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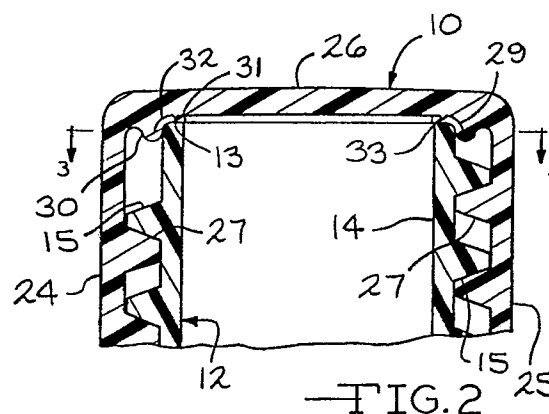
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54 Threaded closure with integral sealing means.

57 A linerless closure (10) for use on a bottle (12) or other container, having a threaded neck (15), has a cylindrical sidewall (25), with mating threads (27), and a top (26). An integral sealing ring (29), including a continuous flexible central member (31), is mounted below the top. Threading movement between the closure and the container positions the central member between the neck and the top to form a continuous seal.



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The present invention is primarily directed to a linerless closure for bottles or other types of generally liquid carrying containers. A normal application would be in connection with a carbonated beverage bottle which could either be a glass bottle or a plastic bottle.

However, the present invention may be utilized in connection with other types of bottles and containers.

United States Patent No. 4,156,490 discloses an annular boss 12 which extends into a bottle mouth.

United States Patent No. 4,206,852 is directed to a linerless closure which includes an annular wall 30 which also extends within a bottle neck 36.

United States Patent No. 4,343,408 discloses a plastic closure which includes annular ridges 34 which engage the upper end of the neck portion 5 of a container 3.

Early plastic closures which were designed to replace conventional metal sealing closures usually incorporated a liner to compensate for unevenness on the top lip of the glass or plastic bottles. The development of plastic materials, such as polyethylene and polypropylene, has enabled linerless closures to be developed.

It is the object of the present invention to provide a new and improved linerless closure for use in numerous applications including hermetic applications and carbonated beverage applications.

The present invention provides a linerless closure for use on a bottle or other container which includes an upper end having a threaded neck. The linerless closure includes a one-piece body, which is normally a plastic body. The body has a cylindrical skirt or sidewall and a top. The container neck and the body sidewall define mating threads. An internal sealing ring is mounted below and adjacent the top of the body. The sealing ring includes a continuous flexible central member. Upward threading movement between the container neck and the cap positions the flexible central member between the neck and the top of the cap to form a continuous seal.

Preferably, the sealing ring also includes a downwardly extending side member. The neck engages the side member to form a side seal and a corner seal in addition to the top seal formed by the flexible central member and the top.

The invention will now be exemplified by reference to the accompanying drawings in which:

Fig. 1 is a cross-sectional view of a linerless closure, according to the present invention, positioned on the neck of a container;

Fig. 2 is a vertical cross-sectional view similar to Fig. 1 showing the linerless closure in a sealed position;

Fig. 3 is a cross-sectional view taken along lines

3-3 of Fig. 2;

Fig. 4 is a fragmentary side elevational view showing a linerless closure, according to the present invention, positioned over the neck of a bottle;

Fig. 5 is a cross-sectional view of another embodiment of a linerless closure, according to the present invention;

Fig. 6 is a bottom plan view of still another embodiment of a linerless closure, according to the present invention; and

Fig. 7 is a cross-sectional view taken along the line 7-7 of Fig. 6.

A linerless closure, according to the present invention, is indicated in Fig. 1 by the reference number 10. A plastic container 12 has an upper end 13 and a neck 14 which defines threads 15. The plastic container 12 is commonly constructed of polyethylene terephthalate. However, the container may be constructed of numerous materials, such as metal, glass or thermoplastics, including polypropylene, high density polyethylene, nylon or polyvinyl chloride.

