

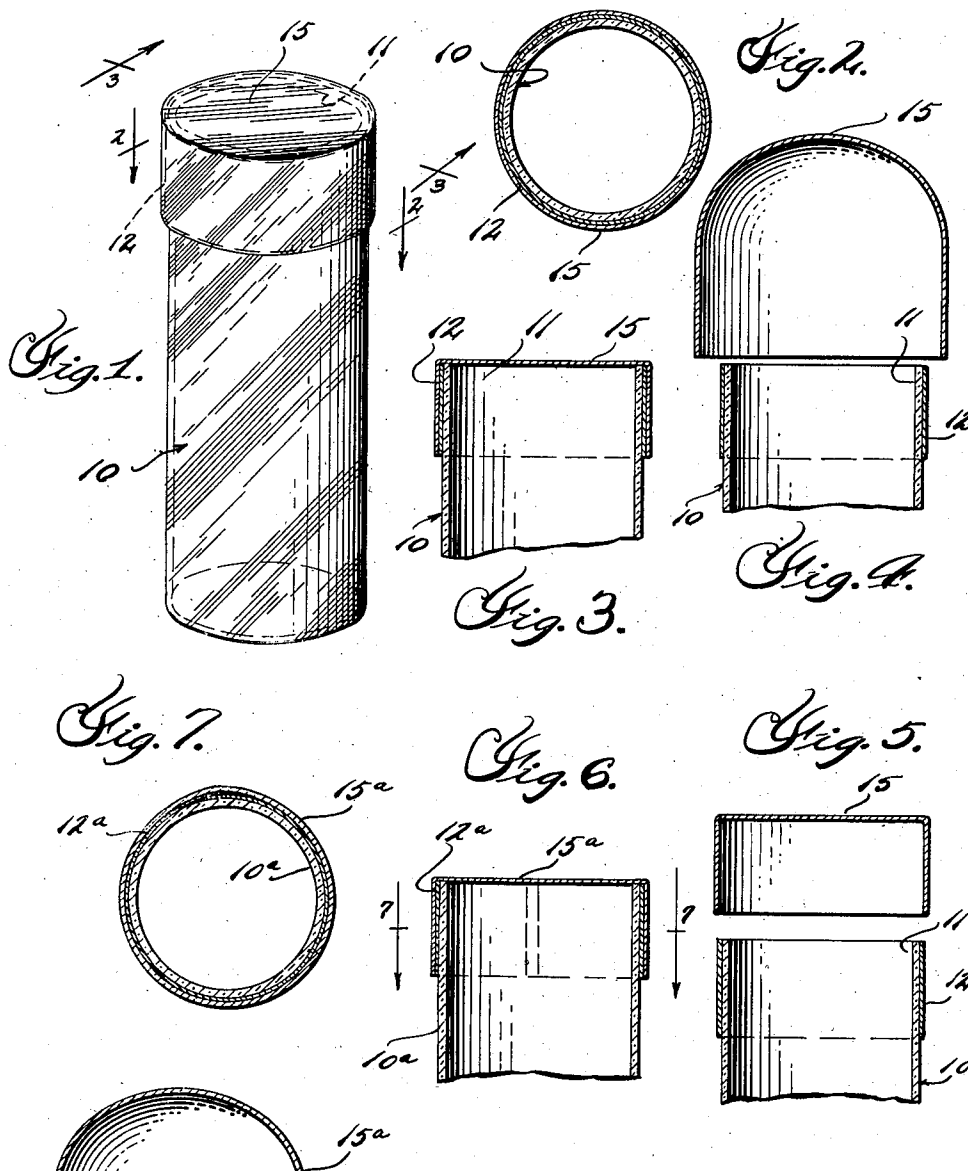
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CLOSURE AND METHOD OF APPLYING THE SAME

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CLOSURE AND METHOD OF APPLYING THE SAME

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This invention relates to closures and has particular reference to closures of the type used as seals for vials, bottles, containers and the like and to methods of applying such closures.

One of the primary objects of this invention is to provide a simple and inexpensive closure which will snugly fit the container to which it is applied so as to form an air-tight seal for the container but which may be removed without being broken so that the closure can be reapplied to the container in the event that all of the contents of the container are not used.

A further object of this invention is to provide improved methods of applying seals to containers in such a manner that the seals may be removed from the containers without being broken.

