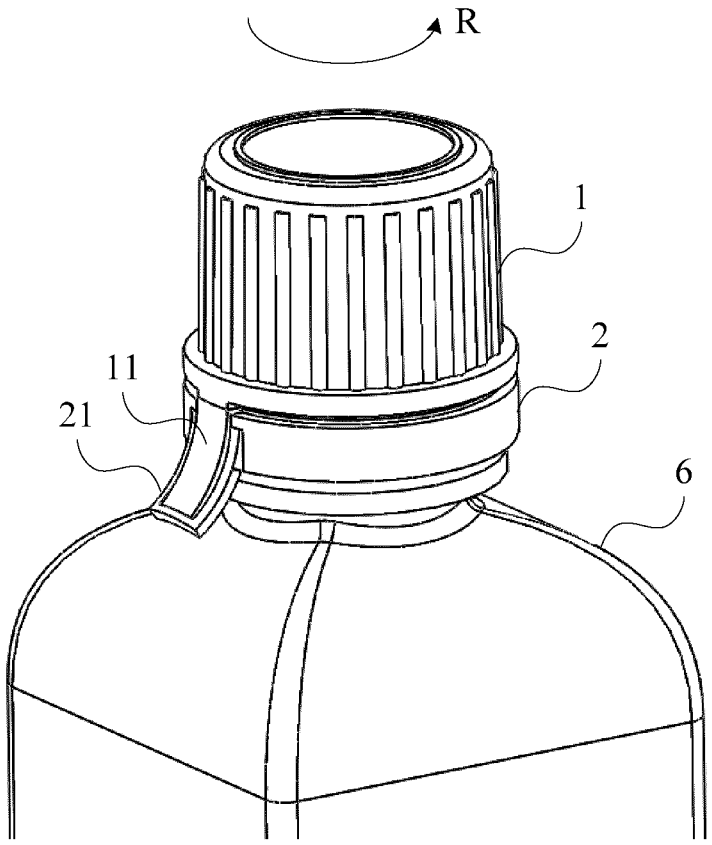

FIG. 3

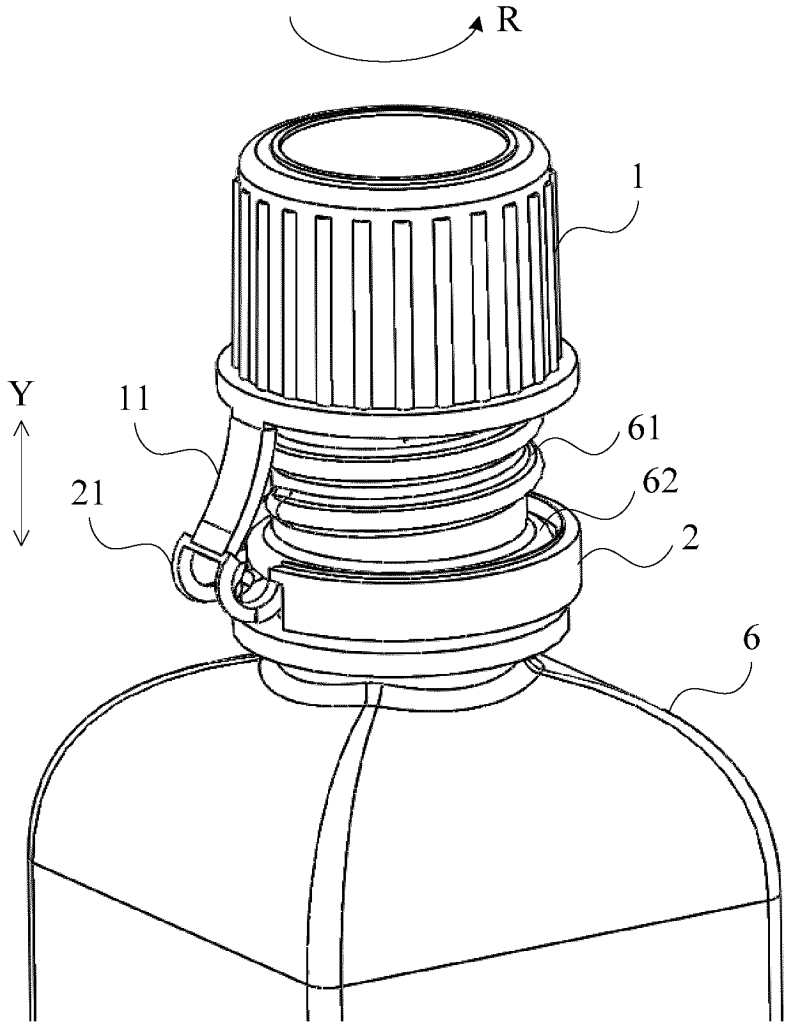

FIG. 4

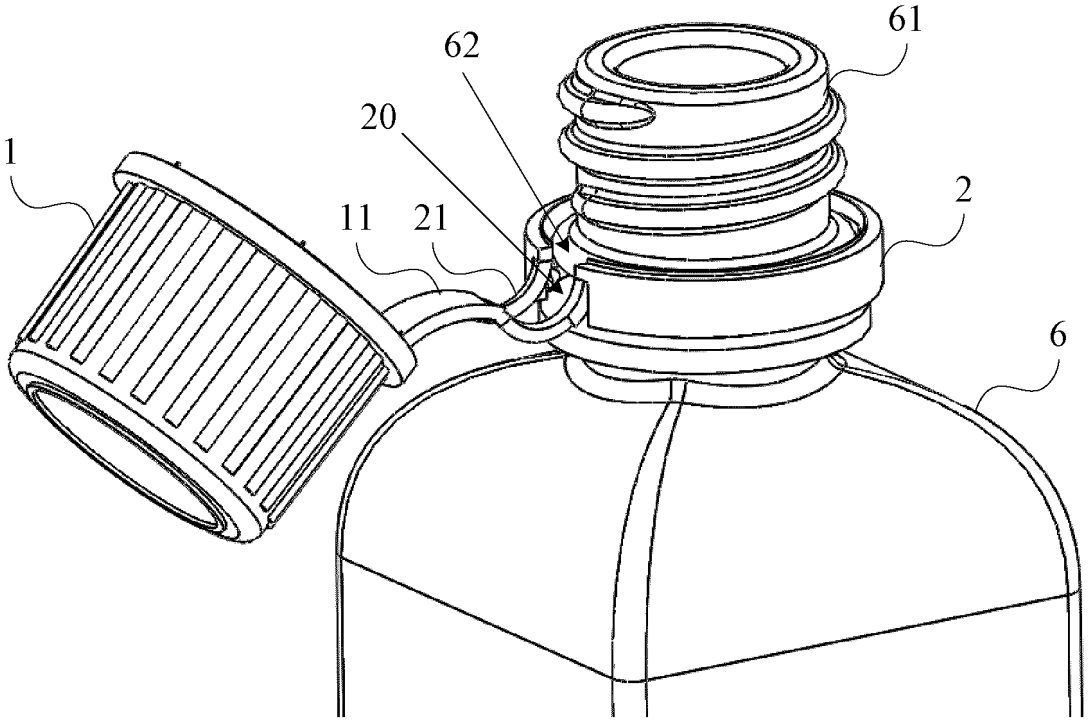

FIG. 5

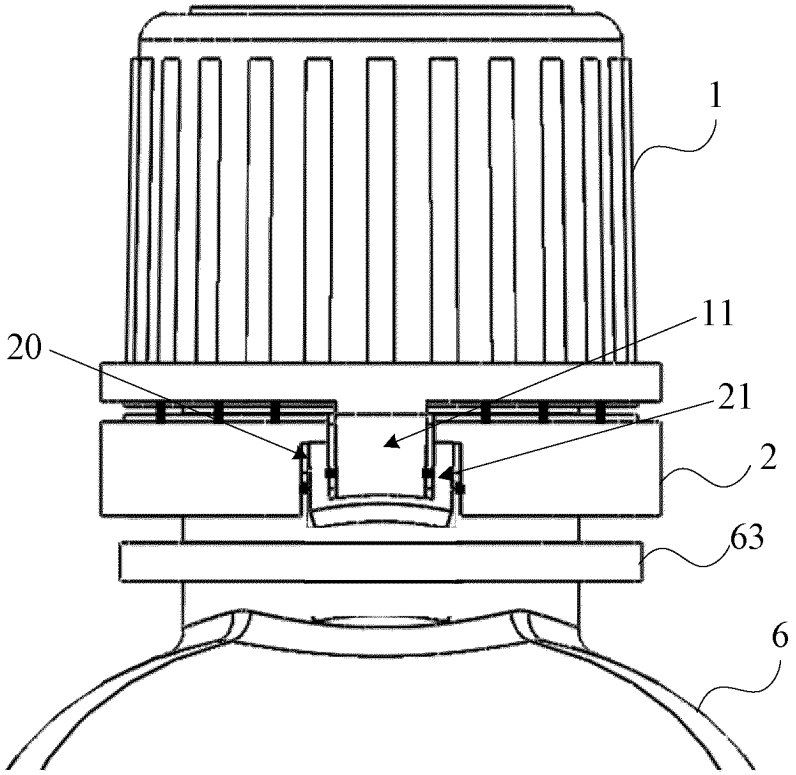

FIG. 6

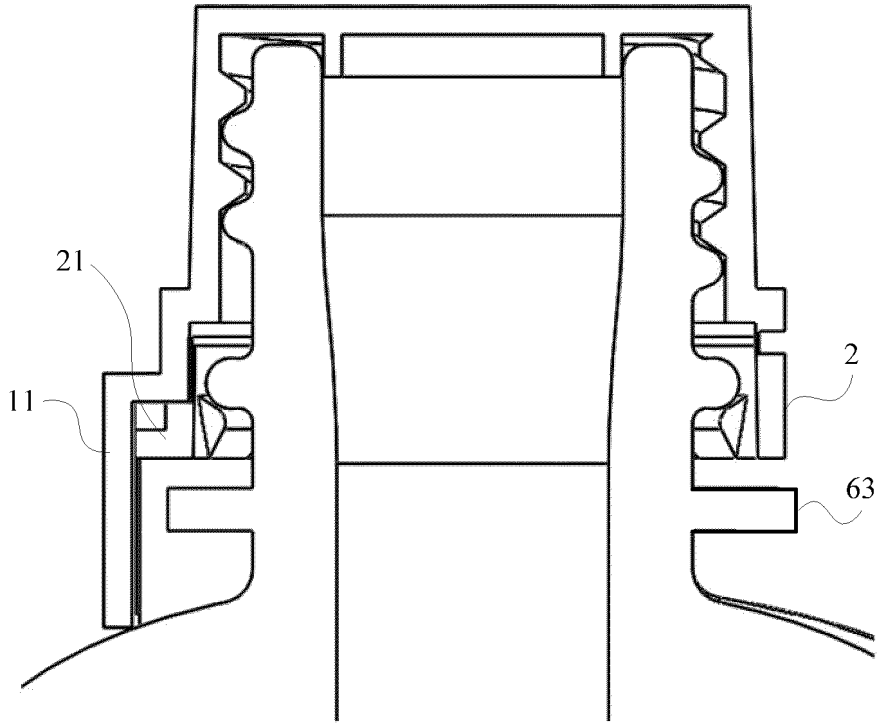

FIG. 7

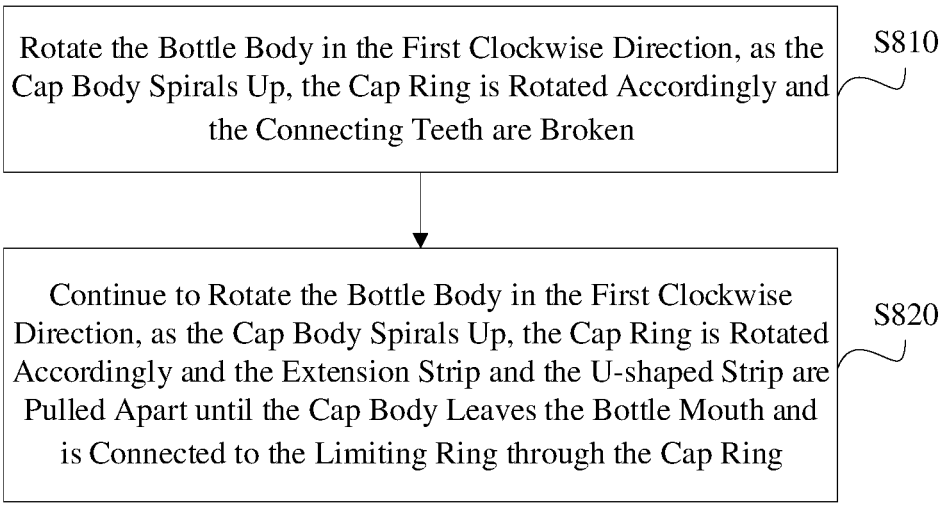
Rotate the Bottle Body in the First Clockwise Direction, as the Cap Body Spirals Up, the Cap Ring is Rotated Accordingly and the Connecting Teeth are Broken
S810
Continue to Rotate the Bottle Body in the First Clockwise Direction, as the Cap Body Spirals Up, the Cap Ring is Rotated Accordingly and the Extension Strip and the U-shaped Strip are Pulled Apart until the Cap Body Leaves the Bottle Mouth and is Connected to the Limiting Ring through the Cap Ring
S820

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/081813

