Jan. 22, 1963 D. H. HESTER 3,074,578

CONTAINER CLOSURES

Filed Dec. 26, 1956

FIG. 1.

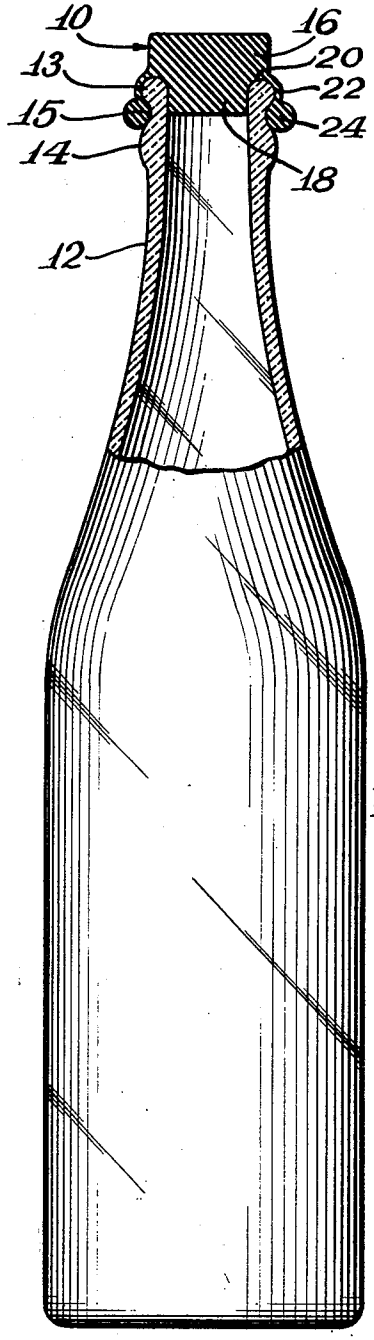


FIG. 2.

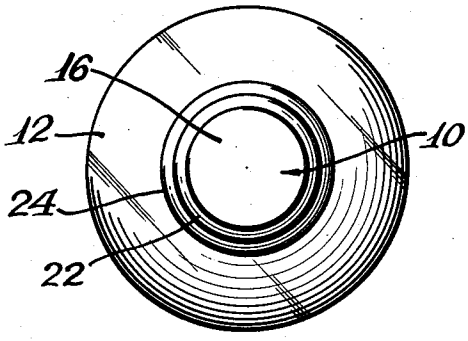


FIG. 3.

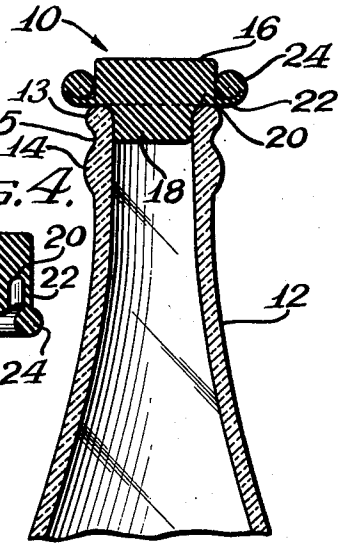
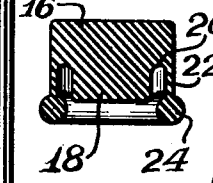


FIG. 4.



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United States Patent Office 3,074,578 Patented Jan. 22, 1963

3,074,578

CONTAINER CLOSURES

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Filed Dec. 26, 1956, Ser. No. 630,490
4 Claims. (Cl. 215—41)

My invention relates to a replaceable container closure. Inventors have worked long and hard at replaceable container closures or stoppers in order to arrive at an article which is effective to contain pressure within the container, to exclude air, to be compact particularly in not extending far above the mouth of the container, to be easy to put on and take off the container, to be proof against deterioration, not to contaminate the contents of the container, and to be inexpensively manufactured. My novel container meets all of these requisites in a highly successful fashion and such may be considered its primary object.

Other objects and advantages of my invention will be apparent from the following description and drawings, of which:

FIG. 1 is an elevation view of a representative container shown partly in section with a stopper incorporating my invention mounted thereon;

FIG. 2 is a top plan view of the container of FIG. 1;

FIG. 3 is a sectional view similar to the upper end of FIG. 1 showing, however, the closure before the container has been sealed;

FIG. 4 is a cross section of the closure, similar to that shown in FIGS. 1 and 3 as it is manufactured.

The closure **10** in FIG. 1 is shown mounted to the mouth of a bottle **12**. The bottle is representative in having a bead or lip **13** about the mouth thereof and a bulge **14** away from the mouth thereof so as to leave a groove **15** between the bead and the bulge. A container having a bead around the mouth is highly desirable in the employment of the stopper incorporating my invention, particularly when it is desired that the stopper contain pressure. The stopper will, however, function without such a bead when it is simply desired to protect the contents of the container from exposure to air or hold very slight pressure at most. The bulge **14** is not necessary to the proper seating and functioning of my stopper.

The stopper **10** embodying my invention is preferably formed of a synthetic rubber-like material. The material must be resilient and elastic, not subject to deterioration or aging, and inert as far as the particular product to be stored in the container is concerned. The stopper generally consists of an upper cylinder **16** of greater diameter and a lower cylinder **18** of less diameter. Both the upper and lower cylinders should be about equal to the distance from the end of the mouth of the bottle to the groove behind the bead of the bottle mouth. It will be appreciated that the stopper of my invention is not adaptable to universal use on all types of containers. Different stoppers will be employed with containers having mouths of different size and proportions.

