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ABSTRACT

A cap for use with a container, said cap including a cylindrical body having an opening and a lid adapted to seal over said opening, the body further having an inner lip disposed circumferentially around the inside of the body and adapted to house a blister having a base and a dome extending over the base to define a chamber for housing a substance, the blister including an internal piercing implement so that when the dome is pressed, the implement pierces the base to define an opening through which the substance escapes into the container.

A cap and blister pack housing a substance and having an integral piercing implement

FIELD OF THE INVENTION

[0001] The present invention relates generally to a sealing cap and blister pack for a container incorporating a substance to be mixed with the liquid in the container prior to use as well as the blister pack on its own.

BACKGROUND TO THE INVENTION

[0002] Sealing methods for food and beverage containers are well known and varied, the most common being a cap or lid. Drinks which include another component or second component, such as a tablet which is added to the liquid, are growing in popularity. Usually such containers include a blister pack contained in the lid which is adapted to store material separately from the liquid in the container.

[0003] It is preferable for the second component to be added immediately prior to consumption, especially when ingredients to be added are UV sensitive or do not have a long shelf life when mixed. Adding ingredients at the point of consumption also simplifies the production and filling of the beverages.

[0004] It is therefore known for a container to include a cap and a tablet holder, or blister pack, so that when pressure is exerted on the blister pack it allows the tablet to be mixed with the liquid in the container.

[0005] In some cases it is preferable to mix granules or powders since they dissolve much quicker and also do not have to be manufactured in a tablet form. It may be also preferable in other cases to mix a liquid in the blister pack with the liquid in the container.

[0006] However when dispensing a powder or liquid the design of the blister pack needs to ensure that the bottom of the blister pack is pierced or torn to ensure that the powder or the liquid drops or flows into the container. In addition, the perforation needs to be sufficiently large that the powder or liquid flows quickly. This is not always possible just by the exertion of external pressure on the blister pack and various complicated solutions have been proposed. All of these however include external elements to the blister pack that aid in the piercing. Furthermore, the container cannot be resealed once the blister pack is broken and therefore the container cannot be reused.

[0007] It is an object of the present invention to overcome these disadvantages or at least provide the public with a useful alternative.

SUMMARY OF THE INVENTION

[0008] Therefore in one form of the invention there is proposed a cap for use with a container, said cap including a cylindrical body having an opening and a lid adapted to seal over said opening, the body further having an inner lip disposed circumferentially around the inside of the body and a blister pack having a base and a dome extending over the base to define a chamber for housing a substance, the dome including an integral internal implement so that when the dome is pressed, the implement pierces the base to define an opening through which the substance escapes into the container;

[0009] In preference the implement is a piercing needle;

[0010] In preference the implement is an internal plunger;

[0011] In preference the blister pack includes as a base aluminum foil;

[0012] In preference the blister pack is attached to the body by glue;

[0013] In preference the blister pack is attached to the body by a ring that overlaps the blister pack and the lip and is bonded to both the blister pack and the body lip;

[0014] In preference the implement is of an inverted frustoconical shape;

[0015] In preference the blister pack dome is so shaped to define the implement;

[0016] In preference the implement comprises a disc from which extend downwardly a number of converging walls;

[0017] In preference the body further includes a means to prevent the implement from falling into the container; and

[0018] In preference the internal plunger comprises an upper disc and a plurality of converging walls extending downwardly from the disk supported by the base.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Preferred features, embodiments and variations of the invention may be discerned from the following Detailed Description which provides sufficient information for those skilled in the art to perform the invention. The Detailed Description is not to be

regarded as limiting the scope of the preceding Summary of the Invention in any way. The Detailed Description will make reference to a number of drawings as follows.

[0020] Reference will now be made, by way of example only, to the accompanying drawings.

[0021] Figure 1 is a perspective view of a known cap having an integral lid in an open state to be used with a drink container;

[0022] Figure 2 is the cap as in Figure 1 but when in a closed state;

[0023] Figure 3 is an exploded view of the cap as in Figure 1 including a known blister pack;

[0024] Figure 4 is the cap as in Figure 3 illustrating the housing of the blister pack;

[0025] Figure 5 is a perspective view of a blister pack according to a first embodiment the present invention;

[0026] Figure 6 is a cross-sectional view of the blister pack of Figure 5 according to a first embodiment of the invention;

[0027] Figure 7 is an exploded perspective view of a blister pack according to a second embodiment of the present invention;

[0028] Figure 8 is a cross-sectional view of the blister pack of Figure 7 according to a second embodiment of the invention;

[0029] Figure 9 is a detailed partial cross-sectional view of the blister pack of Figure 7 according;

[0030] Figure 10 is a perspective cut-out view of the assembled blister pack of Figure 7; and

[0031] Figure 11 is a perspective cut-out view of the blister pack of Figure 7 after it has been used.

