Sept. 27, 1955 H. HELBIG 2,718,974

EXPANSION STOPPER

Filed April 1, 1952

Fig. 1.

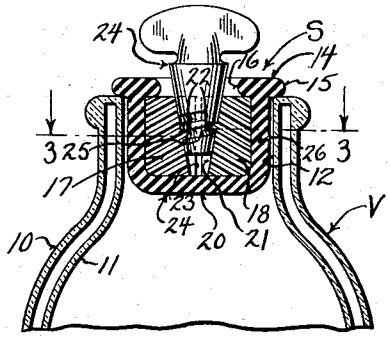


Fig. 2.

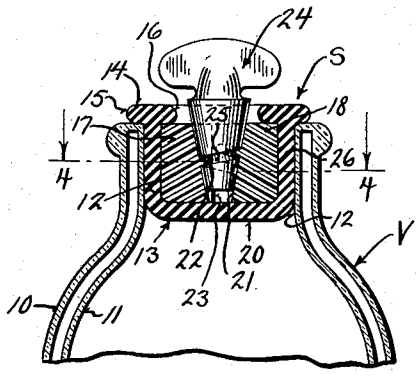


Fig. 3.

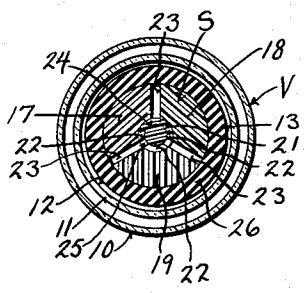


Fig. 4.

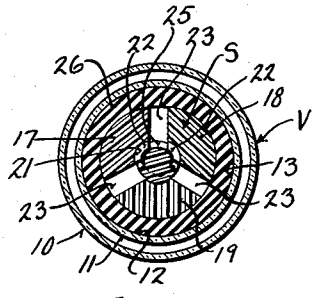


Fig. 5.

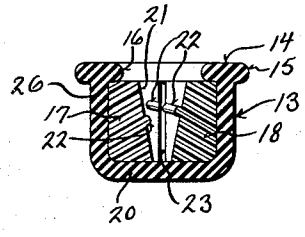
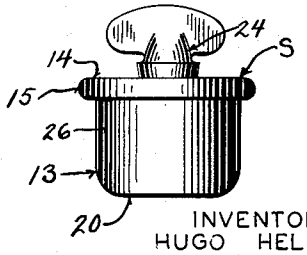


Fig. 6.



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2,718,974

EXPANSION STOPPER

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Application April 1, 1952, Serial No. 279,890

1 Claim. (Cl. 215—54)

This invention appertains to expansion stoppers for sealing the necks of bottles and like containers.

Considerable difficulty has been experienced in the past with various types of stoppers designed for pop bottles and vacuum bottles, in that previous stoppers usually leak pressure, do not seal completely around the neck of the bottle, or are difficult to use. The ordinary cork stopper for vacuum bottles, in particular, is hard to apply and to remove and invariably allows pressure and heat to escape.

It is, therefore, one of the primary objects of my invention, to provide a bottle stopper embodying a body portion formed from rubber or other resilient and compressible material, with means associated with the body for uniformly compressing the walls of the body and to expand the same circumferentially into intimate contact with the bottle mouth to form the desired seal.

Another important object of my invention, is to provide a soft rubber cup-like jacket into which is received independent solid segments, associated to form a conical axial bore therethrough provided with suitable spiral thread into which is received a correspondingly threaded or grooved winged plug which, when inserted in the conical bore, will spread the segments to compress the walls of the jacket and expand the stopper into contact with the bottle neck.

A still further object of my invention is to provide my rubber body or jacket with an upper peripheral flange which not only serves to support the stopper in the neck of the bottle, but also retains the segments in the jacket.

Another object of my invention is to form a short and fast thread arrangement on the plug and segments which begin and end completely within the bore so that the plug may be snapped into place and thereafter be retained against accidental removal.

With these and other objects in view, the invention consists in the novel construction, arrangement, formation of parts, as will hereinafter be more fully described, claimed, and illustrated in the accompanying drawings.

