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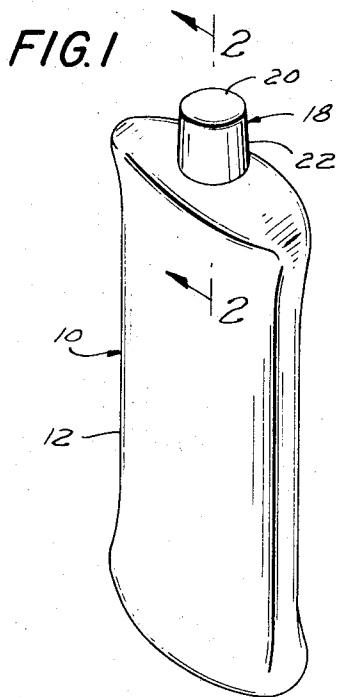
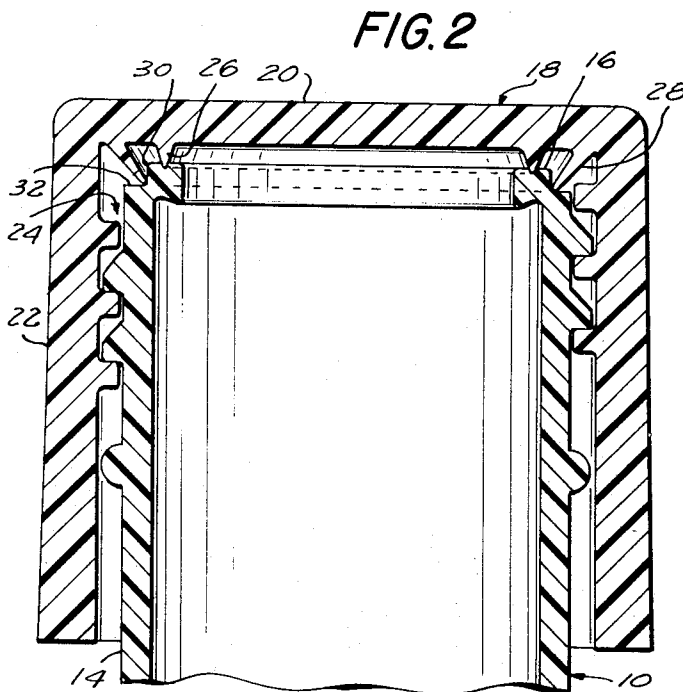
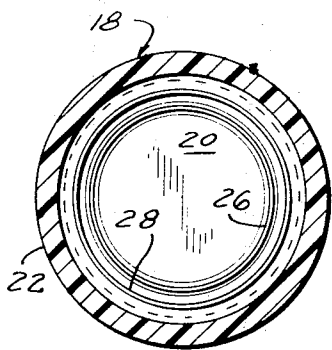
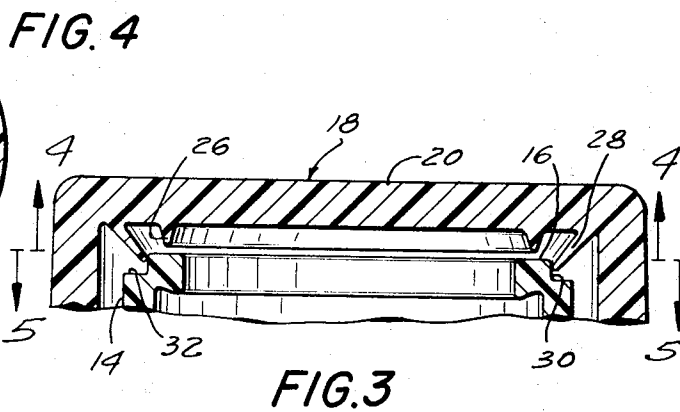
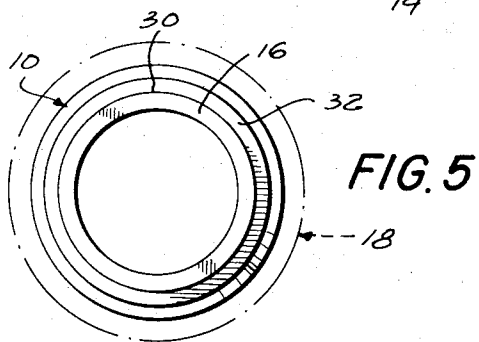
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CAP CONSTRUCTION

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3,360,149

CAP CONSTRUCTION

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ABSTRACT OF THE DISCLOSURE

A cap for a container is provided and includes a top disc from which extends a downwardly depending skirt having internal threads for mating with external threads on the neck of the container. The inner face of the top disc includes a downwardly depending annular lip adapted to engage the upper end of the neck of the container and seal its contents when completely threaded on the container neck. To assure against container leakage when the cap is not completely seated on the neck, a further seal is provided between the cap and the neck in the form of an inwardly and downwardly depending sealing lip on the cap for engaging with exterior side surfaces of the neck.

The present invention relates to an improved cap construction and, more particularly, to a cap adapted to provide a primary as well as a secondary seal with the neck of a container.

Heretofore, containers have been closed and sealed by a threaded cap. Ordinarily this cap would cooperate with the upper end of the container in providing an annular sealing zone. In this manner, the contents of the container would be sealed at this zone by tightening the cap on the neck of the bottle through the interposed cooperating mating threads. Towards this end, the cap would, amongst other proposals, either possess a separate liner or a depending lip for engagement with the upper end of the container in providing the stated sealing zone. A number of people have experienced the unfortunate situation of container contents spillage or leakage during handling, storage, shipping or the like, particularly when the cap was not firmly and tightly threaded or seated on the neck of the bottle or when the cap was subjected to "back-off" as frequently occurs in handling and while in transit.

