

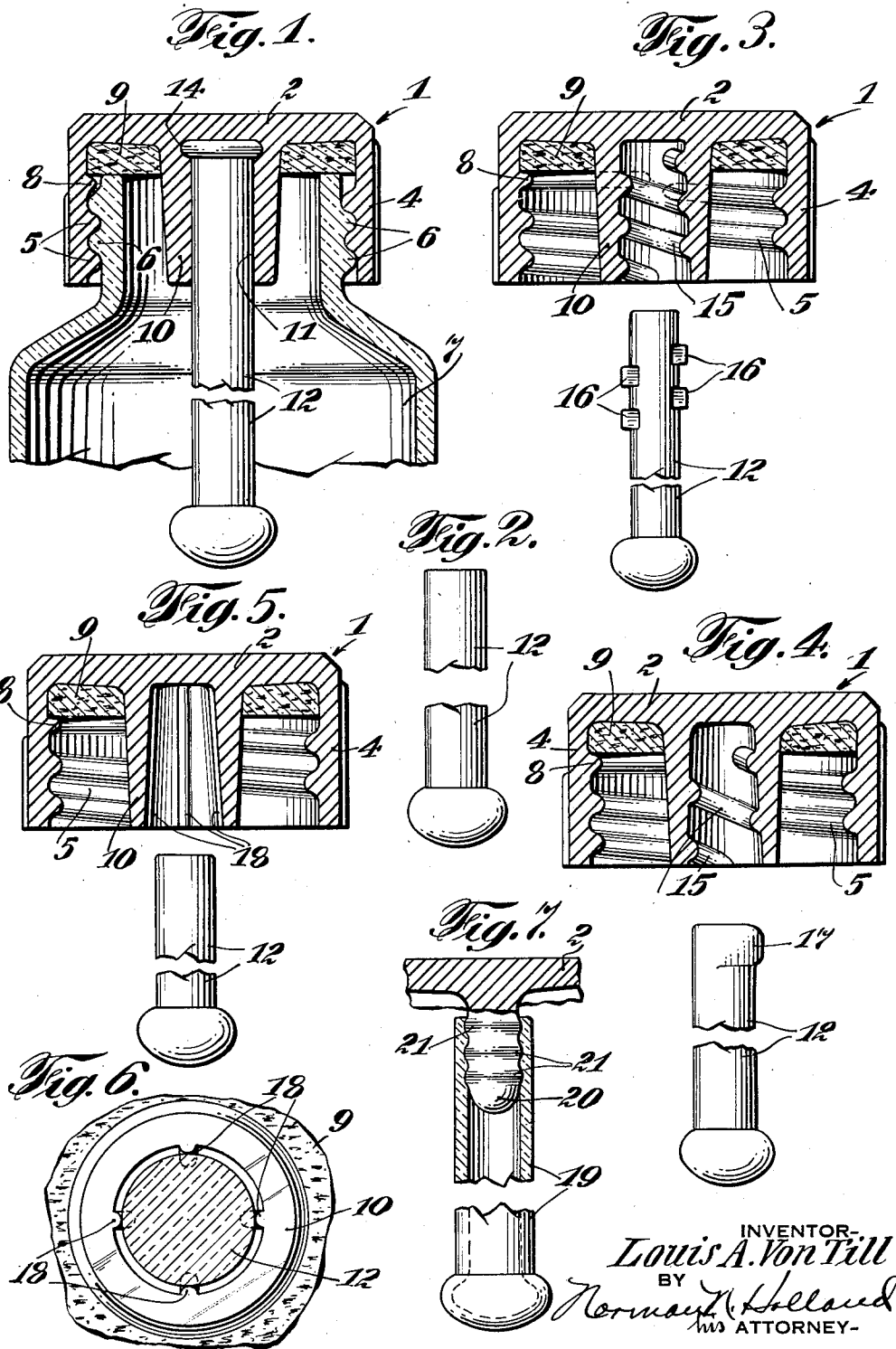
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APPLICATOR CAP AND METHOD OF MAKING THE SAME

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APPLICATOR CAP AND METHOD OF
MAKING THE SAME

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The present invention relates to the sealing art, and more particularly to closures having applicator rods secured thereto.

Various types of products, such as iodine and mercurochrome, are applied in small quantities requiring an applicator rod, which is usually sold with the package. Generally, these rods are attached to a rubber stopper so that the consumer can use the stopper as a handle for applying the product. These stoppers are objectionable because they are difficult to apply and remove; they deteriorate rapidly and frequently become mutilated during use, destroying the stopper and rendering the applicator useless. In addition, the applicator rods frequently work loose from the stopper and are lost. Attempts have been made to utilize metal closure caps, but the products with which applicator rods are used are generally of such character that they attack the metal, causing it to corrode, which results in an unsalable package. Molded closure caps are more suitable than either metal caps or rubber stoppers, for these products, but difficulty has been encountered in attaching applicator rods to the caps. Various types of adhesives and cements have been tried but none have been found which may be used on the various products sealed with applicator caps. Certain cements resist certain products but will not resist others. As a result, it is necessary to use a particular cement for certain products and, with some products, no cements are satisfactory.

