

[54] **TEAR-OPEN TAMPERPROOF CLOSURE SEAL**

[75] Inventor: Eugene W. Menke, Montoursville, Pa.

[73] Assignee: The West Company, Phoenixville, Pa.

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[51] Int. Cl... B65d 41/62; B65d 51/18; B65d 51/20

[58] Field of Search 215/7, 251, 254, 258, 256, 215/34

[56] **References Cited**

UNITED STATES PATENTS

2,162,752 6/1939 Schaver 215/251 X

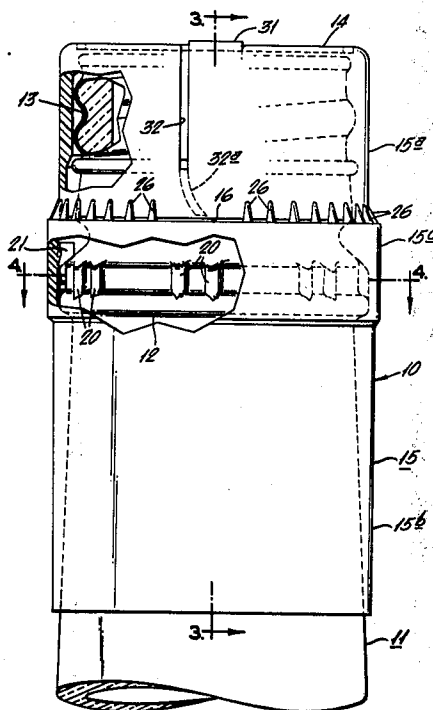
2,947,432 8/1960 Marcel 215/321
3,439,825 4/1969 Glensky 215/251

Primary Examiner—George T. Hall
Attorney, Agent, or Firm—Howson and Howson

[57] **ABSTRACT**

A bottle having a finish with a ribbed annular protrusion is provided with a molded plastic seal having internal surfaces which cooperate with the protrusion to prevent the seal from being disengaged from the bottle without being destroyed. The seal is weakened at predetermined circumferential locations, and an integral finger grip is provided for rupturing the seal at the weakened locations to separate the seal from the bottle when the finger grip is displaced circumferentially.

12 Claims, 6 Drawing Figures



SHEET 1 OF 3

FIG. 2.

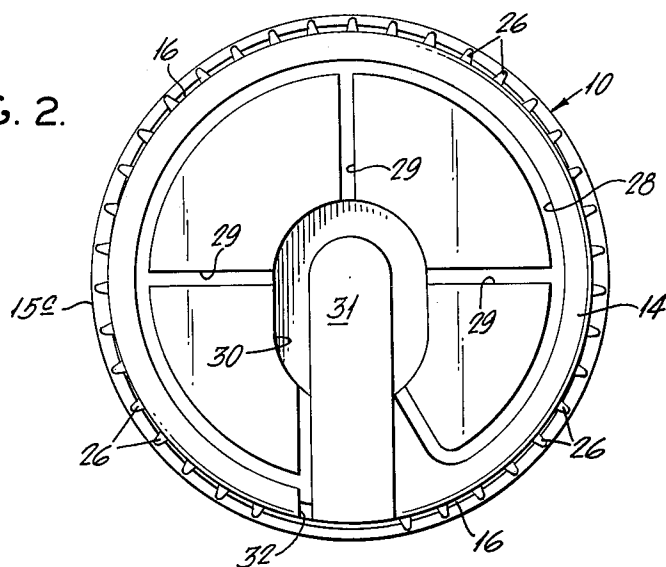


FIG. 1.

