

Sept. 9, 1969

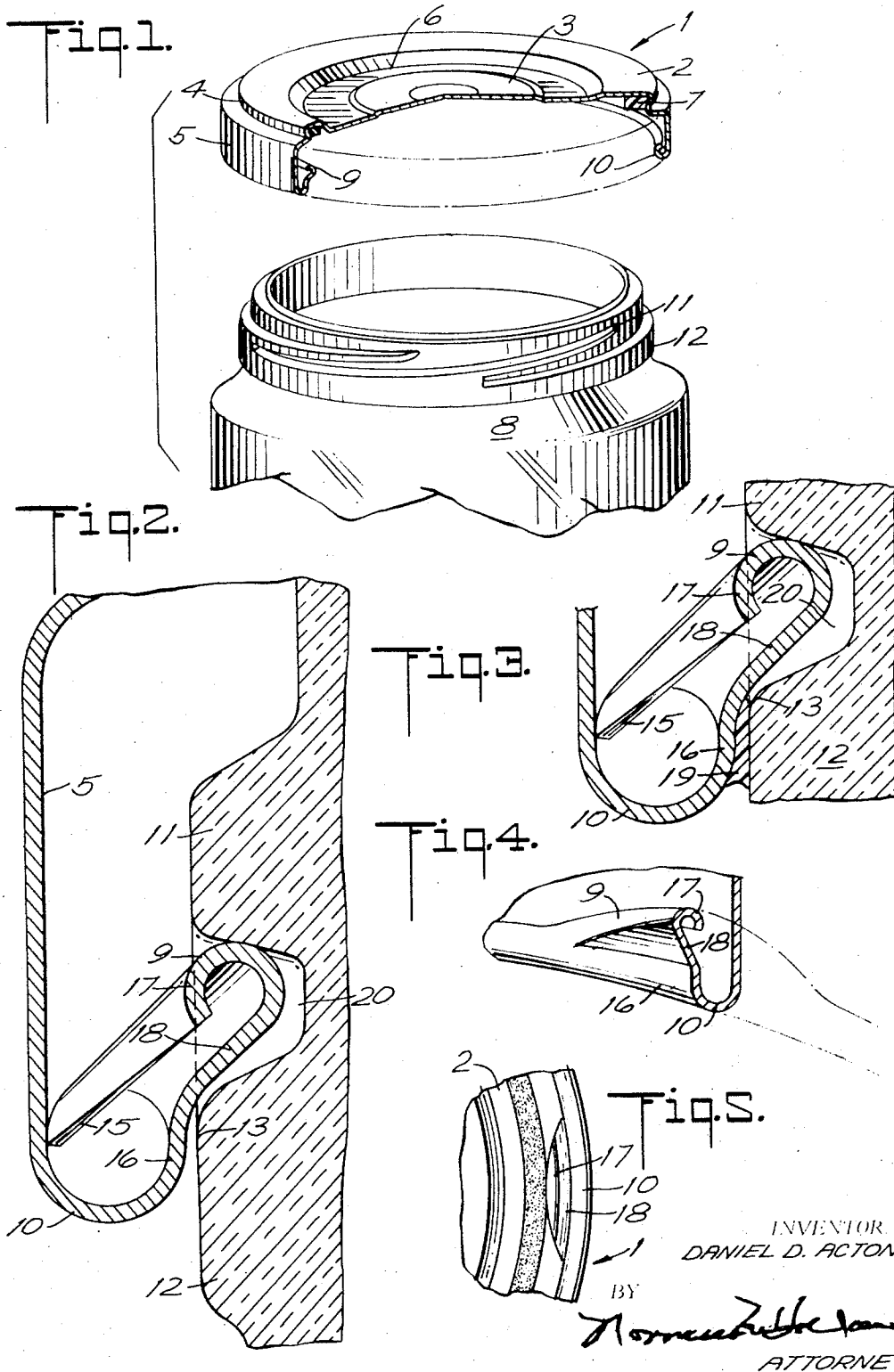
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3,465,908

