May 21, 1963 N. WEAVER ETAL 3,090,531

DISPENSING CLOSURE

Filed May 2, 1961

FIG. 1.

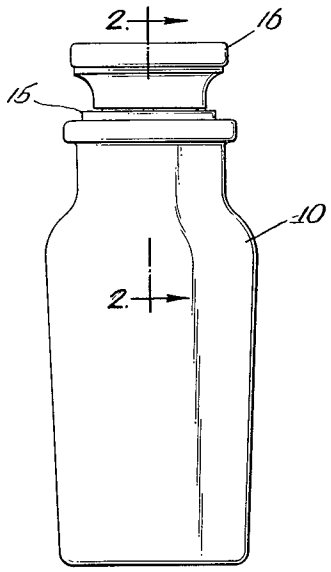


FIG. 3.

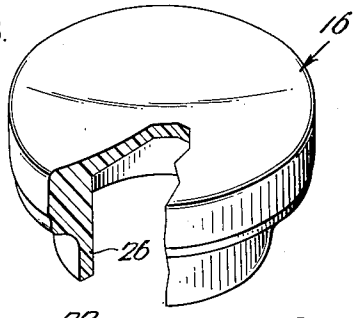


FIG. 4.

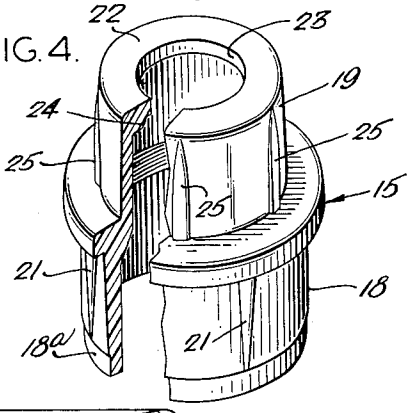


FIG. 2.

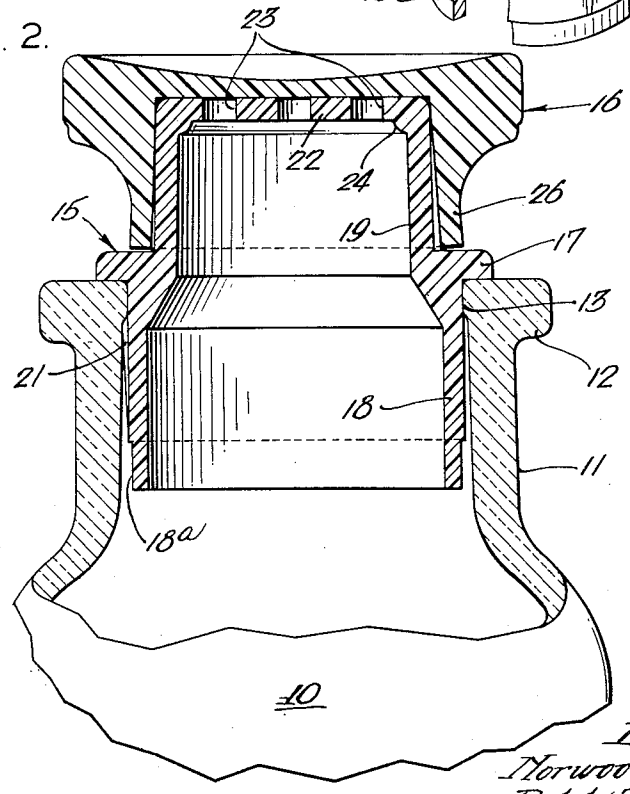


FIG. 5.

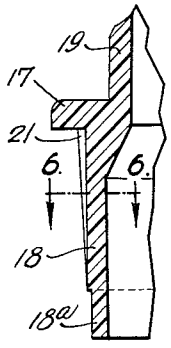
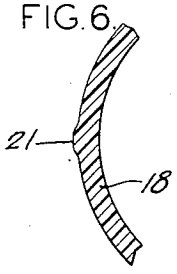


FIG. 6.



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DISPENSING CLOSURE

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4 Claims. (Cl. 222—545)

This invention relates to new and useful improvements in container closures and more particularly to a new and improved dispensing closure for containers.

This application is a continuation-in-part of our copending application Serial No. 809,680, filed April 29, 1959, now abandoned.