DRAWING LABELS

[0032] The drawings include items labeled as follows:

10 cap

11 body

12 opening

- 13 cylindrical skirt
- 14 internal threads
- 15 internal lip
- 16 hinged lid
- 17 blister pack
- 18 plastic film
- 19 flange
- 20 aluminium film
- 21 bottle neck
- 22 dome
- 23 substance
- 24 needle
- 25 point
- 32 dust cap
- 33 blister retaining ring
- 34 blister
- 35 pierce plunger
- 36 substance
- 37 base foil
- 38 cap
- 39 bottle mouth
- 40 protrusions
- 41 disc
- 42 walls
- 43 point

DETAILED DESCRIPTION OF THE INVENTION

[0033] The following detailed description of a preferred embodiment of the invention refers to the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings and the following description to refer to the same and like parts. As used herein, any usage of terms that suggest an absolute orientation (e.g. “top”, “bottom”, “front”, “back”, “horizontal”, etc.) are for illustrative convenience and refer to the orientation shown in a particular figure. However, such terms are not to be construed in a limiting sense as it is contemplated that various components may in practice be utilized in orientations that are the same as, or different than those, described or shown. Dimensions of

certain parts shown in the drawings may have been modified and/or exaggerated for the purposes of clarity or illustration.

[0034] Referring to Figures 1 and 2 there is shown a cap 10 having a body 11 with an opening 12 and a cylindrical skirt 13. Internal threads 14 are used to screw the cap onto a drink container. An internal lip 15 is provided to house a blister as is discussed below. A hinged lid 16 is integrally attached to the body 11 so that when closed it seals the opening 12.

[0035] As illustrated in Figures 3 and 4 the dimensions of the lid 16 are such that the body 11 can accommodate a blister pack 17 defined by a plastic film 18 and having a flange 19. The blister pack flange 19 is supported by internal lip 15 and the dimensions of the lid and the body are such that the blister cap is accommodated when the lid is closed.

[0036] A tablet, powder or liquid is blister packed using standard packaging processes. The blister consists of the formed plastic laminate film 18 that is designed to modify the atmosphere inside the blister. After the tablet/powder/liquid is loaded into the formed plastic blister, the blister is lidded using thin aluminum foil 20. The foil is coated with a heat sensitive adhesive and the edge of the blister is welded to the film to isolate the atmosphere in the blister. The packed blister is cut out so that it is generally circular in elevation shape.

[0037] The blister pack is glued to the internal lip of the body so that the table or powder sits over the opening 12. When the blister houses a liquid the liquid will naturally spread out over the bottom of the blister pack. The adhesive is generally a pressure sensitive adhesive or hot melt adhesive.

[0038] In an alternate embodiment, not shown, instead of using glue a plastic ring lies on top of the flange 19 and is of a diameter slightly larger than that of the blister pack flange so that it can be welded to the outer surface of the lip 15.

[0039] The lid 16 with the assembled blister prevents inadvertent activation of the press release of the substance (such as a tablet, powder or liquid) 23. This protects the blister pack during handling, filling and post-consumer purchase. The lid may not be hinged but be a separate cap that engages with the body in a snap-type arrangement. The lid may also include well known features to provide evidence of tampering.

[0040] As illustrated in Figures 5 to 6, the present invention teaches a blister pack 17 that includes a base aluminium film 20, flange 19 and a dome 22 that is usually a plastic film. In a first embodiment of the invention the dome, instead of being flat as in the known blister

pack, is of an arcuate shape where the center includes a needle 24 comprising side walls and a central point 25 that generally rests against or is close to the base 20. The user simply presses on the dome 22 causing the needle to move down and pierce the base 20 and let the powder escape into the container. Although defined as a needle it may also take the shape of a plunger – that is – having a pointy end that is adapted to engage and pierce through the base.

[0041] Whilst the dome is illustrated as being of a continuous shape with an integral needle, it is to be understood that the dome may also be of different configurations. That is, the dome may have a flat top and the needle is attached to the underside of the film. This however may not be preferred due to difficulties in manufacture.

[0042] The reader will now appreciate that in use, the user simply removes the lid and applies pressure to the top of the blister pack that results in the needle piercing the base and the substance being dispensed. In a preferred embodiment the dome is constructed to be resilient and to spring back when it has pierced the base so that the substance, especially when it is a liquid, can escape the pack without the needle obstructing the flow.

