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(54) **GLUED SYNTHETIC CORK AND METHOD OF MANUFACTURE**

GELEIMTER SYNTHETISCHER KORKEN UND HERSTELLUNGSVERFAHREN DAFÜR
BOUCHON SYNTHÉTIQUE COLLÉ ET SON PROCÉDÉ DE FABRICATION

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Description

BACKGROUND

[0001] The present disclosure relates to container closures using natural looking synthetic cork, as well as a method of making synthetic cork stoppers.

[0002] Producers of liquid consumable products, such as wine, liquor and other products, that are sold in bottles or other containers that are traditionally closed and sealed with cork stoppers have long been concerned about contamination due to the cork, which can lead to spoilage or alteration of the product within the container. In the case of wine or cooking oil, for example, such spoilage is immediately noticeable by the consumer and renders the product unfit for consumption.

[0003] For that reason, there has been a movement in recent times toward the use of synthetic stoppers in place of cork. If the synthetic materials used are non-reactive with the contents of the container, the synthetic stopper is a viable solution to the problem of contamination due to the cork, and consequently the contents of the container.

[0004] One configuration of such synthetic cork stopper comprises a synthetic cork bonded to a cap. With reference to PRIOR ART FIGURE 1, such synthetic cork may comprise a smooth cylindrical cork 10 having a shank 12 with a flat base portion 14 and a beveled or curved tip portion 16. With reference to PRIOR ART FIGURE 2, the flat base portion 14 is glued (note shaded adhesive area 17) to a cap portion 18 (e.g., plastic or wooden) to provide a synthetic cork with a cap useable by the user to remove and re-stopper the synthetic cork.

[0005] While such synthetic stoppers are useful for closing containers, only the bottom of the cork shank and the bottom of the hole in the cap touch and are held together by glue, creating a tensile glued structure. This configuration is problematic in the industry, as such configuration is known to separate during use. What is needed in the art is an improved glued synthetic cork.

[0006] Document EP0810159 A1 discloses the technical features of the preamble of claim 1.

SUMMARY

[0007] The present invention comprises a composite synthetic cork, wherein the flat bottom of the synthetic cork shank includes radial contouring, such that a larger contact area is provided for glue contact to the synthetic cork. In exemplary embodiments, such radial contouring comprises a spoked design on the bottom of the cork shank.

[0008] In exemplary embodiments, a cap hole is utilized in conjunction with the synthetic cork having radial contouring, the cap hole having side walls that only permit liquid glue to flow up the side of the radial contouring. As noted, such configuration provides a larger contact area where the glue is holding the cork compared to traditional

designs. This increases the holding force of the cork to the cap and combines the traditional tensile gluing force with an additional shear gluing force.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Referring now to the drawings, wherein like elements are numbered alike in the following FIGURES:

- 10 PRIOR ART FIGURE 1 is side elevation view of a traditional synthetic cork;
- PRIOR ART FIGURE 2 is a top elevation view of a synthetic cork glued to a cap portion;
- 15 FIGURE 3 is a side elevation view of an exemplary synthetic cork including a base portion having axial contours;
- FIGURE 4 is a bottom elevation view of the exemplary synthetic cork of FIGURE 3;
- 20 FIGURE 5 is top elevation view of a first exemplary cap having a smooth gluing surface;
- FIGURE 6 is a top elevation view of a second exemplary cap having contoured side walls;
- FIGURE 7A is a side plan view of an exemplary cork in a pre-installed condition relative to an exemplary cap;
- 25 FIGURE 7B is a side plan view of an exemplary cork in a post-installed condition relative to an exemplary cap;
- FIGURE 8A is a side plan view of an exemplary cork according to claim 1, in a pre-installed condition relative to an exemplary cap; and
- 30 FIGURE 8B is a side plan view of an exemplary cork in a post-installed condition relative to an exemplary cap.

DETAILED DESCRIPTION

[0010] As was noted above, the present disclosure relates to an improved synthetic cork, wherein a flat bottom of the synthetic cork shank includes radial contouring, such that a larger contact area is provided for glue contact to the synthetic cork.

[0011] Referring now to FIGURE 3, an exemplary synthetic cork is illustrated generally at 20. The exemplary cork includes a shank portion 22, a base portion 24, and a beveled or curved tip portion 26. With reference to FIGURES 3 and 4, the base portion 24 has a flat bottom 28, and at least one radial contour 30, which contour provides increased contact area relative to traditional smooth base portion designs. In exemplary embodiments, as illustrated by FIGURES 3 and 4, such radial contouring 30 comprises a spoked design on the bottom of the cork shank.