Referring to Fig. 4, a linerless closure 10' is shown positioned over a glass bottle 18 having an upper end 19 and a neck 20 which defines a continuous thread 21.

The linerless closures 10 and 10' are preferably constructed of a plastic material. The plastic material is normally a thermoplastic such as polypropylene, polyethylene terephthalate, polyethylene, nylon, blends of such materials and other resins.

The linerless closure 10 has a one-piece body 24 including a cylindrical skirt or sidewall 25 and an integral top 26. The sidewall 25 defines threads 27 on its interior. The threads 27 mate with the threaded neck 14 of the container 12. When the linerless closure 10 is rotated relative to the container 12, the assembly is moved from an unsealed position shown in Fig. 1 to a sealed position as shown in Fig. 2.

Referring to Fig. 1, an integral sealing ring 29 is mounted below and adjacent the top 26. The sealing ring 29 includes a downwardly extending circular side member 30 and a flexible central member 31. The circular side member 30 and the top 26 define a continuous circular receiving groove 32.

In a preferred embodiment, a depending circular "V" shaped ridge is defined on the inner surface of the top 26 of the body 24.

Referring to Figs. 1 and 2, as the linerless closure 10 is moved between the unsealed position in Fig. 1 to the sealed position in Fig. 2, the upper end 13 of the container 12 engages the circular sealing ring 29. Further upward movement urges the flexible central member 31 upwardly into the

receiving groove 32 with the flexible central member 31 being tightly positioned in a seal position between the upper end 13 of the container 12 and the top 26 of the body 24 of the closure 10. As shown in Fig. 2, when the linerless closure 10 is in this sealed position, the flexible central member 31 is also pushed tightly against the V-shaped circular ridge 33 in the top 26 to ensure a positive top seal. At the same time, when the upper end 13 of the container 12 is moved into the Fig. 2 seal position a side seal and a corner seal are defined between the upper end 13 of the container 12 and the rigid continuous circular side member 30 of the sealing ring 29. This side seal and corner seal with the side member 30 is formed as the flexible central member 31 is moved or positioned within the receiving groove 32, as best shown in Fig. 2.

The glass bottle embodiment shown in Fig. 4 operates in a similar manner. As the linerless closure 10' is threaded onto the neck 20 of the glass bottle 18, the side sealing, corner sealing, and top sealing occur.

It has been found that a linerless closure, according to the present invention, provides a good seal, particularly on carbonated beverage containers, and also a cost effective seal.

Another embodiment of a linerless closure, according to the present invention, is indicated in Fig. 5 by the reference number 40. The closure 40 includes a continuous angle groove 41.

As the linerless closure 40 is moved to its sealed position, the upper end 13' of the container 12' engages the circular sealing ring 29'. Further movement urges the flexible central member 31' upwardly into and against the continuous angle groove 41. This forms a side seal, a corner seal and a top seal between the upper end 13' of the container 12' and the closure 40.

Referring to Figs. 6 and 7, another embodiment of a linerless closure, according to the present invention, is indicated by the reference number 50. The closure 50 includes a cylindrical skirt or sidewall 25' and an integral top 26'. The sidewall 25' defines threads 27' on its interior. An integral sealing ring 29' is integrally mounted below the top 26'.

A plurality of reinforcing ribs 52 depend downwardly from the top 26' of the closure 50. In the present embodiment, the ribs 52 are the shape of a cross, however, differing shapes and numbers of ribs may be used. The ribs serve to retard deflection of the top 26' of the closure 50 when under pressure.

Numerous revisions may be made to the linerless closure described above without departing from the scope of the following claims.

