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CONTAINER WITH RESILIENT END CLOSURE AND METHOD OF ATTACHING CLOSURE TO CONTAINER

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Fig. 3

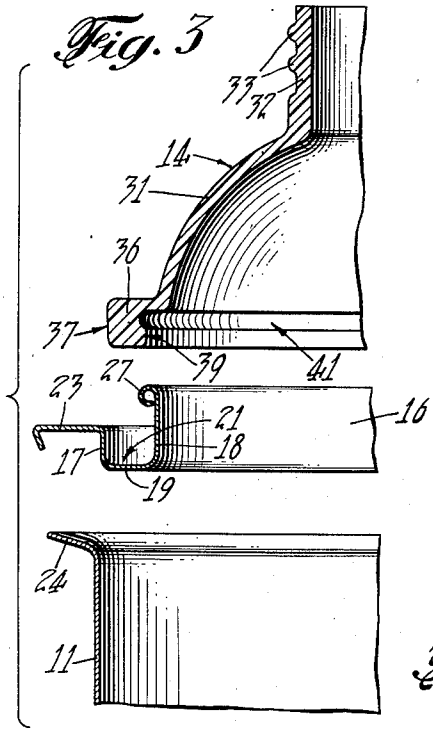


Fig. 1

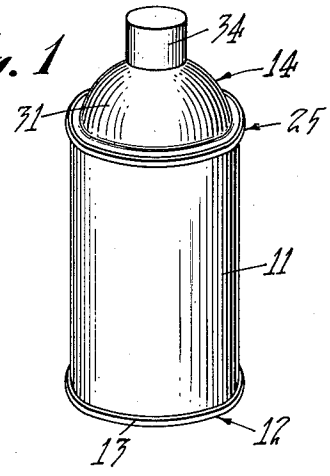


Fig. 4

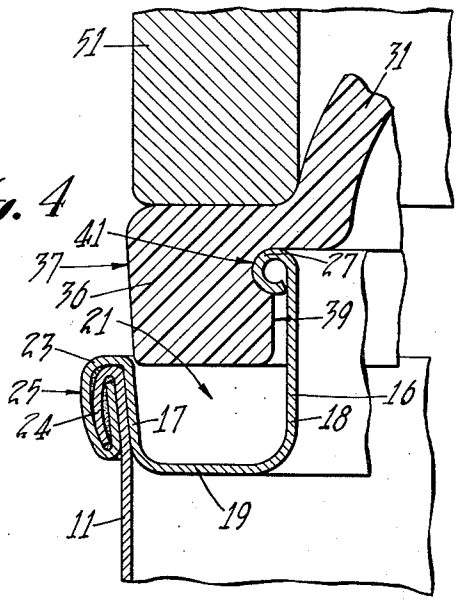
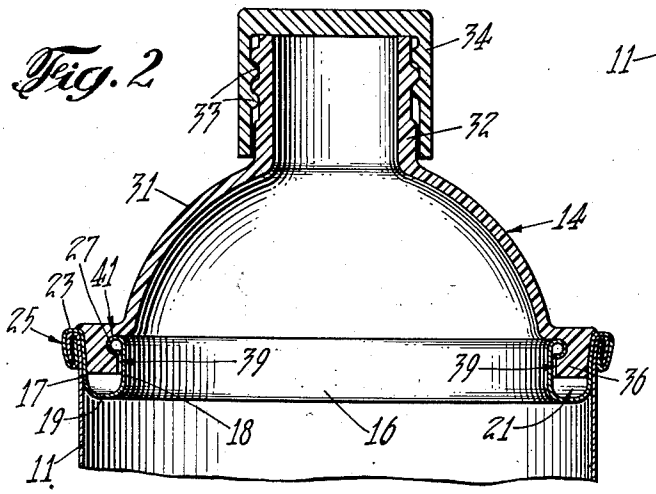


Fig. 2



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CONTAINER WITH RESILIENT END CLOSURE AND METHOD OF ATTACHING CLOSURE TO CONTAINER

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3 Claims. (Cl. 220—67)

The present invention relates to containers for liquid products and has particular reference to such a container having a novel top end construction which includes a resilient material end closure member and to a method of attaching the closure member to the container top end construction.