[0012] FIGURES 5 and 6 illustrate exemplary caps 32 configured with a hole 34 sized to receive the base portion 24 of the synthetic cork. The exemplary cap 32 of FIGURE 5 shows a hole 34 having smooth sidewalls 36. The exemplary cap 32 of FIGURE 6 shows a hole 34 having contoured sidewalls 38.

[0013] FIGURES 7A and 7B illustrate an exemplary assembly of an exemplary cork and cap, wherein FIGURE 7A illustrates the cork and cap in a pre-installed configuration and FIGURE 7B illustrates the cork and cap in a post-installed configuration. As with FIGURE 4, the cork is illustrated having radial contouring 30. Also, as with FIGURE 5, the cap 32 is illustrated with a hole configured to accept the cork, the hole having smooth sidewalls 36.

[0014] FIGURES 8A and 8B illustrate another exemplary assembly of an exemplary cork and cap, wherein FIGURE 8A illustrates the cork and cap in a pre-installed configuration and FIGURE 8B illustrates the cork and cap in a post-installed configuration. As with FIGURE 4, the cork is illustrated having radial contouring 30. Also, as with FIGURE 5, the cap 32 is illustrated with a hole configured to accept the cork, the hole having smooth sidewalls 36. In this exemplary embodiment, at least a lower part 40 (near the base portion 24) of the shank portion 22 has an increased diameter relative to the cap hole 34. Thus, during installation, this lower part 40 creates a seal 42 that prevents excess adhesive from exiting the adhesive contact area 44 for the adhesive in the installed configuration (note that with regard to FIGURE 7B, depending on the amount of adhesive used, it may be possible to get some excess adhesive 46 outside the edges of the cap hole 34 without such seal 42 in addition to retaining adhesive within the nominal adhesive contact area 44). Such seal 42 not only serves to assist in adhesive retention in the nominal adhesive contact area 44 but also serves to provide a more aesthetically pleasing product.

[0015] In exemplary embodiments caps are utilized in conjunction with the exemplary synthetic cork 20 having radial contouring 30, the cap hole having side walls that only permit liquid glue to flow up the side of the radial contouring. As noted, such configuration provides a larger contact area where the glue is holding the cork compared to traditional designs. This increases the holding force of the cork to the cap and combines the traditional tensile gluing force with an additional shear gluing force. Tensile stress develops when forces acting perpendicular to the plane of a joint are distributed uniformly over the entire bonded area. Shear stress results when forces acting in the plane of the adhesive try to separate the adherents. The presently described caps advantageously combine both tensile and shear holding forces.

[0016] The synthetic cork component may comprise any acceptable synthetic cork material, and the cork may be formed by any convenient mechanism, including such materials and mechanisms as are-described in co-pending U.S. Patent Application Serial No. 11/640,999, filed December 19, 2006 and prior U.S. Provisional Application Serial No. 60/751,299 (In short, these applications describe methods of creating the random and irregular markings including molding the details directly into the surface of the stopper and extruding the synthetic material into a desired shape before passing it through forming

cylinders or rollers that contain the negative of the desired surface texture, and which imprint the texture onto the material's exterior surface). The radial contouring 30 of the cork base portion 24 may be molded therein or shaped via forming devices.

[0017] It will be apparent to those skilled in the art that, while exemplary embodiments have been shown and described, various modifications and variations can be made to the synthetic cork and method of making disclosed herein without departing from the scope of the invention as defined by the appended claims. For example, recitations of projections and recesses on particular pieces are non-limiting, it being recognized that the arrangement may be reversed for a given piece. Accordingly, it is to be understood that the various embodiments have been described by way of illustration and not limitation.

