April 13, 1943. C. RAY ET AL 2,316,453

CLOSURE MEMBER

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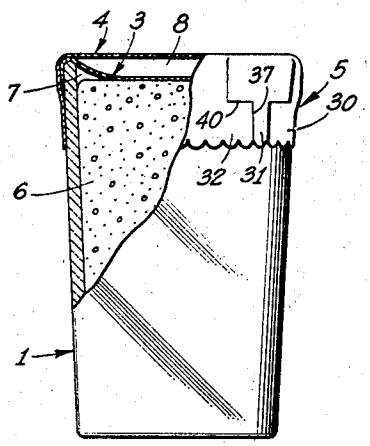


Fig. 1.

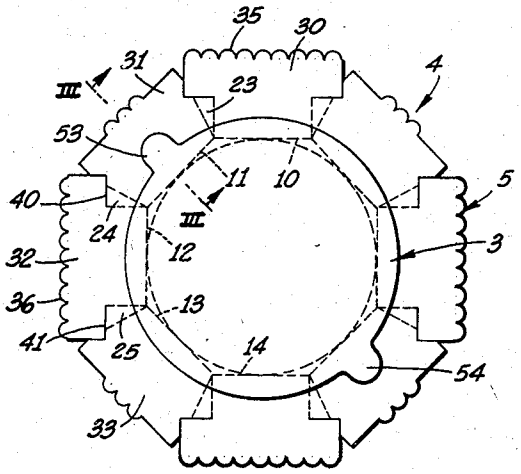


Fig. 2.

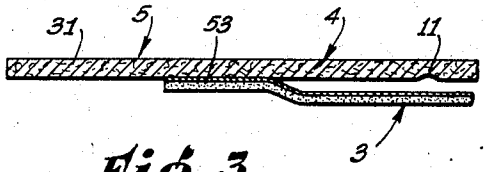


Fig. 3.

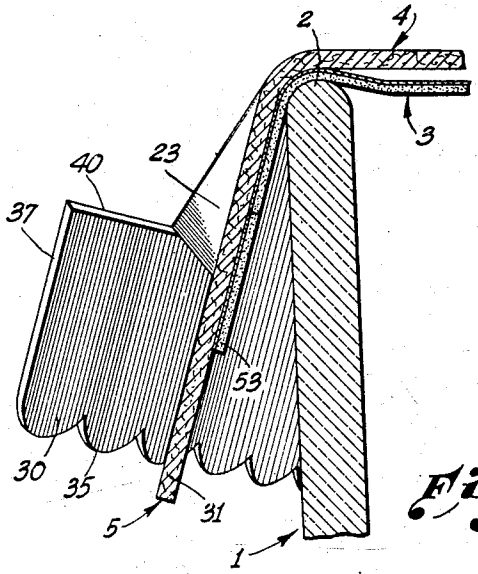


Fig. 4.

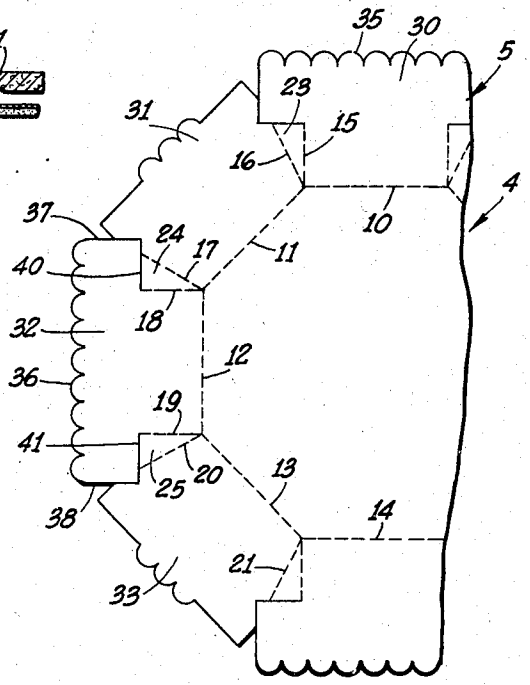


Fig. 5.

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CLOSURE MEMBER

Carlo Ray and Don Ray, Beverly Hills, Calif.

Application May 13, 1941, Serial No. 393,192

4 Claims. (Cl. 215—38)

This invention relates to improvements in packaging various commodities and is particularly directed to the use of a closure member made from foldable material. Although various products may be subjected to the methods and devices of this invention, the invention has greatest applicability in those cases where a hot product is placed into a container prior to sealing.