Numerous other objects and advantages of this invention will become more apparent as the following description proceeds particularly when reference is had to the accompanying drawing wherein

Fig. 1 is a perspective view of a container sealed in accordance with the teachings of this invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a semi-diagrammatic sectional view through a container to which a closure is about to be applied;

Fig. 5 is a vertical sectional view through the container shown in Figure 1 with the closure removed from the same;

Fig. 6 is a vertical sectional view through a container to which a closure has been applied in a manner differing from the manner shown in Figs. 1 to 5 inclusive;

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 6; and

Fig. 8 is a view similar to Fig. 4 showing one step in the method by which the closure of Figs. 6 and 7 is applied.

In the sealing of vials, bottles and various types of containers it has been the general practice to shrink onto the open ends of the containers closures formed of gelatine, viscose, or the like. These closures are applied to the containers in a semi-plastic condition, that is while they are moist, and by drying in place on the containers, shrink and cling tightly to the surfaces of the containers.

Such closures or seals while functioning efficiently as seals, have had the disadvantage that since they become brittle and cling to the

surfaces of the containers when they dry, they generally are broken during their removal from the containers. After the caps or closures are broken, they are, of course, thereafter useless as closures, and it has therefore been necessary to provide additional closures for the containers such as corks or the like so that portions of the contents of the containers could be used at a time, the containers thereafter being closed by the auxiliary closures.

The present invention contemplates the provision first of a closure or seal of the general type referred to above which seal may however, be removed without being broken so that it may thereafter be placed back on the container to close the same. The present invention contemplates further the provision of improved methods whereby seals, which may be readily removed from the containers, may be economically applied to containers on a commercial scale. It will become apparent that under the teachings of the present invention, simple and relatively inexpensive seals may be provided for containers, which seals however, may be readily removed without being broken so that the necessity of applying auxiliary closures such as corks or the like will be eliminated.

In its broader aspects, the present invention contemplates a method which consists in covering the container to be sealed adjacent the open end thereof with a suitable spacing means and then applying the seal or closure so that the latter shrinks into clinging engagement with the spacing means, rather than with the surface of the container itself. Thus the gelatine or like seal may be readily removed from the container without breaking the seal and may thereafter be replaced to again close the container in the event that a portion only of the contents of the container is utilized.

By way of illustration, two different methods will be described in detail although it is to be understood that the described methods have been selected solely for the purposes of illustration and are not therefore to be construed as limiting the scope of the invention.

Gelatine or viscose caps are preformed in any suitable manner and in accordance with the general practice. Given a cap of a size to fit the container, to be sealed, the cap is soaked in a liquid, and by virtue of the characteristics of the substance from which the cap is made, the cap increases in size about fifty per cent. The container to be sealed, or to which the cap is to be applied, has its outer surface adjacent its open

end coated with wax or paraffin for a distance longitudinally of the container equal to the depth of the cap. This may be conveniently effected by dipping the open end of the container into molten wax or paraffin and then permitting the wax to harden onto the outer surface of the container. The cap or closure, while still moistened and therefore while still enlarged, is then slipped over the coated end of the container and allowed to dry and thus shrink to its normal size while in place on the container. The sides of the closure, however, instead of shrinking into clinging engagement with the body of the container, shrink into snug engagement with the wax coating with the result that while the container is effectively sealed, the cap may be readily removed from the container without being broken and thus without being destroyed.

A second method of practicing the invention may consist in coating or covering the outside of the container adjacent the open end thereof with a strip of paper and in then applying the moistened enlarged cap to the container with the result that the cap shrinks into clinging engagement with the paper rather than with the body of the container. Obviously, this paper strip constitutes a spacing means between the sides of the seal and the body of the container which spacing means permits the seal to be removed without being broken even after the seal has become brittle incident to its drying and shrinking.

Under the teachings of this invention it is contemplated that the coating applied to the open end of the container may be of wax, paraffin, oil, grease, lacquer, varnish, gelatine, shellac or in general any lubricating means which will prevent the cap from shrinking directly onto the walls of the container. These substances may be applied to the container by the method first described, that is by dipping the open end of the container into a bath of the selected substance while the substance is in a molten condition or they may be applied to the container in any other desired manner as by painting or the like.

If the spacing means utilized is paper, as described in the second method, the paper may be plain paper or it may be impregnated with oil, wax, paraffin, lacquer, shellac, glycerine, varnish or any other desired substance. The substance with which the paper is impregnated may be such as to cause the paper strip to adhere to the outer walls of the container, thus effectively holding the paper strip in place while the closure is being applied. If wax paper is used, either the paper or the container may be slightly heated causing the wax to melt so that the strip of paper will stick to the container and will remain in place during the application to the container of the closure. In either event it will be understood that the cap will shrink into tight clinging engagement with the strip of paper rather than with the body of the container.