[0043] A second embodiment of the invention is illustrated in Figures 7 to 11 wherein the present invention teaches a blister pack that includes a dust cap 32, a blister retaining ring 33, a blister 34 that houses a pierce plunger 35 and substance 36 sealed in by a base foil 37. The blister sits on top of the cap 38 that is adapted to be screwed onto a bottle mouth 39.

[0044] The user simply removes the dust cap 32 and applies pressure to the top of the blister 34 that results in the piercing plunger 35 piercing the foil 37 and the substance being dispensed into the container. To prevent the plunger from also falling into the container protrusions 40 extend in the cap that hold the plunger in position.

[0045] The plunger may be of many shapes. In this embodiment the plunger includes a disc 41 extending downwardly from which are walls 42 that converge to define an effective point 43 that pierces the foil, typically made from aluminum.

[0046] The reader will now further appreciate the advantage of the present invention. Since the blister pack is an integral part of the cap the powder can be dispensed into the drink container whilst the bottle remains sealed. The cap is simply unscrewed to access the liquid and can be screwed back to the drink container to once again seal the bottle. The blister pack includes a piercing plunger container within the blister that assists in breaking of the foil so that the substance is dispensed into the container.

[0047] The reader will now further appreciate the advantage of the second embodiment of the present invention. Since the blister pack is an integral part of the cap the substance can be dispensed into the drink container whilst the bottle remains sealed. The cap is simply unscrewed to access the liquid and can be screwed back to the drink container to once again seal the bottle. The blister pack includes an integral piercing member in the form of a plunger that assists in breaking of the base foil so that the substance is dispensed into the liquid.

[0048] Therefore, in either embodiment, the invention comprises an internal piercing implement being either a needle or plunger to assist in breaking the base foil so that the substance is dispensed into the liquid.

[0049] Further advantages and improvements may very well be made to the present invention without deviating from its scope. Although the invention has been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus. Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of the common general knowledge in this field.

[0050] For example, although illustrated in Figure 5 and 11 is a blister pack having one central needle or plunger, the blister pack may have numerous needles extending downwardly and adapted to pierce the base when pressured.

[0051] It is to be understood that the present invention, although described by way of example when used for a drink container, may equally well be used for other purposes such as but not limited to glues, pesticides, paints and many other applications where it is necessary or desirable to mix either tablet(s), granules or liquids with a liquid prior to use.

[0052] In the present specification and claims (if any), the word "comprising" and its derivatives including "comprises" and "comprise" include each of the stated integers but does not exclude the inclusion of one or more further integers.

CLAIMS

1. A cap for use with a container, said cap including a cylindrical body having an opening and a lid adapted to seal over said opening, the body further having an inner lip disposed circumferentially around the inside of the body and a blister pack supported by the body and having a base and a dome extending over the base to define a chamber for housing a substance, the dome including an integral internal needle so that when the dome is pressed, the needle pierces the base to define an opening through which the substance escapes into the container.
2. A cap as in any of the above claims wherein the blister pack includes as a base aluminum foil.
3. A cap as in any of the above claims wherein the blister pack is attached to the body by glue.
4. A cap as in any of the above claims wherein the blister pack is attached to the body by a ring that overlaps the blister pack and the lip and is bonded to both the blister pack and the body lip.
5. A cap as in any of the above claims wherein the needle is of an inverted frustoconical shape.
6. A cap as in any of the above claims wherein the blister pack dome is so shaped to define the implement.