The dispensing closure of the present invention is designed to dispense certain condiments, such as salt, through, for example, a shaker top. This dispensing closure may also be used to dispense larger articles such as pills or tablets. In addition to permitting the dispensing of a predetermined quantity of material from the container at any one time, the dispensing closure may be quickly removed from the container to permit the dispensing of larger quantities of material from the container. Furthermore, the dispensing closure of the present invention will effectively seal the contents of the container and maintain the container essentially air-tight.

With the foregoing in mind, a primary object of the present invention is to provide a novel dispensing closure for a container which is effective in maintaining the container essentially air tight and which may be easily and rapidly positioned to dispense the contents of the container.

A further object of the present invention is to provide a dispensing closure for a container which may be easily removed from the container when it is desired to dispense larger quantities of the contents than may be dispensed through the perforated openings or restricted opening in the dispensing closure.

Another object of the present invention is to provide a novel dispensing closure of relatively simple, inexpensive construction which may be manufactured easily and cheaply.

These and other objects of the present invention and the various features and details of the operation and construction thereof are hereinafter more fully set forth and described in conjunction with the accompanying drawings, in which:

FIG. 1 is a front elevational view of a container having the dispensing closure of the present invention applied thereto;

FIG. 2 is an enlarged fragmentary sectional view taken along line 2—2, FIG. 1;

FIG. 3 is an enlarged perspective view partially in section of the cover or cap member of the dispensing closure;

FIG. 4 is an enlarged perspective view partially in section of the dispensing member with a modified form of opening in the dispensing member;

FIG. 5 is an enlarged fragmentary sectional view of a portion of a dispensing member prior to insertion into a container; and

FIG. 6 is a fragmentary sectional view taken on line 6—6, FIG. 5.

For the purpose of illustration, the dispensing closure of the present invention is shown and described as applied to a typical glass container **10** having a reduced neck portion **11**, with a beaded finish **12** in the form of an annular exterior strengthening flange. The interior of a reduced neck portion **11** has a constricted zone formed by an annular inwardly projecting rim or lip **13** whose upper edge is substantially in alignment with the end face of the top of the container. The interior of the neck of the container beneath the inwardly projecting rim **13** is approximately cylindrical but diverges slightly outwardly in a downward direction toward the body of the container.

In accordance with the present invention, a dispensing closure **15** of resilient distortable material is provided which is adapted to fit into the container opening in sealing engagement with the neck of the container. The dispensing closure **15** also is adapted to receive a cap **16** which fits over the top of the dispensing closure in sealing engagement with the top and side edges of the closure. In the illustrated embodiment of the present invention the dispensing closure **15** comprises a flange **17** of greater diameter than the opening to the container which is adapted to engage the top of the container when the dispensing closure is in position on the container. A lower annular skirt portion **18** which is approximately cylindrical on the outer surface projects downwardly from the flange and is adapted to be positioned within the neck of the container while an upper annular skirt portion **19**, which is approximately cylindrical on the outer surface and set back from the outer edge of the flange **17** to leave a flat annular ledge surface, projects upwardly from the upper face of the flange.

The lower cylindrical skirt portion **18** of the dispensing closure is provided with a lower end portion **18***a* of reduced diameter to facilitate insertion of the lower annular sleeve into the neck of the container. It is important that the relative size between the external diameter of the lower annular sleeve and the neck opening of the container be carefully controlled. The lower annular sleeve will have a ½ degree draft from the bottom toward the top to facilitate molding and the diameter of the sleeve immediately below the flange **17** must be equal to or slightly larger than the inner diameter of the neck opening of the container. With this construction and relative dimension an air-tight seal is obtained when the lower annular sleeve is in place in the opening of the container, the sealing being obtained around the upper end of the outer periphery of the lower annular flange **18** and also between the lower surface of the flange **17** and the upper surface of the container.

The lower annular skirt portion is resiliently maintained in the neck opening of the container by means of a plurality of peripherally-spaced ribs **21** extending axially of the skirt portion **18** formed on the outer peripheral surface of the skirt portion and extending downwardly away from the flange. The ribs **21** are tapered downwardly so that their lower ends merge with the outer peripheral wall of the skirt portion **18**. Additionally, the ribs are very flat as illustrated in FIG. 6, and are not the standard half-round ribs normally found in a construction such as this, so that the ribs will flatten out under pressure and not disrupt the seal at the neck of the container. When the skirt is fully inserted into the neck of the container the dispensing closure is resiliently held in place by frictional engagement between the skirt and the neck of the container and is further held in place due to frictional engagement between the container and the ribs. Accordingly, it will be apparent that the dispensing closure may be readily removed and replaced when it is desired, for example, to fill the container or when it is desired to dispense a large quantity of the contents from the container.