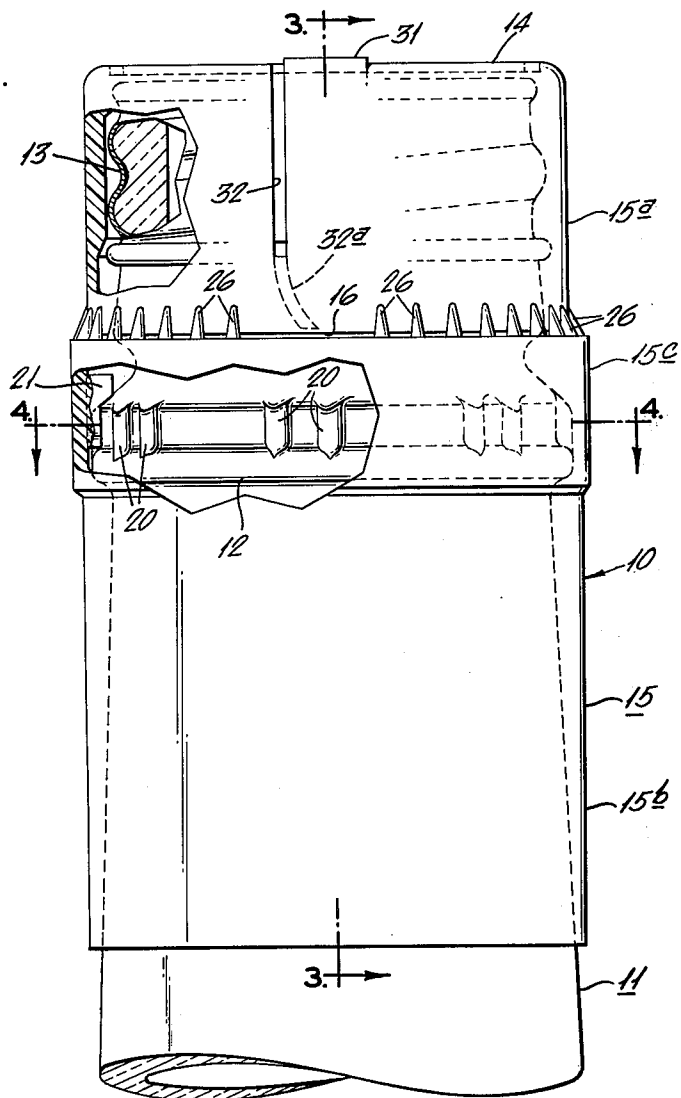


FIG. 6.

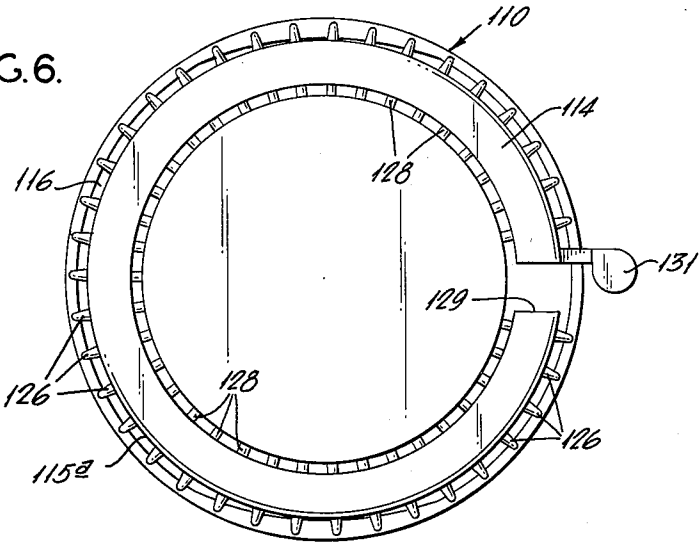
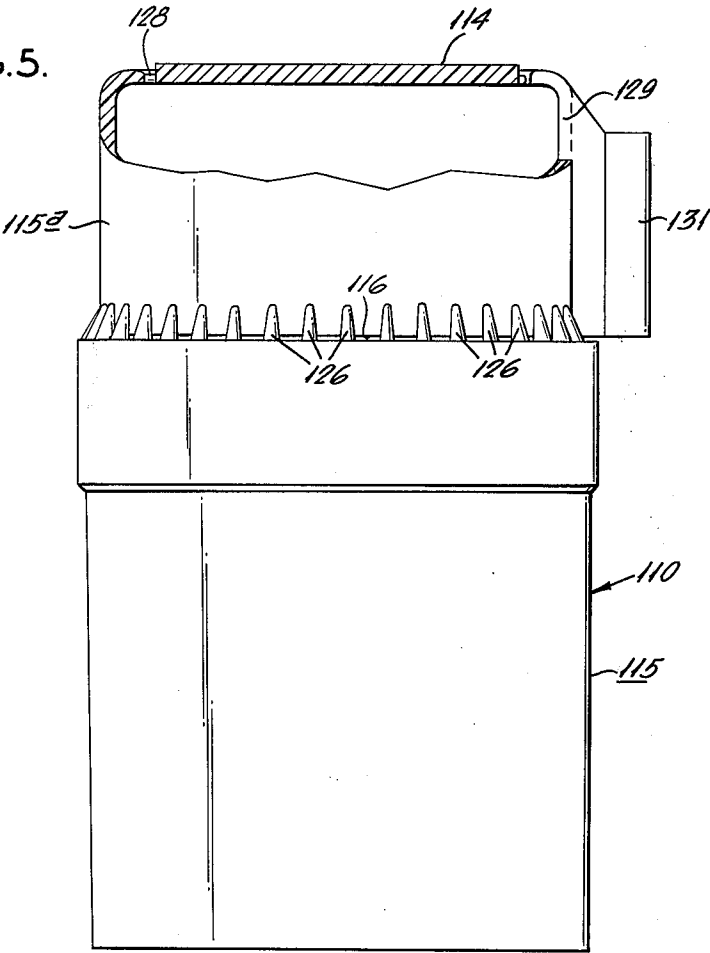


