Jan. 3, 1939. J. E. SHARP 2,142,380

SCREW CLOSURE

Filed Sept. 19, 1936

Fig. 1.

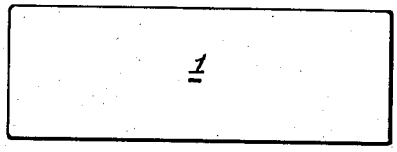


Fig. 2.

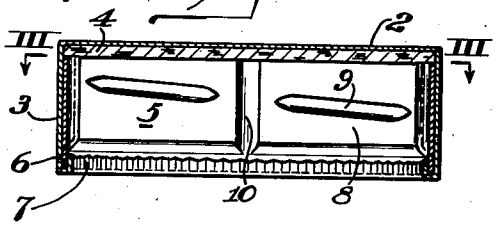


Fig. 3.

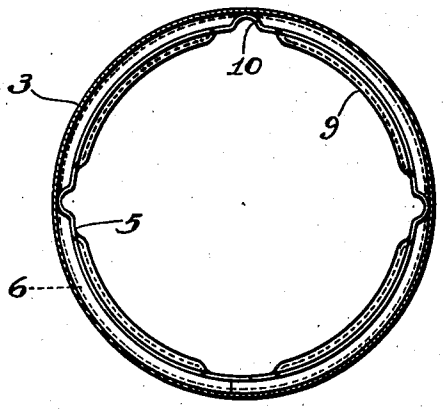


Fig. 4.



Fig. 5.

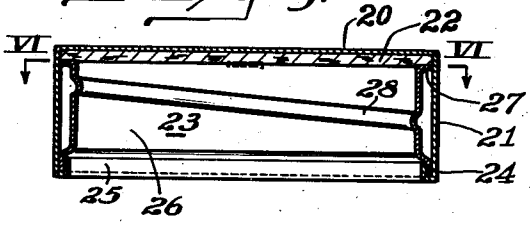


Fig. 6.

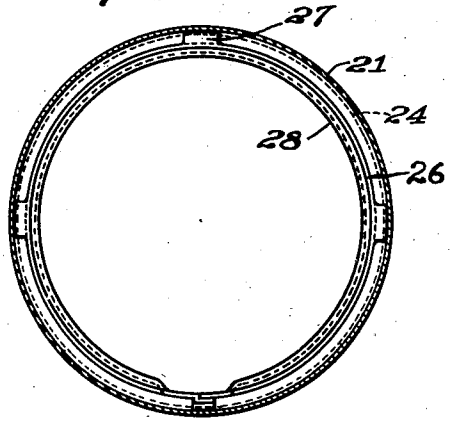


Fig. 7.

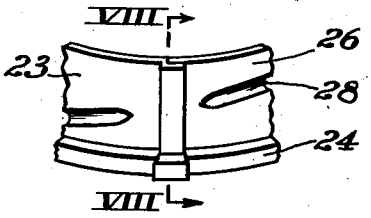
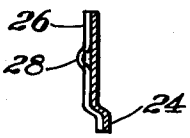


Fig. 8.



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SCREW CLOSURE

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Application September 19, 1936, Serial No. 101,616

4 Claims. (Cl. 215—44)

This invention relates to closures for bottles, jars and the like, and relates particularly to screw closures of the hidden thread type.

It is well known that manufacturers of containers, particularly of glass and the like, are allowed wide tolerances for dimensions and smoothness. These variations often cause difficulty with screw closures in both application and seizures afterwards that make removal troublesome. These variations and seizures resulting therefrom and from other causes, such as coatings upon the threads, built up during the use of the container, increase the difficulty of removal of a screw closure, and often cause the destruction of a screw closure of the hidden thread type, since it is quite easy, with most closures of this type, to dislocate permanently the threaded element and the outer shell. It is an object of this invention to provide a screw closure of the hidden thread type characterized by the threaded element having sufficient flexibility to accommodate the variations of container finish and to release seizures resulting from this and other causes without requiring undue force. It is a further object to provide an inexpensive closure of the hidden thread type characterized by protection of the threaded element from collapse. In providing a closure with such characteristics I not only provide one which in its original application and subsequent re-use will not be attended by the usual seizures and the like but also one which is certain of a longer period of usefulness than the known closures of the type.

These and further advantages will be apparent when considered in the light of the following detailed description of the accompanying drawing, in which:

Fig. 1 is a side view of the closure of this invention;

Fig. 2 is a central cross sectional view of one embodiment of this invention;

Fig. 3 is a cross sectional view taken on the line III—III of Fig. 2;

Fig. 4 is a fragmentary perspective view of the threaded element of Fig. 3;

Fig. 5 is a central sectional view of a second embodiment of this invention;

Fig. 6 is a cross sectional view taken on the line VI—VI of Fig. 5;

Fig. 7 is a fragmentary perspective view of the threaded element of Fig. 6; and

Fig. 8 is a cross sectional view of the threaded element taken on the line VIII—VIII of Fig. 7.

In Fig. 1, the closure generally designated as 1 is revealed as presenting the smooth, unmarked exterior gained by and demanded in a screw closure of the hidden thread type.

