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FLEXIBLE DISPENSING NOZZLE WITH SUPPORTING CLOSURE

Filed Sept. 22, 1955

Fig. 1

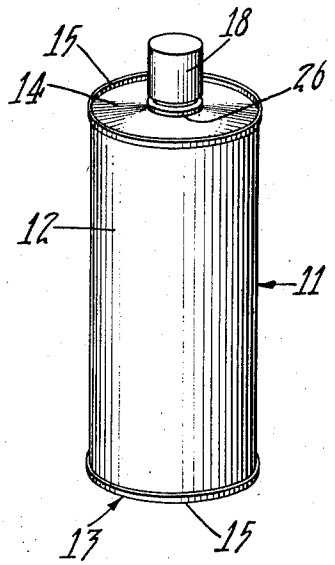


Fig. 2

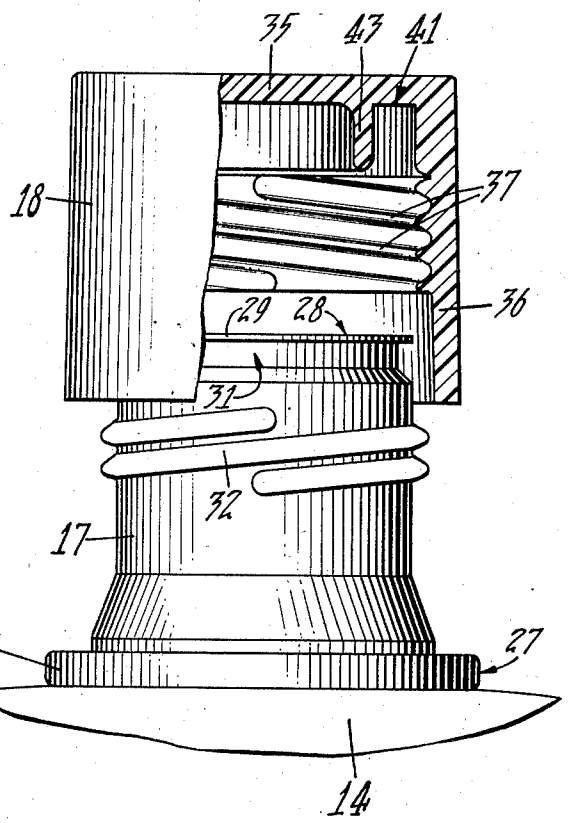
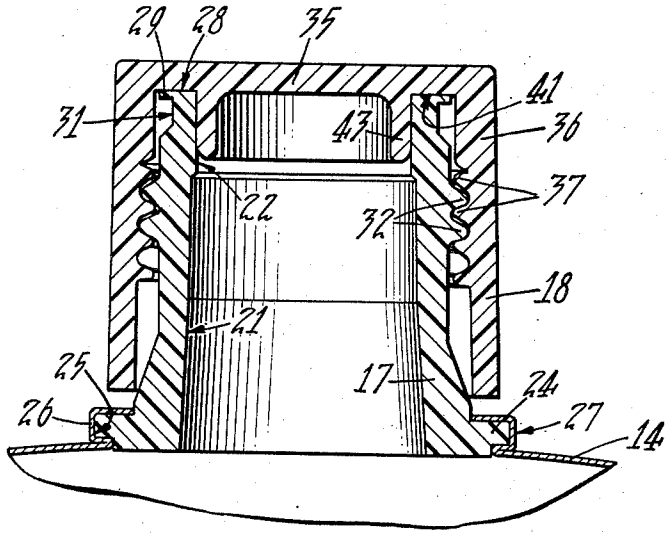


Fig. 3



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FLEXIBLE DISPENSING NOZZLE WITH SUPPORTING CLOSURE

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3 Claims. (Cl. 222—546)

The present invention relates to dispensing nozzles and closures for cans or containers of various kinds, especially cans or containers for liquid products and has particular reference to nozzles made from flexible materials and to closures for supporting the nozzles against distortion when the closures are applied thereto.