Claims

1. A cork (20) for installing in a cap hole (34), comprising a shank portion (22), having a tip portion (26) and a base portion (24), the base portion (24) including a radial contour (30), the radial contour (30) providing increased radial surface area relative to a smooth radial base portion and at least the lower part (40) of the shank portion (22) adjacent to base portion (24) has an increased diameter relative to the diameter of the base portion (24), **characterised in that** the cork is synthetic, and **in that** the base portion (24)
2. A synthetic cork (20) in accordance with claim 1, wherein the tip portion (26) includes a beveled or curved tip contour.
3. A synthetic cork (20) in accordance with claim 1, wherein said radial contour (30) is a spoked radial configuration.
4. A synthetic cork (20) in accordance with claim 1, wherein said base portion (24) includes a flat bottom (28).
5. A composite synthetic cork stopper, comprising:
 - a cap portion (32) having a hole (34); and
 - a synthetic cork (20) according to one of claims 1 to 4, comprising a shank portion (22), having a tip portion (26) and a base portion (24) sized to be received within the hole (34) of the cap portion, the base portion (24) including a radial contour (30), the radial contour (30) providing increased radial surface area relative to a smooth radial base portion, and wherein the diameter of the at least the lower part (40) of the shank portion (22) adjacent to base portion (24) is larger than the diameter of the hole (34) of the

cap portion (32) to provide a seal (42) with the cap portion hole (34).

6. A composite synthetic cork stopper in accordance with claim 5, wherein a said portion (40) of the synthetic cork shank (22) adjacent said synthetic cork base portion (24) seals against a portion of walls of the cap portion (32) outside the diameter of the hole (34) of the cap portion (32) to retain adhesive within the hole (34) of the cap portion (32).

7. A composite synthetic cork stopper in accordance with claim 5, wherein the cap portion (32) includes smooth walls (36) within said cap portion hole (34). includes the radial contour (30) in a pre-installed configuration.

8. A method of making a composite synthetic cork stopper, comprising:

providing a cap portion (32) having a hole (34);
providing a synthetic cork (20), comprising a shank portion (22), having a tip portion (26) and a base portion (24), sized to be received within the hole (34) of the cap portion (32), the base portion (24) including a radial contour (30), the radial contour (30) providing increased radial surface area relative to a smooth radial base portion; and
gluing the synthetic cork base portion (24) within the hole (34) of said cap portion (32).

Patentansprüche

1. Korken (20) zum Installieren in einem Kappenloch (34), der einen Schaftabschnitt (22) umfasst, der einen Spitzenabschnitt (26) und einen Basisabschnitt (24) hat, wobei der Basisabschnitt (24) eine radiale Kontur (30) aufweist, wobei die radiale Kontur (30) erhöhte radiale Oberfläche im Vergleich zu einem glatten radialen Basisabschnitt bereitstellt, und mindestens der untere Teil (40) des Schaftabschnitts (22) benachbart zu dem Basisabschnitt (24) einen erhöhten Durchmesser im Vergleich zu dem Durchmesser des Basisabschnitts (24) hat, **dadurch gekennzeichnet, dass** der Korken synthetisch ist und dass der Basisabschnitt (24) die radiale Kontur (30) in einer vorinstallierten Auslegung aufweist.
2. Synthetischer Korken (20) nach Anspruch 1, wobei der Spitzenabschnitt (26) eine abgeschrägte oder gebogene Spitzenkontur aufweist.
3. Synthetischer Korken (20) nach Anspruch 1, wobei die radiale Kontur (30) eine radiale Auslegung mit Speichen ist.

4. Synthetischer Korken (20) nach Anspruch 1, wobei der Basisabschnitt (24) einen flachen Boden (28) aufweist.

5. Synthetischer Verbundwerkstoffkorkstöpsel, umfassend:

einen Kappenabschnitt (32), der ein Loch (34) hat, und
einen synthetischen Korken (20) nach einem der Ansprüche 1 bis 4, der einen Schaftabschnitt (22) umfasst, der einen Spitzenabschnitt (26) und einen Basisabschnitt (24) hat, die bemessen sind, um innerhalb des Lochs (34) des Kappenabschnitts aufgenommen zu werden, wobei der Basisabschnitt (24) eine radiale Kontur (30) aufweist, wobei die radiale Kontur (30) erhöhte radiale Oberfläche im Vergleich zu einem glatten radialen Basisabschnitt bereitstellt und wobei der Durchmesser des mindestens einen unteren Teils (40) des Schaftabschnitts (22) neben dem Basisabschnitt (24) größer ist als der Durchmesser des Lochs (34) des Kappenabschnitts (32), um eine Abdichtung (42) mit dem Kappenabschnittloch (34) bereitzustellen.

