Aug. 23, 1960 J. HENCHERT 2,950,033

PLASTIC NOZZLE AND SCREW CAP ASSEMBLY

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Fig. 1.

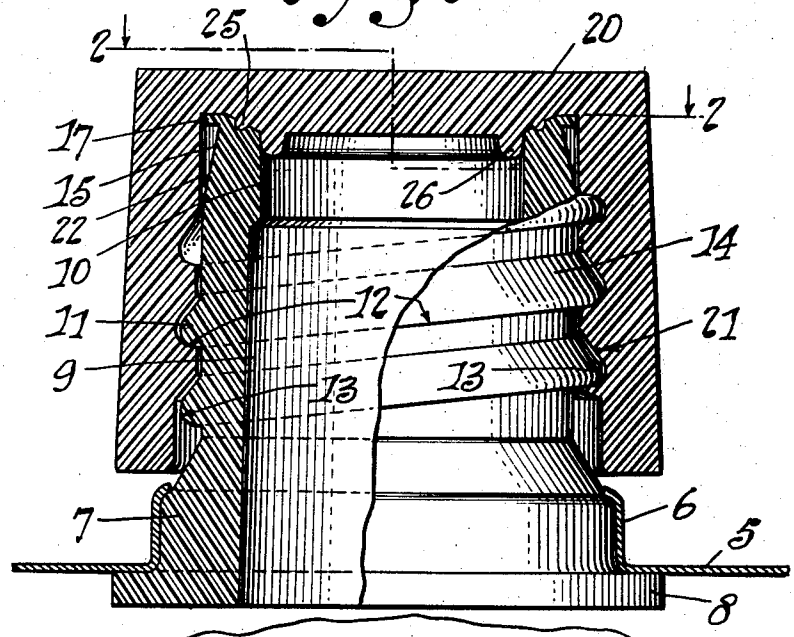
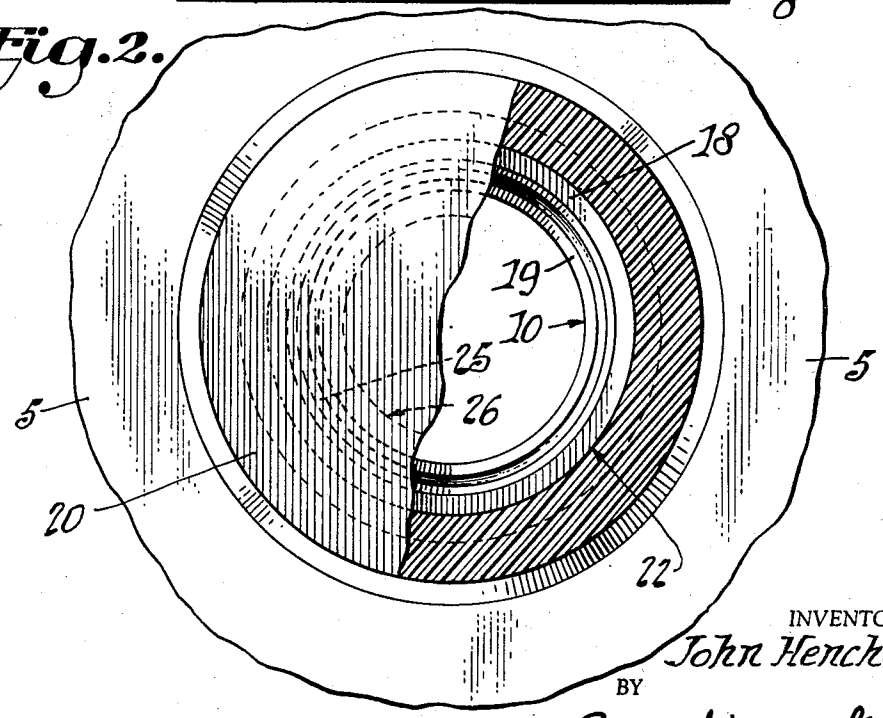


Fig. 2.



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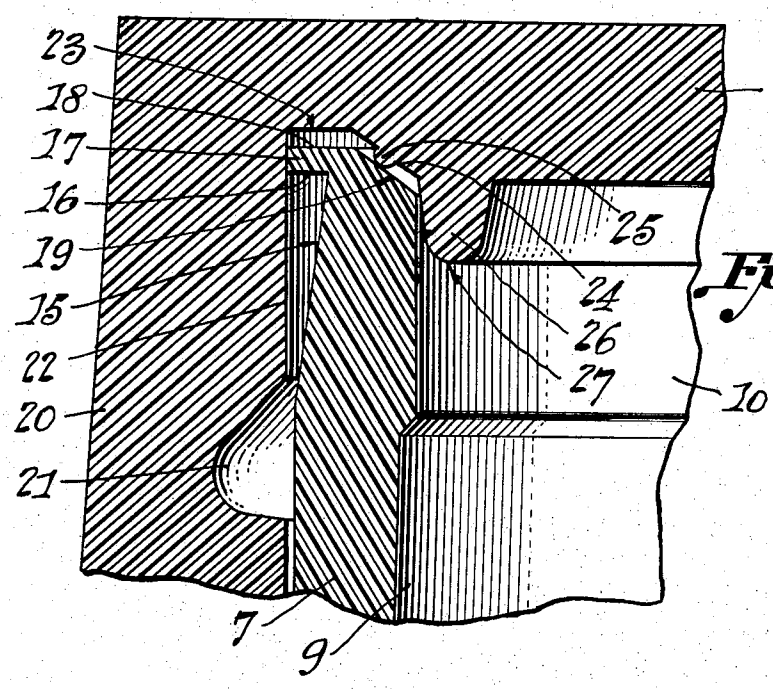

