March 16, 1937. C. E. McMANUS 2,073,750

CAP

Filed July 28, 1931

Fig. 1.

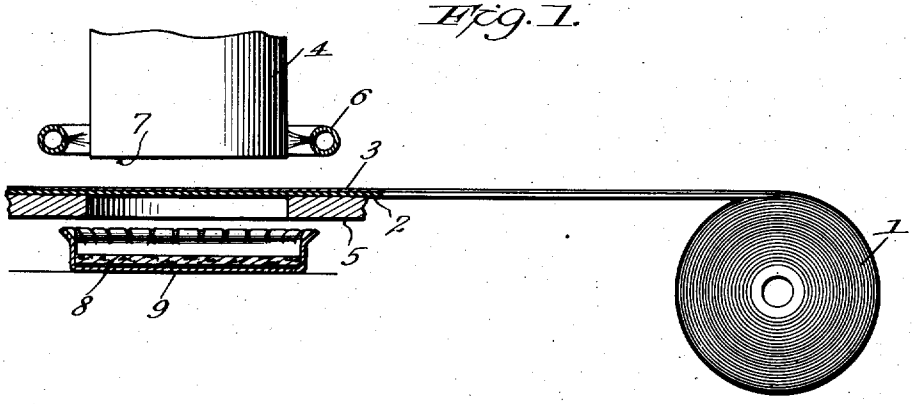


Fig. 2.

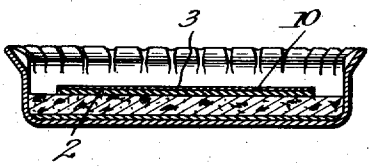
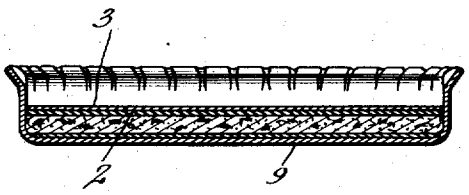


Fig. 3.



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2,073,750

CAP

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11 Claims. (Cl. 215—39)

The present invention relates to container caps or closures and to an improved liner employed in connection with closures of various types.

Primarily the invention seeks to eliminate the use of fibrous materials, such as papers, or foils, such as tin foil, which have been customarily utilized, while retaining all desirable functions performed by such materials.

In lieu of these conventional expedients, the present invention aims to produce a cap facing comprising a heat fusible insoluble adhesive to which is directly united a layer or film of an acid and alkali resistant substance which is likewise insoluble, and has the desired properties of plasticity and elasticity.

A further object of the invention is to provide the material in the form of a strip from which it can be conveniently punched into liners and spots of the required design and size and either immediately or not affixed in the cap in the customary manner.

Referring to the drawing:

Figure 1 is a view partly in section showing a strip of material and the stamping means for punching out a liner and positioning it in a cap.

Figure 2 is a view in section showing the material in the form of a spot applied to the cushion of a cap.

Figure 3 is a view showing the material in the form of a liner applied to the material of a cap and covering the entire interior surface of the cushion.

The two layers constituting the strip from which the facing spots or liners are produced is preferably composed of a layer of a suitable heat fusible, insoluble adhesive, such as gutta percha or gutta percha compounds, balata or balata compounds, chicle or chicle compounds.

These materials, it has been found, when combined with suitable fillers and other gums or resins, as well known, will have the required properties for use with this invention.

I have discovered that such compounds as gutta percha tissue are ideal materials for spots or liners for receptacle closures, since they are waterproof, impervious, non-adsorbent and inert, being resistant to acid and alkali. Such materials have one inherent defect for this type of use however, in that they tend to stick to the lip of the receptacle when the closure is applied thereto. For this reason, the present invention contemplates the provision of a thin film or skin of anti-sticking varnish or lacquer on the exposed surface of the spot. Preferably this coating is applied, as explained below, by spraying, spreading or rolling the varnish directly onto the adhesive tissue before the spots are punched from the sheet.