An object of the invention is the provision of a container for liquids wherein the top end closure member may be utilized as a dispensing closure and is made from a resilient noncorrosive material which will withstand the corrosive action of liquid detergents and the like products to be packed in the containers.

Another object is the provision of a container having an annular member and a resilient end closure member wherein the closure member can be readily attached to the annular member in a tight leakproof joint.

Another object is the provision of a method of attaching such a closure member to a sheet metal container wherein the closure member may be snapped into tight fitting and locked position on an upper part of the container and the part reformed for relocating and compressing the closure member into a permanently attached position on the container by the application of an axially applied pressure so that attachment of the closure member to the container may be effected rapidly and in a single operation.

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 embodying the instant invention;

Fig. 2 is an enlarged sectional view of the upper end of the finished container shown in Fig. 1;

Fig. 3 is an enlarged exploded view of the component parts of the upper end of the container, with portions broken away; and

Fig. 4 is an enlarged sectional view showing the end closure in the process of being attached to the container, with portions broken away.

As a preferred or exemplary embodiment of the invention the drawings show a dispensing container for holding corrosive liquid products such as detergents and the like and also show a method of permanently attaching a resilient noncorrosive material dispensing end closure member to the container. The container preferably comprises a tubular cylindrical sheet metal body 11 (Fig. 1) made of tin plate or the like material having a sheet metal bottom end closure 12 permanently secured thereto in a suitable seam 13 and a resilient plastic material top end closure 14 also permanently secured to the body. The plastic top end closure 14 preferably is made of polyethylene, although other plastic materials which are corrosion resistant, resilient and have at least a slight degree of elasticity may be used satisfactorily. The term "plastic" as used herein is intended to include all

such materials as synthetic and natural resins, polymers and elastomers.

Adjacent its top edge, the body 11 is provided with a sheet metal annular U-shaped ring or element 16 (Fig. 2) which is disposed within the body and which holds the top end closure 14 in place on the container. The ring 16 is formed with a pair of spaced, upright legs which constitute an outer or countersink wall section 17 and an inner or locking wall section 18. These wall sections 17, 18 are connected by or merge into an annular bottom wall section 19. Between them the wall sections 17, 18 set off an open annular channel 21.

The upper edge of the countersink wall section 17 of the ring 16 is formed with a laterally projecting flange 23 (see also Fig. 3) which extends over the top edge of the body 11 and is interfolded with a flange 24 on the body in a conventional double seam 25 to permanently secure the ring 16 to the body. In the conventional formation of the end seam 25 the body side wall and the countersink wall section 17 of the ring 16 are tightly pressed together and are simultaneously expanded outwardly to produce a slight upward and outward taper of above 7 degrees with the vertical, on the countersink wall section of the ring.

The inner or locking wall section 18 terminates at its upper edge in an outwardly and downwardly bent curl which provides a smooth annular curled edge 27, constituting a smooth annular projection, protuberance or bead for locking the top end closure 14 to the container.

The top end closure 14 as shown in the drawings is of breast formation having a domed or spherical or funnel shaped top wall section 31 (Fig. 2) open at its lower or large end and merging at its top end into a cylindrical upright dispensing nozzle 32. The exterior face of the nozzle is provided with screw threads 33 for removable attachment of a threaded metal or plastic sealing cap 34.

Surrounding its lower open end, the top end closure 14 is formed with a generally rectangular shaped enlarged annular depending flange 36 having a slight upwardly and outwardly tapered outer face 37 (see Fig. 4) corresponding with and slightly greater in diameter than the inner annular dimension of the countersink wall section 17 of the ring 16. The top face of the flange 36 preferably is flat and horizontal and merges into the base of the domed wall section 31 so as to avoid exterior recesses in the closure. An annular inner or locking face 39 of the flange 36 is of substantially the same or slightly greater annular dimensions than the annular dimensions of the outer face of the locking wall section 18 of the ring 16 and is formed with an annular groove or locking recess 41 to receive and hold the curled edge or locking protuberance 27 on the locking wall section 18 of the ring.