CLOSURE CAP AND SEALED PACKAGE

Filed Feb. 27, 1967

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

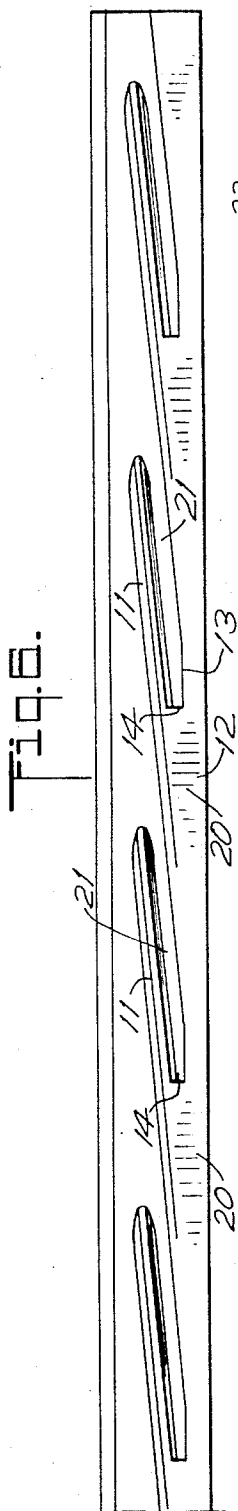


Fig. 7.

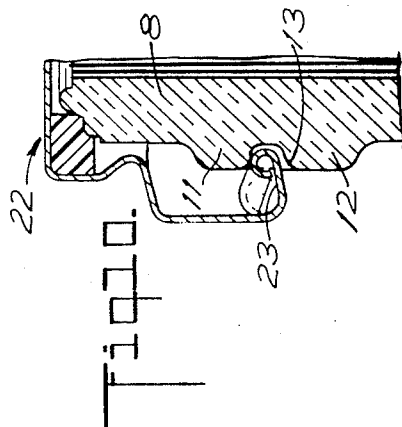
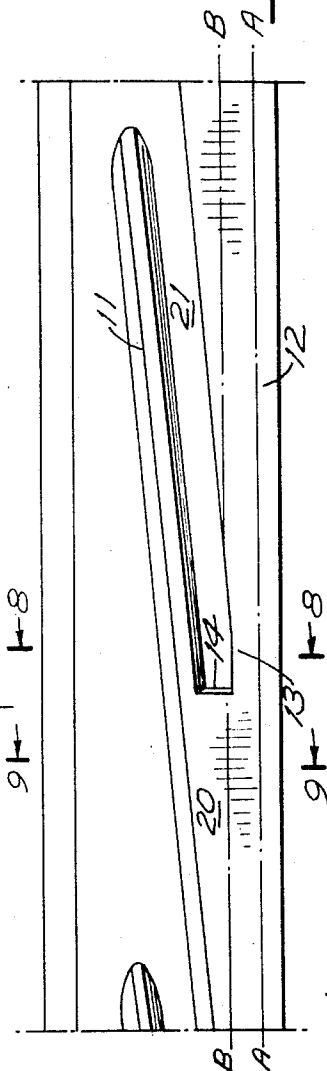
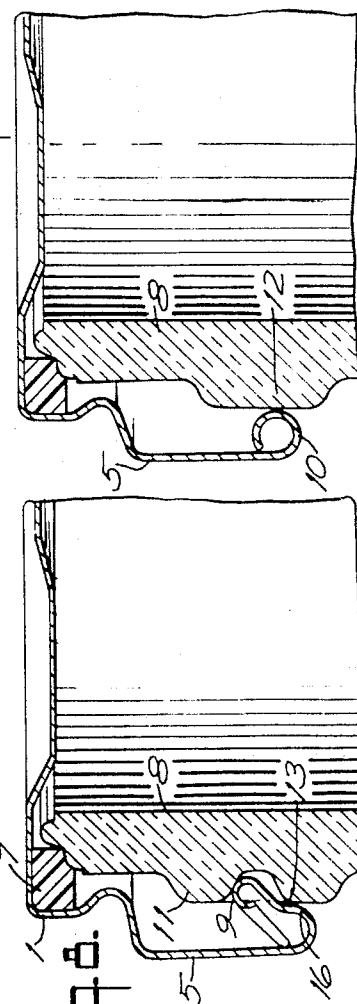


Fig. 9.



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## CLOSURE CAP AND SEALED PACKAGE

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8 Claims

### ABSTRACT OF THE DISCLOSURE

A sealed package comprising an improved closure cap and an improved container finish where the package is sealed by twisting lugs on the closure cap into engagement with lug engaging members on the container and where the lower portion of the closure cap skirt, including the improved lugs, is constructed for fitting snugly about an outwardly facing ledge and about the improved glass finish on the container for forming a barrier to prevent insect infestation or the entrance of other undesirable matter under the closure cap skirt after the package is sealed.

### FIELD OF INVENTION

The present invention relates to an improved closure which cooperates with the improved glass finish of the container to provide a sealed package which prevents insects from infecting the space between the skirt of the cap and the glass finish.