A. CLASSIFICATION OF SUBJECT MATTER

B65D 55/16(2006.01)i; B65D 41/04(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)

IPC:B65D

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

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

CNTXT, ENTXT, ENTXTC, VEN, WPABS, WPABSC, CNKI: 盖, 环, 条, 带, 螺纹, 枢转, 铰链, U型, 门型, 断裂, 易断, 掉落, 丢失, cap, closure, cover, ring, strip, screw, thread, hinge, pivot+, embed+, U, shaped, weak+, break+, fall, lost

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 114560176 A (ZHANG DAPENG) 31 May 2022 (2022-05-31) description, specific embodiments, and figures 1-8	1-11
PX	CN 216888104 U (ZHANG DAPENG) 05 July 2022 (2022-07-05) description, specific embodiments, and figures 1-7	1-11
X	EP 3950531 A1 (CAPARTIS AG) 09 February 2022 (2022-02-09) description, specific embodiments, and figures 1-21	1-11
A	CN 111406093 A (NOVA CHEMICALS (INTERNATIONAL) S.A.) 10 July 2020 (2020-07-10) entire document	1-11
A	CN 113443261 A (SACMI COOPERATIVA MECCANICI IMOLA SOCIETA COOPERATIVA) 28 September 2021 (2021-09-28) entire document	1-11
A	CN 1830730 A (GUO YONGJUN) 13 September 2006 (2006-09-13) entire document	1-11

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

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"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	Date of mailing of the international search report
13 June 2023	**25 June 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/081813

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A	KR 100981240 B1 (KWON SI JOONG) 10 September 2010 (2010-09-10) entire document	1-11
A	US 2021206537 A1 (NOVEMBAL USA INC.) 08 July 2021 (2021-07-08) entire document	1-11

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2023/081813

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				US	10625914	B2	21 April 2020
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				KR	20200091417	A	30 July 2020
				AR	113605	A1	20 May 2020
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				WO	2019111111	A1	13 June 2019
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				BR	112020009680	B1	02 May 2023
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				RU	2762330	C1	17 December 2021
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				EP	3847106	A4	18 May 2022
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				MX	2021001856	A	13 May 2021

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