

Dec. 10, 1968

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3,415,404

SEVERABLE PACKAGING STRUCTURE

Filed March 15, 1967

4 Sheets-Sheet 1

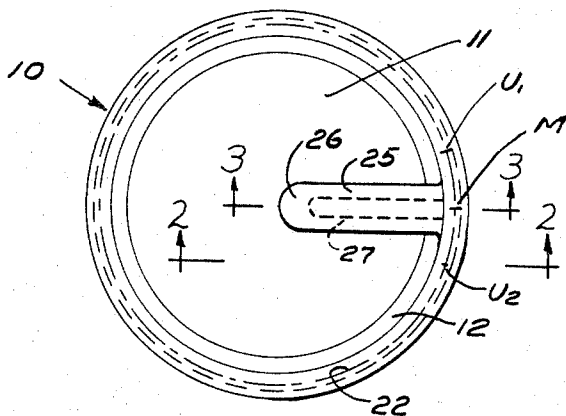


Fig. 1

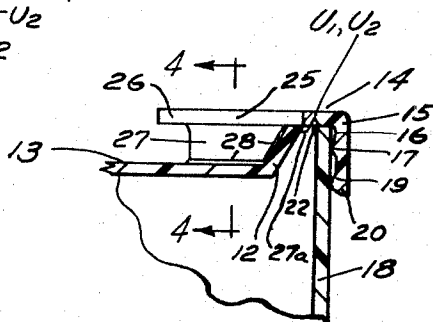


Fig. 2

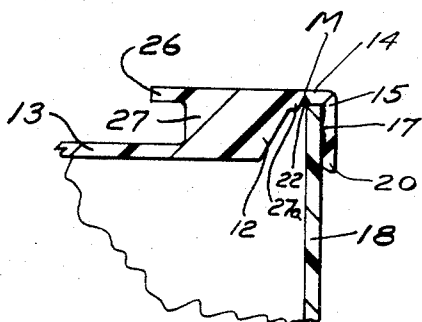


Fig. 3

