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C. A. GEDDES

3,028,033

CLOSURE

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FIG. 1

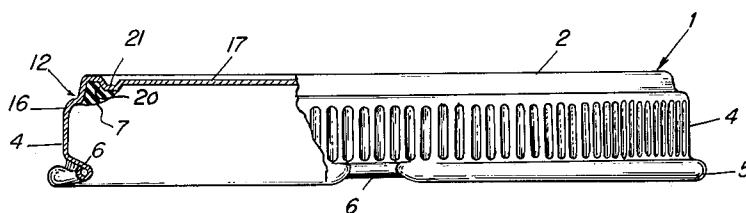


FIG. 2

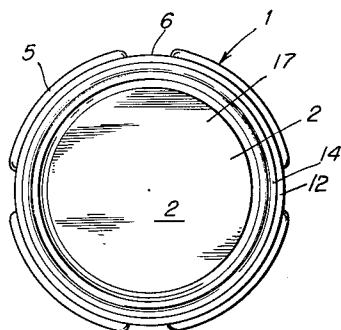
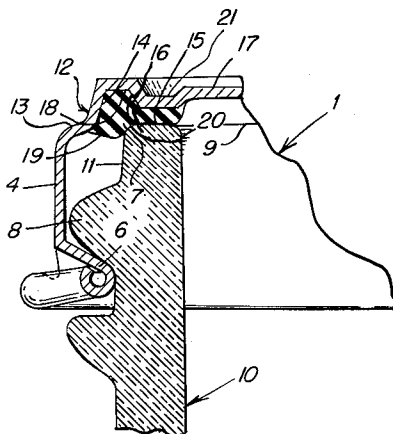


FIG. 3

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3,028,033 CLOSURE

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The present invention relates to an improvement in closure caps and more particularly to an improved cap of the type having an annular gasket applied to the top portion of the closure.

A widely used and relatively simple type of closure which provides an easily applied and relatively tight seal comprises a cup-like closure having an annular gasket applied to or seated adjacent to the outer edge of the closure cover. The gasket is adapted to form a seal with the top surface of the rim of the container and in some instances to form an additional seal with the outer edge and side surfaces of the container rim. This type of closure cap is particularly suited to flowed-in types of gaskets, of which increasing use is now being made.

With the presently used types of closures using these annular gaskets, it is necessary to apply relatively large amounts of gasket material to the closure to provide sufficient gasket material so that it will fit around the container rim to provide a satisfactory seal. In addition, with the presently used closures of this type, the formation of a tight seal between the gasket and the container rim requires a relatively large sealing force on the closure. This force tends to bend and otherwise distort the closure so that its removal and subsequent application is difficult.

Accordingly, an object of the present invention is to provide an improved closure.

Another object of the present invention is to provide a closure cap adapted to provide an effective seal with a sealing gasket of relatively small cross section.

Another object of the present invention is to provide a closure cap having a stiffened cover portion capable of withstanding relatively great sealing forces with minimum distortion.

Another object of the present invention is to provide a closure suitable for use in both hot and cold packing operations.

Another object of the present invention is to provide a closure with an improved top and corner seal.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is an elevational view partially in section showing a closure cap according to the present invention;

FIG. 2 is an enlarged fragmentary sectional view showing the closure applied to a container; and

FIG. 3 is a top plan view of the closure showing the annular step formed at the rim of the cover portion of the closure.

