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G. GLOCKER
CONTAINER CLOSURE
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2,437,515

Fig. 1.

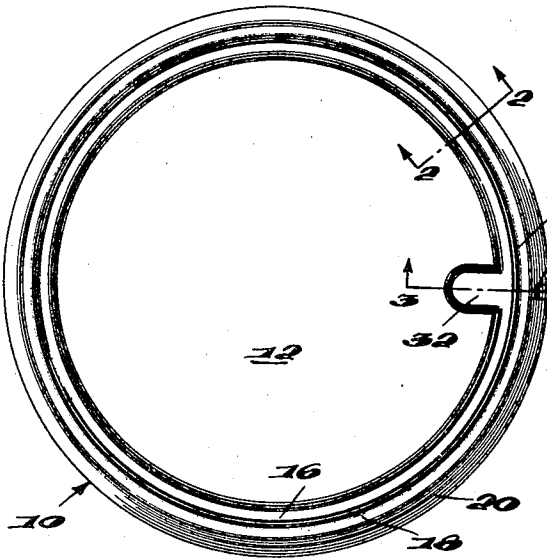


Fig. 6.

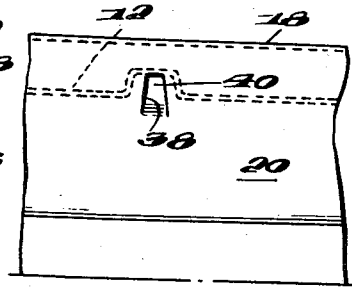


Fig. 2.

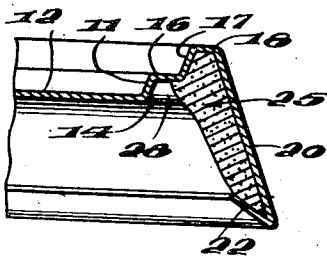


Fig. 3.

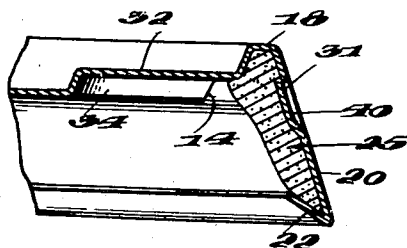


Fig. 4.

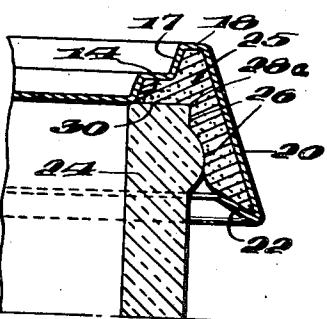
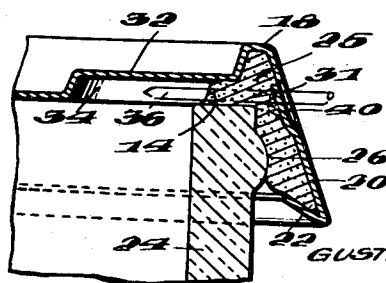


Fig. 5.



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CONTAINER CLOSURE

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3 Claims. (Cl. 215-40)

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The present invention relates to receptacle closures and more specifically pertains to closure caps of the type that may be readily arranged over the mouth of the receptacle and conveniently removed therefrom without material mutilation of the cap structure.

It is an object of the invention to provide a closure cap of such shape as to accommodate a plastic sealing composition substantially within the depending skirt portion of the cap adapted to engage the peripheral portion of the receptacle mouth in a hermetically sealed manner and to provide the cap with such a shape as to permit a portion of the sealing composition to be displaced during arrangement of the cap on the receptacle into sealing engagement with an annular end surfaces of the receptacle around the mouth of the opening.

Another object of the invention is to provide an annular abutment within and around the peripheral portion of the closure cap so as to limit the radial inward displacement of the sealing composition when the cap is arranged in position to close the opening of a receptacle.

It is known in the packing art to seal receptacles with closure members that are held in sealed association with the pouring opening under the influence of a differential in pressure between the interior and exterior of the receptacle. This pressure difference is developed by creating a partial vacuum within the receptacle by evacuating the container or by creating a rarefied atmosphere therein through the condensation of hot vapors within the receptacle. Thus the closure cap when in position over the mouth of the receptacle remains in the closed sealing position by reason of a greater atmospheric pressure applied to the exterior of the cap. The present invention is directed to a closure member of the type adapted to remain in sealed engagement with the mouth portion of the receptacle by such a pressure differential. Another feature of the cap structure pertains to the arrangement of an opening in the skirt of the cap for the introduction of a pointed implement to break the seal and to admit air to the interior of the receptacle and thereby disturb the partial vacuum to facilitate the removal of the closure cap.

