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CLOSURE

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Fig. 1.

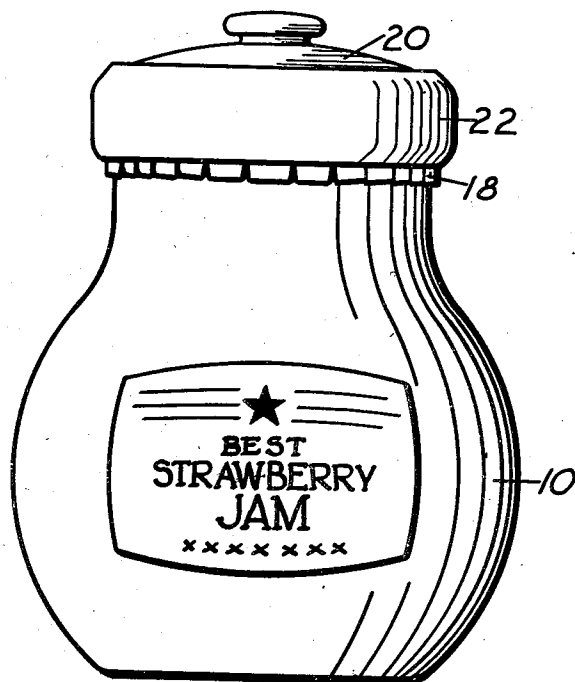
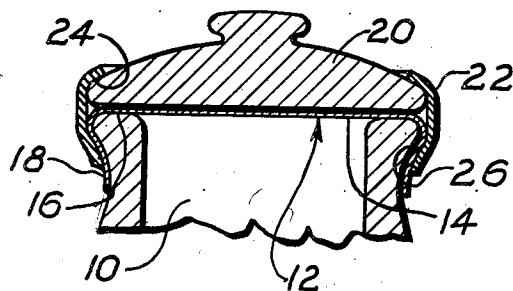


Fig. 2.



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CLOSURE

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1 Claim. (Cl. 215—38)

The present invention relates to container closures. More particularly, it relates to sealed closures in which the seal is provided by a shrunken band of water-swelling material.

Shrinkable bands formed of water-swelling materials such, for example, as cellulose regenerated from viscose, are used generally as secondary closures. That is, as closures for bottles containing wines, liquors, medicinals, chemicals and the like in which the primary closure is provided by a cork, screw thread top or the like and the secondary closure in the form of a band or cap of shrinkable material is placed over the neck of the bottle and permitted to shrink into tight contact with the primary closure and the neck of the bottle. Such shrinkable bands have not been capable of use heretofore where the sealing action has been dependent upon the force set up by the shrunken band and where the moisture content of the container could come in contact with the band. In such closures the moisture content of the container would cause swelling of the shrunken band and loosen the closure with the result that the contents would spill and/or spoil. Since moisture-containing substances comprise a large proportion of materials packed in sealed containers, the use of shrinkable bands to form primary closures has been seriously restricted.

It is an object of the present invention to provide a method of closing containers holding moisture-containing materials by means of water-swelling, shrinkable bands to form water-tight seals.

It is another object of the present invention to provide a container closure, formed in part by a shrinkable band of water-swelling material, which will retain liquid moisture within the container.

Other objects and advantages will be apparent to those skilled in the art from the following detailed description of what are now considered the preferred forms of the invention.

The process of the invention in general comprises forming a container closure by shrinking a band formed of water-swelling material about the container and a top therefor so as to cause the band to press the top onto the container and interposing a moistureproof and water-proof material between the opening of the container and the top and between the container and the shrinkable band so as to prevent moisture from the interior of the container from coming into contact with and swelling the band.

The article of the present invention comprises

in general a container holding therein a liquid-containing substance and a closure for the container comprising a moistureproof and water-proof material disposed over the opening in the container and extended down around the container, a top over the container in contact with the material and a shrinkable band formed of water-swelling material tightly engaging the top and the container over the area covered by the moistureproof, water-proof material and forcing the top into clamping relation with the container to compress the moistureproof and water-proof material therebetween to provide a seal which is substantially proof against the water-content of the material in the container.

The invention accordingly comprises the several steps and the relation of one or more such steps with respect to each of the others, and the article possesses the features, properties, and the relation of elements which are exemplified in the following detailed description and the scope of the invention will be indicated in the claim.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a front elevational view of a container including the closure of the present invention, and

Fig. 2 is a central, vertical, sectional view of the closure of the container illustrated in Figure 1.