Referring to the drawings, a closure cap 1 is shown having a top 2 and a downwardly depending skirt 4 with a bead 5 at its lower edge having lugs 6 formed therein. Adjacent to the outer edge of the closure top 2, an annular gasket 7 is shown attached to the closure cover. In the preferred embodiment, the gasket 7 is a flowed-in gasket formed of a suitable gasket compound such as 100%-solid vinyl plastisol formed from vinyl resin and suitable plasticizers and containing pigments and filling

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or loading materials to vary the properties of the gasket as desired. Such a compound is set up by being subjected to a temperature of 350° to 380° for 60 seconds depending on the thickness. This is a 100%-solid material and consequently in its curing process there is no loss by weight or volume of any liquid material. Another advantage of this material is that it may be flowed onto a surface in its final form, as it will retain its original shape. Water or liquid base compounds tend to spread as the liquid portion seeks its lowest level. These gasket compounds are extruded into the closures in a stream of desired thickness and in the desired position in the closure. The solid flowed compounds such as vinyl plastisol are adhesive when applied so that they adhere tightly to the closure top and are thus secured in place in the closure. When used with a gasket according to the present invention, the compounds form a gasket soft enough to provide a good seal for cold packing operations and hard enough to seal effectively in hot packing operations.

In the embodiment of the closure shown in the drawing, lugs 6 are provided on the closure 1 for engagement with the interrupted thread portions 8 on the rim 9 of a container 10. In order to provide clearance for the inwardly extending lugs 6, the closure skirt 4 is necessarily spaced outwardly as shown from the side surface 11 of the container rim above the interrupted thread portions 8. In order to confine the gasket material forming the gasket 7 in a region adjacent to the container rim 9, a step 12 is formed at the juncture of the skirt 4 and the closure top 2. The step 12 comprises a generally horizontal portion 13 and a generally vertical riser portion 14. In a typical 53 mm. closure the horizontal portion 13 extends inwardly about .045 inch and riser 14 extends upwardly about .065 inch. As seen in FIG. 2, the riser or inner surface 14 of step 12 provides a confining wall for the outer portions of the gasket 7 and thereby limits the cross section of the gasket to the space adjacent to the upper surface 15 of the container rim 9. The gasket 7 is thus confined in an effective region above the container rim 9 so that when the closure 1 is applied to the container 10, the gasket material provides an effective seal across the upper surface 15 of the container rim 9 and, in addition, a portion 19 is enforced downwardly over the outer corner 16 of the container rim by the wall 14 of step 12 to form a corner seal. In a typical closure according to the invention, the gasket compound at 19 extends down the outer side of the container finish for a distance of about .025 inch.

In the preferred embodiment, a downwardly projecting stacking panel 17 is formed in the cover 2. This panel is suitably shaped to provide for the stacking of the containers 10, and its outer edge 20 also provides a channel 18 in cooperation with the inner wall 14 of the step 12 to receive the gasket 7 to assist in anchoring it into position on the closure top 2 above the container rim 9. In the preferred embodiment as shown in the drawing, the outer edge of stacking panel 17 projects downwardly below the remainder of the panel so that an upwardly facing channel 21 is provided at the stacking panel edge. Step 12 and channel 21 combine to provide a double channel stiffener composed of oppositely facing channels 18 and 21 to further stiffen the closure.

The gasket 7 positioned in the channel 18 and the adjacent portions of the closure is effective to provide a tight seal with the container rim while at the same time having a minimum volume due to its effective positioning by the closure step 12 and channel 18. The amount of gasket compound used may be reduced to one-half or one-third the amount of material previously used for flowed-in gaskets. This saving of material is very important with the flowed-in gasket compounds of the 100%-

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solid type as they have a relatively high cost and as a very small saving in the cost of each gasket amounts to a large total saving in the manufacture of closure caps where millions are produced each year. Channel 21 provides an additional stiffening effect for the closure top.

The provision of the step 12 at the rim of the container 10 provides a stiffening effect at the edge of the closure cap immediately adjacent to the gasket 7 at the point where the closure is subjected to the greatest strain during the sealing action. This channel-like stiffening action is particularly important in closures such as the preferred embodiment having lugs 6 at spaced locations on the closure skirt 4 or closures having interrupted thread fasteners. In such closures, the sealing force is concentrated above the lugs and the portions of the top intermediate the lugs is held less tightly against the container rim. By providing the step 12, this portion between the lugs is stiffened so that the entire circumference of the closure rim is drawn downwardly more evenly by the lugs 6 so that the gasket 7 makes a good sealing contact entirely around the container rim, including any low portions or dips which have been inadvertently formed therein. Step 12, therefore, in addition to its above described gasket controlling function, also has a stiffening effect on the closure 1 to provide for a more effective initial seal. It also facilitates the removal and re-application of the closure 1, as it prevents displacement of the closure lugs 6 due to the deformation of closure top 2 and skirt 4.