Fig. 3.

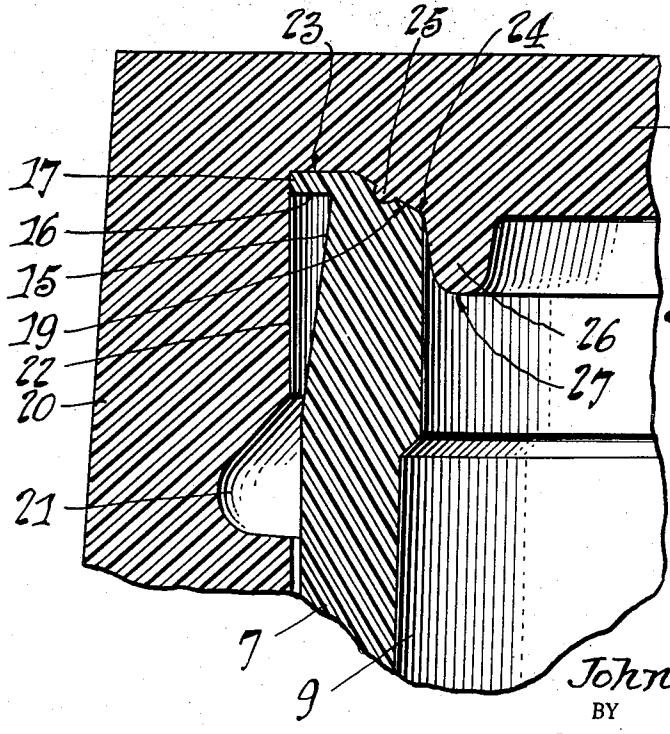

Fig. 4.

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PLASTIC NOZZLE AND SCREW CAP ASSEMBLY

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5 Claims. (Cl. 222—551)

The invention relates generally to metallic receptacles and resides in the provision of a novel plastic nozzle and screw cap closure assembly wherein an efficient seal is provided without the necessity of employing gasket means.

An object of the invention is to provide a screw cap and nozzle assembly of the character stated wherein the nozzle is formed of relatively soft, deformable plastic material, such as polyethylene, and the cap is formed of a harder material, such as polystyrene, the nozzle having an outwardly and upwardly flared wall portion surrounding its pouring outlet and the cap having an inwardly and downwardly tapered wall portion and a projecting annular bead disposed to become embedded in said flared wall portions as the flared and tapered wall portions are brought together during threading home of the cap on the nozzle.

Another object of the invention is to provide a screw cap and nozzle assembly of the character stated wherein the screw cap also has a depending annular bead engageable in the pouring mouth of the nozzle as the cap is threaded home thereon and effective to center the cap on the nozzle and permit tight threading on of the cap without danger of overriding of threads.

A further object of the invention is to provide a screw cap and nozzle assembly of the character stated wherein the nozzle and screw cap flare and taper wall portions are opposed one to the other and disposed in identical angular relation to the axis of the nozzle.

A still further object of the invention is to provide a screw cap and nozzle assembly of the character stated wherein the nozzle flare merges into an outwardly directed flat annulus bearing perpendicular relation to the axis of the nozzle and undercut peripherally to provide a flexible flange dimensioned to fit closely within the threaded wall of the cap.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a vertical cross section illustrating the nozzle and cap assembly, parts being shown in elevation.

Figure 2 is a part plan and part horizontal sectional view taken on the line 2—2 on Figure 1.

Figure 3 is an enlarged fragmentary vertical cross section illustrating the cap partially applied on the nozzle, the annular rib projecting from the cap taper wall portion being shown at its point of first engagement with the flare wall portion of the nozzle.

Figure 4 is a view similar to Figure 3 showing the cap fully applied on the nozzle.

In the example of embodiment of the invention, a metal can breast or top is indicated at 5, the same having an upstanding neck in which the nozzle generally designated 7 is received. The nozzle is formed of a relatively soft, deformable plastic material, such as polyethylene, and is in tubular form as illustrated in Figure 1, and preferably is provided with an enlarged flange 8 so

that in the mounting of the nozzle the same can be inserted upwardly through the neck to seat the flange 8 firmly against the interior of the surface of the can breast as indicated in Figure 1.