Referring to the drawing, the container 10 comprises a jar or other receptacle having a mouth 12 and capable of holding food stuffs such as jams, jellies, honey, beverages, and the like, or other materials such as cements, chemicals and the like materials containing liquid moisture.

A sheet of moistureproof and water-proof material 14 is placed over the mouth of the container 12 so as to completely cover the container lip 16 and is extended downwardly around the exterior surface of the container to form a pleated skirt 18.

A top 20 is disposed over the container in contact with the sheet 14 and an endless band 22 formed of shrinkable, water-swelling material which has been previously swollen is positioned around the periphery of the top 20 and around the skirt 18, and permitted to dry and shrink into tight contact with the periphery of the top 20 and extend slightly over the top as shown at 24

and at the same time shrink tightly into contact with the skirt 18 and force the skirt into tight conformation with the exterior of the container. The exterior of the container is preferably shaped adjacent the opening so as to permit the skirt 18 and band to obtain a grip on the container, as by rounding the container sides inwardly as shown at 26 to form a projection which the band can shrink under and thereby grip. The band thereby forces the container top toward the container lip 16 and brings about a clamping action with the container lip so as to tightly compress the sheet material 12 between the top of the container and the container lip to prevent the passage of moisture out of the container and simultaneously seal the skirt 18 tightly against the side of the container to prevent any moisture which might find its way out of the container from coming in contact with the shrunken band 22. In this manner, all moisture from the interior of the container is effectively prevented from reaching and swelling the shrunken band 22 with the result that the container remains tightly sealed so long as liquid moisture is not applied to the shrunken band from the outside. The band may be coated on the outside with a moistureproof and water-proof lacquer of any desired type to protect the seal from being accidentally loosened if such is desired.

The sheet material 12 may be any moisture-proof, water-proof material such, for example, as that disclosed in patent application Serial No. 207,938, filed on May 14, 1938, in the name of Ralph T. K. Cornwell. This material will suffice to prevent the escape of water from the interior of the container and when ingredients containing other forms of moisture which would have a deleterious effect upon the shrinkable bands are packed within the container, the sheet material 12 should be formed of a substance which is not affected by the said contents. For example, a sheet formed of rubber hydrohalide such as that sold by the Goodyear Tire and Rubber Company under the trade-name "Pliofilm" may be used when certain corrosive types of material are stored within the container. Other materials which may be used are sheets of rubber, sheets of synthetic resins, such as methyl methacrylate, polymerized vinyl acetate, co-polymers of vinyl acetate and vinyl chloride, urea-aldehyde, phenol-aldehyde condensation products, polystyrene, and many other film-forming materials.

The shrinkable band may be made from any shrinkable, water-swelling material, for example, cellulose regenerated from viscose, cupra-ammonium solutions of cellulose, solutions of cellulose in inorganic solvents such as zinc chloride, or solutions of cellulose in organic solvents such as quaternary ammonium compounds, cel-

lulose ethers, as well as gelatin and water-swelling synthetic resins such as urea-aldehyde, phenol-aldehyde and alkyd resins of the Rezyl type.

The container may be formed of any desired shape and the top may be likewise varied in shape as desired.

The process and article of the present invention make it possible to rapidly and economically package liquid-moisture containing ingredients in containers which can be hermetically sealed so as to prevent spoilage or wastage of the container contents and at the same time opened with a minimum of effort. The container seals cannot be loosened by the contents of the container under normal conditions with the result that the containers can be stored, shipped, and handled incidental to placement in the hands of the user without fear of loss or damage to the contents.

The term "moistureproof material" as used throughout this description and the claim is to be understood to mean a material which is substantially impervious to moisture in both liquid and vapor form.

The term "water-proof material" as used throughout this description and the claim is to be understood to mean a material which retains its moistureproof properties while in contact with liquid moisture.

Since certain changes in carrying out the above process, and certain modifications in the article which embody the invention may be made without departing from the scope, it is intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

An article of manufacture comprising a container having a mouth in the top thereof, a sheet of moistureproof material disposed over the mouth of the container and extended downwardly around the side of the container to form a skirt portion, a rigid substantially disc-shaped top for the container disposed over the said sheet over the mouth of the container, and an endless band of water-swellaable material which shrinks upon drying shrunk into tight contact with the periphery of the top and the said skirt portion of said sheet to simultaneously clamp the top onto the container and provide a tight seal between the container and said sheet, the said skirt portion extending below the lowermost edge of the water-swellaable band, whereby moisture from the contents of the container is prevented by the moistureproof sheet from contacting and swelling the band in the event exudation of moisture from the interior of the container occurs.

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