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THREADED STOPPER EXPANDING POURING LIP COMBINATION FOR VACUUM BOTTLE

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FIG. 1

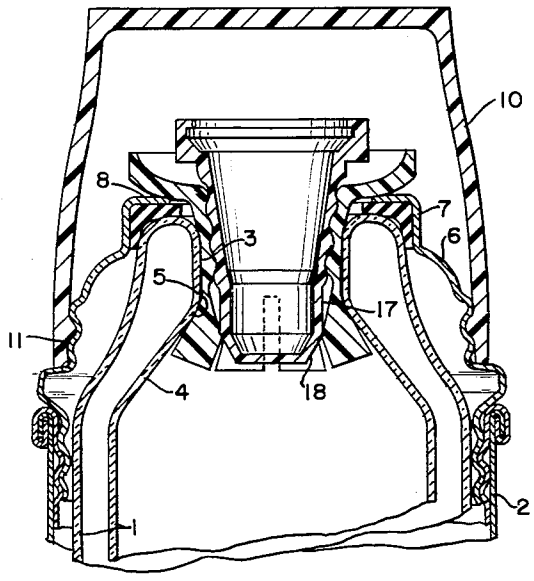


FIG. 2

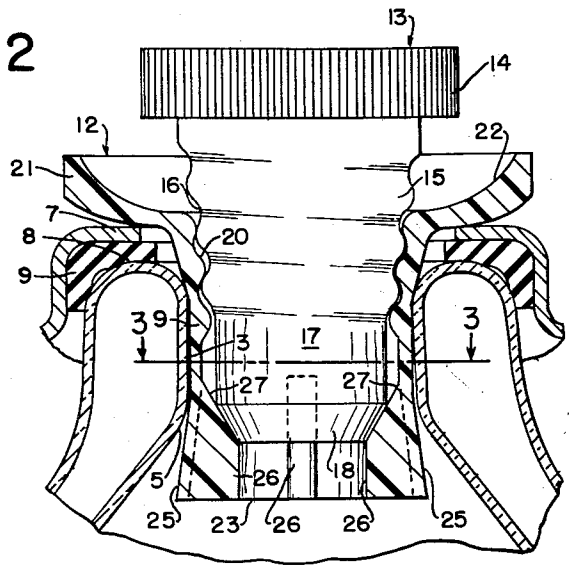
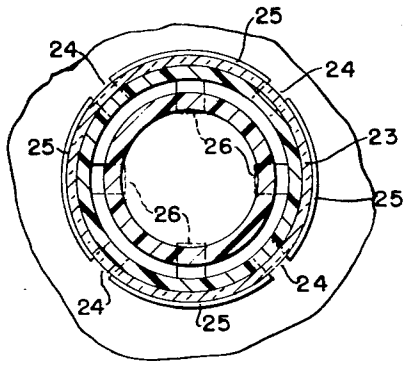


FIG. 3



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THREADED STOPPER EXPANDING POURING LIP COMBINATION FOR VACUUM BOTTLE

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This invention relates to closures for the neck or open-mouth of vacuum insulated bottles or containers and particularly to closure constructions wherein the stopper is held in place by a screw thread.

Inasmuch as the neck portion of the flask or filler of the conventional vacuum container has a smooth inner wall, a stopper of the threaded type cannot be applied directly thereto, and, conventionally a combined stopper-receiving-pouring lip member is employed with which the stopper is threadedly connected. In vacuum containers wherein the stopper-receiving-pouring lip member is not held in place by means of the conventional protective casing, however, something of a problem is presented in the avoidance of leakage between this member and the neck of the filler or flask.

The primary object of the present invention is to provide a stopper and stopper-receiving-pouring lip member combination which is so constructed that when the stopper is in position liquid-tight joints will be formed both between the stopper and the stopper-receiving member, and between this member and the interior surface of the neck of the bottle.

Another object of the invention is to provide a stopper and stopper-receiving-pouring lip member combination which is so constructed and arranged that when the container is emptied of its contents, the stopper-receiving-pouring lip member, as well as the stopper itself, can be easily removed for cleansing purposes.