In the packaging of jams, jellies, preserves, cheese spreads, processed cheese and other products the food stuff is poured into a container such as a jar or glass, and a film of liquid paraffin is then floated on the surface of the food stuff. The container is then normally covered with a metal cap which is crimped on to the upper edge of the container. In some instances the surface layer of paraffin over the surface of the commodity is dispensed with but the caps are an expensive item, being made of metal and requiring special machinery for their application.

In accordance with the present invention, a protective cap of foldable material is employed instead of metal, thereby materially reducing the cost and conserving metal for other purposes. Moreover, in one embodiment of this invention the use of liquid paraffin on the surface of the food stuff is also dispensed with, the cap itself being then provided with a loosely held film or sheet of thermoplastic material capable of sealing the opening leading to the container by reason of the inherent heat of the food stuff. Moreover, as the food stuff cools, the sheet material is placed under tension and a firm seal is assured by the development of a partial vacuum in the container and between the surface of the food stuff and the thermoplastic sheet material.

An object of the present invention, therefore, is to disclose and provide an improved closure member which utilizes the heat content of the food stuff in the formation of a sterile, tight seal on the container.

Another object of the invention is to disclose and provide a novel seal made from foldable material such as paper, cardboard or the like.

A still further object of the invention is to provide devices which may be readily applied to jars, glasses and other containers and properly protect an underlying thermoplastic sealing material.

These and other objects, adaptations, uses and advantages of the invention will become more apparent from the following detailed description of certain exemplary forms of the invention. These exemplary forms will be directed to a form of invention adapted for use on glass containers in which processed cheese and cheese products are sold, but it is to be understood that the invention is not limited to this particular embodiment.

In order to facilitate understanding, reference will be had to the appended drawing, in which:

Fig. 1 is a side elevation of a glass, partly broken away, filled with processed cheese and equipped with the closure of this invention.

Fig. 2 is a plan view of the inner side of a blank formed in accordance with one embodiment of this invention and provided with a thermoplastic seal.

Fig. 3 is an enlarged section of a portion of the device shown in Fig. 2, the section being taken along the plane III—III of Fig. 2.

Fig. 4 is a vertical section of a container showing the position assumed by the various parts of the device during its application to the container.

Fig. 5 is an enlarged view of a portion of the cover blank.

In Fig. 1 a glass container in the form of a drinking glass is indicated at 1, the upper edge or lip of the glass being indicated at 2. In thorough contact with this lip 2 is the edge portion of a disc of thermoplastic material 3 which is preferably moisture resistant, stretchable and capable of readily conforming to slight irregularities in any surface to which such material is applied.

An outer cap is generally indicated at 4 and it will be noted that the edge portions of this cap have been folded around the edge 2 and over edge portions of the sheet material 3 so as to press the same against the outer sides of the glass 1 and hold it in position. The cap 4 is provided with a skirt, generally indicated at 5, which extends a short distance down the outer sides of the glass 1. The contents of the glass or container are indicated at 6 and it is to be noted that the sheet material 3 is spaced from the cap 4 so as to provide air spaces 7 and 8 beneath and above the layer of sheet material 3.

The cap 4 is shown in plan view in Fig. 2 and is composed of one piece of foldable material such as a suitable grade of heavy paper. This paper may be laminated, coated, lacquered, impregnated or otherwise treated. The upper or outer surface of the paper is preferably provided with a suitable printing surface but after printing such surface may be further protected by a coating of lacquer or the like. The lower or inner surface of the blank is preferably provided with a thermo-

plastic heat-bonding film. Either the entire surface of the blank is thus provided with a thermoplastic material or outer portions only are provided with a thermoplastic or adhesive surfacing. The foldable material from which the cap 4 is made should be desirably strong so as to prevent accidental destruction or puncturing of the cap in normal handling.

A cap such as that illustrated herein is preferably provided with a polygonal centrally disposed area, an uncut portion surrounding such area, and a plurality of tabs extending beyond the uncut portion, said tabs being capable of being folded downwardly into planes substantially perpendicular to the plane of the polygonal central area so as to form a skirt 5. In the exemplary form illustrated, an octagonal, centrally disposed area is shown delineated by the fold lines 10, 11, 12, 13, 14, etc. Outwardly extending fold lines emanate from points of intersection between the fold lines 10 to 14. These outwardly directed fold lines are indicated at 15, 16, 17, 18, 19, 20 and 21. It is to be observed that the centrally disposed octagonal area is surrounded by an uncut portion through which these score lines 15 to 21 extend.

