



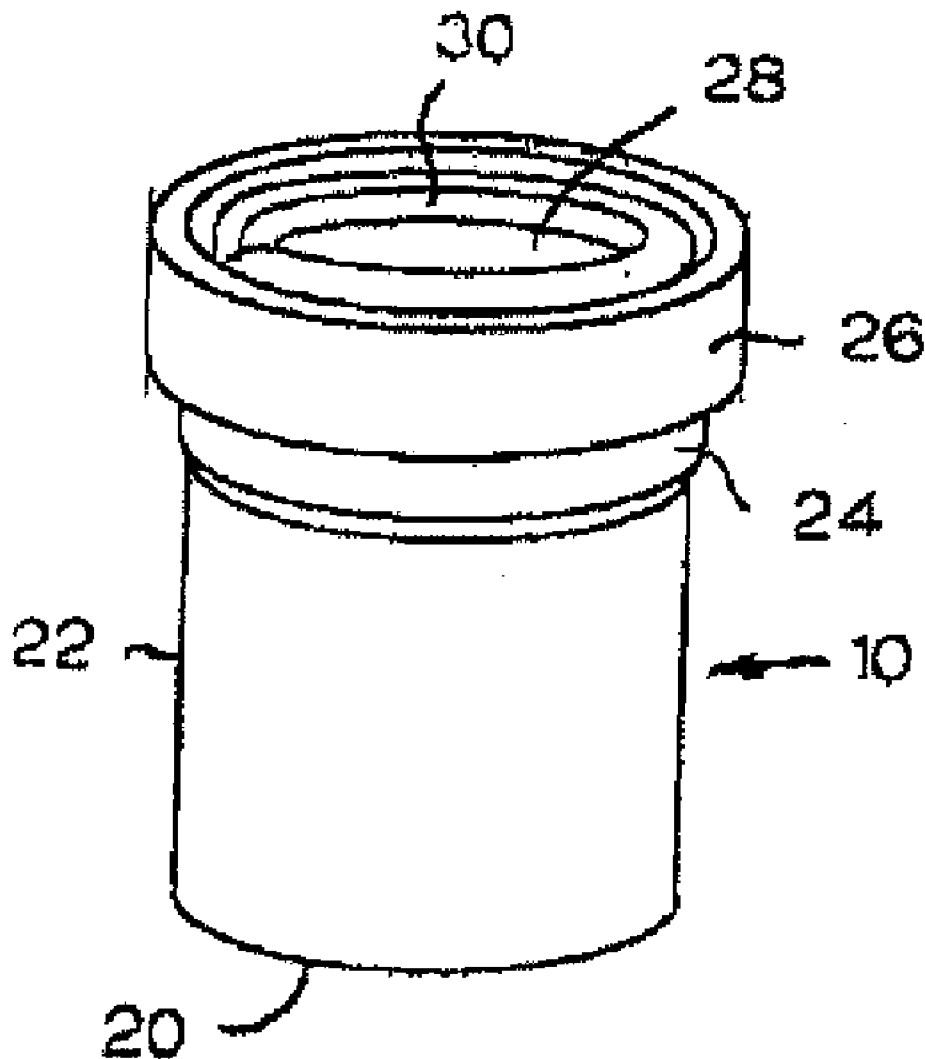
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(19) **United States**(12) **Patent Application Publication****Rault et al.**(10) **Pub. No.: US 2007/0257046 A1**(43) **Pub. Date: Nov. 8, 2007**(54) **PACKAGING INSERT****Publication Classification**(76) Inventors: **Stephane Rault**, Paris (FR); **Jo Ruckdeschel**, Voorhees, NJ (US)(51) **Int. Cl.**  
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(57) **ABSTRACT**

The present invention relates to a packaging insert that comprises a chamber that can be filled with an adsorbent. When the insert is positioned within a closed bottle, the adsorbent can entrap any moisture or gases generally targeted by the adsorbent selected. The insert is designed such that the container can be induction sealed with the insert positioned within the neck of the container.