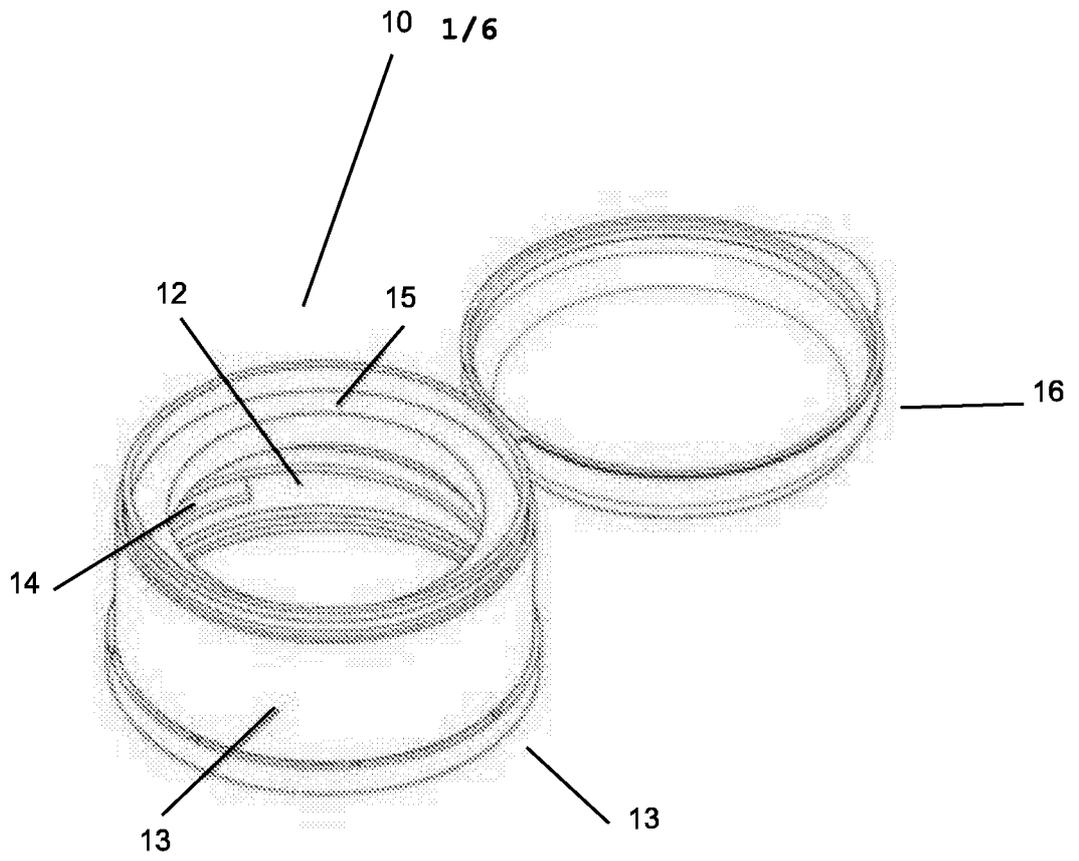


Figure 1.

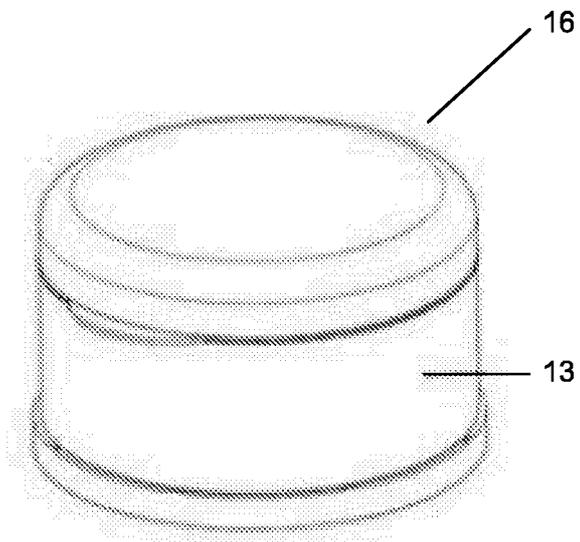


Figure 2.