The present invention aims to overcome the above objections by providing a mounting for an applicator rod on a molded closure cap, which will be equally resistant to all types of products and which may, therefore, be universally used, without danger of the rod becoming loose or being lost.

An object of the invention is to provide an improved closure and applicator rod.

Another object of the invention is to provide an improved means and method of attaching an applicator to a closure cap.

Another object of the invention is to provide means for attaching an applicator rod to the closure cap, which will be equally resistant to all products, and, therefore, universally usable.

Another object of the invention is to reduce the cost of attaching an applicator rod to a closure cap, thereby reducing the cost of the applicator cap.

Another object of the invention is to provide an improved applicator rod and closure cap, which may be used with all products.

Other and further objects of the invention will be obvious upon an understanding of the illustrated embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, wherein

Fig. 1 is a sectional view of an applicator cap applied to a container;

Fig. 2 is a side elevational view of the applicator rod before it is mounted in the closure cap;

Fig. 3 is a sectional view of another form of closure cap and applicator rod about to be assembled;

Fig. 4 is a sectional view, illustrating a third form of closure cap and applicator rod about to be assembled;

Fig. 5 is a sectional view of a closure cap and applicator rod, showing a further modification of the invention;

Fig. 6 is a bottom view of the well shown in Fig. 5, having a rod attached thereto, the rod being shown in section; and

Fig. 7 is a fragmentary sectional view, showing a further modification of the invention.

Referring again to the drawing, and more particularly to Figs. 1 and 2, there is shown a molded closure cap 1 having a cover portion 2 and a depending skirt 4. The inside of the skirt is provided with screw threads 5 adapted to engage corresponding threads 6 on a container 7. The closure cap may be of any suitable material, preferably of a phenolic condensation product or other synthetic resin, commonly known as plastics. Preferably, a liner retaining ledge 8 is provided directly above the thread to support a liner 9 of cardboard, cork, or other suitable material, for engaging the rim of the container to form a suitable seal.

A tubular member 10 is formed on the under side of the cover portion of the cap integral with the cover portion and having a cylindrical well 11 adapted to receive the end of an applicator rod 12. Preferably, an annular recess 14 is provided at the upper end of the well, adjacent the cover portion of the cap, adapted to lock with the end of a rod. In manufacturing the cap, it is ordinarily desirable to have the sides of the well tapered slightly in a downward direction, in order to facilitate the removal of

the mold or pin which forms the interior of the cap. The shape of the rod 12 prior to assembly with the cap is shown more particularly in Fig. 2. When assembling the rod with the cap, the upper end thereof may be heated in a suitable flame, either manually or automatically, until the glass becomes molten or soft, and the end of the rod is then inserted into the well 11. The soft glass is forced into the annular recess 14 and locks the rod rigidly in position, regardless of any irregularities either in the glass rod or the tubular projection 10 of the closure cap.

It has been found that phenolic condensation products and synthetic resins are slightly resilient at the termination of the molding operation forming them. This property may be utilized in forming the liner retaining ledge 8 and the annular recess 14 in the present closure cap. Suitable solid pins may be utilized for making these parts, as well as the threads 5, and the caps stripped from the pin while the material is hot. In this manner, the closure caps, as shown herein, may be manufactured inexpensively. The thread projections in the well of the cap, shown in certain figures of the drawing, may have the same pitch as the skirt of the cap, and, if desired, may be divided so that the threads thereof may be removed from the pins by the customary rotation of the cap.

As shown more particularly in Fig. 3, the inner wall of the tubular member 10 may be provided with thread projections 15, adapted to cooperate with corresponding thread projections 16 on the end of the applicator rod. Preferably, the thread projections or lugs 16 on the applicator rod are formed by flattening the end of the rod while hot, to cause the glass to flow out and form projections offset with respect to each other. Preferably, the end of the rod is assembled with the threaded well while the glass is soft, that is, directly after the formation of the lugs thereon, so that any irregularities in the rod or in the well may be taken care of and so that the rod may be locked firmly in position. It will be understood, however, that the rods may be applied while cool.

In Fig. 4, a closure cap substantially similar to that shown in Fig. 3 is illustrated for receiving a rod having a single projection 17 formed at the end thereof for engagement with the threads 15 on the inner wall of the well. The rod may be assembled with the cap directly after the projection 17 is formed thereon, while the glass is soft or after the glass hardens, as described with respect to the construction shown in Fig. 3.

