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CLOSURE STRUCTURE

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Fig. 1.

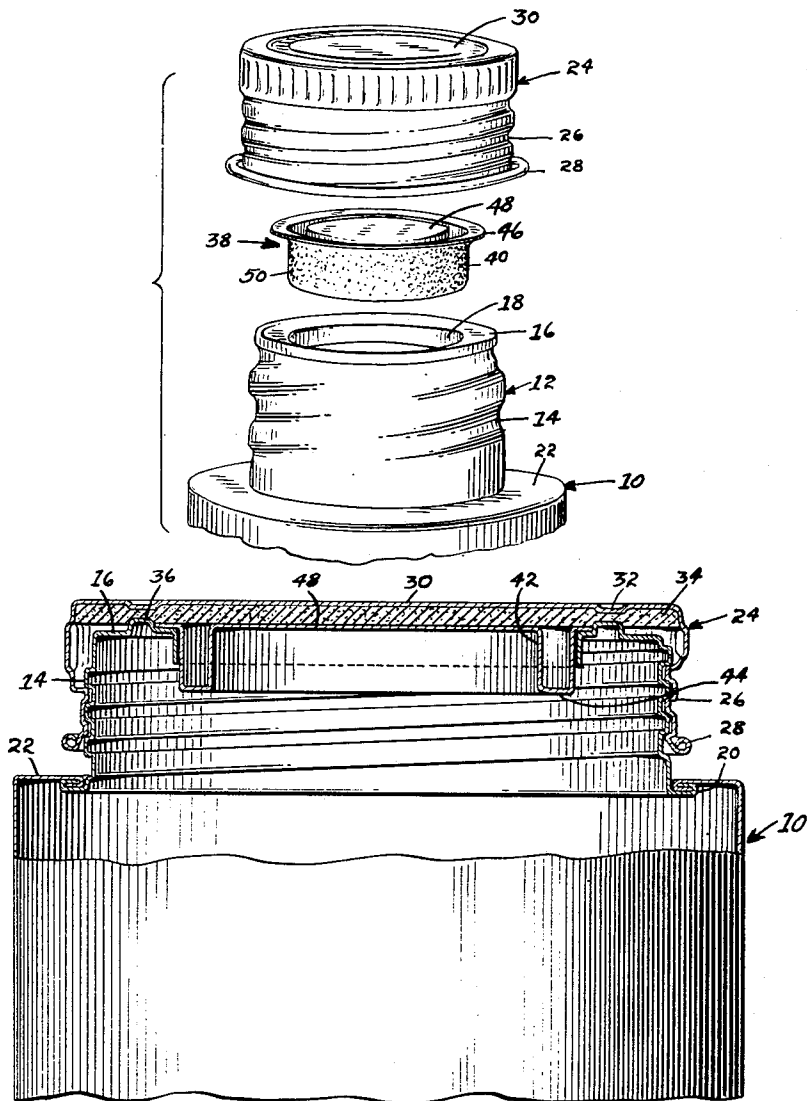


Fig. 2.

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2,705,088

CLOSURE STRUCTURE

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1 Claim. (Cl. 220—29)

This invention relates to a nozzle and screw cap assembly for cans, bottles and the like.

Reference is here made to the type of spout which is provided with two closures, one being frictionally held in place and the other being in screw-threaded engagement with the nozzle. The frictionally held closure constitutes a factory seal which is designed and intended to prevent surreptitious or unauthorized tampering with the contents of the can or bottle to which the nozzle is affixed. It is press-fitted in place and it cannot be removed without some measure of noticeable distortion or defacement which would readily be detected. This closure is sometimes referred to as the inner seal of the container and it is intended to be removed only by the ultimate user or dispenser of the contents of the container. Once removed, it is discarded. The second closure is removable and replaceable. It may be removed to dispense some of the contents of the container and then replaced to seal and protect the remaining contents and this process may be repeated as many times as may be necessary. This second closure is sometimes designated as a screw cap.

The present invention relates particularly to the inner, press-fitted seal or closure member first above mentioned. Seals of this general type are generally stamped out of sheet metal and they assume the shape of a shallow, circular pan having a generally cylindrical side wall, possibly tapered inwardly and downwardly, a flat, generally disc-shaped bottom wall, and an annular, outwardly extending flange along the top edge of said cylindrical wall.