FIG. 5.



TEAR-OPEN TAMPERPROOF CLOSURE SEAL

The present invention relates to seals for container closures, and more particularly, the present invention relates to tear-open tamperproof seals for bottles.

It is customary for beverages such as wine, champagne, and the like, to be sold in bottles which are closed by caps or corks. A seal is normally provided to prevent the cap or cork from leaking and to guarantee to the purchaser that the contents have not been pilfered, diluted, and/or adulterated. A number of different seal structures have been proposed for this purpose.

An example of a seal which may be used satisfactorily in conjunction with a wine bottle is disclosed in U.S. Pat. No. 2,947,432. In this patented seal, the inner periphery of the seal has a series of spaced surfaces which engage the underside of an annular protrusion on the finish of the bottle. The seal is fabricated of a material which expands circumferentially when the seal is forced downwardly over the protrusion and which elastically constricts around the finish of the bottle below the protrusion to prevent the seal from being disengaged from the bottle.

Although the patented seal may function satisfactorily, it possesses certain limitations. For instance, it is possible for the seal to be removed from the bottle by turning the seal slowly and simultaneously pulling it axially. If the seal is removed from the bottle without being destroyed, it should be apparent that the contents of the bottle could be adulterated and the seal replaced without the purchaser's having notice of the same.

Although the patented seal may afford some degree of resistance to tampering, it is not capable of being removed readily from the bottle by the ultimate purchaser. For instance, in order to remove the seal, a knife or other sharp instrument is required in order to rupture the seal for removing the same. It should be apparent that a seal which is capable of being removed from a bottle without requiring a separate tool is highly desirable.

With the foregoing in mind, it is a primary object of the present invention to provide a novel tamperproof seal.

It is another object of the present invention to provide an improved tamperproof seal which is relatively easy to remove from a container without requiring a tool.

As another object, the present invention provides a unique seal which is incapable of being rotated and axially-disengaged from the finish of a container without being ruptured.

A still further object of the present invention is to provide a molded tamperproof seal which is capable of being installed on the finish of a bottle by a high-speed pressing operation.

More specifically, the present invention provides a tamperproof seal which is designed to be used in conjunction with a bottle having a finish with an annular protrusion carrying a series of relatively short peripheral ribs. The seal has a circular transverse end wall which engages the top of the bottle cap, and the seal has a depending tubular skirt which surrounds the periphery of the cap and the finish of the bottle. The skirt is divided into an upper and a lower portion by a circumferential separation, and a series of rupturable gussets extend across the separation to connect the portions. The separation is located above the bottle-protrusion and below the lower edge of the cap when

the seal is installed on the bottle. A series of elongated tapered ribs are spaced apart on the inner periphery of the lower portion of the skirt and terminate in latch surfaces which engage the underside of the protrusion. The seal is fabricated of an elastic material which permits it to stretch when pressed downwardly over the protrusion for causing the latch surfaces to engage the underside of the protrusion and thereby prevent removal of the seal. A series of inwardly-extending rib surfaces are spaced apart around the inner periphery of the skirt above the latch surfaces for engaging the ribs on the protrusion to prevent the seal from being rotated relative to the finish. The transverse end wall of the seal is provided with score lines having predetermined configurations, and finger grip means integral with the upper portion of the skirt is provided for rupturing the score lines and the gussets when the finger grip is pulled circumferentially about the bottle.