### PRIOR ART

More particularly this invention is an improvement upon the closure cap and upon the glass finish of the container disclosed and claimed in Patent No. 3,174,640 owned by the assignee of the present invention. The closure and container in the above patent provide an excellent hermetic seal which may be subjected to high temperature processing and to a long shelf life without impairment. The closures and containers of the above patent have been sold in large quantities for several years.

### SUMMARY OF INVENTION

The present invention aims to provide an improved lug construction with a reduced inward extension with respect to the inside of the inturned bead and which does not impair the rounded contour of the cross-section of the inturned bead as to substantially the lower half of the bead. In addition the invention aims to combine said closure with a glass container having an annular bead with a ledge at its upper portion varying in height to cooperate with the inner sides of the bead of the closure to prevent infestation of the space between the skirt of the cap and the outer wall of the container.

Accordingly, an object of the present invention is to provide an improvement upon the closure and the container glass finish of the above patent.

Another object of the invention is to provide a glass container having an annular ledge adapted to fit snugly into the inturned bead of the improved closure.

Another object of the invention is to provide a container with an annular bead having raised portions intermediate the lower ends of the plurality of closure threads or lugs on the glass finish to provide a substantial reduction in the space between the inner lower portion of the skirt of the cap and the glass finish.

Another object of the invention is to provide an improved sealed package through the cooperation of the improved closure and the improved glass finish of the container to prevent infestation of the space between the

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inside of the skirt and the outer wall of the container by insects.

Another object of the invention is to provide a sealed package which bars the entry of insects between the lower edge of the cap and the container and which permits any overflowed product between the inside of the skirt and the outer wall to be washed away.

Other and further objects of the invention will be obvious upon and 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.

### BRIEF DESCRIPTION OF DRAWINGS

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 exploded perspective view illustrating a preferred embodiment of the cap of the invention and a preferred embodiment of the cooperating container finish;

FIG. 2 is an enlarged detail vertical sectional view of the cap shown in FIG. 1 taken through a lug on the cap skirt and shown in sealed position on the container finish shown in FIG. 1;

FIG. 3 is a enlarged fragmentary vertical perspective view of the lug and container finish shown in FIG. 2 embodying a sealant;

FIG. 4 is an enlarged perspective view partially in section illustrating the lug of the cap shown in FIG. 1;

FIG. 5 is a fragmentary enlarged bottom plan view of the closure cap of FIG. 1;

FIG. 6 is an elevational view of a preferred embodiment of the container finish flattened to show the finish in a single plane;

FIG. 7 is an enlarged fragmentary elevational view of a portion of the container finish of FIG. 6;

FIG. 8 is a vertical section of the container finish taken along line 8—8 on FIG. 7 and illustrating the cap shown in FIG. 1 in sealed position on the finish with the section taken through a cap lug;

FIG. 9 is a vertical section of the container finish shown in FIG. 7 taken along line 9—9 and illustrating the cap shown in FIG. 1 in sealed position on the finish with the section taken through a portion of the bead intermediate the cap lugs;

FIG. 10 is a vertical section of the container finish as shown in FIG. 8 and illustrating a known type of lug cap in sealed position on the container finish with the section taken through a cap lug; and

FIG. 11 is a vertical section of the container finish as shown in FIG. 9 illustrating a known type of lug cap applied to the container finish with the cap section taken intermediate the cap lugs.

### DESCRIPTION OF PREFERRED EMBODIMENTS

A preferred embodiment of the improved closure cap will now be described with particular reference to FIGS. 1, 2, 4 and 5. The cap is illustrated with a cut gasket 1 for the sealing member and where the upper portion of the cap follows the general form as described in the above-mentioned U.S. Patent No. 3,174,640 includes a stepped skirt having a crown in its upper portion. The improved closure of the present invention may be provided with upper portions of differing construction and employing differing sealing gaskets.

A preferred embodiment of the improved closure cap 1 embodies a cover 2 which may conveniently include a vacuum indicating flip panel 3.

Preferably the cap has a stepped skirt including a crowned upper portion 4 and an enlarged lower skirt por-

tion 5. A recessed panel 6 in the cap cover forms a stacking panel for receiving the bottom of another container to facilitate the stacking of sealed packages. A sealing gasket 7 is provided preferably in the corner between the cap cover and the crown portion 4. This may be a cut gasket or a flowed-in plastic gasket or any other suitable gasket for forming a seal with the glass container 8. Improved container engaging lugs 9, which will be described in detail below, are formed on an inwardly turned curl or bead 10 at the lower edge of the skirt for engaging the container 8.