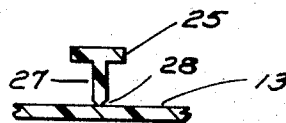


Fig. 4

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Fig. 6

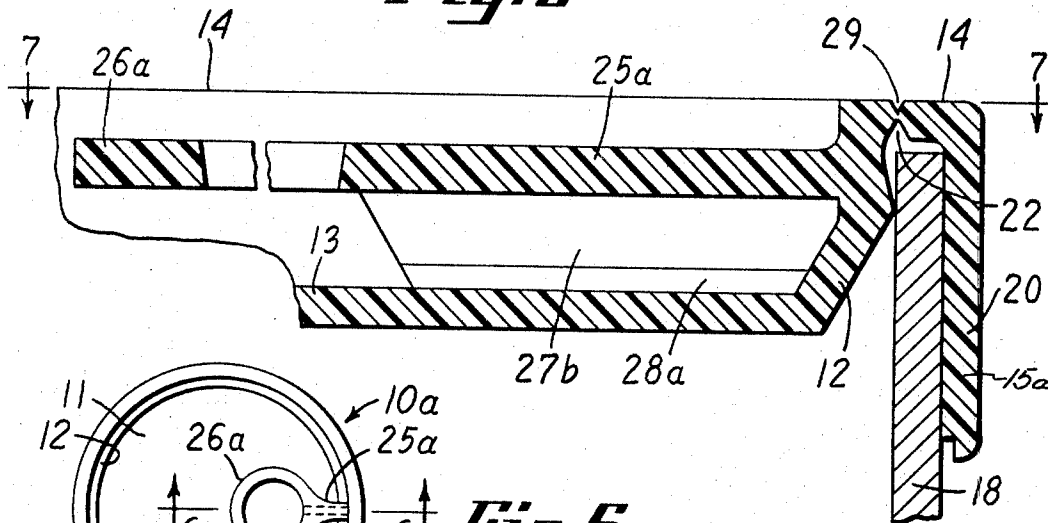


Fig. 5

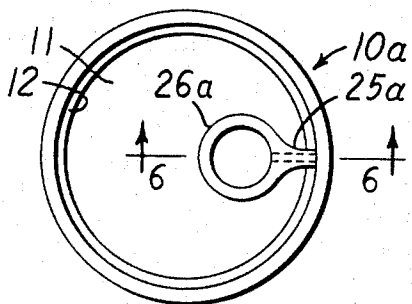


Fig. 7

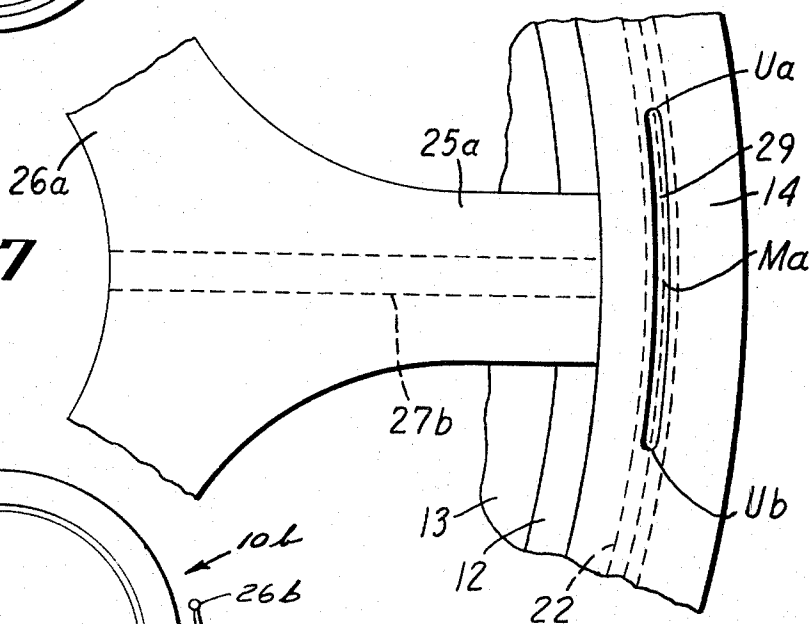
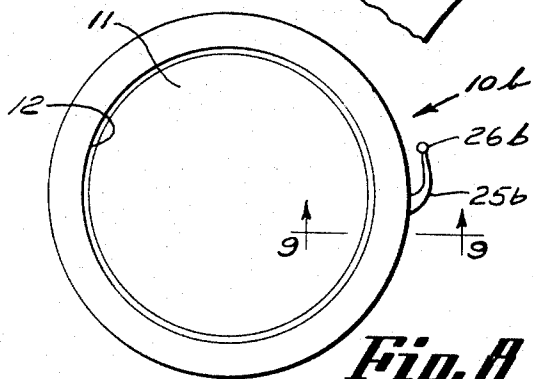