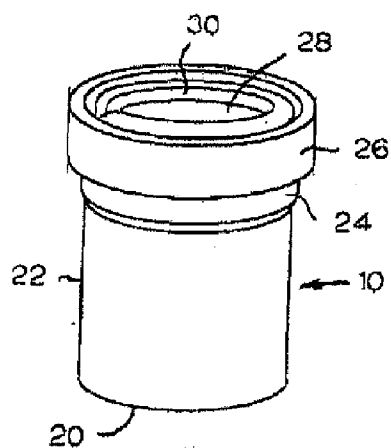


FIG. 1

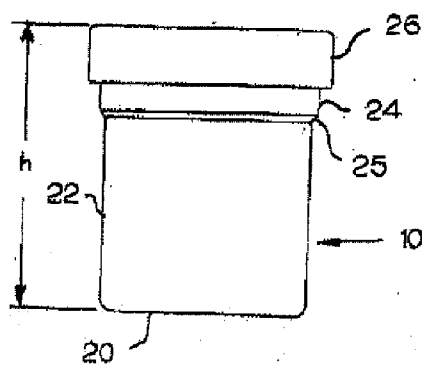
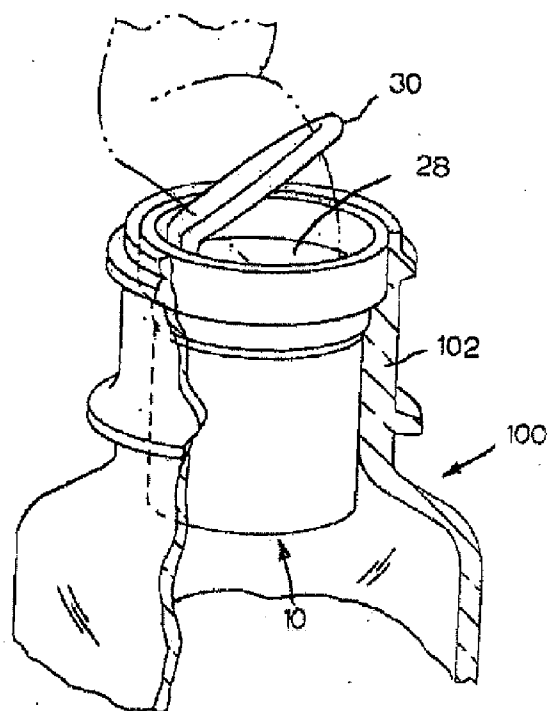