These and other objects, features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an enlarged elevational view of a tamperproof seal embodying the present invention, portions of the seal being broken away to expose ribs located on the inside of the seal and the finish of a bottle to prevent rotation of the seal relative to the bottle;

FIG. 2 is a top plan view of the seal illustrated in FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 1 with the finish of a bottle being illustrated in broken lines;

FIG. 4 is a sectional view taken along lines 4—4 of FIG. 1 to illustrate rib means for preventing rotation of the seal relative to the finish;

FIG. 5 is an elevational view of a modified embodiment of the tamperproof seal of the present invention, the modified seal being partially broken away to illustrate certain structural details; and

FIG. 6 is a top plan view of the seal of FIG. 5.

Referring now to the drawings, there is illustrated in FIG. 1 a tamperproof closure seal 10 which embodies the present invention. The illustrated seal 10 is mounted on the finish 11 of a beverage container such as a wine or champagne bottle which is closed by a cap 13 threaded on to the upper end of the finish 11 above a ribbed annular protrusion 12. The seal 10 has a circular transverse end wall 14 which engages the top of the cap 13, and the seal 10 has a tubular skirt 15 depending from the end wall 14. The skirt 15 surrounds the periphery of the cap 13 and the finish 11 of the bottle below the protrusion 12, and the skirt 15 is divided into an upper portion 15a and a lower portion 15b by a separation or first weakened zone 16. The interior of the lower portion 15b of the skirt 15 has a plurality of longitudinally-extending ribs 18,18 (FIG. 3) which taper inwardly from locations adjacent the middle thereof and which terminate at their upper ends in latch surfaces 19,19. The seal 10 is fabricated of a plastic material which is sufficiently elastic as to stretch circumferentially as the ribs 18,18 pass downwardly over the protrusion 12 when the seal 10 is pressed onto the finish 11. When the latch surfaces 19,19 pass beyond the protrusion 12, the lower portion 15b of the skirt 15 elastically constricts around the finish 11 to cause the latch surfaces 19,19 to engage the underside of the pro-

trusion 12 for preventing the seal 10 from being disengaged from the finish 11.

As described thus far, the function of the latch surfaces is similar to that described in the aforementioned patent, and as noted above, there is the possibility that such a seal could be removed and the contents of the bottle pilfered without the seal's being destroyed. For instance, if the seal is rotated slowly while being simultaneously pulled away from the bottle, the upper ends of the ribs can be cammed radially outward over the rounded protrusion, thereby enabling the seal to be disengaged from the finish. In accordance with the present invention, however, a tamperproof seal is provided which is incapable of being rotated and disengaged axially from a bottle without being destroyed.

As best seen in FIG. 1, a series of relatively short ribs 20,20 are provided on the protrusion 12, and series of inwardly-extending ribs 21,21 are provided on the inner periphery of the skirt 15 below the separation web 16. In the illustrated embodiment, the ribs 20,20 on the protrusion 12 are disposed in pairs, and the pairs are arranged in diametrical arrays. The inwardly-extending ribs 21,21 on the inside of the skirt 15 are arranged in diametrical arrays each of which extends in an arc greater than $\pi/2$ radians, and the spacing between adjacent skirt-ribs 21,21 is greater than the thickness of each skirt-rib. With this structure, angular orientation of the seal 10 relative to the finish 11 is not critical because one of the ribs 21,21 on the skirt will always be located between one pair of ribs 20,20 on the protrusion 12. Preferably, the upper portions of the skirt-ribs 21,21 have inwardly tapered surfaces 22,22 which engage the upper side of the protrusion 12 when the latch surfaces 19,19 engage the underside of the protrusion 12 for limiting downward motion of the seal 10 when pressed onto the bottle-finish. By virtue of this construction, the seal 10 may be placed rapidly on a bottle by a high-speed pressing operation without complex orienting procedures. Moreover, once installed, the seal 10 is incapable of being rotated relative to the finish 11 and disengaged axially from the bottle without being destroyed. As a result, the contents of a bottle having a seal of the present invention are incapable of being pilfered, diluted and/or adulterated.