It may also be noted that alternate fold lines delineating the centrally disposed octagonal area are provided with outwardly directed fold lines at right angles to the first named fold lines. For example, outwardly directed fold lines 18 and 19 are perpendicular to the fold line 12 whereas the adjacent fold lines 11 and 13 are not provided with such perpendicular outwardly directed fold lines. The remaining fold lines, such as the fold lines 16, 17, 20 and 21, are substantially radial. The spaces between fold lines emanating from the intersection of boundaries of the central area form triangular portions such as 23, 24 and 25, flexibly associated with and connected to the rest of the blank.

It may also be stated that the polygonal centrally disposed area is provided with a plurality of outwardly extending tabs such as 30, 31, 32, 33, etc. having portions extending beyond the uncut portions surrounding the centrally disposed polygonal field or area. In its preferred form, these tabs are wider at their outer ends than the length of the fold lines from which they originate. Tabs such as 30 and 32 may be provided with outer edges 35 and 36 respectively, which edges may be either straight, scalloped or otherwise formed for decorative purposes. The side margins of the tab 32 are indicated at 37 and 38, these side margins being spaced a distance greater than the length of the fold line 12 from which the tab 32 emanates. The outer edge 36 of the tab 32 is generally parallel to the fold line 12 and shoulders are formed in the tab by slits 40 and 41 which are also substantially parallel to the fold line 12, these slits extending inwardly from the side margins 37 and 38 respectively to the fold lines 18 and 19.

The lower side of the cap blank 4 is provided with a sheet of flexible, deformable, thermoplastic, moistureproof, and preferable elastic material 3. As shown in Fig. 2, this sheet material 3 is in the form of a disc having tabs 53 and 54. The diameter of the disc is slightly greater than the outer diameter of the glass or jar at its mouth, and slightly greater than the diameter of a circle adapted to circumscribe the polygonal field or area embraced by fold lines 10—14. In Fig. 2 the outer diameter of the glass at its mouth is indicated by dotted lines at 43, and it will be seen that this is completely within the area embraced by fold lines 10—14. The diameter of the disc of sheet material 3 should not exceed the diameter or area embraced by the uncut portion of the blank and should not cover the outer portions of tabs 30—33.

The sheet material 3 is attached to the underside of the cap blank only at edge portions of the disc 3. The tabs 53 and 54 may be attached to the cap blank, leaving the rest of the sheet material unattached.

The completed cap assembly including the scored and precut blank and its loosely attached sheet or disc 3 of thermoplastic material may then be applied to freshly filled jars or glasses by suitable devices such as, for example, a machine disclosed in my copending application Serial No. 431,899. For example, the cap of this invention is used in sealing glasses containing processed cheese; the sterilized glasses are filled with hot liquid processed cheese and immediately capped with the device of this invention. The cap is applied with the thermoplastic sheet 3 in contact with the mouth of the glass and the various tabs 30, 31, 32 and 33 are folded along the fold lines 10, 11, 12, 13, etc. so as to form a skirt. During such folding operation, the intermediate tabs such as 31 and 33, are preferably folded slightly in advance of the outer tabs 30 and 32 so as to cause the triangular portions 23 and 24, for example, to overlie the outer surfaces of the tab 31 as most clearly shown in Fig. 4. The outer portions of the tabs 30 and 32 will then overlie the outer portions of the intervening tab 31.

Immediately prior to the application of the precut and prepared blank to the glass, the outer portions of tabs 30 and 32 (or the outer portions of all of the tabs) are heated sufficiently to activate a film of thermoplastic material carried by the under side of the cap blank so that when the blank is applied to and folded about the glass to form a cap, the overlying portions of the tabs firmly bond together so as to form a strong skirt 5. Preheating of the blank before applying to the glass has been found to be more desirable than the step of applying both pressure and heat to the blank during or after folding around the glass. It has been found that the heat carried by the preheated paper maintains the thermoplastic material on the under surface of the tabs in suitably tacky condition to permit positive and rapid bonding and sealing upon application of pressure during folding. The heat of the material (processed cheese) within the glass to which the cap is being applied, also exerts an effect upon the thermoplastic material and facilitates thorough bonding of the overlapping portions of the skirt.

In the event heat and pressure are applied during folding of the blank upon the glass, there is a tendency for the tabs to shift when the pressure is relieved, the thermoplastic material being in a somewhat fluid condition. The preferred method permits placement and adhesion while the temperature of the blank is falling, not while it is increasing.