Frequently the seals or closures are applied to the containers by dipping the open ends of the containers in a solution of the substance of which the closures are formed. Thus the open ends of the containers may be dipped in a gelatinous or viscous solution, the open ends of the containers being thus coated with the gelatine or viscose which subsequently shrinks onto the containers to seal the open ends of the same. It will be apparent that even if the closures are applied in this manner, the containers adjacent the open ends thereof may be covered or coated as previously described so that the gelatinous or viscous

seals will shrink onto the coverings rather than onto the bodies of the containers themselves.

Referring now to the drawing wherein containers sealed in accordance with the teachings of this invention are disclosed and wherein like reference characters designate corresponding parts throughout all views, the numeral 10 designates a container which in the embodiment shown is a glass vial. The outside of this container adjacent the open end 11 thereof is coated as designated by the reference character 12. As brought out before, this coating may be any one of a number of different substances and may be applied to the container by dipping the open end of the container into the substance while the substance is in a molten condition.

After the outer surface of the container has been suitably coated a desired distance longitudinally of the container, as illustrated in Fig. 4 of the drawing, the preformed cap 15 is slipped over the open end of the container, the coating 12 preferably being coextensive with the sides of the cap. As brought out before the cap, slipped on while the same is moistened and thus while the same is enlarged, shrinks into place on the container with the sides of the seal engaging the coating 12. Obviously, after the seal has become hard or brittle the seal may be removed as a unit from the container and without being broken by virtue of the spacing and preferably lubricating effect of the coating 12. Thus while the closure will effectively seal the container it may be removed and replaced as many times as desired.

It might be noted that as illustrated in Fig. 4 of the drawing, the cap or closure prior to its being placed on the container is of a different shape than the shape of the dried seal as illustrated in Figs. 3 and 5. It will be understood that by virtue of its semi-plastic condition and by virtue further of the fact that the closure or seal shrinks, the closure is changed by the container from its original shape to that shown in Figs. 3 and 5.

In Figs. 6 to 8 inclusive, there is disclosed a container 10^a to which a strip 12^a of paper has been applied. As brought out before, this paper may be either plain paper or paper impregnated with any desired substance and the substance with which the paper is impregnated may be such as to cause the paper to adhere to the outer surface of the container. With the strip of paper in place, the preformed and moistened cap 15^a is slipped on the container over the open end thereof and is then permitted to dry, shrinking into clinging engagement with the paper strip during this drying operation. Obviously, the cap may be removed as desired without destroying the cap. The adjacent edges of the paper strips may overlap slightly as illustrated in Fig. 6 of the drawing, the amount of overlapping varying dependent upon variations in the circumference of the containers to which the strips of paper are applied.

While in the drawing the caps have been shown as being preformed, it will be understood that after the outer surfaces of the containers are coated or covered with the paper or the desired substance, the open ends of the containers may then be dipped in solutions of gelatine, viscose or the like thus directly forming the caps on the containers. The seals thus produced will be similar in all respects to those disclosed in the drawing, the sides of the seals being spaced from the

body of the container by the spacing means previously applied to the container.

From the above it will be apparent that the invention provides a seal for a container which seal is of the type now generally in use in that it is formed of gelatine, viscose or the like and in that it is relatively brittle and has been shrunk in place on the container. The seals will however, be readily removable from the containers by virtue of the fact that the sides of the seals are spaced from the containers by suitable means which prevent the sides of the seals from clinging directly to the bodies of the containers.

While the invention has been described with some detail, it is to be understood that the description is for the purposes of illustration only and that various changes in the details of construction and in the steps of the method may be made without departing from the spirit of the invention.

What I claim as my invention is:

1. In combination, a container having an open end, that portion of the container adjacent said open end being of uniform cross-section throughout a substantial length thereof, a coating of wax on the outer surface of said portion adjacent the open end thereof, and a gelatine cap shrunk into engagement with said coating of wax, said

coating extending longitudinally of the container a distance at least equal to the length of the sleeve of said cap.

2. The method of sealing a container having an opening therein which consists in dipping the portion of the container adjacent the opening in molten wax to coat the outer surface of the container adjacent the opening with wax, allowing the wax to harden, covering the opening in the container and the portion of the outer surface of the container which is covered by said wax with a moistened closure formed of a substance adapted to shrink during drying, and allowing said closure to dry while in said position.

3. In combination a container having an open end, that portion of the container adjacent said open end being of uniform cross-section throughout a substantial length thereof, a cap for said container having a rim portion of substantial length adapted to be shrunk into embracing relation with respect to the outer surface of the container adjacent the open end thereof, and a layer of waxy material extending longitudinally of the container between the rim portion of the cap and the container for a distance at least equal to the length of said rim portion longitudinally of the container to facilitate removal of the cap.

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