In which drawings:

Figure 1 is a vertical sectional view through my improved stopper, with the winged plug snapped in place and turned to its upper inoperative position, the stopper being shown applied to a vacuum bottle in its inoperative unsealed position;

Figure 2 is a vertical sectional view similar to Figure 1 of the drawings, but showing the winged plug turned to a lowered operative position with the segments compressing the walls of the jacket tightly about the neck of the bottle;

Figure 3 is a horizontal sectional view through my stopper taken on the line 3—3 of Figure 1 looking in the direction of the arrows and showing the rubber body spaced from the neck of the bottle;

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 2 looking in the direction of the

arrows and showing my stopper in its sealed position illustrated in Figure 2;

Figure 5 is a vertical sectional view through my stopper similar to Figures 1 and 2 of the drawing but with my winged conical plug removed; and

Figure 6 is a side elevational view of my novel stopper.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter "S" generally indicates my novel stopper, and the same can be made in various sizes for association with bottles of different character, such as pop bottles, vacuum bottles and the like.

In the drawings I have shown the stopper "S" of a size for use with vacuum bottles, and a fragment of the vacuum bottle "V" has been shown in Figures 1, 2, 3 and 4 of the drawings. As the vacuum bottle "V" is of the usual character, the same will not be described in detail, but it is to be noted that the bottle includes the double walls **10**, **11** and a restricted neck **12**.

My novel stopper "S" embodies an outer jacket or body portion **13** which can be formed from rubber or other compressible material. The jacket **13** is cup shaped as shown and is provided with an enlarged upper peripheral flange **14**. The flange **14** has an outer portion **15** and an inner portion **16**. The outer portion **15** supports the jacket or stopper on the mouth of the bottle while the inner portion **16** of the flange serves to retain the solid segments **17**, **18** and **19** in their proper positions.

It is to be noted that the solid segments **17**, **18** and **19** are of a size and configuration to fit the inner contour of the jacket **13**. The solid segments **17**, **18** and **19** are so constructed that, when associated and retained within the jacket **13**, they extend from the upper flange portion **16** to the jacket bottom **20** and form with one another a conical opening or bore **21** extending centrally to the bottom **20** of the jacket **13**. This conical bore **21** is provided with an external spiral or thread **22**. The segments are also arranged to form the split openings **23** therebetween.

Received in the conical bore **21**, is a cone-like plug **24** which is provided with a correspondingly formed internal spiral groove or thread **25**. The solid segments **17**, **18** and **19** and the conical plug **24** may be made of any desired material but are preferably formed of plastic.

It is to be noted that the thread portions **22** and **25** of the solid segments **17**, **18** and **19** and plug **24** respectively, do not extend completely from top to bottom but each terminates short thereof so that, in assembling my novel stopper the segments must be spread slightly so that the plug may be snapped into engagement with the conical bore. This serves to limit the turning movement of the plug and the same is retained against accidental removal.

In utilizing my novel stopper "S," the conical plug **24** is moved to the position as illustrated in Figure 1 of the drawings and no pressure whatever is exerted against the walls of the jacket **13** through the solid segments **17**, **18** or **19**. The stopper "S" is then inserted in the neck **12** of the bottle, where it is supported by the outer portion **15** of the upper flange **14** as illustrated in Figure 1 of the drawings. The plug is then turned and due to the interlocking of the spiral thread **22**, and spiraled groove **25**, the plug will move downwardly in the conical bore **21** and spread the solid segments outwardly against the outer wall **26** of the jacket **13**. This will compress the wall **26** and expand my stopper circumferentially into intimate engagement with the neck **12** of the bottle to form a seal as illustrated in Figures 2 and 4 of the drawings.

A salient feature of my novel stopper resides in the fact that the side wall **26** of the jacket **13** is expanded uniformly and evenly against the mouth or neck **12** of the bottle to give a more perfect seal than has hitherto been possible with prior devices.

Changes in detail may be made without departing from the spirit or scope of my invention, but what I claim as new is:

A bottle stopper comprising, an outer cup-like expansible body, an upper peripheral flange on said body having a portion extending beyond the outer periphery of the body and a portion extending beyond the inner periphery of the body, said inner flange portion forming a top reduced central opening in said cup-like body, a series of solid segments, received in said cup-like body and retained by the inner flange portion, said segments being of a size and configuration to conform to the contour of the body and being disposed to form a central conical bore therebetween, each segment having a respective portion of an external spiral thread on its

bore surface, and a conical plug adapted to be received in said conical bore having a corresponding internal thread therein, said plug and reduced central opening being so constructed and arranged as to be spaced one from the other, said threads on the plug and segments respectively terminating short of the top and bottom of said plug and segments to limit the turning movement of said plug, whereby the plug will be restrained and turning of the plug will spread the solid segments outwardly to expand the body circumferentially into intimate engagement with the mouth of a bottle.

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