While it is desirable for the seal to be prevented from being surreptitiously disassociated from a bottle, it is desirable for there to be provided means to permit a purchaser to remove the seal 10 without requiring any special tools. To this end, the seal 10 is provided with integral means for separating its upper portion 15a from its lower portion 15b. As best seen in FIG. 3, the separation 16 provides a lower or first weakened zone extending circumferentially of the seal and located above the protrusion 12 but below the lower edge of the cap 13. In the illustrated embodiment, the upper portion 15a of the skirt 15 has an outside diameter which is smaller than the outside diameter of an enlargement 15c on the lower portion 15b of the skirt. A plurality of radially-extending gussets 26,26 connect the upper and lower portions of the skirt across the separation 16 to secure the portions together and to prevent their unintentional separation. It is noted, however, that the lower weakened zone 16, may be provided by a thin circumferential web which connects the upper and lower portions rather than the gusseted structure illustrated.

In addition to the first weakened zone provided by the separation 16, an upper or second weakened zone

is provided in the end wall 14 of the seal 10. As best seen in FIG. 2, the upper weakened zone is provided by a score line 28 which extends substantially completely about the periphery of the end wall 14 adjacent its juncture with the upper portion 15a of the skirt 15. The upper weakened zone includes a series of score lines 29,29 which extend radially inward from the peripheral score line 28 to intersect an elongated aperture 30 located centrally in the end wall 14.

In order to rupture the upper and lower weakened zones, finger grip means 31 is provided. In the embodiment illustrated in FIGS. 1-4, the finger grip 31 extends into the aperture 30 from the periphery of the end wall 14, and the upper weakened zone includes a score line 32 extending alongside the finger grip 31 in the end wall 14 and downwardly in the upper portion 15a of the skirt 15 transversely to the upper and lower weakened zones. The score line 32 terminates at its lower end in a curved portion 32a which assists in initiating shearing of the gussets 26,26. With this structure, a person can separate the upper portion 15a of the skirt 15 from the lower portion 15b thereof by pulling the finger grip 31 upwardly away from the end wall 14 to rupture the score line 32, with complete separation of the upper portion 15a being effected when the finger grip 31 is pulled downwardly and circumferentially about the finish 11 to rupture both the upper and lower weakened zones. Access to the cap 13 is thereby provided.

It is noted that the ribs 20,20 on the finish-protrusion 12 and the ribs 21,21 on the seal 10 prevent the skirt 15 from rotating about the finish 11 when the upper portion 15a of the skirt is being separated. The interaction of the ribs augments the frictional resistance which is present due to the elastic engagement of the seal 10 with the finish 11. Although the ribs 21,21 on the seal engage mating ribs 20,20 on the protrusion 12, it should be apparent that a bottle may be provided with finish having a series of ribs located below the protrusion 12 for interengaging the elongated tapered ribs 18,18 to prevent the lower portion 15b of the skirt 15 from rotating relative to the bottle.

If desired, a seal 110, somewhat similar to the seal 10, may be provided with modified means for separating the upper portion of its skirt 115 from the lower portion thereof. As best seen in FIGS. 5 and 6, the seal 110 has a transverse end wall 114 with an upper weakened zone 128 provided by a circular line of perforations in the end wall 114. A radially extending slot 129 intersects the perforated line 128 and extends downwardly to intersect a lower weakened zone 116 which has a structure similar to the structure of the web 16 in the embodiment of FIGS. 1-4. A finger grip 131 is molded integrally with the upper portion 115a of the skirt 115 and extends outwardly to terminate in an enlargement which is capable of being gripped by a person's fingers for simultaneously rupturing the upper and lower weakened zones when finger grip 131 is displaced circumferentially.

In view of the foregoing, it should be apparent that there has now been provided a novel seal which is particularly useful in conjunction with wine and champagne bottles to prevent leakage and to warrant the genuineness of their contents. The seal is incapable of being rotated relative to the bottle and disengaged axially therefrom once it is installed. Moreover, when utilized in conjunction with a bottle having a screw cap, the seal of the present invention renders it impossible

for the underlying cap to be rotated with the seal to effect disengagement of both from the bottle. The seal, however, does possess a tear-open structure which permits it to be readily separated from the bottle by the purchaser.

While preferred embodiments of the present invention have been described in detail, various modifications, alternations and changes may be made without departing from the spirit and scope of the present invention as defined in the appended claims.