Claims

1. A linerless closure for use on a bottle or other container including an upper end and a threaded neck, said linerless closure, comprising, in combination, a one-piece body having a cylindrical sidewall and a top, said sidewall defining threads which mate with such threaded neck of such bottle or container, an integral sealing ring mounted below and adjacent said top, said sealing ring including a continuous flexible central member, whereby upward threading movement of such neck engages said sealing ring and further movement positions said central member between such neck and said top to form a continuous seal.
2. A linerless closure as claimed in claim 1, said sealing ring including a downwardly extending side member and a flexible central member, wherein upward threading movement of such neck engages said sealing ring and further movement of such neck forms a continuous side seal with said side member, a corner seal and a top seal with said flexible central member and said top.
3. A linerless closure as claimed in claim 2, wherein said side member and said top define a circular receiving groove and wherein said flexible central member is positioned within said groove when in a seal position.
4. A linerless closure as claimed in claim 2, wherein said side member and said top define an angular receiving groove and wherein said flexible central member is positioned within said groove when in a seal position.
5. A linerless closure as claimed in claim 2, wherein said top has an outer and inner surface, a depending circular ridge on said inner surface of said top, said flexible inner wall engaging said depending circular ridge when in a seal position.
6. A linerless closure as claimed in claim 5, wherein said depending circular ridge is generally "V" shaped.
7. A linerless closure as claimed in any one of the preceding claims constructed of a plastic material.
8. A linerless closure as claimed in any one of the preceding claims including means on said top for retarding deflection of said top.
9. A linerless closure as claimed in claim 8,

wherein said retarding means comprises at least two downwardly depending ribs on said top.

10. A linerless closure as claimed in claim 1 for use on a bottle or container including an upper end and a threaded neck, said linerless closure comprising, in combination, a one-piece plastic body having a cylindrical sidewall and a top, said top having an outer surface and an inner surface, said sidewall defining threads which mate with such threaded neck of such bottle or container, an integral sealing ring mounted below and adjacent said top, said sealing ring, including a downwardly extending side member and a flexible central member, wherein upward threading movement of such neck engages said sealing ring and further movement of such neck forms a continuous side seal with said side member, a continuous corner seal and a top seal with said flexible central member and said top, a depending circular ridge on said inner surface of said top, said flexible inner wall engaging said depending circular ridge when in the seal position.