The upper annular skirt portion **19** has an end wall **22** extending across its upper face within which suitable openings **23** are provided for the purpose of dispensing contents from the container. If desired, the end wall **22** may be formed as illustrated in FIG. 4 of the drawings

consisting solely of a short annular lip projecting inwardly from the upper end of the upper annular skirt **19** providing a large central opening **23***a* in the dispensing closure. In order to strengthen the dispensing closure an annular rib **24** may be provided about the inner periphery of the upper skirt portion **19** adjacent the end wall **22**. A plurality of ribs **25** extend axially of the upper skirt portion **19** and taper inwardly toward the upper end of the skirt **19** merging with the peripheral surface of the skirt. Preferably the ribs are relatively flat such as the aforementioned ribs **21** and are spaced uniformly about the outer periphery of the skirt portion **19**.

In accordance with the present invention the cover **16** is provided to cover the upper annular skirt of the dispensing closure and the end wall **22** to provide an essentially air tight seal. The cover **16** has an annular side wall **26** which is approximately cylindrical interiorly and preferably shorter in length than the axial length of the annular skirt portion **19** of the dispensing closure so that when the cover is in its fully seated position on the dispensing closure the side wall **26** of the cover terminates a short distance above the flange **17**. Additionally, the inner peripheral surface of the side wall of the cover tapers outwardly slightly in a direction toward the flange away from the outer peripheral surface of the upper annular skirt portion **19** with the inner diameter of the annular wall **26** being slightly greater at its lowermost portion than the outer diameter of the annular skirt portion **19** at a point adjacent the flange **17**. However, the inner diameter of the side wall **26** of the cover at its upper end is equal to or slightly smaller than the outer diameter of the upper annular skirt portion **19** at a point adjacent its upper end so that the side wall of the cover engages and seals against the side wall of the annular skirt portion **19** at the upper end of the annular skirt portion **19**. The upper end of the cover is thickened to provide sufficient body to maintain tight this seal at the upper end and extends outwardly in an annular flange to provide a good hand grip for handling the cover.

With this above construction, the cover **16** may be easily positioned over the upper annular skirt portion **19** of the dispensing closure and moved practically to its fully seated position before a seal is formed between the side wall **26** of the cover and the upper annular skirt portion **19**, thus preventing the entrapment of a substantial volume of air within the container prior to the cover reaching its fully seated position. When the cover is in its fully seated position over the upper annular skirt portion **19** of the dispensing closure the inner peripheral surface of the wall of the cover is frictionally engaged with ribs **25** to maintain the cover in position.

The dispensing closure **15** and cover **16** are so dimensioned that the frictional engagement between the lower annular skirt portion **18** and the container is greater than the frictional engagement between the cover **16** and the upper annular skirt portion **19**, thereby permitting the cover to be removed from the dispensing closure without causing the dispensing closure to be removed from the container. This is an important feature of the present invention in that it permits the container to be used in the normal manner as a shaker type container dispensing predetermined uniform quantities of material but also permits the user of the container to obtain a greater quantity of material from the container than normally could be obtained through the dispensing closure portion.

From the foregoing it will be apparent that the present invention provides a novel dispensing closure which is adapted to hermetically seal the contents of a container and which may be easily used to dispense the contents as desired.

While particular embodiments of the present invention have been illustrated and described herein it is not intended to limit the invention to such a disclosure and

changes and modifications may be incorporated therein within the scope of the following claims.

We claim:

1. A dispensing closure adapted to be removably positioned in the neck opening of a container comprising: a one-piece integral dispensing top formed of resilient distortable material and a cover member therefor, said top including an external radially projecting annular flange portion adapted to engage against the end surface of the neck of said container when said dispensing closure is in said opening, said dispensing top also including first and second axially spaced annular skirt portions disposed in coaxial alignment at respectively opposite sides of said annular flange portion, said first annular skirt portion being of approximately cylindrical external shape and adapted to be inserted into the container opening, said first skirt portion having an outer diameter adjacent said flange slightly greater than the diameter of said container neck opening and tapering away from said flange to maintain said dispensing top sealed in position in said container with a predetermined restraining force, said second annular skirt portion being of approximately cylindrical external shape and projecting from the flange portion in a direction opposite said first annular skirt portion and coaxial therewith, said second annular skirt portion having an end wall extending across the outer end thereof and provided with at least one opening therein through which material may be dispensed from said container, and said cover member having an imperforate top wall portion adapted to overlie the end wall of said second annular skirt portion and having an annular side wall portion of approximately cylindrical internal shape adapted to frictionally engage about and form a seal with said second annular skirt portion to maintain said cover member in position on said dispensing top with a predetermined restraining force, the diameter of the annular side wall portion of the cover member and said second skirt portion of the dispensing top being correlated to the diameters of said first wall portion of the dispensing top and the container neck opening so that the restraining force maintaining the cover member in position on the second annular skirt portion of the dispensing top is less than said predetermined restraining force maintaining said first skirt portion of the dispensing top within said container opening.