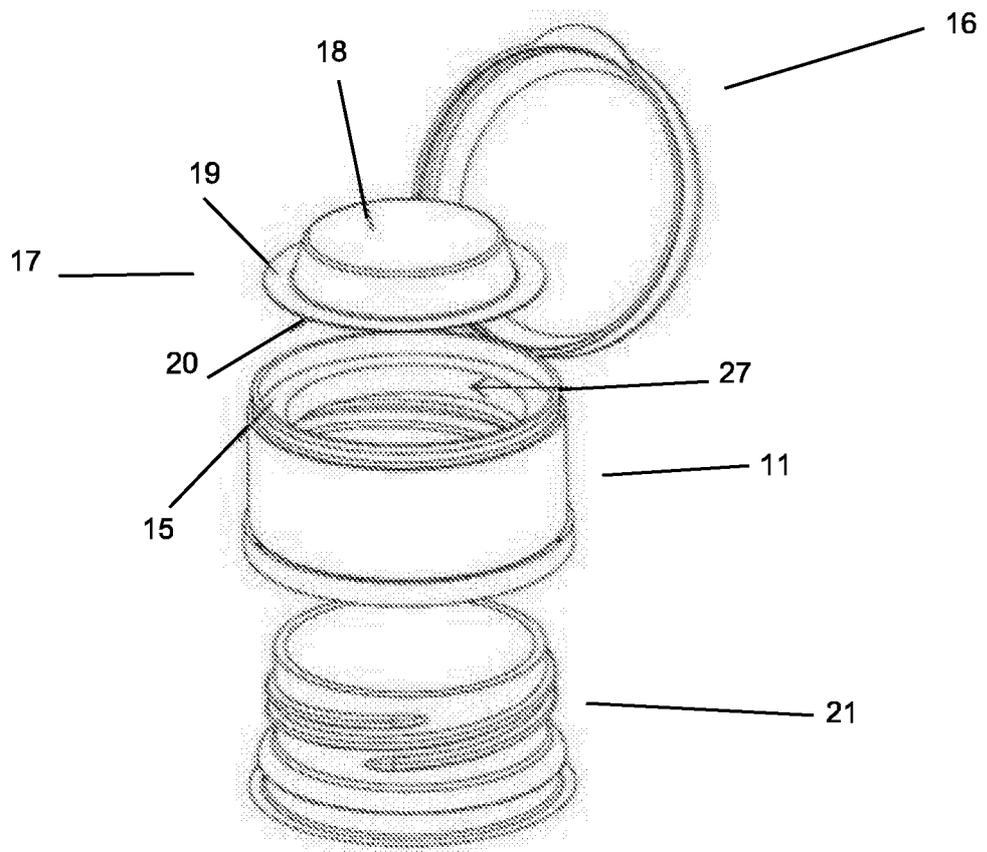


Figure 3.

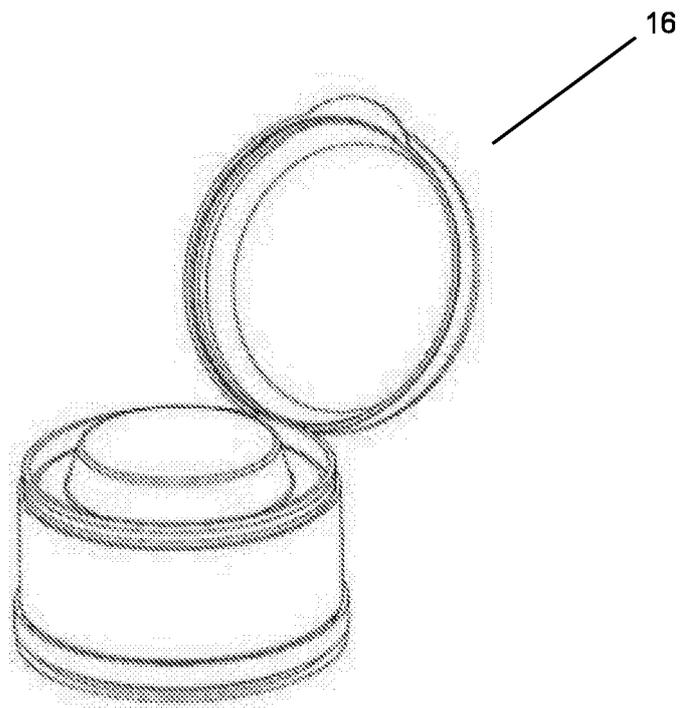


Figure 4.

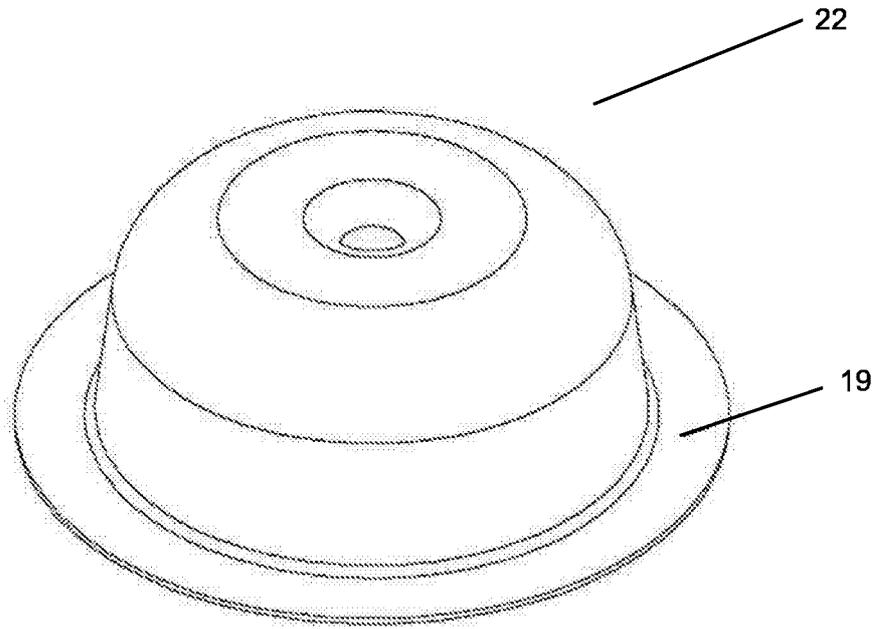


Figure 5.