A further object of the invention resides in providing means adjacent the implement-receiving opening in the skirt of the cap so as to prevent the escape of the somewhat plastic sealing composition outwardly through the opening through which the piercing implement is adapted to be inserted.

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A further object of the invention pertains to the shape and arrangement of the depending skirt in relation to the top portion of the cap member so as to provide an adequate quantity of sealing compound around the upper and outer corner of the receptacle neck and thereby avoid the possibility of an imperfect seal of the receptacle.

Other and further objects and features of the invention will be more apparent as the present disclosure proceeds and upon consideration of the following detailed description and the accompanying drawing wherein an exemplary embodiment of the invention is disclosed.

In the drawing:

Fig. 1 is a plan view of a closure cap embodying the invention;

Fig. 2 is an enlarged fragmentary sectional view of the cap taken on the line 2-2 of Fig. 1;

Fig. 3 is a similar sectional view taken on the line 3-3 of Fig. 1;

Fig. 4 is a fragmentary sectional view through a part of the closure cap taken approximately at the same annular position as Fig. 2 and showing the closure member applied to a receptacle;

Fig. 5 is a fragmentary sectional view taken generally through the same portion of the cap as Fig. 3 and showing a portion of the receptacle; and

Fig. 6 is a fragmentary side elevational view taken generally in the direction of the arrow 6 in Fig. 1.

Referring to the drawing, there is shown generally at 10 a closure cap of the type adapted to close the neck of a bottle or the mouth of a jar or the like in a so-called air-tight manner simply by arranging the closure cap in position over the mouth of the receptacle which is partially evacuated or contains a rarefied atmosphere to thereby establish a greater pressure on the outside of the cap. The top portion 12 of the cap is disc-shaped and substantially flat as shown in Fig. 1. The cap or closure member may be formed of sheet material such as a suitable metal alloy and the top portion extends upwardly at the periphery of the disc 12 to provide an annular wall 11 which is inclined upwardly and outwardly from the plane of the top portion 12. This inclined portion of the sheet material provides an annular abutment surface 14 on the interior of the cap and the purpose thereof will be apparent as the description proceeds. The sheet material forming the cap is then arranged substantially horizontal as shown at 16 and this band extends annularly of the closure member. Thereafter the

sheet material forming the cap is turned further upwardly to provide one wall 17 of a relatively high annular bead 18 around the top of the cap. This bead provides a relatively deep inverted channel thereunder inasmuch as the top of the bead 18 is raised materially above the surface or the plane of the flat disc portion 12.

The cap member includes a depending annular skirt 20. The skirt 20 is formed from an integral portion of the sheet material and preferably extends downwardly from the periphery of the bead 18 at an angle to provide a frusto-conical shaped skirt. The lower end portion of the skirt 20 is turned upwardly to provide means for retaining a sealing composition within the peripheral portion of the closure cap. The lower end of the skirt may be turned upwardly as shown at 22.

The closure cap includes and carries a resilient and yieldable plastic composition for sealing the cap with reference to a receptacle and a portion of a receptacle neck is illustrated at 24. Any suitable known compound may be employed as the sealing composition 25 such as one containing about thirty per cent water, approximately twenty-four per cent rubber, and the remainder of material fillers and protectives. The plasticity of such a compound may be adjusted so as to provide some displacement of the material during the arrangement of a cap over the mouth of the receptacle and in response to relatively slight pressure applied axially of the container. The plasticity and viscosity characteristics desirable in such a sealing composition and suitable for the purposes of the present invention are known in the art and disclosed in the patent to Dewey and Crocker 1,765,134. It is to be understood that other known sealing compositions may be employed for providing the hermetically sealed juncture between the closure member and the receptacle.

In carrying out the invention, a sealing composition of the types hereinabove referred to may be arranged around the inner surface of the skirt 20 so as to fill the inverted channel provided by the bead 18 and the V-shaped annular groove provided at the lower end of the skirt by the inturned portion 22. The sealing composition thus assumes a position somewhat as illustrated in Fig. 2. It will be observed that the inverted channel defined by the bead 18 and groove within the inturned flange 22 provides means for restraining the flow of the plastic composition as it is arranged around the periphery of the cap. The depending skirt is entirely covered with a relatively thick layer of the compound and a small additional quantity extends into annular chamber 28.