The flange 36 is disposed, in a compressed condition, in the channel 21 between the countersink wall section 17 and the locking wall section 18 of the ring 16 with the curled edge 27 of the ring locked in the recess 41 of the flange and with the top wall of the flange substantially flush with or slightly overlapping the top edge of the end seam 25 to permanently secure the end closure 14 in place on the container. The relation of the flat top edge of the flange to the end seam 25 eliminates any exterior recesses around the top of the can for sanitary purposes. The closure 14 may be of any desired form for any purpose, as long as the depending annular flange 36 is provided to secure the closure in place on the container.

The method of attaching the closure 14 to the container comprises broadly steps of compressing the flange 36 of the end closure 14 over the locking protuberance 27 on the locking wall section 18 and into the channel 21 of the ring 16. For this purpose the ring 16 is initially formed with the locking wall section 18 higher or of

greater depth than the countersink wall section **17** as shown in Fig. 3 so that the locking curled edge **27** and a portion of the ring wall section **18** project above the top of the end seam flange **23** of the ring. The ring **16** when secured to the container body **11** is in this initially formed condition as shown in Fig. 4.

With the ring **16** initially secured to the body **11** by the double seam **25** as shown in Fig. 4, the flange **36** of the resilient end closure **14** is snapped or forced by pressure over the curled edge **27** on the ring **16** until the annular groove **41** in the closure flange receives the curled edge **27** of the ring as shown in Fig. 4. The seating of the curled edge **27** into the groove **41** locks the end closure **14** in place on the locking wall section **18** of the ring.

As the next step in the instant method, a vertical or axial pressure is applied to the flat top surface of the closure flange **36** and the curled edge **27** in a direction toward the interior of the container. This may be accomplished in any suitable manner as by the upward movement of the container toward a pressure head **51** (Fig. 4) or by movement of the head **51** downwardly against the supported container. The head **51** pressing against the flange **36** and the curled edge **27** simultaneously, reforms the ring **16** by forcing the locking wall section **18** thereof downwardly into the container body in an axial direction to deepen the channel **21**. This also simultaneously presses the closure flange **36**, while still interlocked with the curled edge **27**, downwardly into the deepened channel **21** until the top face of the closure flange is substantially flush with the top edge of the double seam **25** as shown in Fig. 2. Since the outer diameter of the flange **36** is slightly greater than the inner diameter of the countersink wall section **17** of the ring, the outer tapered closure face **37** is compressed tightly against the correspondingly tapered face of the countersink ring wall section **17** and the flange as a unit is compressed radially inwardly to tightly hold it against the locking protuberance or curled edge **27** in the flange groove **41**, thus permanently securing the flange **36** in place in the channel **21** of the ring **16** to hold the end closure **14** permanently attached to the container.

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 and that changes may be made in the steps of the method described and their order of accomplishment 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 dispensing container for corrosive liquid products, comprising a sheet metal body having an annular sheet metal ring secured thereto, said ring having an outer upstanding countersink wall snugly fitting within and permanently secured to the top end of said body in an end seam and further having an inner upstanding substantially vertically coextensive locking wall setting off with said outer ring wall an annular countersunk channel adjacent said end seam, said inner locking wall terminating in a rigid outwardly and downwardly curved annular locking bead overhanging said channel with its upper edge disposed substantially in the plane of the upper edge of the end seam, and an end closure member of resilient plastic material having a thick depending annular flange permanently seated within and substantially filling said channel and compressed between said bead and end seam, the inner depending face of said flange having an annular recess enclosing said ring wall bead for permanently locking said closure member against displacement from said channel to provide a liquid tight closure for said container, said resilient plastic closure member having a domed breast terminating in an upstanding nozzle for the reception of a closure cap.

2. A container for dispensing liquid products, comprising a sheet metal body having an annular sheet metal ring secured thereto in an end seam, said ring having connected outer and inner upright annular walls disposed in radially spaced relation and setting off an annular U-shaped channel therebetween, said inner wall terminating at its upper end in a rigid annular locking projection extending into said channel with its upper edge disposed substantially in the plane of the upper edge of the end seam, and an end closure member of resilient plastic material permanently secured to said ring, said end closure member having a depending annular solid flange confined within said channel with said locking projection embedded in said flange so that the radial space between said projection and said outer wall is less than the radial width of the confined portion of the flange below the projection, said solid flange being compressed between said projection and the end seam and permanently secured in said channel.

3. A container of the character defined in claim 2 wherein said rigid projection is embedded in a preformed annular recess in said solid flange.

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