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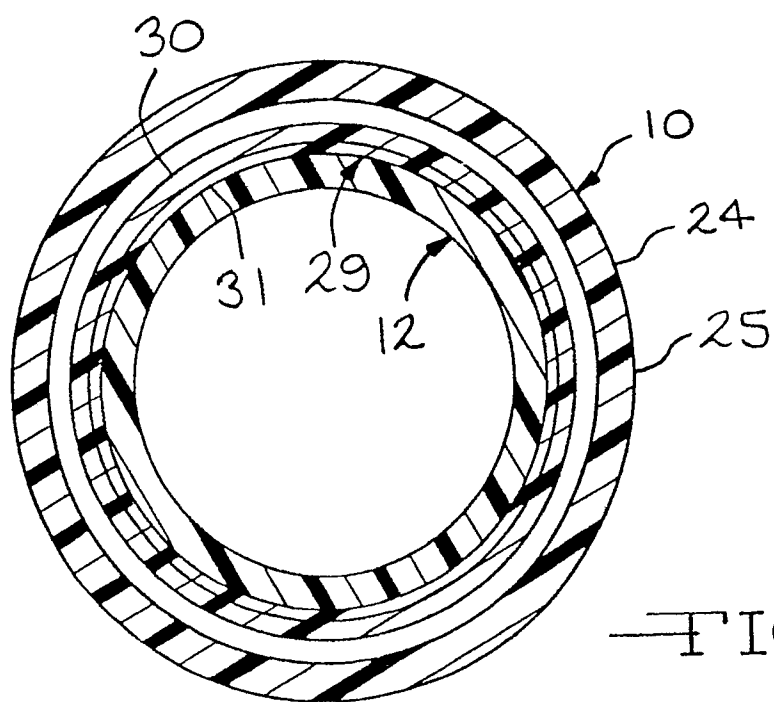
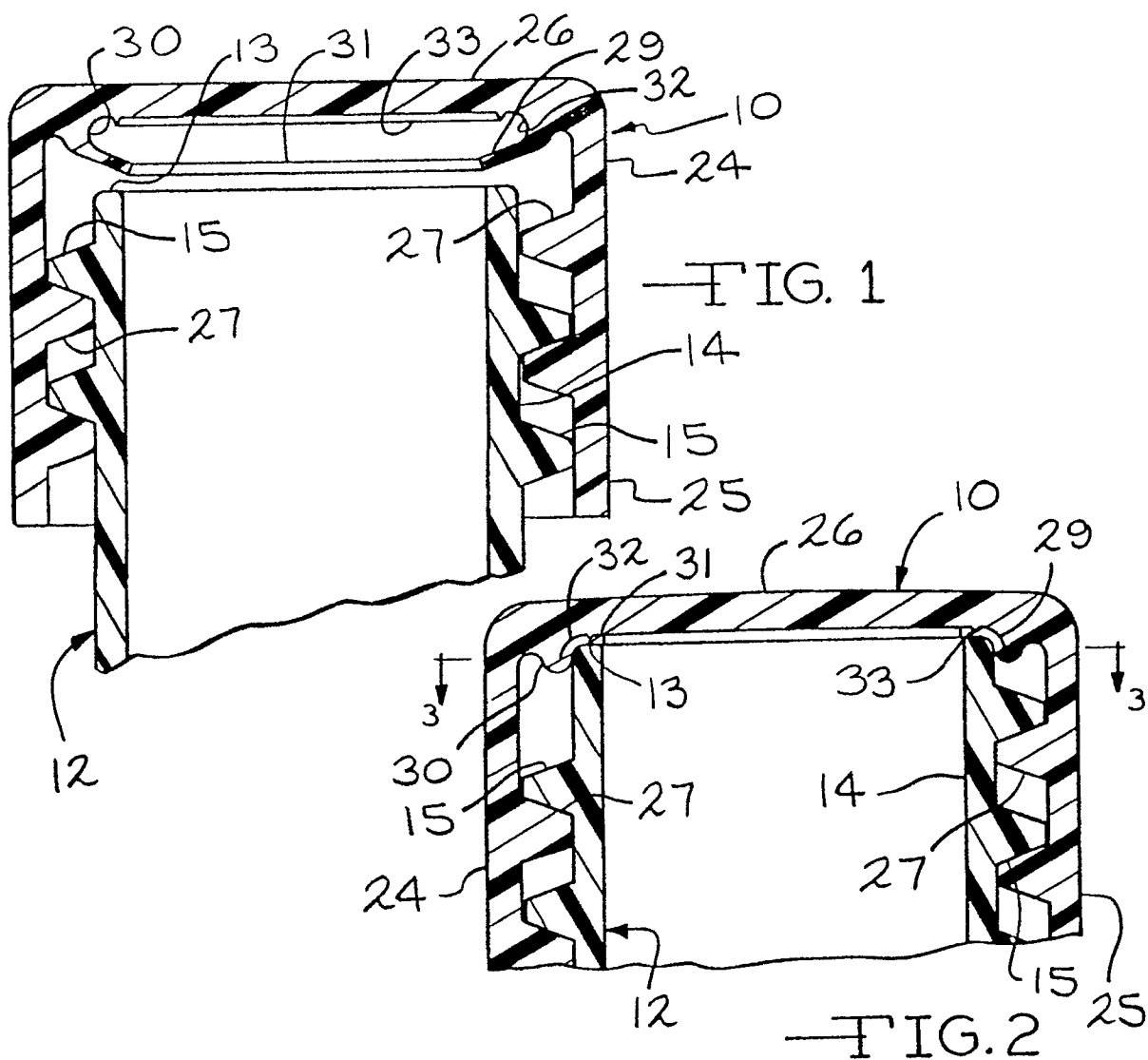