Referring more particularly to Figs. 5 and 6, there is shown a closure cap having longitudinal ribs 18, herein shown as four in number, on the inner wall of the well. These projections are adapted to frictionally engage the cylindrical end of a glass rod 12 and hold the rod in position. A bottom view showing the end of the rod in the well is illustrated in Fig. 6. The ribs 18, by reason of the concentrated pressure, tend to distort the tubular well from its cylindrical shape and, in this way, take up slight irregularities, both in the glass and in the molded tubular member. A good friction grip may be obtained in this way without heating the end of the rod, that is, by forcing the end of the glass rod into the well. Due to the variations in the size of the glass rods, it is usually desirable to have selected rods with as little variations in size as possible. There is a certain amount of flexibility in the side wall of the well and, by forcing the end of

the rod therein, a tight grip is obtained. The ribs 18 increase this flexibility by permitting the wall to flex and also to expand, giving the members the appearance of being swaged together. The tapered walls of the tubular member facilitate the molding operation and also the forceful insertion of the end of the rod into the tubular well. If desired, the end of the rod may be heated to a softened state before the insertion.

A slightly different construction is shown in Fig. 7, wherein a glass tube 19 is assembled on a pin 20 having projections 21 thereon. The projections 21 are preferably small, so that the tube 19, when in heated condition, may be telescoped over the pin 20 to lock with the projections. These projections may be small in order to facilitate the molding operation. The lower end of the tube may be closed by melting the glass over a flame, either automatically or manually. It will be seen that the present invention provides a closure cap and applicator rod which are securely attached to each other, without the use of cements, adhesives and the like. By forcing the glass rod into the well, either with or without cooperating projections, a very strong union is obtained which is fully capable of resisting the various products which the cap is used to seal. The method of assembling the applicator rod with the cap is simple and inexpensive and may be performed rapidly. By threading the well, the rod, or both, an interlocking connection is made and, if the parts are assembled while the glass is in heated condition, a permanent connection is provided.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. As an article of manufacture, a closure cap having a cover portion, a depending skirt, and a substantially cylindrical well on the inner side of the cover portion, an annular recess in said well adjacent the cover portion, and a rod having one end thereof fused into said well and into said annular recess.

2. As an article of manufacture, a closure cap comprising a cover portion, a depending skirt, a tubular member projecting from the under side of said cover portion, a circumferentially extending projection on the inside of said tubular member, and a glass rod fused into secure engagement with said tubular member and said projection.

3. As an article of manufacture, a closure cap comprising a cover portion, a depending skirt, a tubular projection integral with the under side of said cover portion, and a glass applicator rod having one end thereof fused into cooperative relation with the inside of said tubular projection.

4. As an article of manufacture, a closure cap having a cover portion and a depending skirt, a tubular member projecting from the under side of the cover portion, thread projections on the inside of said tubular member, a glass rod having thread projections at one end thereof threaded into engagement with the projections in said tubular member and fused into permanent relation therewith.

5. As an article of manufacture, a closure cap having a depending tubular member forming a

well, ribs extending downwardly along the side wall of said well and radially inwardly therefrom, and a glass applicator rod having one end thereof inserted into said well and fused therein to engage and be held in position by said ribs.

6. The method of attaching applicator rods to closure caps having wells therein provided with a recess, which method comprises fusing one end of the applicator rod and inserting it into the well to extrude the fused end into the recess.

7. The method of assembling a closure cap having a well with an irregular interior with a glass applicator rod, which method comprises heating the end of the rod until the glass softens and inserting the end of the rod in said well while in softened condition causing the end of the rod to conform in part to the irregularity of said well.

8. The method of assembling a closure cap having a well with a glass rod, which method comprises heating one end of the rod until it softens, fusing one end of the rod into engagement with the well, and permitting the parts to cool.

9. The method of assembling a closure cap having a threaded well with a glass rod, which method comprises heating the end of the rod until it softens and inserting it into engagement with the thread in said well while in softened condition.

10. The method of securing glass applicator rods having a thread portion to closure caps having a well therein, which method comprises

heating the threaded portion of the applicator rod until it softens, and threading the rods into the well while in softened condition.

11. As an article of manufacture, a closure cap having a cover portion, a depending skirt, and a downwardly depending projection on the inner side of the cover portion having an annular recess therein, and a glass applicator member having a portion thereof fused into said annular recess.

12. In the method of applying fusible members to closures having wells therein, the steps consisting in softening a portion of said member, thrusting the softened portion into the well of a closure and applying pressure to the member sufficient to upset the softened portion of the member in the well.

13. In the method of applying fusible members to synthetic resin composition closures having wells therein, the steps consisting in softening the tip of the fusible member by the application of heat thereto, inserting the softened tip into the well and applying pressure to the member to deform the softened portion thereof within the well.

14. In the method of applying glass applicators to synthetic resin composition closures having wells therein, the steps consisting in exposing the tip of the applicator to a heating flame until the tip softens, positioning the applicator in the well of the closure and applying pressure to deform the softened tip of the applicator in the well.

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