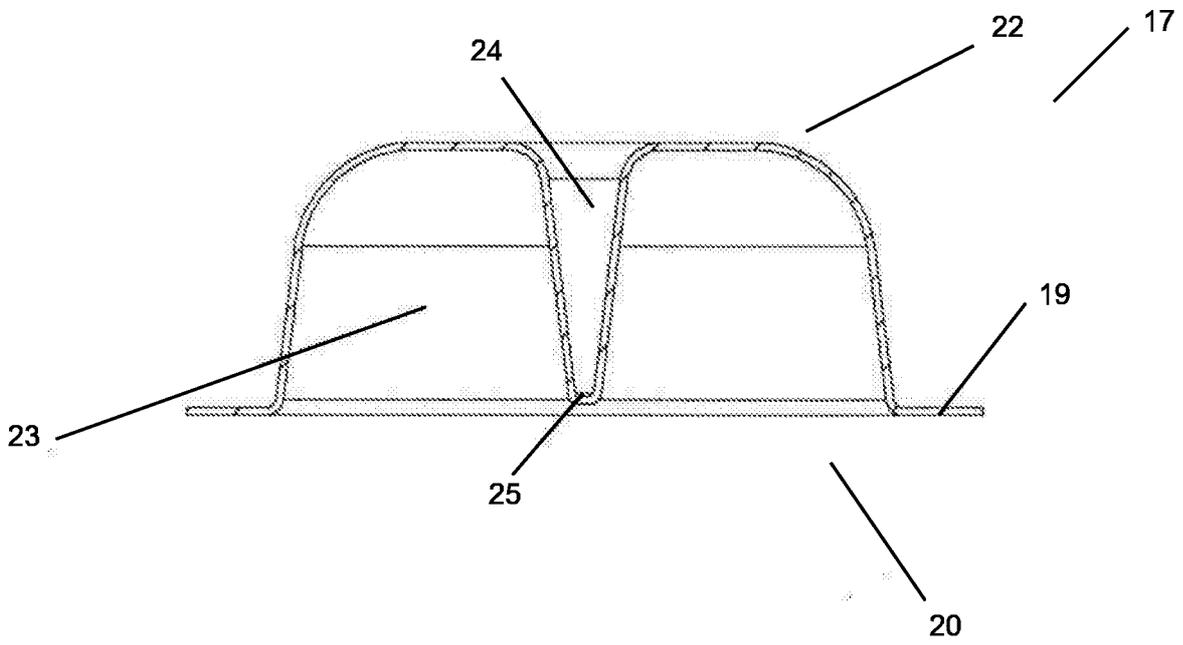


Figure 6.