Although the preferred embodiment of the closure 1 has been illustrated and described with lug fasteners 6, an interrupted thread or other suitable means may be used on the closure skirt 4 to cooperate with an interrupted thread or other suitable fastener means on the container 10.

It will be seen that an improved closure cap has been provided adapted for use with an annular flowed-in gasket which provides an effective seal and which at the same time has a minimum cross-sectional area. The closure cap thus preserves gasket material and at the same time assures an effective seal by controlling the gasket contact with the sealing surfaces of the container. The provision of the step at the rim of the closure also provides a stiffening action for the closure which prevents warping or bending of the closure and which thereby insures the desired sealing action and facilitates removal and re-application of the closure. The improved closure is relatively simple to manufacture and is particularly adapted for use with 100%-solid flowed-in gaskets. With these flowed-in gaskets, the closure cap of the present invention provides an effective sealing action while at the same time reducing the amount of flowed-in gasket material required and allowing the more expensive and more desirable gasket materials to be economically used.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A lug type closure for a threaded container com-

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prising a top, a depending skirt, inwardly extending container thread engaging lugs on said skirt, an annular step formed at the junction of said skirt and said top having a generally horizontal portion extending inwardly over only a portion of said lugs and having a generally vertical riser portion connecting said horizontal portion and said top, a downwardly projecting annular bead on said top spaced inwardly from the riser portion of said annular step and forming a relatively narrow downwardly facing gasket anchoring channel between said bead and said riser portion of the step, said horizontal portion of said step being below the bottom of said annular bead, an annular gasket at the outer edge of said top positioned at least partially in the channel formed between the riser portion of said step and the outer surface of said annular bead and extending radially inwardly and upwardly from the outer and lower edge of said channel at said horizontal portion of said step over at least a portion of said bead, whereby said sloping gasket surface is adapted to form a corner seal with the container and the annular bead on the top forms a top seal between the gasket and the container rim.

2. A sealed package comprising a container having closure securing threads beneath and spaced from its rim and a lug type closure for said container comprising a top, a depending skirt, inwardly extending thread engaging lugs on said skirt engaging said closure threads, an annular step formed at the junction of said skirt and said top having a generally horizontal portion extending inwardly over only a portion of said lugs and having a generally vertical riser portion above said lugs and connecting said horizontal portion and said top, a downwardly projecting annular bead on said top spaced inwardly from the riser portion of said annular step and above a major portion of the container rim forming a relatively narrow downwardly facing gasket anchoring channel between said bead and said riser portion of the step, said horizontal portion of said step being below the bottom of said annular bead and being at about the level of the container rim, an annular gasket at the outer edge of said top positioned in the channel formed between the riser portion of said step and the outer surface of said annular bead and extending radially inwardly and upwardly from the outer edge of said channel at said horizontal portion of said step over at least a portion of said bead, whereby said sloping gasket surface is adapted to form a corner seal with the container rim and a top seal between said cover bead and the top of the container rim.

References Cited in the file of this patent

UNITED STATES PATENTS

829,980	Lorenz	Sept. 4, 1906
1,118,606	Weissenthanner	Nov. 24, 1914
2,085,934	Von Till	July 6, 1937
2,109,805	Steward	Mar. 1, 1938
2,456,972	Maeder et al.	Dec. 21, 1948
2,484,039	Krueger	Oct. 11, 1949
2,489,407	Foye	Nov. 29, 1949
2,528,506	Foye	Nov. 7, 1950

FOREIGN PATENTS

402,623	Great Britain	Dec. 7, 1933
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