In the present invention, the inner seal has a cylindrical side wall, tapered, if desired, and an annular flange along the top peripheral edge of the cylindrical wall. Thus far, it resembles the inner seals of the prior art. It does not, however, have a flat, disc-shaped bottom wall and, indeed, it has no bottom wall of any kind whatsoever, in the commonly accepted meaning of the word "wall." Instead, it has a flat, disc-shaped top wall which occupies substantially the same plane as the annular flange. This top wall is supported by an inner cylindrical wall which is connected at its lower end either directly or by means of an annular web portion to the lower end of the outer cylindrical wall.

In the conventional inner seal, the disc-shaped bottom wall performs only the function of a closure for sealing off the contents of the container. In the present invention, the disc-shaped top wall performs the same function but in addition, it serves an additional, highly important function, namely, that of supporting the liner or gasket in the screw cap.

It has been found that leaks sometimes develop by reason of failure in the liner or gasket of the screw cap. The exact cause of failure has heretofore not been ascertained, in the absence of defects inherent in the liner or gasket itself. I have now discovered the cause and remedy for this failure. The cause resides in the absence of support of the main body of the liner or gasket. Partial vacuums sometimes develop in the container which tend to suck the unsupported portion of the liner or gasket downwardly into the container. Consequently, breaks develop along the peripheral edge of the liner or gasket where said edge is clamped down upon the nozzle by the screw cap. Even where breaks do not occur, shifting of the liner or gasket sometimes takes place with respect to the cap and nozzle and this alone is sufficient to cause leaks.

The remedy resides in the use of an inner seal having

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a top wall as above described. This top wall adequately supports the main body of the liner or gasket so that no sagging or shifting or breaking can possibly take place under all conditions of normal use.

Another important advantage of the inner seal herein described and claimed is the greater space or volume which it provides within the nozzle of the container. This greater space or volume results from the fact that this inner seal has no bottom wall. Consequently, the space between the top wall of the present inner seal and the bottom wall of a conventional inner seal is added to the available or usable space within the nozzle.

There are other advantages which will be apparent to those familiar with the art.

A preferred form of this invention is shown in the accompanying drawing in which:

Fig. 1 is an exploded view in perspective, showing a typical screw-threaded nozzle, an inner seal made in accordance with this invention and a typical screw cap.

Fig. 2 is an enlarged fragmentary view of a typical can showing in detailed section, the construction of the nozzle and how it is affixed to the can, the construction of the inner seal and how it is secured to the nozzle, and the construction of the screw cap and how said screw cap is secured to the nozzle and how its liner is supported by the top wall of the inner seal.

Referring now to Fig. 1 of the drawing it will be seen that a conventional can 10 is provided which is intended to be illustrative of the various types of cans and bottles and the like which are provided with a nozzle or neck 12 of the kind shown in the drawing. This nozzle is substantially cylindrical in shape and it has screw threads 14 rolled therein or formed therein in any other conventional manner. The top edge of the nozzle is bent inwardly to form an annular shoulder 16. It is then bent downwardly to form an annular flange 18 which may be tapered inwardly and downwardly. The lower end of the nozzle (see Fig. 2) is bent radially outwardly and then upwardly and then radially inwardly to form a locking portion 20 which interlocks with top wall 22 of container 10. More specifically, said top wall 22 has a circular opening formed therein to receive said nozzle and the peripheral edge surrounding said circular opening is bent downwardly and then radially outwardly into the space between the radially outwardly and radially inwardly bent portions of the lower end of the nozzle, to securely interlock therewith. Soldering instead of crimping may also be employed to secure the nozzle or neck to the body of the can. This is conventional construction and a liquid-tight and air-tight seal is thereby provided between the nozzle and the container which supports it.

Screw cap 24 is conventional in construction and it is provided with screw threads 26 which are either rolled or otherwise formed therein. It is provided along its lower peripheral edge with an annular bead 28. Its top wall 30 may be provided with an annular depression 32 (Fig. 2) which on its lower or under side assumes the form of an annular ridge or shoulder. Mounted within the screw cap is a disc-shaped liner or gasket 34 which may be made of any suitable material, depending upon the nature of the contents of the container and other similar considerations. For example, it may consist of varnished-facing paper laminated to a compressible impervious impregnated material which prevents absorption and leakage. It will be noted that the upper surface of the liner abuts the annular shoulder which is formed in the top wall of the screw cap. The liner may, if desired, be contoured to receive said annular shoulder, as Fig. 2 of the drawing clearly shows, and its top surface will then snugly abut not only said annular shoulder but also the disc-shaped portion of the top wall which is disposed within said annular shoulder and the annular portion of said top wall which is disposed outside of said annular shoulder.