The facing layer which is united to the adhesive lamination will preferably comprise a cellulose derivative, such as cellulose acetate or cellulose nitrate, or a plastic resin, such as a natural resin or a synthetic resin, of which amberol, glyptal, vinylite and rezyl are sufficiently illustrative, or the reaction product of a cellulose derivative and any one or more of the several natural or synthetic resins. I prefer to use a coating which will be suitably resistant to the acids and alkalies present in the liquids to be capped and also somewhat transparent so as to present as little contrast as possible to the color of the cushion.

Rezyl resin which is a plastic resin belongs to the class known as alkyd resins and is a chemical compound produced from phthalic acid and glycerine by heat conversion. For example, by heating these substances together at 110°–115° C., a hard glassy, clear resin is produced. This may be made plastic by the use of linoleic acid. About 100 grams of glycerine are used to combine with 243 grams of phthalic anhydride (anhydrous pthalic acid).

Other alkyd resins are made by using instead of glycerine; phthalic acid with ethylene glycol, propylene glycol, or diethylene glycol. The term alkyd resins covers also plastic resins which are not made with phthalic acid, such as by combining glycerine with succinic acid or with citric acid, or with maleic acid. I use, therefore, any alkyd resin such as that produced by the conversion of glycerine with heat, with phthalic acid, succinic acid and maleic acid.

Where I use a synthetic resin such as rezyl resin, I have used acetone as the principal solvent. The simple procedure is to soak chips of the resin in acetone and in the course of time a thorough solution of the resin is obtained. The amount of solvent used is sufficient for dissolving the resin and thinning it out to the required consistency for coating or spraying.

The type of solvent used for the other synthetic resins would depend upon which resin was used. The solvents used are those usually known in the art of synthetic resins.

I have found it advantageous also to add small amounts of tin decorator's dryer. This makes it so much easier to dry the coating, which as will be understood is best applied in solution.

In the drawing, the numeral 1 indicates a roll of material comprising the two layers or thin films of adhesive and facing material united together. The adhesive or gutta percha compound layer is

indicated at 2 and the facing layer, which is exposed to the contents of a vessel, is indicated at 3.

The integral strip or sheet of material 1 is shown as being fed from the roll to a suitable stamping or punching machine having a plunger 4 and a die 5. The plunger is preferably heated by the heating means 6 and may be provided with a felt tip 7, if desired, that is kept dampened, so as to have the effect of moist heat if dry heat is not desired.

The plunger and die will stamp from the strip a spot or liner of the proper size and shape and the temperature will be such as to cause the adhesive layer to fuse sufficiently that upon application of the liner or spot to the cushion 8 of the cap 9 by pressure of the plunger, as shown, the spot or liner will adhere to such cushion in the proper position and throughout its entire adhesive surface.

In Figure 2, there is illustrated a spot 10 comprising the improved liner of this invention having the adhesive layer 2 and the facing layer 3.

In Figure 3, the liner is shown as being coextensive with the area of the cushion, the adhesive layers being indicated at 2 and the facing layer at 3.

It will, therefore, be seen that a relatively thin, plastic, elastic, resistant, composite strip material is provided which does not require the use of conventional expedients, such as an intermediate layer of paper or a layer of tin foil, and which can be applied by heat and pressure in the customary manner to attach a spot or facing liner to the cushion or other portion of a conventional closure.

The gutta percha compound is preferably first made in the form of a strip or sheet and thereafter the surface facing material is applied thereto in the form of a coating or film, either by spreading, spraying or rolling, or in any other suitable manner, so as to provide a gutta percha tissue having a continuous facing or film of hardened set lacquer or varnish-like substance.

As will be clear, in referring to gutta percha compounds, it will be understood that the gutta percha employed may be either the pure gutta percha or that combined with other gums or substances to refine or impart to the gutta percha desirable properties. For example, mineral fillers such as zinc oxide, magnesia, chalk, and talc may be added in substantially 25–35%, as well as balata and other resinous gums and resins which are frequently used for the purpose of producing a gutta percha compound. The same is true with respect to other gums mentioned, as balata and chicle. Coloring in the form of red oxide, lamp black or other harmless coloring may be added.

Thus gutta percha, within the meaning of this specification, is intended to describe an adhesive, heat fusible, insoluble material which is substantially impervious and non-absorbent with respect to fluids in the gaseous or liquid phase and whether carbonated or not.