It is to be remembered, however, that instead of thermoplastic material applied to the tabs of the cap, various adhesives such as solvent-activated adhesives or glues may be employed.

When the cap is applied, the thermoplastic disc 3 is pressed into intimate contact with the edge of the glass and because of its thermoplastic character, the heat of the glass causes such sheet material 3 to bond to the edge of the glass. Although the sheet material 3 may be composed of

any suitable flexible, thermoplastic material, it has been found that thermoplastic wax-rubber compositions of the character disclosed in Abrams Patents Nos. 2,054,112 and 2,054,115 are particularly suitable, as are mixtures of acrylic or vinyl halide resins with waxes and suitable plasticizers. Coating compositions of this character may be carried by a thin sheet of Cellophane, paper, cellulose acetate, or the like, and, becoming relatively soft and thermoplastic at rather low temperatures, become readily activated by reason of the heat of the product within the freshly filled glass.

It is also to be noted that the edge portions of the sheet material 3 engage the outer edge portions of the glass, thereby forming a complete seal over the mouth of the glass.

After the cap has been applied to the glass in the manner described, the contents of the glass will cool to normal temperatures. A partial vacuum will be formed between the contents 6 and the sheet material 3 within the space 7 (Fig. 1). This partial vacuum will cause the sheet material 3 to stretch inwardly into the position shown in Fig. 1. Some air will be admitted to the space immediately above the sheet material 3 and between such material and the cap 4 through minute openings between folded-over tabs of the skirt 5. It will now be apparent to those skilled in the art why the sheet material 3 is attached to the lower side of the cap blank only at the edge portions of the disc 3 and preferably only at spaced edge portions.

The completed container is therefore hermetically sealed by the sheet material 3 and this material protected in turn by the cap 4. The sealing material and the cap are applied simultaneously.

In the specific example given hereinabove, particular reference has been made to the use of the cap on processed cheese. It is evident that the cap may be applied to various other food stuffs such as jellies, jams, preserves and many other products. Moreover, the cap need not be applied to containers filled with a hot food stuff but instead may be applied wherever a thorough seal is desired.

We claim:

1. A closure member for jars, glasses and other containers comprising: a precut outer member composed of foldable fibrous material provided with a thermoplastic film on the lower surface, said member having a centrally disposed polygonal area of a size slightly greater than the outer diameter of the lip of the container to which it is to be applied, said area being defined by score lines formed in said member, an imperforate portion surrounding said area and a plurality of tabs extending from such polygonal area and imperforate portion whereby a multiple skirt composed of said imperforate portion and tabs is formed when the member is folded; and a sheet of thermoplastic, stretchable, moisture-resistant material on the lower surface of said outer member, said sheet of thermoplastic material covering the polygonal area and a part of the imperforate portion of the outer member, said sheet being attached at edge portions only to the lower surface of the outer member.

2. A closure member for jars, glasses and other containers comprising: an outer member composed of foldable material provided with a thermoplastic film on the lower surface, said member having a centrally disposed polygonal area, an imperforate portion surrounding said area and a plurality of tabs extending from such polygonal area and imperforate portion and a sheet of stretchable, moisture-resistant, thermoplastic material on the lower surface of said outer member, said sheet of thermoplastic material being adapted to cover the polygonal area and a part of the imperforate portion of the outer member, said sheet being attached at edge portions only to the lower surface of the outer member.

3. A closure member for jars, glasses and other containers comprising: an outer member composed of foldable material provided with a thermoplastic film on the lower surface, said member having a centrally disposed polygonal area, an imperforate portion surrounding said area and a plurality of tabs extending from such polygonal area and imperforate portion, alternate tabs being wider than the intervening tabs whereby a multiple skirt composed of said imperforate portion and tabs is formed when the member is folded, and a sheet of stretchable, moisture-resistant, thermoplastic material on the lower surface of said outer member, said sheet of thermoplastic material being adapted to cover the polygonal area and a part of the imperforate portion of the outer member, said sheet being attached at edge portions only to the lower surface of the outer member.

4. A closure member for jars, glasses and other containers comprising: a precut outer member composed of foldable material and adapted to cover the opening into a container and to have its edge portions folded around said opening to form a skirt and a sheet of stretchable, moisture-resistant, thermoplastic material on the lower surface of said outer member, said sheet of thermoplastic material being attached at edge portions only to the lower surface of the outer member, whereby said sheet is adapted to contact with and seal the opening of a container and to be drawn thereinto by the cooling of the heated contents.

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