For a better understanding of the invention consideration should be given to the following detailed description and to the accompanying drawing, in which:

FIG. 1 is a vertical sectional view of the upper portion of a vacuum insulated bottle embodying the closure construction of the present invention;

FIG. 2 is a somewhat enlarged vertical section of the closure construction with the stopper in a different position; and

FIG. 3 is a horizontal section taken on line 3—3 of FIG. 2.

Referring now to FIG. 1 of the drawing the device comprises a conventional double-walled flask or filler 1 which is mounted within an outer protective casing 2 which advantageously is of metal. The filler 1 has the usual open-ended filling neck or mouth 3 having a smooth and approximately cylindrical inner wall. This wall is joined at its lower end to the upper frusto-conical wall 4 of the filler by a curved shoulder 5.

The casing 2 includes a shoulder section 6 which is screw-threaded onto the upper end of the cylindrical casing. This shoulder section has an inwardly extending circumferential flange 7 which overlies the outer end 8 of filler 1, this end portion surrounding the open-ended neck 3. A resilient sealing gasket 9 is interposed between flange 7 and the top 8 of the filler. When the shoulder section 6 is screwed in place the filler 1 is clamped between the flange at the top of shoulder section 6 and the bottom of casing 2. A fluid-tight connection is formed at the top of the filler by gasket 9 so as to prevent liquid working inbetween the exterior of the filler and the casing.

The conventional outer protective closure member 10 which may also serve as a cup to receive liquid from the flask, is removably secured to shoulder section 6 by the threaded connection 11. A stopper-receiving-pouring lip member 12 is positioned in the open neck 3 and within it there is a stopper or closure member 13. Closure member 13 has the customary knurled rim 14 by which it is manipulated, and a tapered stopper portion 15 having an external screw-threaded formation 16. Beyond the threads 16 on stopper 15 there is a cylindrical extension 17 which terminates in a conical inner end 18 for a purpose which will presently appear.

The threaded stopper portion 16 is tapered and is received within an oppositely tapered bore in the cylindrical or neck-fitting sleeve portion 19 of the stopper-receiving member 12. This bore has an internal thread formation 20 with which the thread formation 16 cooperates. At the upper end of the sleeve portion 19, and integral therewith, there is an enlarged flange-like head 21 having a dished or cup-shaped upper surface 22 which forms the pouring lip.

The lower end of sleeve section 19 of the stopper-receiving member has a divided or slotted extension 23 which projects below the curved shoulder 5 at the bottom of neck 3. Extension 23 is divided by four equi-spaced slots 24 (FIG. 3) into four arcuate sections 25, and each of these four sections has a central and integral rib 26 projecting radially inwardly therefrom. Each of these four ribs 26 has an angular upper surface 27 which slopes downwardly and inwardly, these sloping surfaces being arranged to cooperate with the frusto-conical end 18 of closure member 13.

The stopper-receiving-pouring lip member 12 is made of a suitable resilient locally-distortable material such as polyethylene, natural or synthetic rubber compounds, polyvinyl co-polymers, or other suitable synthetic plastic material. Advantageously the closure member or stopper 13 is made of the same material, or it may be made of a more rigid or substantially rigid material, if desired.

In FIG. 2 the slotted extension 23 at the lower end of the stopper-receiving-pouring lip forming member 12 is shown in its normal and un-expanded position. In such position and before the stopper member 13 has been placed within it, the member 12 can be inserted easily into the neck 3 of the filler and during this insertion the four sections 25 will be flexed inwardly slightly to permit them to enter the neck. Then when the closure or stopper member 13 is screwed into the stopper-receiving-pouring member 12 it will be advanced by the screw threads first to the position shown in FIG. 2 where the conical surface 18 begins to engage the sloping surfaces 27 at the upper ends of the four ribs 26.

As the stopper portion 15 of the closure member is screwed further into place, not only will the interengaging threads 16 and 20 form a tight joint between the stopper and the interior surface of the sleeve portion 19 of the stopper-receiver member, but also the conical end 18 will force the four arcuate sections 25 outwardly and expand them so that their outer surfaces are forced into close contact with the curved shoulder 5 and with the surface of neck 3, as shown in FIG. 1.