2. A dispensing closure adapted to be removably positioned in a container opening comprising, a one-piece integral dispensing top formed of resilient distortable material, a flange formed integrally with said dispensing top adapted to engage against the top end surface of said container when said dispensing closure is in said opening, a first annular skirt, having an approximately cylindrical outer surface, formed integrally with said flange and adapted to be inserted into the container opening, said first skirt having an outer diameter adjacent said flange slightly greater than the diameter of said opening and tapering inwardly away from said flange, a plurality of flat ribs extending axially of said first annular skirt and formed integrally therewith, said ribs adapted to be distorted upon insertion of said first annular skirt into said container opening to maintain said dispensing top in position on said container with a predetermined restraining force, a second annular skirt, having an approximately cylindrical outer surface, formed integrally with said flange and projecting outwardly therefrom in a direction opposite to said first annular skirt and co-axial therewith, said second annular skirt having an inner diameter which is slightly smaller than the interior diameter of said first skirt, an end wall extending across the outer end of said second annular skirt, means defining at least one opening in said end wall through which material may be dispensed from said container, a cover member having a top wall adapted to engage and seal against the end wall of said second annular skirt, said cover member having an annular flange with an approximately cylindrical inner surface adapted to engage about said second annular skirt

and having a close peripheral fit around the periphery of the upper end of said second skirt to form a seal therewith, the upper end of the cover member having a thickened peripheral portion at the upper end to provide body to maintain the peripheral seal at the upper end, to frictionally maintain said cover member in position on said dispensing top with a predetermined restraining force less than said predetermined restraining force maintaining said dispensing top within said container opening, both the fit of the first annular cylindrical skirt of said top in the container opening and the fit of the annular side wall of said cover on the second annular cylindrical skirt of said top being frictional force push fits.

3. A dispensing closure adapted to be removably positioned in a container opening comprising, a one-piece integral dispensing top formed of resilient distortable material, a flange formed integrally with said dispensing top adapted to engage against the top end surface of said container when said dispensing closure is in said opening, a first annular skirt, having an approximately cylindrical outer surface, formed integrally with said flange and adapted to be inserted into the container opening, said first skirt having an outer diameter adjacent said flange slightly greater than the diameter of said opening and tapering inwardly away from said flange, a plurality of flat ribs extending axially of said first annular skirt and formed integrally therewith, said ribs adapted to be distorted upon insertion of said first annular skirt into said container opening to maintain said dispensing top in position on said container with a predetermined restraining force, a second annular skirt, having an approximately cylindrical outer surface, formed integrally with said flange and projecting outwardly therefrom in a direction opposite to said first annular skirt and co-axial therewith, said second annular skirt having an inner diameter which is slightly smaller than the interior diameter of said first skirt, an end wall extending across the outer end of said second annular skirt, means defining at least one opening

in said end wall through which material may be dispensed from said container, a cover member having a top wall adapted to engage and seal against the end wall of said second annular skirt and an annular side wall with an approximately cylindrical inner surface adapted to engage about said second annular skirt and form a peripheral seal with the upper end thereof, and means, including spaced axially extending ribs formed on the outer surface of said second annular skirt, to frictionally maintain said cover member in position on said dispensing top with a predetermined restraining force less than said predetermined restraining force maintaining said dispensing top within said container opening, both the fit of the first annular cylindrical skirt of said top in the container opening and the fit of the annular side wall of said cover on the second annular cylindrical skirt of said top being frictional force push fits.

4. Apparatus in accordance with claim 3 wherein said ribs on the second skirt of the top increase in radial thickness downwardly from the said peripheral seal at the upper end, and wherein the inner peripheral surface of the annular side wall of said cover member when seated tapers outwardly slightly away from the top wall thereof relatively to the outer peripheral surface of said second annular skirt from a diameter which fits tightly at said top wall of said second annular skirt to a diameter at a point remote from said top wall greater than the diameter of said second annular skirt.

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