The upper cylinder **16** has a diameter about equal to or slightly less than the exterior diameter of the mouth of the bottle. The diameter of the lower cylinder **18** should be such as to fit snugly inside the mouth of the bottle. It will be evident that a shoulder **20** exists between the juncture of the two cylinders, and this shoulder is preferably shaped to follow the curvature of the mouth of the container from the interior thereof to the top periphery thereof.

A thin annular flange **22** extends downwardly from the upper cylinder **16** from the outer edge of the shoulder **20** and the flange has an annular band **24** of relatively heavy cross section formed on its lower edge. The band **24** is formed to have a substantially smaller inside

diameter than the diameter of the groove **15** of the neck of the bottle or the exterior diameter of the neck of the bottle rearward of the bead **13**. The flange **22** should be long enough so that as the shoulder **20** rests on the mouth of the bottle, the band **24** will lodge in the groove **15**.

The use of my stopper will be readily apparent from the drawings. As the stopper is molded (as illustrated in FIG. 4), it would be difficult to insert the band **24** over the mouth of the bottle so as to bring it to its lodging position behind the bead **13** of the bottle. To fix the stopper for use, therefore, the band is rolled up on the exterior of the flange **22** and onto the periphery of the upper cylinder **16**. This causes a substantial stretching of the band and, at the same time, frees the lower cylinder from its overlying parts of the band **24** and flange **22**. The stopper may then be inserted into the mouth of the bottle as illustrated in FIG. 3. To latch the stopper to the bottle, the band **24** is simply rolled down over the mouth of the bottle to the point where it lodges behind the bead **13**. As stated, the flange **22** should be so proportioned as to length so as to permit this movement and preferably no more than this movement of the band **24**.

It will be appreciated that the band can be so formed or have a cross section such that it may be quite difficult to stretch. This is possible because once the band rests on the periphery of the upper cylinder as illustrated in FIG. 3, it has been stretched to nearly the full degree required to roll it over the container mouth. It is true that the bead **13** as illustrated bulges out slightly beyond the periphery of the upper cylinder, but the slight additional stretching required of the band in order to pass over the bead is accomplished in the easiest of circumstances. The band is rolled up a wedge-shaped surface, and the nature of the application of the necessary force to the band to achieve this additional stretching makes the stretching very easy. Therefore, the band rolls down over the bead and snaps in behind the bead with the exertion of very little effort. Removal of the stopper is similarly easily accomplished. The band is simply rolled over the bead and up onto the periphery of the upper cylinder at which point the stopper may be simply pulled out of the container.

It will be appreciated that since the band **24** is always stretched to nearly full degree required whether it rests back of the bead of the bottle or on the upper cylinder, it may be very heavy and strong and still not impose any difficulty in stretching. Under such circumstances, it can be proportioned both as to unstretched inside diameter and to elastic strength so as to clamp very tightly behind the bead of the bottle and hold the stopper to the bottle with a degree of force sufficient to maintain the pressure in bottles of charged water, for instance, under conditions of sensible storage as, for instance, in a refrigerator, etc. An additional sealing effect is achieved by the stretching of the flange **22** over the bead of the bottle. It will be noted that, that unstretched, the flange is simply a continuation of the cylindrical surface of the upper cylinder whereas when placed in use on a bottle as in FIG. 1, it is stretched outwardly appreciably.

It will be also noted that the flange does not meet the band **24** radially but rather meets it tangentially. This facilitates the rolling of the band up onto the upper cylinder and provides a closer fit of the flange against the bead of the bottle when the band is unrolled in use.

It will be appreciated that my stopper is capable of application to almost any kind of container. It will serve to stop metal, pottery, etc. containers as well as glass containers. It may be used to close wide as well as narrow-mouthed containers. It is also conceivable that my invention can be applied to stop rectangular openings. As stated before, while a bead on the container is neces-

sary to obtain optimum results from the use of my invention, a bead nevertheless is not essential and my device will seal just as effectively unbeaded container openers as will any other stopper where there is no substantial pressure differential between the inside and outside of the container.

It will be further appreciated that my invention is capable of taking many forms, and many alternative as to structure and material are possible, and I, therefore, desire that my invention be regarded as being limited only as set forth in the following claims.

I claim:

1. An elastic rubber-like stopper for the mouth of a container comprising a lower cylinder adapted to fit snugly into the mouth of said container, an upper cylinder having a diameter about equal to the exterior of the mouth of said container, a thin annular flange depending from the lower edge of said upper cylinder and a band having a normal unstretched diameter smaller than the exterior of the mouth of said container on the lower edge of said flange.

2. A closure for the mouth of a container comprising a cylindrical element having a diameter about equal to and not larger than the exterior of the mouth of said container, a thin elastic annular flange on the lower peripheral edge of said cylindrical element and an elastic band of relatively heavy cross section having a normal unstretched inside diameter less than the exterior of the mouth of said container on the other edge of said flange.

3. The combination as set forth in claim 2 wherein the thickness of said cylindrical element is at least as great as the diameter of said band.

4. A closure for the mouth of a container comprising a cylindrical element about equal in diameter to the exterior of the mouth of said container, a thin elastic annular flange on the lower peripheral edge of said cylindrical element, a strong elastic band connected to the other edge of said flange, said band having a normal unstretched inside diameter less than the diameter of the exterior of the mouth of said container, on the peripheral surface of said cylindrical element, said flange extending from said cylindrical element under said band and merging tangentially with said band at a point remote from said peripheral surface of said cylindrical element.

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