Simultaneously, the tapered thread formations 16 and 20 will also urge the outer surface of sleeve 19 into close-fitting engagement with the upper end of neck 3. In this way a tight joint is formed both between the stopper portion 15 and the stopper-receiver member sleeve 19, and, in addition, a liquid-tight joint is provided between the outer surface of sleeve 19 which has a smooth cylindrical surface and the interior wall of neck 3. Thus, the contents of the flask 1 are securely sealed within the flask.

When it is desired to open the flask, the removal of the closure member 13 allows the expanded flexible sections 25 to return from the position of FIG. 1 to that

of FIG. 2, but because of the fact that these sections normally flare outwardly in their relaxed position, the stopper-receiving-pouring lip member 12 will not be separated from the bottle during a pouring operation. This member is also held firmly in place because of the fact that its upper portion is constructed to make a snug fit within the neck 3.

Surface 22 serves as the pouring lip to prevent the liquid contents from coming into contact with the sealing gasket 9 and the flange of the shoulder section 6 of the casing. When the vacuum container is washed before storing it away or re-filling, the stopper-receiving-pouring lip member 12 is removed from the filler and cleansed at the same time that the closure 13 is cleansed.

It will be understood that the specific embodiment of the invention described and illustrated herein is to be considered as representative only, and that changes may be made without exceeding the teaching of the invention. Accordingly, the scope of the invention is to be determined from the appended claims.

I claim:

1. In a vacuum insulated bottle the combination of a double-walled vacuum insulated container having an approximately cylindrical open neck, a closure member having a threaded tapered stopper portion, said stopper portion having an inner extension thereon, the inner end of said stopper portion having the form of the frustum of a cone, a stopper receiving member having a sleeve portion with an outer surface fitting within said mouth and a pouring lip portion above said mouth, said sleeve member being integrally tapered and threaded to receive said stopper portion, said sleeve also having a plurality of flexible arcuate extensions at its inner end, each of said flexible arcuate extensions being provided with a longitudinal central rib having a sloping upper end to cooperate with the cone-shaped end of the stopper portion, said inner cone-shaped end of said stopper portion cooperating with said flexible sections to cause them to expand into fluid-tight connection with said neck as the closure is turned into position.

2. A vacuum container according to claim 1 wherein said container has a generally cylindrical inner wall and an upper frusto-conical wall joined to the lower end of the neck by a shoulder, said flexible extensions being expanded by said stopper against said shoulder and said frusto-conical wall.

3. In a vacuum insulated bottle the combination of a double-walled vacuum insulated container having an approximately cylindrical open neck, a closure member having a threaded tapered stopper portion, said stopper portion having an inner extension thereon, a stopper-receiving member having a sleeve portion with an outer surface fitting within said mouth and a pouring lip portion above said mouth, said sleeve portion being integrally tapered and threaded to receive said stopper portion, and said sleeve having an outwardly flexible flared extension at its inner end; said inner end of said stopper portion cooperating with said flexible portion to cause said flexible flared extension to expand into fluid-tight connection with said neck as the closure is turned into position.

4. A vacuum container according to claim 3 wherein said container has a generally cylindrical inner wall and an upper frusto-conical wall joined to the lower end of the neck by a shoulder; said flexible extension being expanded by said stopper against said shoulder and said frusto-conical wall.

5. In a vacuum insulated bottle the combination of a double-walled vacuum insulated container having an approximately cylindrical open neck, a closure member having a threaded tapered stopper portion, a stopper-receiving member having a sleeve portion with an outer surface fitting within said mouth and a pouring lip portion above said mouth, said sleeve member being internally tapered and threaded to receive said stopper portion, said sleeve also having a plurality of flexible arcuate extensions at its inner end, portions of said flexible arcuate extensions protruding radially inwardly and into interference with the passage of said stopper portion when the latter is threaded fully into said sleeve member; said stopper portion having an inner extension thereon which forms a radially inwardly inclined cam surface and each of said flexible arcuate extensions having a corresponding radial cam surface whereby said flexible arcuate extensions are caused to expand into fluid-tight connection with said neck as the closure is turned into position.

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