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SHRINKABLE CONTAINER CLOSURE

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Fig. 1

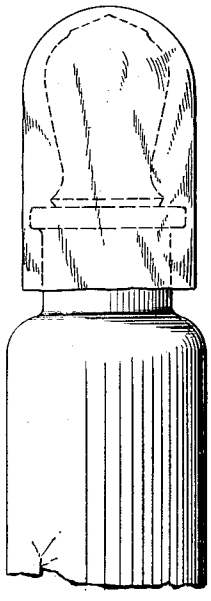
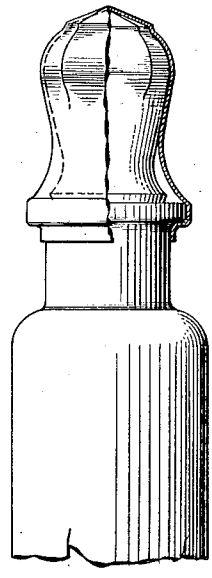


Fig. 2



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SHRINKABLE CONTAINER CLOSURE

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6 Claims. (Cl. 18—57)

This invention relates to shrinkable container closures having a glossy silky lustre formed from viscose solutions and the like and in particular to an improved shrinkable container cap.

The gloss or lustre obtained in the production of artificial silk from viscose and other aqueous cellulose solutions depends on the diffused reflection of incident light by the surface of the filaments. Moreover, the lustre of artificial silk filaments is determined in part by the uniformity of the internal structure, the transparency of the mass and the physical cross-sectional characteristics. These factors may be controlled by the use of various compounded cellulose solutions, by the manner of spinning the solutions and by the nature of the precipitating baths.

However, in the case of non-filamentary structures such, for example, as hollow bodies produced from viscose solutions and the like, it has been found impracticable or substantially impossible to impart a glossy silky lustre thereto by the methods utilized with filamentary forms as above described.

It is an object of the invention to provide shrinkable container closures formed from viscose solutions and the like by mixing therewith a filamentary filler and arranging the filaments to impart a glossy silky lustre to the surface of the bodies.

It is a further specific object of the invention to provide a shrinkable cap having a glossy silky lustre and adapted to be self-affixing to a container and to conform more or less to the shape thereof and a process of producing such a cap.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

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

It has heretofore been suggested to obtain special surface characteristics in non-filamentary bodies produced from viscose solutions and the like by adding thereto comminuted material such, for example, as ground glass, mica, powdered cork, ground leather, precipitated chalk or kaolin. Such non-filamentary fillers have been added, however, chiefly only for increasing the covering power or opacity and for imparting bulk to the mass when used as a coating material. Further, in the case of bottle caps, the addition of mica has a deleterious effect on the shrinking capacity of the caps. The addition of glass, cork and other comminuted material makes the bodies rough on the surface and consequently unsightly.

In the German Patent No. 529,529 and corresponding British Patent No. 274,054, there is taught the production of filamentary and non-filamentary bodies having somewhat of a silky lustre by mixing, with viscose solutions and the like asbestos or asbestine, in the form of powder in as finely divided a state as possible. While the articles thus produced have certain applications in special fields, these articles actually appear matte in reflected light, are deficient in covering power and lustre and further, the random arrangement of the powder produces a surface which is rough and impairs the shrinkage capacity of such bodies as caps for containers, capsules, etc. None of said filling materials has resulted in bodies having sufficient silky lustre. In contra-distinction to the prior teachings the present invention comprises a process of preparing non-filamentary bodies having an attractive glossy silky lustre from viscose solutions and the like by mixing, with a solution suitable for forming the desired body, asbestos in the form of filaments having a specific ratio of length to diameter and a lower limit of average length, and working up the mixture into the desired body.

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

Figure 1 is a side elevation of a portion of a bottle illustrating the initial condition of a closure cap of the invention, and

Figure 2 is a similar view illustrating the final condition of the cap in Figure 1 after it has shrunk over the closure of the bottle.

In the practice of the invention, the solution used will be one suitable for forming the desired non-filamentary body and may comprise viscose, cellulose derivatives, gelatine, casein or the like and, in particular, for the preparation of shrinkable hollow bodies we employ viscose or other solutions which form masses capable of shrinking by the loss of water or other swelling agent.

To a solution suitable for forming the desired body we add a small proportion of asbestos fibres which have been cut to form filaments having an average length of not substantially less than about 100μ and having a ratio of width to length of not substantially less than 1 to 5 and preferably of between 1 to 10 and 1 to 20. The cut fibres are carefully ground and then suspended in water. After the coarser particles

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have been allowed to settle out, the suspended filaments are decanted and added to the solution to be employed. It is substantially essential that the asbestos filaments have very small dimensions for, if the filaments added are too large, the surface of the bottle caps will be rough and matte and lacking in the desired silky lustre. On the other hand, if the particles are too small, a dull, matte surface also results. The permissible average length for the asbestos filaments may vary somewhat with the viscosity of the solution, that is, filaments having the smaller ratio of width to length are more satisfactory with solutions of low viscosity than the solutions of higher viscosity.