6. Synthetischer Verbundwerkstoffkorkstöpsel nach Anspruch 5, wobei ein Abschnitt (40) des synthetischen Korkschafts (22) neben dem synthetischen Korkbasisabschnitt (24) gegen einen Abschnitt von Wänden des Kappenabschnitts (32) außerhalb des Durchmessers des Lochs (34) des Kappenabschnitts (32) abdichtet, um klebend innerhalb des Lochs (34) des Kappenabschnitts (32) zu halten.

7. Synthetischer Verbundwerkstoffkorkstöpsel nach Anspruch 5, wobei der Kappenabschnitt (32) glatte Wände (36) innerhalb des Kappenabschnittlochs (34) aufweist.

8. Verfahren zum Herstellen eines synthetischen Verbundwerkstoffkorkstöpsels, umfassend:

Bereitstellen eines Kappenabschnitts (32), der ein Loch (34) hat;
Bereitstellen eines synthetischen Korkens (20), der einen Schaftabschnitt (22) umfasst, der einen Spitzenabschnitt (26) und einen Basisabschnitt (24) hat, die bemessen sind, um innerhalb des Lochs (34) des Kappenabschnitts (32) aufgenommen zu werden, wobei der Basisabschnitt (24) eine radiale Kontur (30) aufweist, wobei die radiale Kontur (30) erhöhte radiale Oberfläche im Vergleich zu einem glatten radialen Basisabschnitt bereitstellt; und
Kleben des synthetischen Korkbasisabschnitts (24) in die Bohrung (34) des Kappenabschnitts (32).

Revendications

1. Bouchon synthétique (20) pour une installation dans un trou de capuchon (34), comprenant une partie de tige (22), ayant une partie d'extrémité (26) et une partie de base (24), la partie de base (24) comportant un contour radial (30), le contour radial (30) étant à l'origine d'une superficie radiale accrue par rapport à une partie de base radiale lisse et au moins la partie inférieure (40) de la partie de tige (22) adjacente à la partie de base (24) a un diamètre accru par rapport au diamètre de la partie de base (24), **caractérisé en ce que** le bouchon est synthétique, et **en ce que** la partie de base (24) comporte le contour radial (30) dans une configuration préinstallée. 5 10 15
2. Bouchon synthétique (20) selon la revendication 1, dans lequel la partie d'extrémité (26) comporte un contour d'extrémité biseauté ou courbé. 20
3. Bouchon synthétique (20) selon la revendication 1, dans lequel ledit contour radial (30) est une configuration radiale à rayons. 25
4. Bouchon synthétique (20) selon la revendication 1, dans lequel ladite partie de base (24) comporte un fond plat (28). 30
5. Bouchon de liège synthétique composite, comprenant : 30
 - une partie de capuchon (32) ayant un trou (34) ;
 - et
 - un bouchon synthétique (20) selon l'une des revendications 1 à 4, comprenant une partie de tige (22), ayant une partie d'extrémité (26) et une partie de base (24) dimensionnée de manière à être reçue à l'intérieur du trou (34) de la partie de capuchon, la partie de base (24) comportant un contour radial (30), le contour radial (30) étant à l'origine d'une superficie radiale accrue par rapport à une partie de base radiale lisse, et où le diamètre de l'au moins la partie inférieure (40) de la partie de tige (22) adjacente à la partie de base (24) est plus grand que le diamètre du trou (34) de la partie de capuchon (32) pour fournir un joint d'étanchéité (42) avec le trou de la partie de capuchon (34). 35 40 45
6. Bouchon de liège synthétique composite selon la revendication 5, dans lequel ladite partie (40) de la tige de bouchon synthétique (22) adjacente à ladite partie de base de bouchon synthétique (24) assure l'étanchéité contre une partie de parois de la partie de capuchon (32) à l'extérieur du diamètre du trou (34) de la partie de capuchon (32) pour conserver un adhésif à l'intérieur du trou (34) de la partie de capuchon (32). 50 55
7. Bouchon de liège synthétique composite selon la revendication 5, dans lequel la partie de capuchon (32) comporte des parois lisses (36) à l'intérieur dudit trou (34) de la partie de capuchon. 5
8. Procédé de fabrication d'un bouchon de liège synthétique composite, comprenant le fait :
 - de fournir une partie de capuchon (32) ayant un trou (34) ;
 - de fournir un bouchon synthétique (20), comprenant une partie de tige (22), ayant une partie d'extrémité (26) et une partie de base (24) dimensionnée de manière à pouvoir être reçue à l'intérieur du trou (34) de la partie de capuchon (32), la partie de base (24) comportant un contour radial (30), le contour radial (30) étant à l'origine d'une superficie radiale accrue par rapport à une partie de base radiale lisse ; et
 - de coller la partie de base de bouchon synthétique (24) dans le trou (34) de ladite partie de capuchon (32). 5