Fig. 8



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Fig. 11

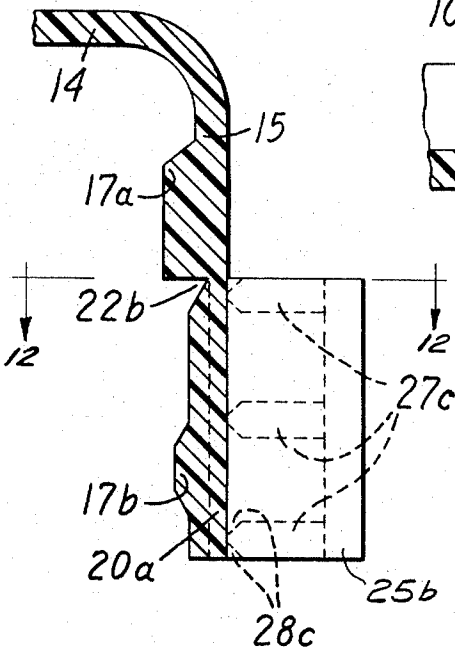


Fig. 9

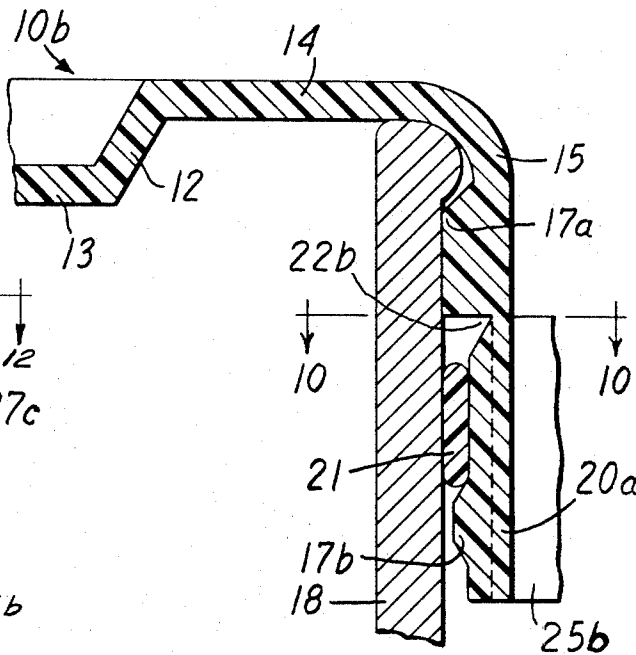


Fig. 12

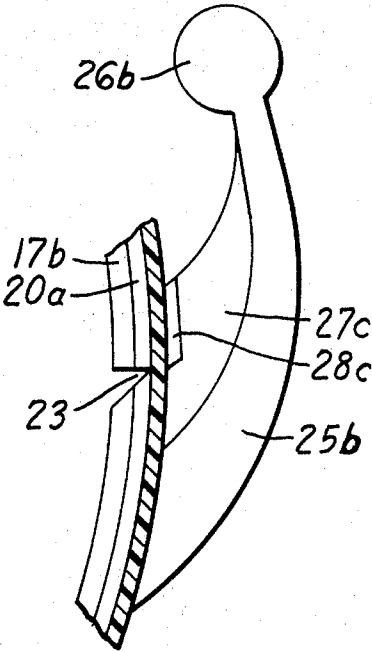
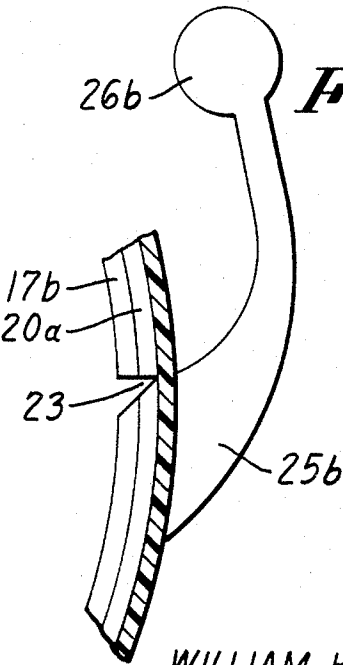