The cap member formed as hereinabove described may be arranged over the neck of the receptacle and the sealing material 25 then engages the peripheral portion 26 of the receptacle and provides a hermetically sealed contact with these portions of the container. A slight axial pressure is employed in arranging the closure member over the neck of the container and this force displaces the sealing composition into the annular chamber 28 and thereby provides sealed engagement of the plastic material with the annular end surface 30 of the receptacle as shown in Fig. 4. It will be observed that the annular abutment surface 14 limits the inward displacement of the sealing composition and prevents this somewhat plastic material from passing inwardly beyond the inner wall of the container neck. The plastic material also engages the

upper and outer corner 28a of the container wall so as to provide sealing of this portion of the cap with respect to the mouth of the receptacle. The bead 18 being arranged materially above the plane of the disc portion 12 and the feature of the skirt 20 flaring outwardly and downwardly from the periphery of the bead 18 provides a space for accommodating a sufficient quantity of the sealing composition outwardly of the corner 28a to insure a hermetically sealed joint around this portion of the closure assembly.

When a closure of the type herein described is employed for sealing receptacles by the so-called vacuum seal method, it is advantageous to provide a simple arrangement for breaking the vacuum within the receptacle so that the closure cap may be removed without material mutilation of the cap. The cap is accordingly provided with a passage or opening 31 through the upper portion of the skirt 20 at a point above the end surface 30 of the receptacle. A portion of the flat disc-shaped top 12 is deformed upwardly to form a radially arranged protuberance 32 and this protuberance provides a channel 34 thereunder which is arranged substantially in alignment with the opening 31. Thus an implement such as a pointed tool 36 may be inserted through the opening 31 to puncture the sealing compound and thereby vent the head space of the receptacle to the atmosphere. When the pressure within the receptacle is substantially equal to the pressure outside, the closure cap may be readily removed from the container without further mutilation of the cap structure.

The invention includes means for preventing the outward displacement of the sealing composition through the opening or passage 31 when the plastic material is arranged within the cap and during the application of the cap to the neck of the container or receptacle. This means may be provided by a portion of the sheet material which forms the skirt 20. Accordingly, in forming the opening 31, the skirt is cut in an inverted U-shaped outline as indicated at 38 in Figs. 1 and 6. The tongue 40 formed by such cutting of the sheet material is then upset inwardly of the skirt as shown in Figs. 3 and 5. The partly severed portion or tongue 40 prevents outward displacement of the sealing compound and at the same time permits the puncturing implement 36 to be quite readily introduced through the opening 31 so as to be easily pushed through the sealing composition when it is desired to remove the cap from the receptacle. The protuberance 32 and the channel 34 formed thereunder permit the pointed end of the tool 36 to pass entirely through the sealing material and particularly that portion within the chamber 28.

While the invention has been described with regard to various structural details of the cap structure and with reference to sealing compounds of specific types, it will be appreciated that changes may be made in the shape of the cap and in the materials forming the cap assembly. Such modifications may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A closure cap assembly comprising, a disc-shaped portion having a diameter substantially equal to the diameter of an inner surface of a receptacle neck, an annular wall extending upwardly from the periphery of said disc-shaped portion, an annular band around the periphery of said annular wall, an annular bead arranged

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around the periphery of said annular band and thereabove providing an inverted channel thereunder, an annular skirt depending from the peripheral portion of said bead, an inwardly directed flange carried by the lower portion of said skirt, plastic sealing material around the inner surface of said skirt extending from said flange into said inverted channel, said annular wall in cooperation with said annular band defining a chamber within which said plastic sealing material may be displaced to engage an end surface of the receptacle neck when the closure cap is arranged thereon, and said annular wall forming an abutment limiting the inward displacement of the plastic sealing material.

2. A closure assembly for sealing the neck of a receptacle comprising, a disc-shaped portion formed of sheet material, said sheet material extending upwardly at the periphery of the disc-shaped portion to form a raised portion and an annular chamber thereunder, an annular bead arranged above and outwardly of said raised portion providing an inverted channel around the periphery of said raised portion, a depending skirt carried by said annular bead, a layer of plastic material along the inner surface of the skirt filling said inverted channel whereby the plastic material in engaging peripheral portions of the receptacle neck is displaced into sealed engagement with an end surface of the neck, and a wall

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of said raised portion forming an annular abutment limiting the inward displacement of said plastic material.

3. In a closure cap, a disc-shaped portion, an annular wall extending upwardly from the periphery of said disc-shaped portion, an annular band outwardly of said annular wall, an annular bead around the periphery of said annular band and arranged thereabove, an annular skirt depending from said bead, said skirt having an opening therethrough, a layer of plastic and readily displaceable sealing material arranged around the inner surface of said skirt, and a tongue formed from an upset portion of the skirt substantially obstructing said opening and preventing the outward displacement of said plastic sealing material through said opening.

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