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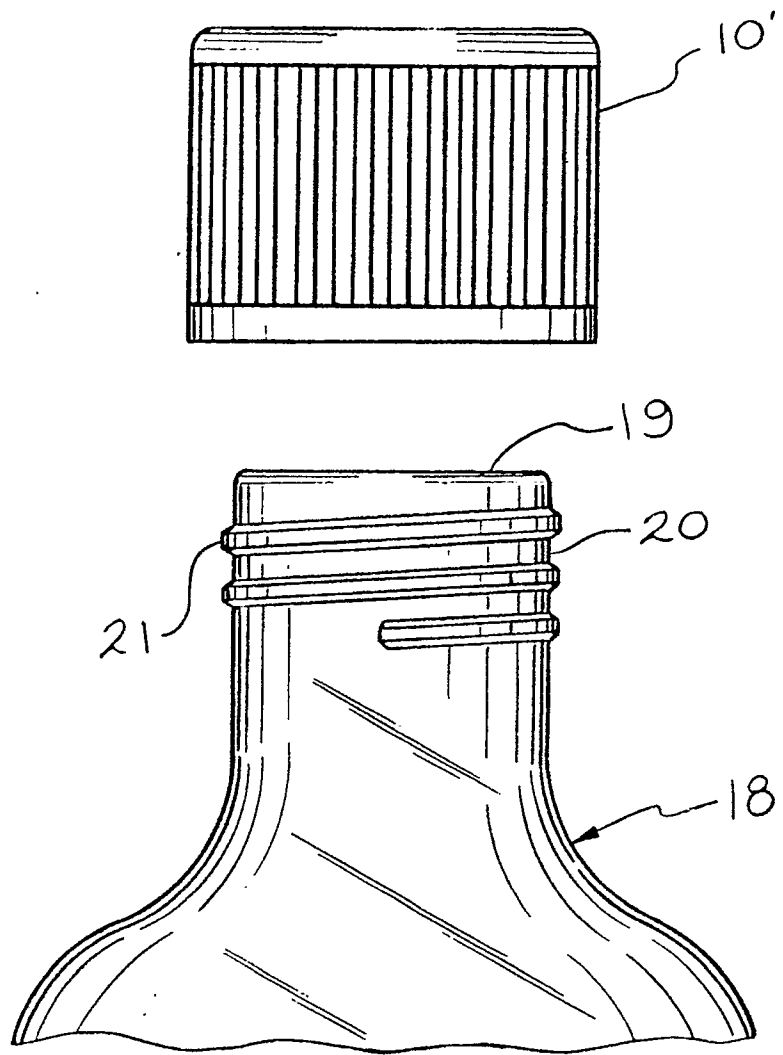