It will be apparent by reference to the drawings that the nozzle 7 is tubular in form so as to provide a central pouring throat 9, and the throat 9 preferably is slightly reduced in diameter as at 10 at its upper or outlet end. The tubular nozzle body is externally threaded as at 11 and each thread is formed to include an abruptly angled undersurface 12 merging through a well rounded shoulder 13 into an upwardly and inwardly directed surface 14 of lesser angle. It is preferred that the undersurfaces 12 of the threads be inclined at an angle of ten degrees with relation to the horizontal, as viewed in Figure 1, and that the upper surfaces 14 of the threads be inclined at an angle of 45°. It will thus be apparent that the under surfaces are inclined at a very abrupt angle with relation to the axis of the nozzle, and that the upper surface of the threads are inclined at a much lesser angle.

The external surface of the tubular body of the nozzle is peripherally tapered at 15 to provide an undercut at 16 forming a thin flexible overhang flange 17 presenting a flat upwardly directed annulus 18. The annulus 18 bears perpendicular relation to the axis of the nozzle and merges into an upwardly and outwardly flared wall portion 19 at the pouring outlet of the nozzle.

The screw cap generally designated 20 is equipped with threads 21 complementary to the threads of the nozzle and formed in the inner wall 22 of the cap which is dimensioned to snugly receive the nozzle flange 17. The cap has a flat annulus 23 disposed to engage the flat upper annulus 18 formed on the outlet end of the nozzle and opposing said cap annulus. The cap annulus 22 merges into a taper wall portion 24 of the cap, the same opposing and being complementary to the nozzle end flare 19. It will be apparent that the nozzle and screw cap flare and taper wall portions, or in other words, the opposing frusto-conical surfaces 19 and 24 are disposed in identical angular relation to the axis of the nozzle. An annular rib 25 depends centrally from the taper wall portion 24 of the cap as clearly illustrated in Figure 3.

The cap 20 also is equipped with a depending annular rib 26 having a rounded bottom 27 and slightly tapered sides. The rib 26 is disposed to enter and engage in the pouring outlet of the nozzle in the manner clearly illustrated in Figures 3 and 4 for centering the cap on the nozzle and permitting tight threading on of the cap without danger of overriding of the nozzle threads.

When the cap 20 is screwed home on the nozzle 7, the annular rib 26 first enters the pouring mouth 10 in the manner illustrated in Figure 3, and then the annular rib 25 comes against the flare surface 19 of the nozzle as shown in Figure 3. It will be noted that the nozzle flange 17 has a close fit in the interior wall of the cap 20 and when the threading home of the cap is continued, the annular bead will become embedded in the nozzle flare surface 19 and the taper and flare surfaces 24 and 19 respectively of the cap and nozzle will be brought together in sealing contact as indicated in Figure 4. This final threading home of the cap also brings the opposing cap and nozzle annuli 23 and 18 in sealing contact, and the deformation of the nozzle end by the embedding of the annular rib 25 therein tends to press the periphery of the flange 17 against the interior of the cap. The embedding of the bead 25, the contacting of the frusto-conical surfaces 24 and 19, the flat annuli 23 and 18 and the engagement of the periphery of the flange 17 against the interior wall of the cap 20 serves to provide a very secure seal.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that

various changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a container structure, a deformable plastic nozzle comprising a tubular body providing a pouring throat opening outwardly through a frusto-conical wall portion flared outwardly at an acute angle with relation to a perpendicular to the axis of the nozzle, and a closure cap of material harder than the nozzle and threadedly mounted on said tubular body, said cap including an outer depending portion having a smooth internal surface having a close fit with said tubular body at the upper end of said tubular body, said cap having an inwardly tapered frusto-conical wall portion opposed to said flared wall portion and including a projecting annular bead disposed to become embedded in said flared wall portion and to distort the upper portion of said tubular body outwardly to move the outer surface of said tubular body into sealing engagement with said cap outer depending portion as said flared wall portion and said tapered wall portion are brought together during the threading home of said cap on said nozzle.

2. Container structure as defined in claim 1 wherein said flared wall portion and said tapered wall portion are disposed in identical angular relation to the axis of said nozzle and are in face-to-face sealing contact at the conclusion of the threading home of said cap on said nozzle.

3. Container structure as defined in claim 2 wherein said flared wall portion merges into an outwardly directed flat annulus bearing substantially perpendicular relation to the axis of said nozzle, said cap having a flat annulus extending outwardly from said tapered wall portion and engaging in sealing contact against said nozzle flat annulus.

4. Container structure as defined in claim 1 wherein said flared wall portion merges into an outwardly directed flat annulus bearing substantially perpendicular relation to the axis of said nozzle, said cap having a flat annulus extending outwardly from said tapered wall portion and engaging in sealing contact against said nozzle flat annulus.

5. Container structure as defined in claim 1 wherein said nozzle tubular body is undercut peripherally adjacent the upper end thereof to define a thin flexible overhang flange which forms the seal with said cap outer depending portion.

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