It will be noted in Fig. 2 that an annular ridge 36 is formed at the top of nozzle 12 in registration with the annular ridge which depression 32 forms in the screw cap. When the cap is mounted on the nozzle, liner or gasket 34 is squeezed or gripped between these two annular ridges to provide a leak-proof seal.

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Inner seal 38 which is made in accordance with this invention has an outer cylindrical wall 40 and an inner cylindrical wall 42. The two walls are joined at their lower ends by means of a ring-shaped web 44. The upper peripheral edge of outer wall 40 is bent radially outwardly to form an annular flange 46. A top wall 48 which is flat and disc-shaped is formed at the top of inner wall 42. The outer wall 40 may be tapered to correspond to the taper of flange 18 of the nozzle. An adhesive or sealing material 50 may be applied to the outer surface of outer wall 40. It will be noted that top wall 48 and annular flange 46 occupy a substantially common plane.

Inner seal 38 may be stamped out of suitable sheet metal and it may be formed to the shape shown in the drawing. Hot-dipped tinplate or terneplate would be suitable for the purposes of this invention.

The use of the inner seal is clearly apparent from the drawing. It is pressed into the nozzle with its outer wall 40 frictionally engaging flange 18 of the nozzle. The adhesive or sealing coat 50 will help secure the inner seal to the nozzle and it will also help to provide a fluid-tight seal. It will be noted that flange 46 of the inner seal is seated within the annular ridge 36 which is formed in the top of the nozzle. The liner or gasket rests flat against flange 46 and top wall 48 of the inner seal. Consequently, it is unsupported in the area within annular ridge 36 only in that narrow ring-shaped portion which occupies the space between the inner and outer walls of the inner seal. Consequently, the liner or gasket is adequately supported throughout substantially its entire effective area. Breaks, shifting and leaks are thereby prevented under all conditions of normal use and normal abuse.

The foregoing is illustrative of a preferred form of this invention and it will clearly be understood that this preferred form may be modified and other forms may be provided within the broad spirit of the invention and the broad scope of the claim.

I claim:

A closure of the character described, comprising a nozzle, a removable closure plug press-fitted into said nozzle and a screw cap mounted on said nozzle and bearing against said closure plug, said nozzle having a cylindrical wall with screw threads formed therein, a first annular web connected integrally along its outer peripheral edge with the upper peripheral edge of said cylindrical

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drical wall, a raised annular bead formed in said first annular web concentrically therewith, and a cylindrical flange integrally depending from the inner peripheral edge of said first annular web, said closure plug having an annular flange which rests upon said first annular web within said annular bead, a cylindrical wall integrally depending from the inner peripheral edge of said last mentioned annular flange, a second annular web integrally connected along its outer peripheral edge to the lower peripheral edge of said last mentioned cylindrical wall, an inner cylindrical wall projecting upwardly from the inner peripheral edge of said second annular web, integrally therewith, and a disc-shaped platform integrally connected along its peripheral edge to the upper peripheral edge of said inner cylindrical wall, said annular flange which rests on the first annular web and said disc-shaped platform occupying a common plane slightly below the plane occupied by said annular bead, and said screw cap comprising a cylindrical wall having screw threads formed therein for engagement with the screw threads of the cylindrical wall of the nozzle, a disc-shaped web integrally connected along its peripheral edge to the upper peripheral edge of the cylindrical wall of said screw cap, an annular bead formed in said disc-shaped web in registration with the annular bead on the nozzle and facing in the direction of said last mentioned annular bead, and a disc-shaped gasket mounted in said screw cap between said disc-shaped web on the one hand and the nozzle and closure plug on the other hand, said gasket being pinched between the two annular beads to provide a tight seal and being supported in the area within said beads by the annular flange and disc-shaped platform of the closure plug.

References Cited in the file of this patent

UNITED STATES PATENTS

437,233	Norton	Sept. 30, 1890
1,079,238	Hammer	Nov. 18, 1913
1,279,487	Wardell	Sept. 17, 1918
1,758,916	Aulbach	May 20, 1930
1,995,350	Hoag	Mar. 26, 1935
2,305,374	Beasley et al.	Dec. 15, 1942
2,362,421	Von Till	Nov. 7, 1944
2,602,565	Regan	July 8, 1952