The lower portion 5 of the cap skirt is best illustrated in FIGS. 2 and 4. The inwardly rolled bead 10 preferably has a generally rounded cross-section with its cut edge 15 adjacent the inner surface of the cap skirt except at the container engaging lugs 9 which are formed at intervals on the bead 10. As best seen in FIG. 2, the inner side 16 of the bead 10 forms a snug fit with the adjacent surface of the container 8 to permit rotation of the cap and to prevent insects from passing between these surfaces into the space between the skirt and the finish as will be described below.

As shown in FIG. 2, the lug 9 extends inwardly and upwardly above the innermost portion 16 of the bead 10 thus leaving a continuous annular surface around the complete circumference of the cap skirt at inner portion 16 on cap bead 10.

The lug 9 of the cap preferably has a generally outwardly rolled and relatively tight curl 17 formed from the free edge of the metal at its upper and inner portion for engaging the container threads 11. Curl 17 on lug 9 on the closure is formed at the upper end of a flared support portion 18 connecting the container lug engaging curl 17 with the inner side 16 of the cap bead 10.

A preferred container finish for cooperating with the above-described closure cap is illustrated in FIGS. 6 and 7. This finish comprises an outwardly projecting annular bead or shoulder 12 including a series of inclined lugs or threads 11, for engaging the cap lugs 9 and an outwardly and upwardly facing ledge or surface 13 below the container threads 11.

In order to control the final sealed position of the closure cap 1 on the container 8, stops 14 are provided at the lower portions of the inclined container threads 11. In the preferred embodiment illustrated, the areas in advance of the stops 14 and underneath the adjacent threads 11 are filled in as illustrated at 20 (FIG. 2 and FIG. 6) to provide additional barrier area on surface 13 to prevent the entrance of insects or other foreign matter under the sealed cap both with the cap of FIG. 1 and with other caps as will be described below.

FIGS. 8 and 9 show the cap of FIG. 1 in sealed position on the container finish illustrated in FIGS. 6 and 7. In FIG. 8 the vertical section is taken through the cap skirt at the lug 9 and in FIG. 9 the section is taken through the cap skirt bead at a position intermediate the lugs 9. As illustrated in FIGS. 8 and 9, it is clear that a snug fit is provided which creates an insect barrier around the entire circumference of the cap skirt between the innermost portion or surface 16 on the cap skirt and the surface 13 on bead 12 of the container finish. This barrier formed by the surfaces 16 and 13 occurs around a circumferential zone on the preferred container finish at about the position of the line A—A on FIG. 7.

Not only does the underside of the lug 9 make a snug fit with container ledge 12 so that the surfaces 16 and 13 provide a barrier around the entire lower edge of the cap skirt, but at the same time, an effective and resilient cap lug construction is provided for forming a tight hermetic seal with a relatively wide range of tolerances for both the container finish and the cap dimensions. The lug and glass finish provide excellent ranges of cap application and removal torque values. This permits the cap 1 to be applied at high speed by automatic machinery with a cap application torque sufficient to keep the cap tightly in place during package shipment, storage, and display while

permitting the cap to be readily removed by the consumer. The slight gap or clearance between the cap bead 16 and the container bead 12 may be as little as .001 inch but it should be sufficient to permit rotation of the cap and slight variation or tolerance in the size of the container and enable any overfilled product to be washed out of the space between the skirt and glass finish.

The annular surface 13 extending about the container below the container threads 11 varies in height as shown more particularly in FIGS. 6 and 7 so that the vertical width of the surface 13 is at a minimum at the lower end of each thread as shown to the right of the stop faces 14. The maximum vertical height of the surface is greatest at the lower end of each thread 11 on the opposite side of the stop face 14. The upper portion of the annular surface 13 fills in the space under the threads 11 and leaves a gap 21 between the bottom of each thread and its upper inclined surface. Preferably this space 21 is sufficient to accommodate the vertical section of the cap lug and to give sufficient clearance for the lug to pass under the thread without interference but fitting sufficiently snug to minimize any excess space in order to prevent insects from passing the lug if one should get in between the lug and the face 14.

When the cap of the preferred embodiment of the invention is applied to the container finish the lug passes under the thread 11 as shown in FIG. 8 and usually engages the stop face 14. If it should not do so there would be a space between the front end of the lug and the face 14, however, the fit of the bead at this point would still prevent insect entrance.

The inner side 16 of the bead in the cap of the preferred embodiment would give ample overlap as shown in FIG. 8. Hence maximum protection against insects is provided with the preferred embodiment of the closure. The annular zone of protection would extend down to the line A—A shown in FIG. 7 which is substantially below the lowest portion of the upper side of the surface 13 on the glass container.