FIG. 3

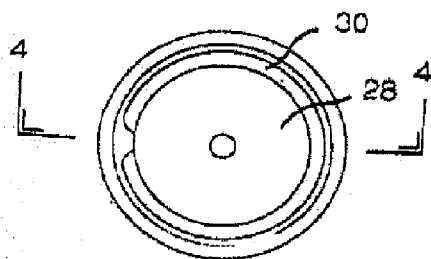


FIG. 5

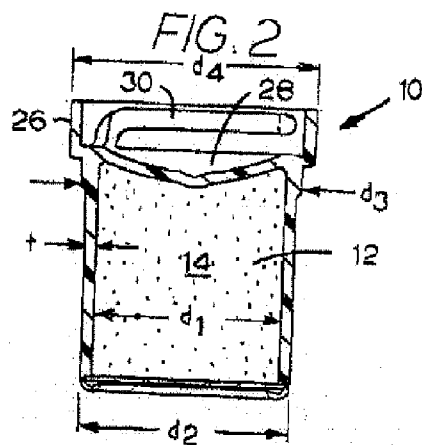


FIG. 4

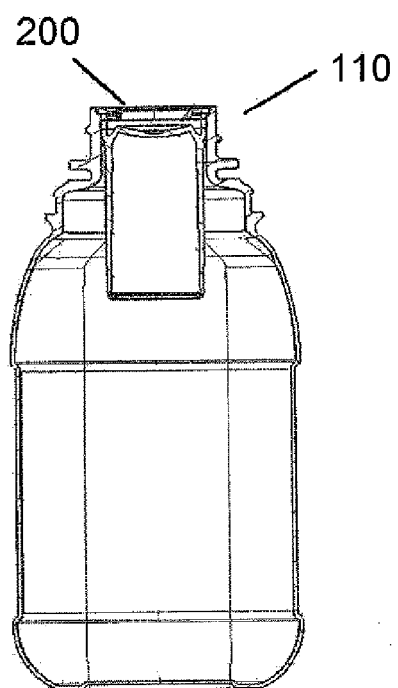


FIGURE 6

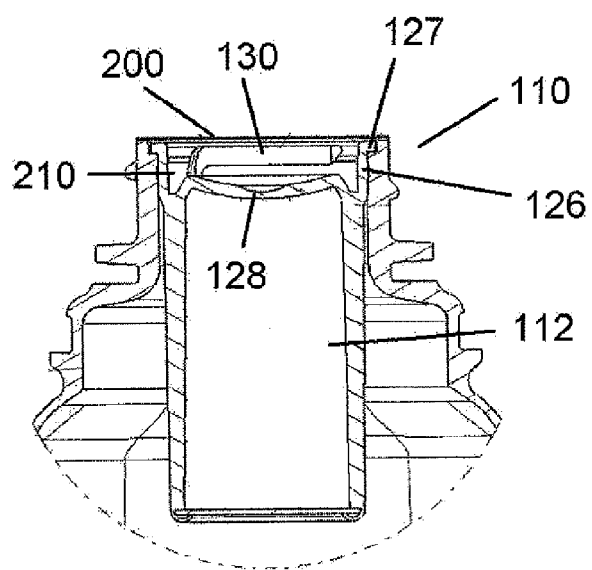


FIGURE 7

## PACKAGING INSERT

### BACKGROUND

[0001] The present invention relates to a packaging insert designed to entrap gases or other volatiles sealed into a bottle or similar container. In an alternative embodiment, the insert is designed to further restrict access of additional gases into the container, while still allowing the widely used and accepted induction seal.

[0002] Many pharmaceutical and nutraceutical products are known to be moisture and/or oxygen sensitive. Thus, these products must be packaged so as to minimize the amount of moisture and/or oxygen packed with the product. This may be accomplished by packaging the products in an environmentally-controlled facility, but even under these conditions it is virtually impossible to eliminate all moisture or certain gases from the packaging facility.

[0003] The prior art teaches desiccant-containing canisters or packets or similar containers inserted into the pharmaceutical bottle or package. Although this was an effective means for controlling the pharmaceutical environment, it could be cumbersome when inserted into a pharmaceutical supplied in the form of a powder that needed to be reconstituted with water before use. In this case, the desiccant-containing canisters had to be removed before the powder could be reconstituted, requiring additional preparation time on the part of the pharmacist, risking contamination of the pharmaceutical powder as the pharmacist attempted to remove the packet from the bottle, and creating the risk that the desiccant packet could be punctured or otherwise damaged allowing the desiccant to mix with the powdered pharmaceutical.

[0004] The prior art also teaches that a pharmaceutical package may be prepared from a polymeric material that incorporates desiccant or oxygen adsorbents. These desiccant-containing polymers may be used to form the pharmaceutical bottle or as a bottle or cap liner. However, these systems may require significant amounts of desiccant-containing polymer and can thus be costly to prepare.

### SUMMARY OF THE INVENTION

[0005] The present invention relates to a packaging insert that comprises a chamber that can be filled with an adsorbent. The insert fits inside a container in such a way that it can be easily opened or removed by hand or by any other small device. Typically this insert sits inside the container neck. In contrast to prior art insert, the present invention allows for induction sealing of the container with the insert positioned in the neck. For pharmaceutical and nutraceutical products, induction seals are a preferred means of package sealing because of the high quality of the seal and because a broken or damaged seal provides evidence of prior opening or tampering.

[0006] When the insert is positioned within a closed bottle, the adsorbent can entrap any moisture or other volatiles targeted by the adsorbent selected. In an exemplary embodiment, the insert is filled with desiccant and is intended to entrap moisture that enters a pharmaceutical product bottle during the packaging and shipping process. In an alternative embodiment, the insert may be filled with an adsorbent selected to entrap other volatiles coming from the product, such as organic compounds that can create unpleasant odors within the bottle.