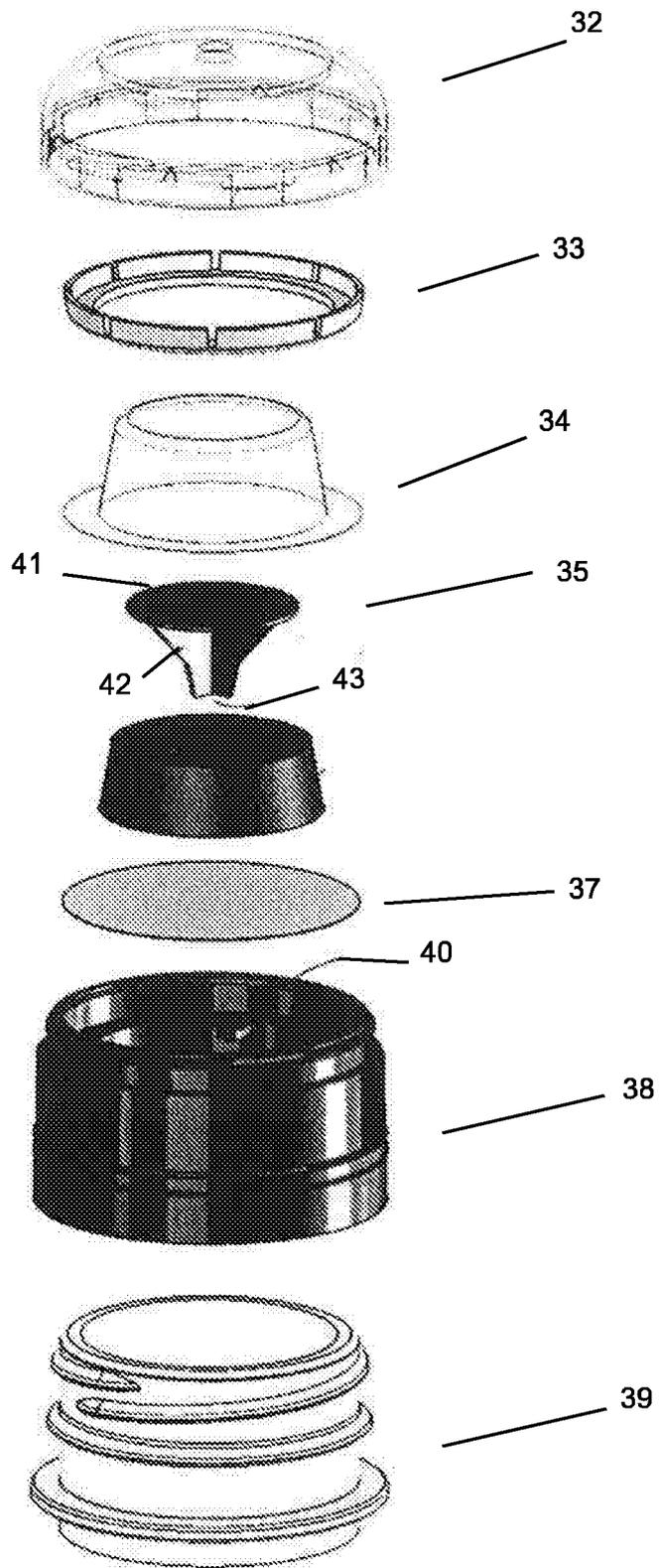


Figure 7.

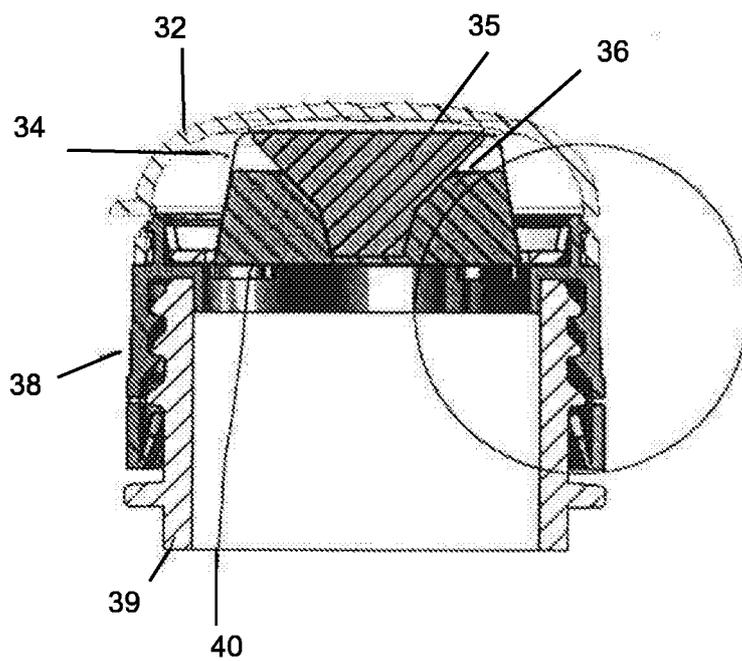


Figure 8.

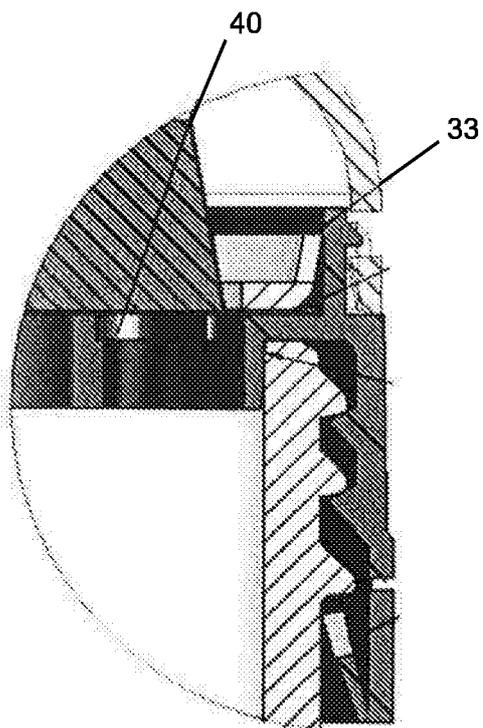


Figure 9.