In the utilization of nozzles made from flexible materials such as plastics and sheet metals like aluminum, to prevent corrosive reactions from detergents and the like products to be dispensed from containers, it has been found that due to its flexibility, the nozzle adjacent its mouth has a tendency to become distorted or deformed out of shape when the closure is applied to the nozzle. This distortion of the nozzle deforms its mouth. Under certain conditions this distortion becomes permanent because the material takes on a definite set, i. e. distortion beyond the elastic limit of the material. This results in a damaged or malformed pouring mouth and unsatisfactory dispensing of the container contents. It also disrupts the seal between the nozzle and the closure and results in leaky nozzles.

An object of the instant invention is the provision of a noncorrosive flexible nozzle for a container and a closure therefore wherein the nozzle mouth is supported by the closure, against distortion when the closure is applied to the nozzle, so as to preserve the shape and full opening of the nozzle mouth and thereby insure satisfactory dispensing of the contents of the container.

Another object is the provision of such a flexible nozzle and closure therefor wherein the support for the mouth of the nozzle serves as a supplemental seal in the mouth in addition to a primary seal between nozzle and closure outside the mouth, these seals being effective without the use of separate sealing gaskets so as to eliminate the use of such gaskets.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a container for liquids having a dispensing nozzle and closure embodying the instant invention;

Fig. 2 is an enlarged elevational exploded view of the nozzle and closure of the container shown in Fig. 1, with the closure partly broken away and shown in section; and

Fig. 3 is an enlarged sectional view showing the closure fully assembled with the nozzle in sealing position.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a sheet metal container **11** (Fig. 1) comprising a cylindrical tubular body **12** closed at its ends with a bottom **13** and a top or convex breast **14** secured thereto in suitable end seams **15**.

An upright dripless nozzle **17** (Figs. 2 and 3) having a closure or cap **18** is carried on the breast **14** to dispense repeated amounts of liquid products from the container.

The nozzle **17** is made from a relatively inexpensive material which has non-corrosive characteristics. Such materials generally are flexible or somewhat resilient by nature and include metals such as aluminum and polymeric substances such as thermoplastic resins, for example polyethylene, polystyrene, acrylic acid polymers, nylon, etc. The nozzle **17** preferably is a molded, plastic material, relatively thick walled, tubular member. The term "plastic" as used herein is intended to include all such materials as synthetic and natural resins, polymers and elastomers.

The nozzle **17** preferably is formed with a cylindrical body having a centrally located smooth bore **21** (Fig. 3) which terminates at its upper end in a slightly smaller diameter, annular, smooth dispensing mouth **22**. The lower end of the nozzle body is secured to the breast **14** in any suitable manner. For this purpose the drawings show the lower end of the nozzle **17** formed with a surrounding thick flange **24** which is incorporated in an annular channel **25** of a short neck **26** formed on the breast **14** and folded under and over the flange **24** of the nozzle to provide a seam **27** to tightly hold the nozzle in place.

At its top or dispensing end, surrounding its mouth **22**, the nozzle **17** is formed with a flat sealing face **28** which is part of a thin walled, sharp edged, laterally projecting, non-drip annular flange or collar **29** set off by an annular groove **31** formed in the outer wall surface of the nozzle. Intermediate its ends, the outer surface of the nozzle wall is provided with a screw thread **32**.

The closure or cap **18** preferably is made of relatively rigid material such as metal or plastic, preferably a hard plastic which may be molded to present a pleasing appearance. This cap **18** preferably is formed with a flat top wall **35** terminating at its outer edges in a depending skirt wall **36**. When the cap is in place on the nozzle **17** the skirt wall **36** surrounds the nozzle. The inner surface of the skirt wall **36** is provided with screw threads **37** for cooperation with the screw threads **32** on the nozzle **17** for securing the cap in place on the nozzle.