FIG. 4

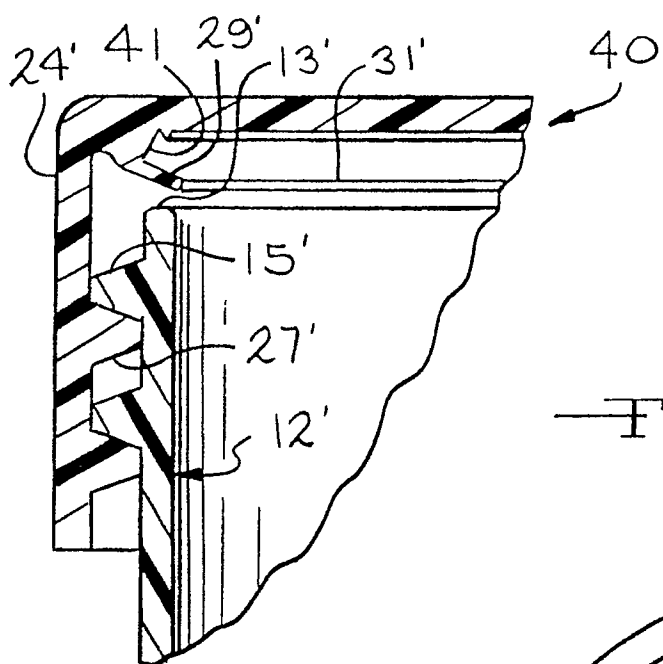


FIG. 5

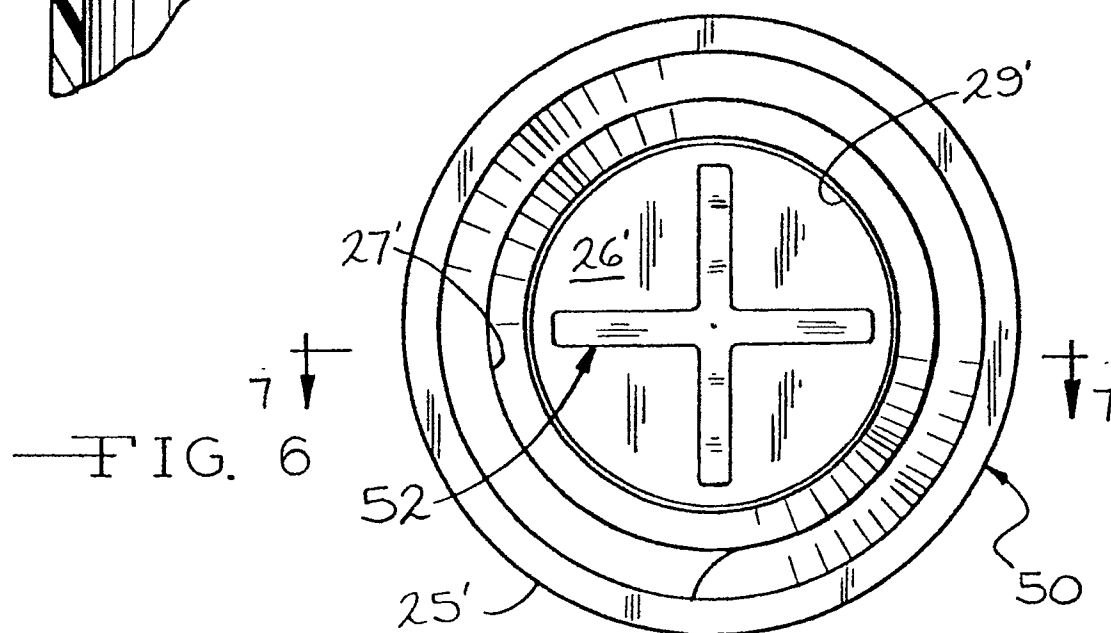


FIG. 6

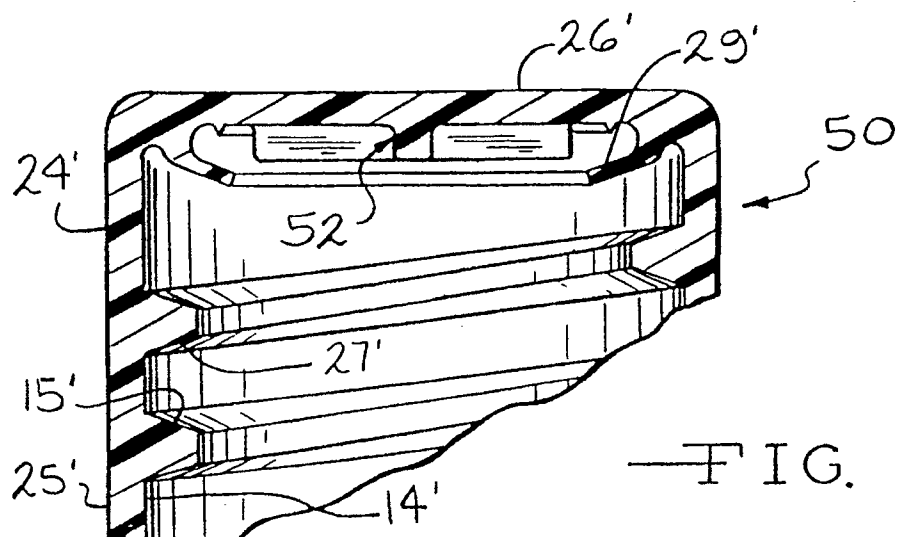


FIG. 7