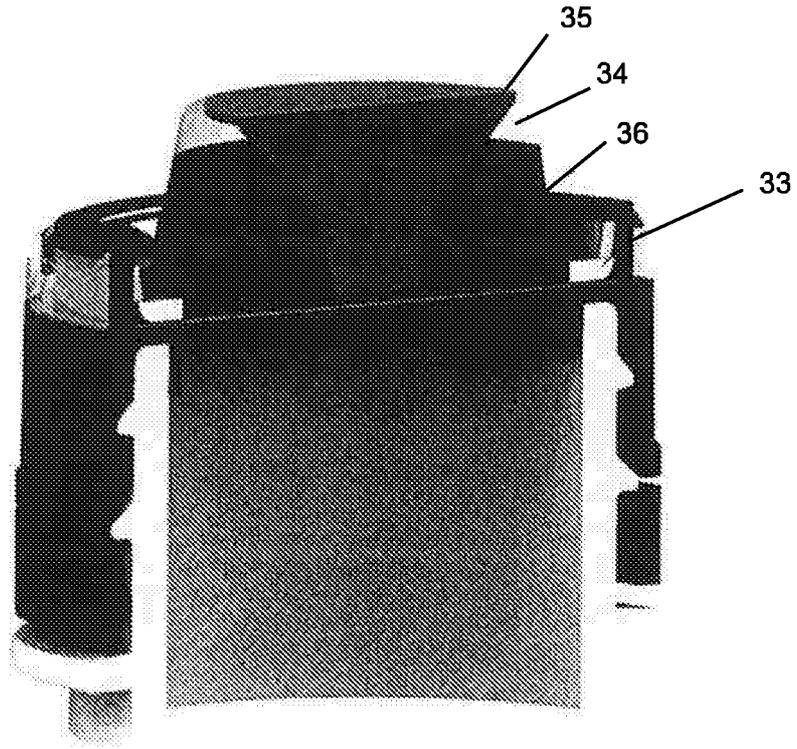


Figure 10.

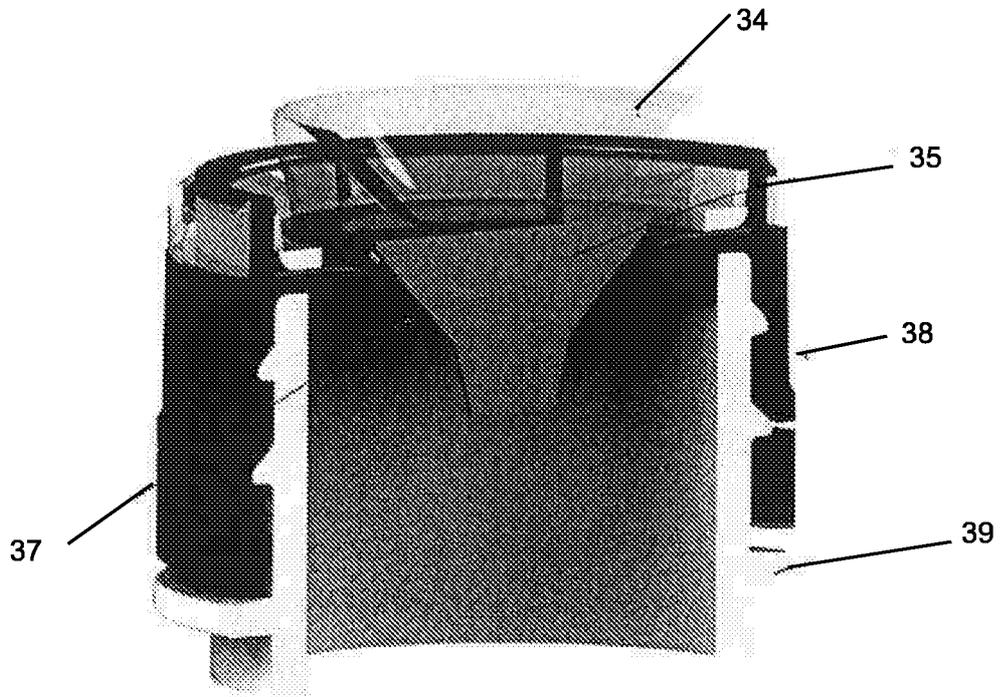


Figure 11.