The cellulose derivative will preferably be in the form of a liquid or plastic constituting a varnish or lacquer and will be applied to the adhesive backing in this condition and allowed to harden to a substantially plastic condition. The natural or synthetic resin will likewise be applied in the form of a fluid or plastic, as a varnish of lacquer, and allowed or caused to assume a substantially plastic condition.

The re-action product of the cellulose derivative and any one of the several natural or synthetic resins will similarly be utilized as a varnish or lacquer and be applied in a plastic or in fluid and form a substantially plastic film or cuticle.

Furthermore, the combined material is taste-free and does not yield a metallic or oily taste to the beverage, whether it be a pressure beverage or a syrup concentrate.

By the employment of a facing film of the character described, there is no possibility of the gutta percha sticking to the sealing lip of the container, such as would be highly objectionable.

The material of the facing film, as above described, has a very high resistance to solutions containing tartaric, acetic and carbonic acid.

It is also found that the composite spot or liner of this invention can be successfully applied not only to cork, rubber and other fibrous material cushions, such as are commonly in use, but can be very satisfactorily employed in connection with resinated cork cushions, that is, cork in which the particles thereof have been coated with a resin of the natural or synthetic type and a plasticizer which is also a solvent for the resin.

The thin plastic spot or liner lends itself to securing the full resiliency of the cork, rubber, paper or other fibrous cushion, making it unnecessary to use much pressure in sealing. It is well known in the art of sealing that the more resilient and elastic materials can be used with decreased thickness and therefore the thinner disc of this invention with its plastic and elastic characteristics is highly desirable.

The adhesive layer 2 will preferably be in the form of a thin tissue, gutta percha tissue being a recognized article of manufacture which is self-sustaining and has sufficient thickness and strength to permit handling thereof as a sheet, and as stated the plastic or fluid lacquer or varnish applied thereto will constitute a hardened plastic film or cuticle co-extensive with the adhesive. Thus, the gutta percha tissue performs the dual function of serving as a base or carrier fabric for the resistant coating material, and of acting as an adhesive to secure the liner within the cap after the same has been applied thereto.

The composite material will by reason of its ingredients be relatively thin as compared with present liners, but will be possessed of the elasticity and plasticity which are characteristics of the material of each layer, and thus substantial enough to be prepared in strip form and applied as described above.

Furthermore, although the adhesive layer has a lower heat of fusion than the facing layer, no distortion will result because of the elastic and plastic properties of each layer.

The gutta percha or adhesive layer, as stated, will be thin or tissue-like and will be preferably translucent. It may be variously colored or not, to conform to the color of the facing layer or the color of the cushion or similar conventional insert. Thus brown, green, red, gray and yellow and other coloring materials may be incorporated in the tissue to obtain various effects. Moreover, the tissue may be rendered colorless and substantially transparent, as desired.

The facing layer prepared by using a lacquer or varnish as described which is permitted or caused to harden to a substantially plastic condition on the adhesive may, of course, be colored, but I prefer to use a clear lacquer or varnish for the reason that when the spot or liner is applied

to a cushion, as set forth, by reason of the thinness of the respective layers and the resultant composite material, a substantially transparent spot or liner will be formed. At the present time the paper and foil spots and liners present an objectionable contrast to the color of the cushion layer, whereas with the present invention, the substantially clear or transparent spot or liner will conform nicely and without such objectionable contrast to the color of the cushion. This result is obtained by using a clear varnish or lacquer to obtain a transparent film and by reason of the thinness of the layers and of the resultant composite material, and thus the liner when applied will appear clean and merge into the color of the material of the cushion, if desired.

The varnish of lacquer may contain various ingredients to improve its resistant properties for use with the present invention and it will be understood that I propose to use any such coating as will have the required characteristics for the purpose of cap liner or spot material and can be satisfactorily applied to an adhesive or have an adhesive applied to it.

The liner or spot material will be efficient with all varieties of bottled, preserved or canned goods and the particular compounds for the two layers may be modified or selected, as set forth, to suit conditions, as for example the chemical and physical nature of the liquid or solid food or other material to be capped, without departing from the spirit of this invention which avoids the use of paper, foil or other intermediate layers as now conventionally used.