[0007] The insert is designed to fit snugly within the neck of a bottle or similar container. However, the insert functions to adsorb moisture if it has a relatively loose fit in the container neck as well. When the insert is designed to fit snugly within the neck, the insert adsorbs moisture and/or other volatiles within the bottle and also creates a physical barrier to restrict access of additional gases from entering the container. The tight fit of the insert can also help prevent product spill.

### FIGURES

[0008] FIG. 1 is a perspective view of an insert prepared according to the present invention;

[0009] FIG. 2 is a side view of the insert of FIG. 1 inserted in the neck of a bottle with the pull-tab being lifted by the user;

[0010] FIG. 3 is a side view of the insert of FIG. 1;

[0011] FIG. 4 is a cut-away side view of the insert of FIG. 1;

[0012] FIG. 5 is a top view of the insert of FIG. 1;

[0013] FIG. 6 is a cut-away side view of a second embodiment of an insert prepared according to the present invention; and

[0014] FIG. 7 is an enlarged view of the insert shown in FIG. 6.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] The packaging insert of the present invention is intended for use in containers having an essentially rigid opening, such as a bottle, vial, tube, jar. For the purpose of discussion herein, "bottle" will be used generically to cover any of these containers.

[0016] As shown in FIGS. 1-7, the insert (10) is a self-contained unit. In an exemplary embodiment, the insert is a one-piece unit.

[0017] Referring to FIG. 4, the insert (10) has a chamber or cavity (12) that can be filled with an absorbent or adsorbent (14). For the purposes of discussion herein, the term adsorbent will be used, but it is intended that the term absorbent is covered there under Adsorbents (14) that may be used to fill the chamber (12) include, without limitation, moisture adsorbents, oxygen adsorbents, activated charcoal, molecular sieve, silica gel, clay or combinations thereof. The adsorbent may irreversibly entrap water vapor or gases, or may be selected so as to maintain a specific gas or vapor concentration range within the bottle. The amount of adsorbent (14) may be varied as desired by the packager.

[0018] As shown in FIG. 2, the insert (10) is intended for use within a bottle (100), and preferably is proportioned to fit within a neck section (102) of the bottle (100). In a preferred embodiment, the insert is designed to fit under or within an induction seal—a sealing process commonly used in the packaging industry. A separate cap (not shown) may be fitted over the insert by the packager. The insert (10) is inserted into the bottle neck (102) during the bottle-filling process. More specifically: (a) the clean, dry empty bottle (100) is fed to a filling line (possibly in a controlled environment, particularly for nutraceutical/pharma products), (b) a product (not shown) is deposited in the bottle, (c) the insert (10) is inserted into the bottle neck to a predetermined depth, (d) a cap or lid (not shown) is affixed to the bottle (100), and (e) the filled and sealed bottle (100) exits

the packing line. The bottle (100) can then be labelled, packed in outer boxes, or otherwise prepared for marketing as desired by the manufacturer or packer.

**[0019]** From the consumer's perspective: When the consumer receives the bottle (100) with the insert (100), he or she would be expected to remove the cap or lid from the bottle (100) but will not be able to see the product. Rather, after having removed the cap or lid, the consumer will see a top (28) and a pull-tab (30) of the insert (10) filling the entire bottle neck opening. The pull-tab (30) may be a flexible or rigid design—both of which are known in the art. The consumer can then remove the insert (10) by grabbing the pull tab (30) and pulling the insert (10) out of the bottle neck (102). Once removed, the insert (10) can be discarded and the consumer can work with the product as necessary, e.g. reconstituting a powder. The consumer can then close the bottle (100) with the cap or lid provided by the manufacturer or packer.

**[0020]** The insert (10) is made of any material that will allow for moisture or gas permeation. Such materials may include, for example, polymeric or thermoplastic materials that optionally may further comprise adsorbents. Any moisture or other targeted gas that remains in the bottle during the bottle-filling process is drawn to the insert where it becomes essentially trapped in the adsorbent. Further, any moisture or other targeted gas attempting to enter the bottle after it is filled and the insert is positioned in the bottle neck is drawn into the adsorbent before it reaches the internal cavity of the bottle.

**[0021]** Referring again to FIGS. 1-5, the insert (10) defines a bottom (20), a sidewall (22), a neck (24), a collar (26), a top (28) and a pull-tab (30). Specifically, the bottom (20) is an essentially circular piece proportioned to fit within the bottle neck (102).