In Figs. 2, 3 and 4, the various details of one form of the invention are illustrated. Referring now to Fig. 2, the closure consists of an external metallic shell, preferably of aluminum, having a top 2 and a depending skirt 3. A sealing insert 4 of suitable resilient material is held within the shell and against the top 2 thereof by means of the band generally indicated at 5, the upper edge of which is slightly embedded in the resilient insert. The lower offset portion 6 of the band, as shown in Fig. 2, has folded about it the edge 7 of the shell skirt 3. The skirt edge 7 is preferably crimped against the band portion 6, and when so crimped will cause some complementary deformation of the band portion 6 to lock the band and shell against rotation. The band 5 also has an upper portion 8 which carries a fragmentary thread 9 that is directed inwardly from the closure shell. This band portion is spaced from the shell wall by reason of the offset portion 6 and the vertical ribs 10, shown to advantage in Figs. 2 and 3, which are disposed towards the shell to space positively the upper and otherwise unsupported edge of the band.

In Fig. 4, the band of this embodiment is disclosed as a divided one having an oblique line of division between abutting ends. This joint is illustrative of one manner of joining the band ends so that the ends can move relatively to each other to a degree sufficient to give the flexibility which I have found necessary to guarantee easy removal of the closure.

Figs. 5, 6, 7 and 8 are related in the illustration of a second embodiment of the invention. Referring now to these figures, the closure in this form has a shell with a top 20 and a depending skirt 21. A sealing insert 22 is held against the shell top 20 by means of the divided band, generally indicated at 23, which in turn is secured within the shell by means of an offset portion 24 which has turned inwardly about it the edge 25 of the shell skirt 21. The band 23 has an upper portion 26 which is spaced from the shell skirt 21 by both the offset portion 24 and the lugs 27, shown to advantage in both Figs. 5 and 6, which are integral with the band and serve to prevent collapsing of the top of the band against the shell skirt. As in the first embodiment, the upper band portion carries a thread-like deformation identified in the second embodiment as 28.

Figs. 7 and 8 serve to illustrate further the overlapping band joint shown in Fig. 6. The joint is formed by one end of the band fitting within a

substantially Z-shaped seat in the other end. This form of joint also permits the ends to move relatively to each other, at least in the upper portion 26 of the band, so that the band will have the desired flexibility. It should be noted that the forms of joint shown in both Figs. 4 and 7 are merely illustrative, and that other forms can be substituted, such as, for instance, a loose interengagement or a vertical abutting of the band ends.

In the foregoing description it has been pointed out that the sealing insert is retained within the shell by the divided band that bears the thread-like deformations. This relation makes for easy assembly of the closure in that the sealing insert is placed within a drawn blank which has, if necessary, been trimmed to size, after which the band is placed within the shell against the sealing insert and secured against rotation by folding over or beading the shell edge against the offset portion of the band, which is preferably followed by a crimping operation.

The assembled closure of either embodiment has the divided band so joined that at least the upper portions of the ends can move relatively to each other to accommodate the closure to variations in container finish, and to release the thread-like deformations of the band in case of seizure between such deformations and complementary deformations upon the container, whether the seizure be caused by oversized finish, lack of smoothness, corrosion, or adhesiveness of container contents. In both forms the band is supported at intervals by integral portions of itself which prevent permanent deformation or collapse of the same under the service conditions of the closure.

While the invention has been illustrated with reference to two embodiments, the appended claims are not intended to be limited to those embodiments alone but to extend to all closures that come within the spirit of the invention.

I claim:

1. A closure of the hidden thread type, comprising an external shell, a sealing insert, and an expansible, tubular band retaining said insert, said band having an upper portion bearing thread-like conformations and integral, circumferentially spaced reinforcing means disposed against the shell wall, and a lower offset portion locked against rotation to the shell.

2. A container closure of the hidden thread type including in combination, an external shell, and a divided, expansible, tubular band, said band being retained within said shell by an overlapped shell portion in a manner preventing relative rotation between the shell and band and having an upper portion spaced from said shell substantially throughout the entire periphery of said portion, said upper portion being provided with inwardly disposed, thread-like conformations and outwardly disposed projections of such number and spacing to permit expansion of said band without permanent dislocation thereof during rotation of the closure relative to a container.

3. A container closure of the hidden thread type including in combination, an external shell, and a divided, expansible, tubular band, said band being retained within said shell by an overlapped shell portion in a manner preventing relative rotation between the shell and band and having an upper portion spaced from said shell substantially throughout the entire periphery of said portion, said upper portion being provided with inwardly disposed thread-like conformations, and outwardly disposed ribs extending transversely of said portion of such number and spacing to permit expansion of said band without permanent dislocation thereof during rotation of the closure relative to a container.

4. A container closure of the hidden thread type including in combination, an external shell, and a divided, expansible, tubular band, said band being retained within said shell by an overlapped shell portion in a manner preventing relative rotation between shell and band and having an upper portion spaced from said shell substantially throughout the entire periphery of said portion, said upper portion being provided with inwardly disposed, thread-like conformations, and outwardly disposed vertical ribs of flexible shape and of such number and spacing to permit expansion of said band without permanent dislocation thereof during rotation of the closure relative to a container.

JOHN E. SHARP.