The term "resistant" as used in the appended claims is intended to cover the resistant properties of the composite liner material under the use to which it is put, namely, as a cap or closure liner or spot.

By the term "tissue" as used in the specification and claims is meant a thin or film-like body. When it is stated with reference to the adhesive tissue that it has the film of anti-sticking material "formed directly thereon", it is meant that the film is produced on the tissue as distinguished from laminating with the tissue a separate or preformed sheet of paper, metal foil or the like.

It is further within the province of this inventionto form a composite laminated cap material in strip or sheet form comprising the cushion layer, adhesive layer bonded thereto and facing layer or film bonded to the adhesive layer in the manner described as a laminated unit and stamp out a cushion liner therefrom as a unit.

In referring to a "liner" in the appended claims, I mean the thin tissue-like product of this invention comprising an adhesive layer of gutta percha or equivalent material and a facing film or layer.

In referring to cushioning material, I mean the conventional pulp board, cork, rubber, cardboard or other discs and inserts of compressible or non-compressible material, known in the art, to which the product of my invention is applied.

Where a rigid or non-yielding insert is employed, the liner of the present invention will impart the desired plasticity to effect tight sealing.

In some cases, the insert may be omitted and the liner of the present invention applied directly to the cap to effect the seal.

I claim:

1. A cap having an interior liner or spot, said liner or spot comprising preformed material consisting of a layer of inert, waterproof, adhesive tissue provided on its outer face with a film of anti-sticking coating material formed directly thereon and adapted to prevent adhesion of said layer to the sealing lip of a receptacle upon application of the cap thereto.

2. A cap having an interior liner or spot, said liner or spot comprising preformed material consisting of a layer of inert, waterproof, thermo-plastic, adhesive tissue provided on its outer face with a film of anti-sticking coating material formed directly thereon and adapted to prevent adhesion of said layer to the sealing lip of a receptacle upon application of the cap thereto.

3. A cap having an interior liner or spot comprising preformed materials consisting of a layer of gutta percha tissue provided on its outer face with a film of anti-sticking coating material formed directly thereon adapted to prevent adhesion of said layer to the sealing lip of a receptacle upon application of the cap thereto.

4. Lining material for use as a spot or liner in a receptacle cap, comprising a layer of gutta percha tissue provided on one face with a film of anti-sticking coating material formed directly thereon, the gutta percha tissue being adapted to serve as an impervious liner adherent to the inner surface of the cap upon the application of heat and pressure thereto, the said film serving as a means to prevent sticking of the tissue to the sealing lip of a receptacle.

5. Lining material for use with receptacle caps consisting of a layer of inert, thermo-plastic, adhesive tissue having on one face an anti-sticking coating film formed directly thereon.

6. Lining material for use with receptacle caps consisting of a layer of impervious, inert, thermo-plastic, adhesive tissue coated with an anti-sticking film of varnish.

7. As a spot or liner for use with receptacle caps, an impervious layer of adherent, thermo-plastic elastic tissue adapted to be secured to the cushion disc of a cap by heat and pressure, said layer being provided on its outer surface with a facing film of anti-sticking coating material formed directly upon said tissue to prevent adhesion of the spot or liner to the sealing lip of a receptacle upon application of a cap thereto.

8. As a spot or liner for use with receptacle caps, an impervious layer of gutta percha tissue adapted to be secured to the cushion disc of a cap by heat and pressure, said layer being provided on its outer surface with a facing film of anti-sticking coating material formed directly on said tissue to prevent adhesion of the spot or liner to the sealing lip of a receptacle upon application of the cap thereto.

9. Lining material for use with receptacle caps consisting of a layer of impervious inert, waterproof, thermo-plastic, adhesive tissue coated with an anti-sticking film of resin varnish.

10. Lining material for use with receptacle caps consisting of a layer of impervious, inert, waterproof, thermo-plastic, adhesive tissue coated with an anti-sticking film of cellulose derivative.

11. Lining material for use with receptacle caps consisting of a layer of impervious, inert, waterproof, thermo-plastic, adhesive tissue coated with an anti-sticking film of a reaction product of cellulose derivative and a resin.

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