**[0022]** The sidewall (22) forms a cylinder defining an interior diameter ( $d_1$ ) and an exterior diameter ( $d_2$ ) that is securely affixed to and rises from the bottom (20) by a predetermined distance (h), preferably selected to extend into the bottle (100). The sidewall (22) defines a thickness (t) that should be adequate to maintain the integrity of the sidewall (22) but should also be sufficiently thin to allow a cavity (12) to remain within the insert (10). The sidewall (22) terminates at the insert neck (24).

**[0023]** The neck (24) is securely affixed to the sidewall (22) and forms a cylinder defining an exterior diameter ( $d_3$ ) that is greater than the sidewall exterior diameter ( $d_2$ ). The neck (24) also defines an interior diameter that may be greater than or equal to the sidewall interior diameter ( $d_1$ ), depending on how the neck (24) is formed and secured to the sidewall (22). The neck (24) may be molded to the sidewall (22) as shown in FIGS. 1-5, or may be otherwise fixedly attached to the sidewall (22) by methods known in the art. Optionally, there may be a bead or other connection section (25) between the neck (24) and the sidewall (22), although this section is not necessary for the insert (10) to function as intended. In the figures shown, the insert neck (24) is sized to fit snugly within the bottle neck (102) such that a slight force must be applied to disengage the insert (10) from the bottle neck (102). Alternatively, the insert may be sized to fit loosely within the neck (24).

**[0024]** Extending upward from the neck (24) away from the sidewall (22) is the collar (26). The collar (26) is securely affixed to the neck (24) and forms a cylinder defining an exterior diameter ( $d_4$ ) that is greater than the neck exterior

diameter ( $d_3$ ). The collar (26) also defines an interior diameter ( $d_5$ ) that is preferably greater than the sidewall interior diameter ( $d_1$ ). The collar (26) may be molded to the neck (24) as shown in FIGS. 1-5, or may be otherwise fixedly attached to the neck (24) by methods known in the art. Optionally, similar to the neck (24), there may be a bead or other connection section (not shown) between the collar (26) and the neck (24), although this section is not necessary for the insert (10) to function as intended.

**[0025]** Fixedly attached to the interior of the neck (24) is the top (28). The top (28) may have any shape or configuration that will allow it to form a sealed cavity (12) within the region defined by the bottom (20), the sidewall (22) and the neck (26). For example, the top (28) may be slightly concave as shown in the FIGS. 1-5, or it may be essentially flat, or it may be slightly convex, or it may have dimples or other patterns. However, the top (28) must be capable of providing an adequate seal for the insert (10) that any adsorbent (14) is contained within the cavity (12).

**[0026]** The pull-tab (30) is a means to allow the consumer to remove the insert (10) from the bottle (100). The pull-tab (30) may be a ring secured to the top (28) and proportioned to fit within the collar (26), as shown in FIGS. 1-5, or it may have any of several designs known in the art. Functionally, the design of the pull-tab should be such that the consumer can use the pull-tab (30) to exert sufficient force against the insert (10) to extract the insert (10) from the bottle neck (102).

**[0027]** As noted above, once removed, the insert (10) can be discarded and the consumer can then close the bottle (100) with the cap or lid provided by the manufacturer or packer. Alternatively, the insert (10) may be sized such that the consumer can replace the insert (10) in the bottle neck (102)—similar to inserting a cork in a bottle—to provide a seal or closure for the bottle contents without the need for an additional cap.

**[0028]** A second embodiment of an insert (110) prepared according to the present invention is shown in FIGS. 6 and 7, wherein the insert (110) further comprises a flexible seal (200). The seal (200) may be made of aluminum foil or plastic foil or similar materials known in the art, and is intended to provide an additional barrier against moisture and to provide tamper resistance. The seal (200) is fitted on an upper rim (127) of a neck (126). To ensure the best adhesion of the seal (200) to the rim (127), the neck (126) should be long enough to allow a pull tab (130) to rest within a cavity (210) formed between the seal (200) and a top (128). Preferably, the pull tab (130) should not press against the seal (200) so that the seal (200) will not be accidentally broken when pressure is applied to the seal (200) either by the pull tab (130) or by an external force. Although not intended as a limitation of the invention, an exemplary length of the neck (126) ranges from a few tenths of millimeters, such as about 0.5 mm, up to a few millimeters. Similar to the first embodiment (10), adsorbent (14) may be used to fill a chamber (112) of the insert (110) (not shown).