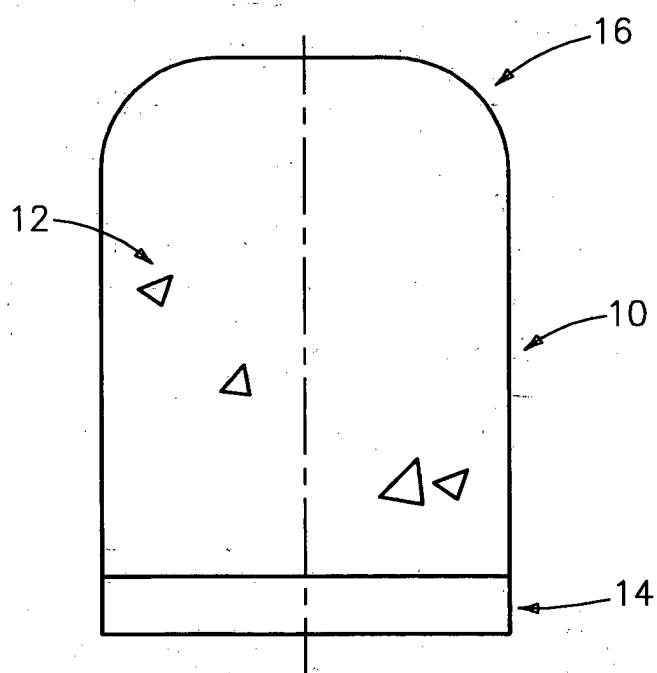


FIG. 1
(PRIOR ART)

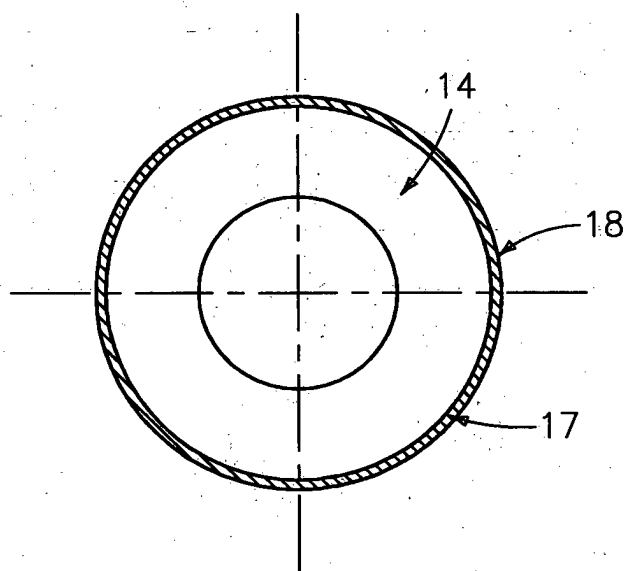


FIG. 2
(PRIOR ART)