The improved finish is also effective with closure caps having other types of lugs. For example, the cap shown in the above mentioned Patent No. 3,174,640 is shown in sealed position in FIG. 10 of the drawings, the section being through the lug. The cap is shown in sealed position in FIG. 11 with the section through the bead. The lug fills the space between the thread 11 and the ledge 13. In addition, the inclined upper side of the ledge 13 on the container permits the inner side of the bead 24 on the closure to telescope over the bead 12 and form a snug fit which prevents insects from passing between the glass and the cap bead.

The improved container finish cooperates with the preferred embodiment of closure to give a greater margin of safety in preventing insects from getting under the skirt of the cap; fruit flies, for example, or one of the troublesome insects. In addition, the glass finish provides a good margin of safety in connections with lug caps of other types by sizing the bead of the cap to fit snugly about the outer surface of the bead on the container. On the latter type of closures the inner side of the bead of the cap will extend about the outer side of the bead on the container along the zone B—B shown in FIG. 7.

The closure and finish described above provides an effective barrier for insects. If a hermetic or more nearly hermetic seal is desired at the bottom of the closure, this may be obtained as shown in FIG. 3. A sealing material 19 is then provided between the inner side of the inturned bead 10 of the cap and the upper corner of the bead 12 on the container. This sealing material may conveniently be a disc of rubber or impregnated paper which may be snapped over the glass finish onto the upper surface of the bead 12. If preferred, hot melts or paraffin wax may be applied to the inner side of the bead on the closure or on the upper outer portion of the bead on the glass container. The discs of rubber or impregnated paper may

be machine applied to the container. Hot melts or paraffin wax may be applied about the upper part of the bead on the container by rolling the container against an elongated wax applicator or against a suitable wax applying brush or in any other suitable manner. The added sealing material can be made to form either a hermetic seal or a near hermetic seal. The snug fit between the bead on the closure and the bead on the container minimizes the amount of sealing material required and simplifies and sealing operation.

It will be seen that the improved closure and glass finish cooperate in the sealed package to provide an effective barrier against foreign matter including insects. The effective barrier is provided with or without additional sealing elements and in a package which provides an improved hermetic seal. The improved cap lug and bead cooperate with the container bead to prevent insects from getting under the skirt of the cap.

As various changes may be made in the form, construction and arrangements 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 sealed package comprising the combination of a container having cap lug engaging members positioned below its rim and an annular ledge positioned below said members having upwardly and outwardly facing surfaces, a closure cap telescoped over the rim of the container having a cover and a depending skirt, an inwardly rolled bead extending around the lower edge of the skirt, spaced portions of said bead comprising container engaging lugs, said lug portions of said bead extending inwardly and upwardly toward the cap cover and terminating in a curl positioned inwardly of the remaining portions of said bead and in engagement with a lug engaging member on the container and above the upwardly facing surface of said ledges, and the lower portion of the bead around its entire circumference being positioned closely adjacent to the outwardly facing surface to form an insect barrier.

2. The sealed package as claimed in claim 1 including a stop portion on the underside of at least one of said cap lug engaging members.

3. The sealed package as claimed in claim 1 in which the upper part of the cap lug is above the normal upper portion of the cap bead.

4. The sealed package as claimed in claim 1 in which the outer surfaces of the cap lug engaging members and

the outwardly facing surface of the ledge are substantially vertically aligned.

5. The sealed package as claimed in claim 1 wherein a sealant is disposed between said cap and said ledge.

6. A closure cap for a container having cap lug engaging members positioned below its rim and an annular ledge positioned below said members having upwardly and outwardly facing surfaces, said closure cap having a cover and a depending skirt, an inwardly rolled bead extending around the entire lower edge of the skirt, spaced apart portions of said bead comprising container engaging lugs, said rolled bead being generally annular in cross section intermediate said lugs and generally semi-circular at said lugs, said lugs extending from the inner edge of the semi-circular portion of said bead, said lug in cross-section having a first generally upwardly directed arcuate portion extending from said inner edge and terminating in an inwardly and upwardly extending straight portion, said straight portion terminating at an outwardly rolled curl position radially inwardly of the remaining portions of said bead for engagement with a lug engaging member on the container and above the upwardly facing surface of said ledge, and the lower portion of the bead around its entire circumference including the inner part of said semi-circular portions being adapted for being positioned closely adjacent to the outwardly facing ledge surface to form an insect barrier.

7. The cap as claimed in claim 6 in which said straight portion of said lug has an angle of about 45° from the vertical.

8. The cap as claimed in claim 6 in which said cap skirt is generally vertical.

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