Fig. 10



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Fig. 13

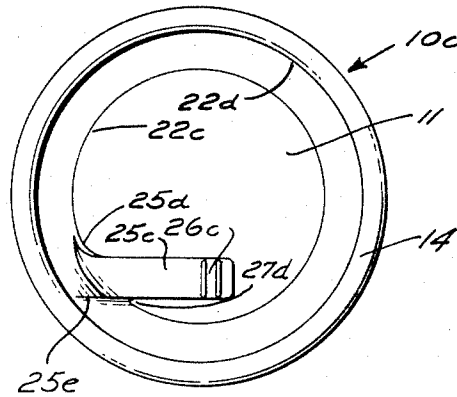


Fig. 14

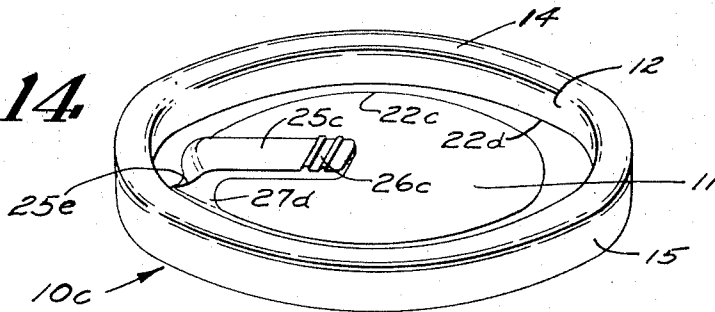
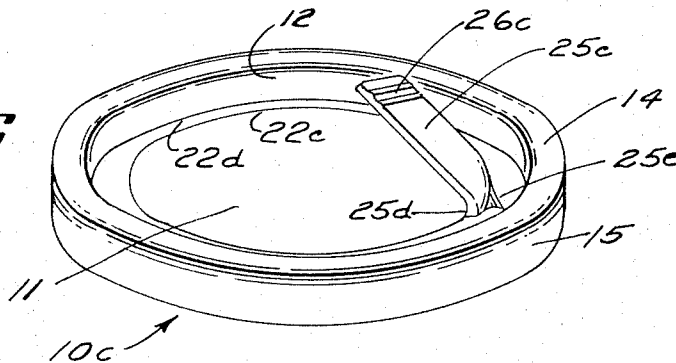


Fig. 15



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SEVERABLE PACKAGING STRUCTURE

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Continuation-in-part of application Ser. No. 557,837,
June 16, 1966. This application Mar. 15, 1967, Ser.
No. 623,433

9 Claims. (Cl. 215—46)

ABSTRACT OF THE DISCLOSURE

A sealed container-closure structure with closure portion having a severable portion joined with a gripping member and having certain weakened sections to facilitate severability and to insure that it occurs at desired locations. Closure portion may also include a tamper resistant member joined with the gripping member to prevent inadvertent or other unintended severing action.

This application is a continuation-in-part of co-pending application Ser. No. 557,837 filed June 16, 1966 for Severable Packing Structure And Process which was, in turn, a continuation-in-part of application Ser. No. 404,720 filed Oct. 19, 1964 for Closure, now U.S. Patent 3,257,022 issued June 21, 1966.

Field of invention

The present invention relates generally to merchandise packaging wherein merchandise is placed within a container and sealed therein in a tamper-resistant manner and, more particularly, to dual-purpose closures that are especially suitable for vacuum or hermetic sealing of containers.

Summary and objects

In the packaging of food and/or beverages, as well as other merchandise, it is desirable to provide closure means that can be easily and economically used in desired quantities and which are useful and effective to enclose various types of contents within various types of containers. In certain instances, it is desirable that the container-closure combination be sealed in a manner capable of preventing leakage when the seal is subjected to a high pressure differential so as to be useful to provide a gas or vapor barrier when vacuum packaging filling and sealing methods are employed. In other instances, a hermetic seal capable of providing air tightness or moisture tightness at relatively low pressure differentials may be sufficient. In still other instances, it may be sufficient that the sealing means merely provide sufficient connection between closure and container so that the closure functions essentially as a cover to avoid spillage of the contents of the container or to avoid contamination of the contents thereof by foreign material.