The percentage of asbestos filaments which may be added will depend among other factors, chiefly upon the degree of covering power or opacity desired in the finished article. For example, with viscose solutions of the concentrations suitable for the preparation of non-filamentary bodies, asbestos filaments having dimensions within the limits given above may be added in an amount of from about 1% to about 3% by weight of the solution.

The invention will be described in detail in conjunction with the preparation of shrinkable caps for the closures of bottles and other containers.

To 100 kg. of an ordinary viscose solution containing 6.5% of cellulose and 6.5% of alkali are added 2 kg. of asbestos filaments prepared as above described and the particles of which have an average width of 5μ and an average length of 100μ. After mixing thoroughly, the viscose solution is aged as usual and then the mandrels are dipped into it so that they get a thick coating of viscose. After the mandrels have been taken out of the viscose solution, the surplus is allowed to run off. The viscose is hardened on the mandrels in the usual way by means of a suitable bath, such, for example, as an acid-salt bath. Then the cap is drawn from the mandrel, is desulfurized, bleached and washed or otherwise finished in a known manner to render the cap ready for commercial use.

The finished cap may be placed while wet over the stopper and neck of a bottle or other container as illustrated in Fig. 1, and allowed to dry, whereupon it shrinks to form a tight closure having a glossy silky lustre as shown in Fig. 2.

The glossy silky lustre of the body is enhanced by the unidirectional alignment of the asbestos filaments in the solution during the formation of the desired body and prior to the hardening or coagulation of the mass. For example, during the flow of the viscose solution off the mandrel in the production of hollow bodies the asbestos filaments being of unequal dimensions, align themselves to a substantial extent with their longest dimension parallel to the direction of flow. This alignment of the asbestos filaments is of great importance in the production of shrinkable caps as it permits the cap to shrink properly and to substantially the same extent as a cap formed from the same material free of solid fillers, as it dries chiefly by reason of the fact that the asbestos filaments shrink relatively more breadthwise than they do lengthwise. Further, the shrinking of a body containing aligned filaments results in a smooth surface having a silklike gloss, whereas the shrinking of a body containing asbestos powder or fragments of diverse sizes result in a rough surface lacking in the desired sheen.

The alignment of the asbestos filaments also will occur when the prepared solution is flowed as in coating sheet materials and the like with the solution, and in pouring the solution into a hollow form and draining away the surplus.

If desired, the shrinkable container closures having a glossy silky lustre may be produced by a process comprising a plurality of steps, for example, in the preparation of hollow bodies, by dipping a suitable mandrel twice into the solution in which case one or both of the layers thus deposited on the mandrel may contain the filler of the asbestos filaments as above described.

If desired, the novel articles of this invention may be colored, dyed, tinted, embossed or otherwise decorated and in certain cases it may be permissible to add small quantities of another filler to the solution containing the asbestos filaments for the purpose of increasing the covering power or opacity of the article.

It is seen that by the present invention there has been provided shrinkable container closures having a glossy silky lustre which improves the appearance and increases the sphere of utility of the same. For example, the bottle caps of this invention have an improved external appearance and a covering power sufficient to hide the unsightly closure of the container to which applied. Further, this desirable glossy silky lustre is obtained without loss of shrinking capacity of the cap and without impairing or preventing the further treatment or decoration thereof and without imparting to the cap a coarse or rough surface.

I claim:

1. As an article of manufacture, a shrinkable container closure, formed from viscose solutions and the like, containing asbestos filaments which are aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a degree substantially equal to that of a cap free of solid fillers.

2. As an article of manufacture, a shrinkable container closure, formed from viscose solutions and the like, containing asbestos filaments having a ratio of width to length of not substantially less than 1:5, said filaments being aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a degree substantially equal to that of a cap free of solid fillers.

3. As an article of manufacture, a shrinkable container closure, formed from viscose solutions and the like, containing asbestos filaments having a ratio of width to length of between 1:10 and 1:20, said filaments being aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a degree substantially equal to that of a closure free of solid fillers.

4. As an article of manufacture, a shrinkable container closure, formed from viscose solutions and the like, containing asbestos filaments having an average length not substantially less than 100μ and a ratio of width to length not substantially less than 1:5, said filaments being aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a

degree substantially equal to that of a closure free of solid fillers.

5. As an article of manufacture, a shrinkable container closure, formed from viscose solutions and the like, containing of from about 1% to 3% of asbestos filaments having an average length not substantially less than 100μ and a ratio of width to length not substantially less than 1:5, said filaments being aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a degree substantially equal to that of a cap free of solid fillers.

6. As an article of manufacture, a shrinkable cap, formed from viscose solutions and the like, containing of from about 1% to 3% of asbestos in the form of filaments having a length of not substantially less than 100μ and a ratio of width to length of between 1:10 and 1:20, said filaments being aligned with their longest dimensions parallel to the longitudinal axis of the closure, said closure having a smooth surface and a glossy silky lustre in reflected light and being capable of shrinking to a degree substantially equal to that of a cap free of solid fillers.

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