I claim:

1. The combination of a tear-open tamperproof closure seal and a container having a finish with an annular protrusion having locking means, said seal having a body with a transverse end wall and a skirt depending from said end wall, said depending skirt having an upper portion, a lower portion and rupturable means connecting said portions, and providing a first weakened zone, said lower skirt portion having an annular enlargement adjacent said rupturable means, inwardly-projecting latch surface means on the inner periphery of said skirt below said enlargement for engaging below said protrusion to limit axial displacement of said seal and prevent the same from disengaging said finish when mounted thereon, locking means on the interior of the enlarged portion of said skirt engageable with locking means on said annular protrusion of said finish operable to prevent rotation of said seal relative to the finish when mounted thereon, said upper portion of said skirt having a second weakened zone with a portion extending transversely to said first weakened zone, means providing a finger grip alongside said portion of said second weakened zone for rupturing said connecting means when said finger grip is displaced circumferentially about said seal to disengage the upper portion of said seal from the container finish, said lower skirt portion remaining seated on the container with the locking portion overlying the annular protrusion on said finish when the upper portion is detached.

2. A closure seal according to claim 1 wherein said second weakened zone has a portion extending circumferentially around said seal adjacent the juncture of said end wall and the upper portion of said skirt, said first and second weakened zones cooperating to cause the seal to tear at two spaced locations when the finger grip is displaced circumferentially to separate the seal from the container.

3. A closure seal according to claim 2 wherein said upper and lower portions are separate and said connecting means includes a plurality of circumferentially-spaced gussets extending across said first weakened zone for securely connecting said upper and lower portions of said skirt while affording ready separability.

4. A closure seal according to claim 3 wherein said end wall has a central aperture and said finger grip extends into said aperture, said second weakened zone including a score line extending along one side of said finger grip in said end wall and continuing into said upper portion of said depending skirt.

5. A closure seal according to claim 4 wherein said second weakened zone in said end wall includes a circumferential score line and a plurality of radially-extending score lines intersecting said aperture and said circumferential score line to facilitate separation of the upper portion of said skirt from the lower portion thereof.

6. A closure seal according to claim 2 wherein said finger grip extends radially outward from the upper portion of said skirt and between said end wall and said rupturable connecting means.

7. A closure seal according to claim 2 wherein said rotation preventing means includes a series of outwardly extending ribs on said protrusion and a plurality of complementary ribs extending inwardly around the periphery of the lower portion of said skirt for engaging selected ones of said series of protrusion-ribs when said seal is installed on said finish.

8. A closure seal according to claim 7 wherein said ribs on said skirt have surfaces tapering inwardly toward said end wall and spaced from said latch surface means to engage an upper side of said protrusion when said seal is installed on said finish with said latch surface means engaging a lower side of the protrusion.

9. A tear-open tamperproof closure seal for use in conjunction with a container having a finish with an annular protrusion, said seal having a body with a transverse end wall and a skirt depending from said wall, inwardly-extending latch surface means on the inner periphery of said skirt for engaging below said protrusion to prevent said seal from disengaging said finish when mounted thereon, means on the interior of said seal for engaging said finish to prevent said seal from rotating relative to the finish when mounted thereon, said depending skirt having an upper portion and a lower portion, rupturable means connecting said portions and providing a first weakened zone, means defining a central aperture in said end wall, said finger grip extending into said aperture, said second weakened zone including a score line extending along one side of said finger grip and continuing into said upper skirt portion and terminating adjacent said first weakened zone, a circumferential score line and a plurality of radial score lines extending from said aperture to said circumferential score line to facilitate separation of the upper skirt portion from said lower skirt portion.

10. For use in combination with a container having a finish with an annular protrusion and rib means including a plurality of pairs of ribs spaced apart on the periphery of said protrusion and disposed transversely thereof, a seal adapted to mount onto said finish, said seal having a transverse end wall and a depending tubular skirt, surface means on the interior of said skirt to prevent rotation of said seal relative to said finish and for engaging an underside of said protrusion to prevent displacement of said seal transversely to said protrusion without rupturing the seal, said surface means including diametrically-opposed arrays of rib surfaces extending on the inner periphery on said skirt a distance greater than the corresponding peripheral spacing between adjacent pairs of ribs on said protrusion.

11. The combination according to claim 10 wherein said skirt has upper and lower portions with said surface means being located on said lower portion, a rupturable circumferential web connecting said portions, and finger grip means integral with said skirt for rupturing said web to effect separation of said upper portion from said lower portion.

12. A closure seal as claimed in claim 12 in combination with a container wherein the finish includes threads and a closure cap having complementary threads to facilitate application and removal from the container.

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