With the foregoing in mind, it is the primary object of this invention to circumvent the several disadvantages inherent in prior art cap constructions by providing an improved cap adapted to provide a secondary seal which cooperates to effectively seal the container contents in the event the cap has not been firmly seated or threaded on the neck of the container or when the cap is subjected to "back-off" in handling or in transit.

Another object is to provide a cap construction of this type which is relatively inexpensive to manufacture with the secondary sealing means adapted to be readily incorporated into existing cap constructions where needed or desired thereby eliminating the need for a separate liner and the added and attendant costs commonly experienced in the industry today.

Briefly stated, the cap construction of this invention includes a top disc from which extends a downwardly depending skirt having internal threads adapted to be coupled with external threads appearing on the neck of a container to be sealed. The inner face of the top disc is provided with a downwardly depending annular lip adapted to sealingly engage the upper end of the neck of the container to seal the container contents when the cap is firmly and completely threaded on the container neck. In order to assure against container content leakage when the cap is not completely seated on the neck of the container, a secondary seal is provided between the cap and the container neck which seal is in actuality a primary seal

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because of its prolonged engagement with the bottle neck even following disengagement of the annular lip or primary seal. In this connection, a downwardly and inwardly depending sealing lip on the cap is adapted to sealingly engage exterior side surfaces of the neck of the container following disengagement of the primary annular seal lip with the top end of the container neck.

Other objects and advantages will become apparent from the following detailed description which is to be taken in conjunction with the accompanying drawings illustrating a somewhat preferred embodiment of the invention and in which:

FIG. 1 is a perspective view of a container or bottle having a cap secured thereon in accordance with the teachings of the present invention;

FIG. 2 is an enlarged fragmentary sectional view taken along the line 2—2 of FIG. 1 showing the cap fully threaded on the neck of the container whereupon both primary and secondary seals serve to seal the container contents;

FIG. 3 is a somewhat similar fragmentary sectional view showing the release of the primary seal as is the case when the cap is not fully threaded on the neck of the container while maintaining the secondary seal to assure the sealing of the container contents;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3; and

FIG. 5 is a cross-sectional view taken along the line 5—5 of FIG. 3.

In the drawings, a container 10 is illustrated having the usual main body portion 12 and a reduced upper neck 14 terminating in an upper end 16. The contents of the container 12 are adapted to be effectively sealed by means of the cap 18 incorporating the teachings of this invention. With this in mind, the cap 18 includes a top disc portion 20 and a downwardly depending annular skirt 22. As is usually the case, the cap 18 is adapted to be secured on the neck 14 of the bottle by means of cooperating intermeshed threads 24.

In order to effectively seal the container contents, the cap 18 is provided with a primary seal defined by a substantially annular downwardly depending lip 26 or series of concentric lip to avoid mismatching particularly with thin bottle necks. This lip 26 is adapted to sealingly engage the upper end 16 of the bottle neck 14 when the cap 18 is fully threaded on the bottle neck 14. Naturally when the cap is fully threaded on the neck of the bottle the seal between the annular lip 26 or stated concentric lips and the top end 16 will be adequate to seal the container contents. In those cases where the cap 18 is inadvertently not fully threaded on the container neck 14 this seal will never be developed. This seal when once obtained may be relieved perhaps during container handling, usage or shipping and, in a number of instances, by the inherent resiliency and relief of the parts particularly when modern organic resins are employed.

In order to assure against leakage of the container contents, together with maintenance of the desired seal between the cap 18 and bottle 10, a secondary seal is provided. This seal is defined by a downwardly and inwardly depending lip 28 which possesses a degree of resiliency and flexibility for optimum compressibility with the reduced diameter section 30. This lip 28 is substantially annular in configuration and originates at substantially the juncture between the top disc portion 20 and skirt 22 of the cap 18. The free or other end of this lip 28 is adapted to cooperate with the exterior of a reduced section 30 which may be of variable length and angularity and defines a shoulder 32 with the remaining portions of the neck 14. As will be appreciated from FIG. 2, the sealing lip 28, together with the annular lip 26, sealingly engage with surfaces of the neck 14 of the bottle 10. Upon

disassociation of the annular lip 26 with the upper end 16 of the neck 14, the sealing lip 28 will remain in engagement with exterior surfaces of the reduced section 30. This association will continue for awhile before broken upon further unthreading of the cap 18 relative to the neck 14. Naturally, the period of association between the lip 28 and bottle neck may be varied.

Thus, the several aforementioned objects and advantages are most effectively attained. Although a single somewhat preferred embodiment of the invention has been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

I claim:

A cap in combination with a container having a neck defining an opening to the interior of the container and the neck of the container being reduced at the upper end thereof with the reduced upper end of the neck defining with the remaining portions of the neck an external annular shoulder at the bottom of the reduced neck, said cap being on the container and sealing the opening of the neck, said cap comprising a top disc portion having a substantially circular periphery and an annular skirt depending downwardly from the periphery of said top disc portion and having an inner face, means for temporarily securing the cap to the neck of the container, sealing means presented by surfaces of the cap for engaging the neck of the container for sealing the container and an annular radially extending sealing lip

for sealingly engaging surfaces of the neck of the container to provide a supplemental seal between the cap and the container which will seal the container independent of said sealing means, said sealing lip extending both downwardly and inwardly from the juncture between the top disc portion and skirt, said sealing lip being substantially flexible and being in sealing engagement with the reduced upper end of the neck substantially at the shoulder when the cap is fully on the neck of the container and the sealing lip being adapted to remain in engagement with the reduced upper end for a predetermined period following the breaking of the seal presented by said sealing means when the cap is only partially on the neck of the container and short of being fully on the neck of the container.

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