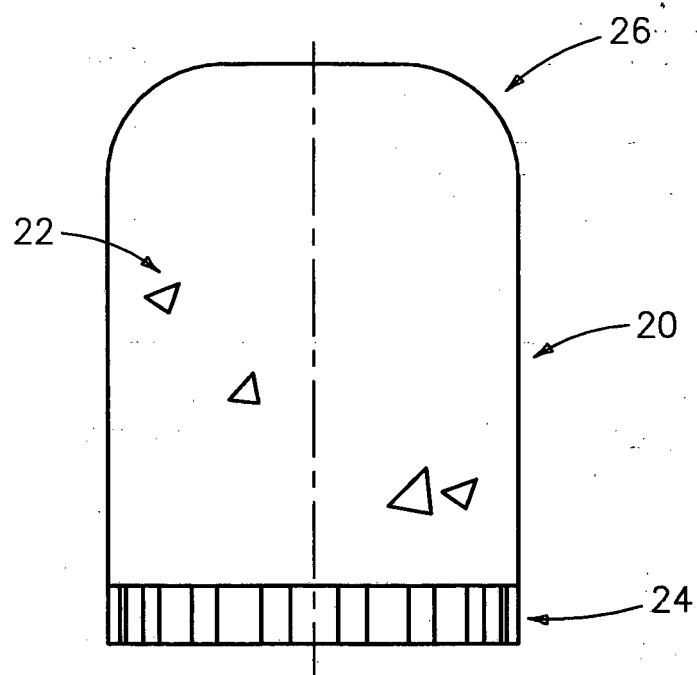


FIG. 3

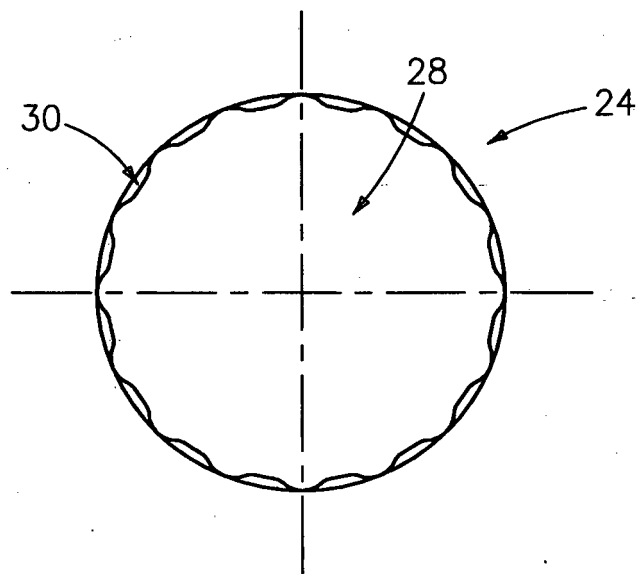


FIG. 4

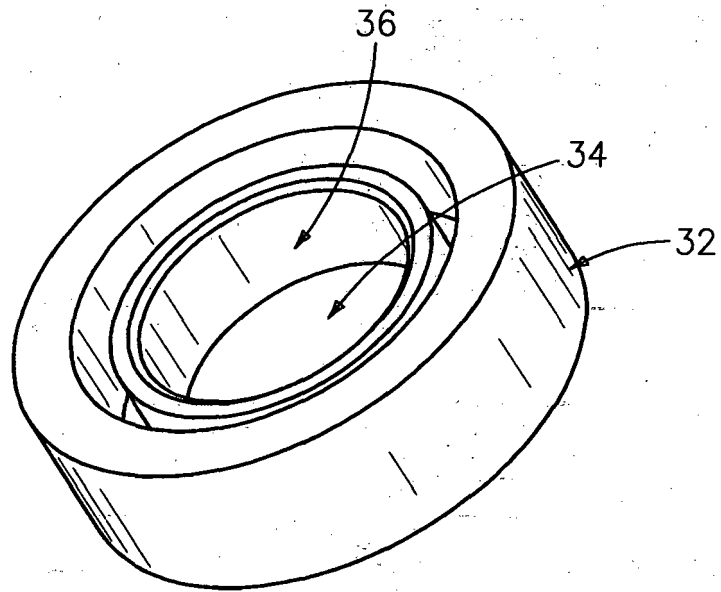


FIG. 5

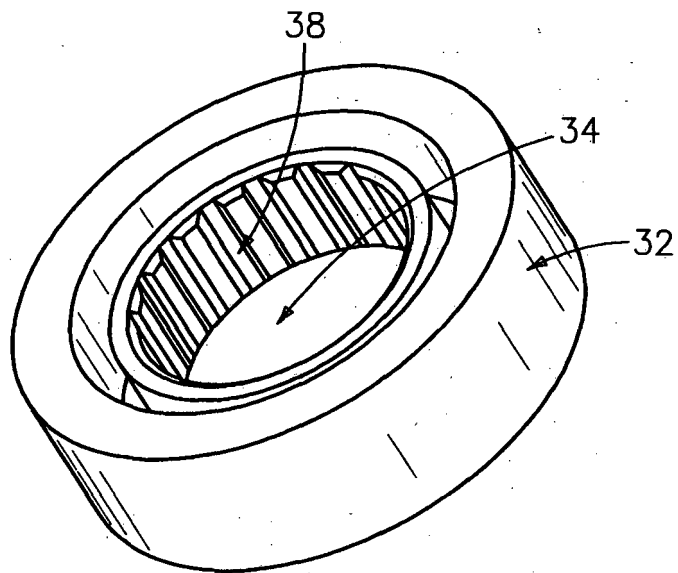


FIG. 6