Inside the cap **18**, the top wall **35** is formed with a flat annular seat **41** for engagement against the flat face **28** of the nozzle **17** to effect a tight leakproof seal for the nozzle, without the use of gaskets of any kind, when the cap **18** is screwed down tight on the nozzle.

To overcome distortion of the flexible nozzle **17** by the axial compression incident to securing the cap **18** to the nozzle through cooperation of the screw threads **32, 37**, the top wall **35** of the cap **18** is provided with a depending support member **43** (Figs. 2 and 3). This support member **43** is a rigid cylindrical element, preferably formed as an integral part of the cap and preferably in the form of a cylindrical ring having an outside diameter substantially equal to the inside diameter of the nozzle mouth **22** and being disposed in axial alignment with the nozzle mouth.

When the cap **18** is applied to the flexible nozzle **17** and screwed down tight to effect a seal between the nozzle face **28** and the cap seat **41**, the rigid support member **43** enters and projects into and engages the mouth **22** of the nozzle **17** and thereby backs up and laterally supports the nozzle adjacent its dispensing end, while the nozzle is held under axial compression through cooperation of the nozzle and cap screw threads **32, 37**. This internal support of the dispensing end of the flexible nozzle **17** protects the nozzle from lateral distortion or out-of-round displacement and thereby preserves the proper shape of the nozzle mouth for satisfactory dispensing of the contents of the container. It also preserves the proper seal between the nozzle sealing face **28** and the cap sealing seat **41**. This support member **43** disposed within the resilient nozzle mouth further provides for an

additional or supplemental seal in the mouth of the nozzle and thereby insures against leakage of the contents of the container during shipment and storage.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A sheet metal container having a top wall provided with an upstanding deformable tubular nozzle for dispensing the container contents, said nozzle being formed of flexible resilient plastic material having external screw threads thereon and secured at its inner end to said container wall, said nozzle terminating at its outer end in a flat annular seat surrounding the nozzle bore, and a cap member having a depending skirt provided with internal screw threads engageable with said nozzle threads for closing the nozzle, said cap having a flat top wall provided with an integral depending support member of substantially the same diameter as and fitting snugly within the upper end of the nozzle bore, and a flat annular seat on the lower top wall surface of said cap member between said cap skirt and said support member for firm sealing engagement against said flat annular nozzle seat when the cap member is screwed home with said depending support member and said cap skirt disposed on opposite sides of said nozzle seat to preserve the peripheral configuraton of the deformable plastic material at the outer end of the nozzle during axial pressure exerted thereon by said cap.

2. A deformable plastic dispensing nozzle as defined in claim 1, wherein a thin resilient non-drip flange is provided on the outer periphery of said annular nozzle seat by means of an annular groove in the outer wall surface of said outer nozzle end.

3. A sheet metal container having a top wall provided with an upstanding deformable tubular nozzle for dispensing the container contents, said nozzle having external screw threads thereon and being formed of flexible resilient plastic material secured at its inner end to said container wall, the outer end of said nozzle terminating in a flat annular seat surrounding the nozzle bore, an annular groove in the exterior wall surface of said nozzle beneath said seat setting off a thin flexible non-drip flange on the periphery of the seat, and a cap member having a depending skirt provided with internal screw threads engageable with said nozzle threads for closing the nozzle, said cap member having a substantially flat top wall provided with an annular seat on the lower surface thereof adjacent said cap skirt for firm sealing engagement against said flat annular nozzle seat without the aid of an interposed sealing gasket when the cap member is screwed home on the nozzle.

References Cited in the file of this patent

UNITED STATES PATENTS

2,025,406	Whelan	Dec. 24, 1935
2,144,902	Temple	Jan. 24, 1939
2,663,463	Benbury et al.	Dec. 22, 1953
2,717,728	Gray	Sept. 13, 1955
2,731,053	Lockhart	Jan. 17, 1956
2,736,447	De Brock	Feb. 28, 1956
2,760,691	Henchert	Aug. 28, 1956

FOREIGN PATENTS

1,031,159	France	Mar. 18, 1953