**[0029]** The packaging insert of the present invention is intended for use in containers that could benefit from a controlled environment. The insert differs from the inserts of the prior art by providing a means to entrap any moisture or gases that enters the container, while still allowing for induction sealing of the container. Further, the insert of the present development has been found to be particularly effective when used in applications that involve induction

sealing, a feature not generally allowed by adsorbent packaging of the prior art. It is understood that the composition and design of the insert and the specific processing conditions may be varied without exceeding the scope of this development. Similarly, it is understood that the descriptions provided herein are for example only and that the size and/or geometry of the insert may be varied as desired by the user to conform to the bottle or container with which the insert is to be used.

What is claimed is:

1. A packaging insert for use in containers having an essentially rigid opening, said insert comprising:

- (a) an essentially circular bottom proportioned to fit within said rigid opening;
- (b) a sidewall, defining an interior diameter and an exterior diameter, securely affixed to and extending upward from said bottom by a predetermined distance so as to form a cavity with respect to said bottom;
- (c) a neck, securely affixed to said sidewall, and defining an exterior diameter greater than said sidewall exterior diameter and an interior diameter at least equal to said sidewall interior diameter;
- (d) a collar, extending upward from said neck and away from said sidewall, and defining an exterior diameter that is greater than the neck exterior diameter and an interior diameter that is at least equal to said sidewall interior diameter;
- (e) a top, fixedly attached to the interior of said neck, and being proportioned so as to completely cover said cavity; and
- (f) a pull-tab secured to said top.

2. The insert of claim 1 wherein said cavity is filled with adsorbent.

3. The insert of claim 1 further comprising a connecting section between said neck and said sidewall.

4. The insert of claim 1 further comprising a connecting section between said neck and said collar.

5. The insert of claim 1 wherein said pull-tab is a ring.

6. The insert of claim 1 wherein said insert is made from a permeable material.

7. The insert of claim 6 wherein said insert is made from a polymeric material, a thermoplastic material, and a combination thereof.

8. The insert of claim 1 wherein said insert is a single unit.

9. The insert of claim 1 wherein said insert is molded.

10. The insert of claim 1 wherein said adsorbent is a moisture adsorbent, an oxygen adsorbent, activated charcoal, molecular sieve, silica gel, clay and combinations thereof.

11. The insert of claim 1 wherein said top forms a seal to contain said adsorbent within said cavity.

12. The insert of claim 1 wherein said neck further defines a rim, and wherein a seal is reversibly attached to said rim.

13. The insert of claim 12 wherein said seal comprises a flexible material.

14. A packaging insert for use in containers having an essentially rigid opening, said insert comprising:

- (a) a cavity defined by a top and a bottom and sidewall, defining an interior diameter and an exterior diameter, securely affixed to and extending upward from said bottom;
- (b) a neck, securely affixed to said sidewall, and defining an exterior diameter greater than said sidewall exterior diameter and an interior diameter at least equal to said sidewall interior diameter; and
- (c) a collar, extending upward from said neck and away from said sidewall, and defining an exterior diameter that is greater than the neck exterior diameter and an interior diameter that is at least equal to said sidewall interior diameter.

15. The insert of claim 14 wherein said cavity is filled with adsorbent.

16. The insert of claim 14 further comprising a pull-tab fixedly attached to said top.

17. The insert of claim 14 wherein said insert is made from a polymeric material, a thermoplastic material, and a combination thereof.

18. The insert of claim 15 wherein said adsorbent is a moisture adsorbent, an oxygen adsorbent, activated charcoal, molecular sieve, silica gel, clay and combinations thereof.

19. The insert of claim 14 wherein said top forms a seal to contain said adsorbent within said cavity.

20. The insert of claim 14 wherein said insert is positioned within a container sealed by an induction seal.

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