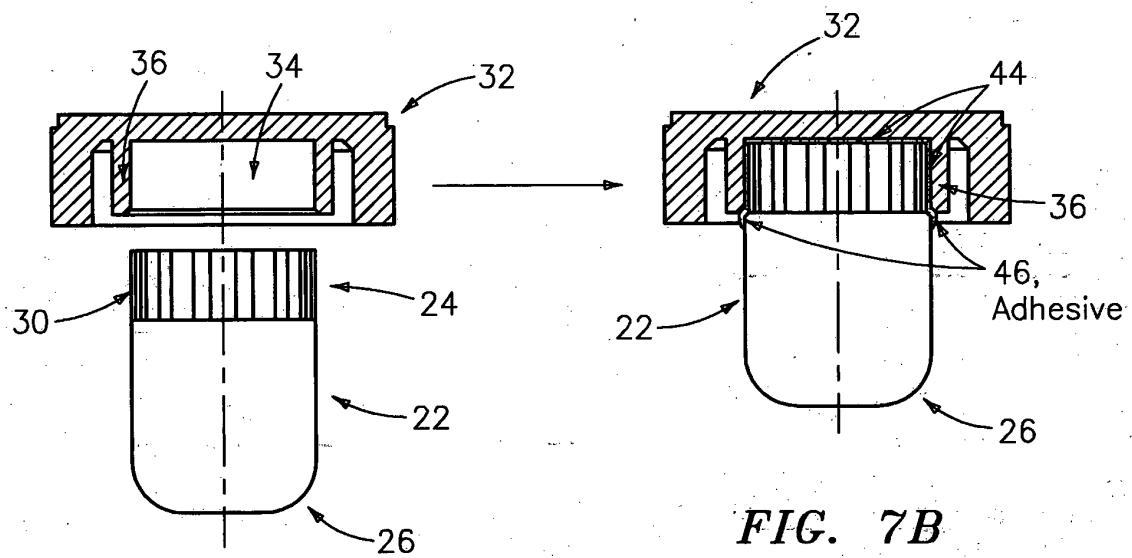


FIG. 7A

FIG. 7B

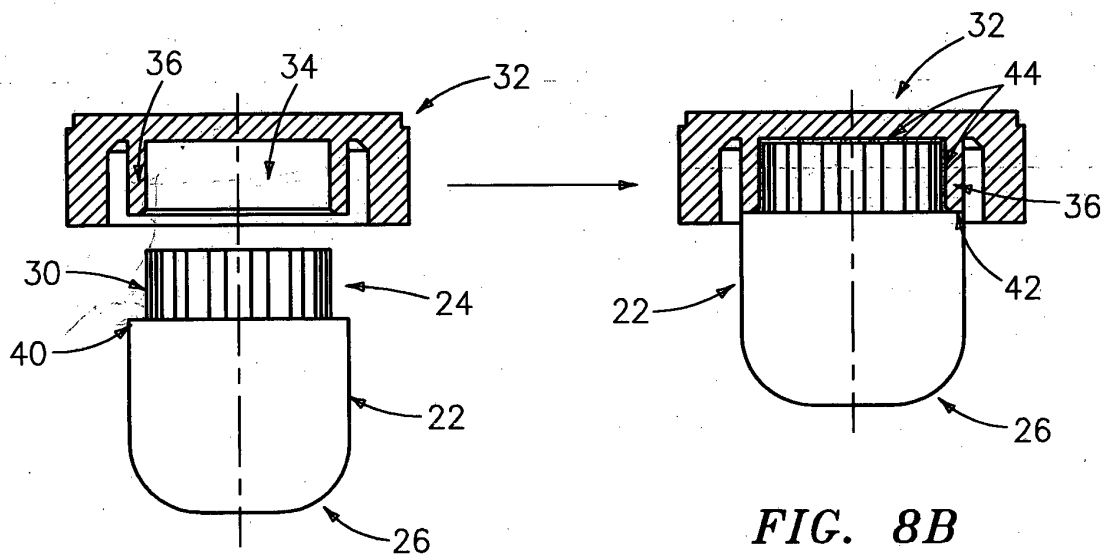


FIG. 8A

FIG. 8B

REFERENCES CITED IN THE DESCRIPTION

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