Closure members in accordance with the present invention preferably employ structures of molded plastic material or a combination of such material with other material in order to provide a tough durable surface having substantial elasticity or resilience and dimensional stability and which is capable of being sealed by various sealing methods including heat sealing or welding or sealing by use of a sealing compound of a well known type such as plastisols, organosols, sealants of heat or pressure sensitive type, or by use of a suitable solvent. Such plastic materials may include, for example, polyethylene, polypropylene, polystyrene, and resinous materials such as polyvinyl chloride and the like although the invention is not necessarily limited thereto. The closure devices and containers employed therewith may have various shapes and configurations such as, for example, circular, oval, polygonal, etc. Additionally, closures and containers in

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accordance with the invention may be utilized for packaging, either under a hermetic or vacuum type seal, various liquids and solids including food, beverages, dairy products, drugs, industrial, commercial and other products such as metals, chemicals, poisonous materials, nuts, bolts, nails, etc.

Accordingly, it is an object of the invention to provide an improved dual-purpose closure member.

Another object of the invention is to provide a closure device having portions adapted to tightly engage or to be sealed to surface portions of a container and a removable tear portion together with readily accessible grasping means therefor.

A further object is to provide a device of the character described for effectively sealing contents within a container and which may be readily opened with a minimum of effort.

Another object is to provide an improved device of the character described which is simple and durable in construction and which can be readily and inexpensively manufactured and which will reliably and effectively provide a fluid tight seal between the interior of a container and the ambient atmosphere.

Still another object of the invention is to provide an improved device of the character described which includes unique structural features which simultaneously perform the dual function of providing tamper-resistance while maintaining such structural elements in a desired position during manufacturing operations without interfering with ready accessibility thereof and also simultaneously providing visual indication regarding the integrity of the seal.

Another object of the invention is to provide an improved device of the character described and having means for insuring that the tear portion thereof will tear at desired locations.

Description

These and other objects of the invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a plan view of a merchandise package embodying the present invention;

FIGURE 2 is a fragmentary sectional view looking in the direction of arrows 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary sectional view looking in the direction of arrows 3—3 of FIGURE 1;

FIGURE 4 is a fragmentary sectional view looking in the direction of arrows 4—4 of FIGURE 2;

FIGURE 5 is a plan view of a modification of the embodiment of FIGURE 1;

FIGURE 6 is an enlarged fragmentary sectional view looking in the direction of arrows 6—6 of FIGURE 5;

FIGURE 7 is an enlarged fragmentary plan sectional view looking in the direction of arrows 7—7 of FIGURE 6;

FIGURE 8 is a plan view of a further modification;

FIGURE 9 is an enlarged fragmentary sectional view looking in the direction of arrows 9—9 of FIGURE 8;

FIGURE 10 is an enlarged fragmentary sectional view looking in the direction of arrows 10—10 of FIGURE 9;

FIGURE 11 is an enlarged fragmentary sectional view showing a modification of FIGURE 9;

FIGURE 12 is an enlarged fragmentary sectional view looking in the direction of arrows 12—12 of FIGURE 11;

FIGURE 13 is a plan view of a further modification of the embodiment of FIGURE 1; and,

FIGURES 14—15 are enlarged perspective views of the embodiment of FIGURE 13.

Referring to the drawings, a closure in accordance with the present invention is generally indicated at 10 and includes a top 11, which may be provided with an annular

shoulder 12 forming a depressed center portion 13 and a slightly raised rim 14. An annular skirt 15 depends from rim 14 and includes an upper outwardly offset portion 16 spaced by means of an integral rib 17 from the outer side wall of container 18. An inwardly and downwardly inclined portion 19 connects offset portion 16 with a lower skirt portion 20 which engages the outer side wall of container 18.

In the aforesaid prior co-pending application, various embodiments are shown wherein the tear portion may comprise a tear strip disposed at various locations or may comprise the central portion of the closure which, after severance thereof from a container, may be discarded. In the interests of simplicity and clarity, the present invention will be described in reference to a central tear portion but it is to be understood that the invention is not necessarily limited thereto.

As best shown in FIGURES 2, 3, an annular score line 22 is provided in the inner wall of closure 10, such score line 22 being disposed between skirt portion 15 and shoulder 12. Additionally, for reasons which will become apparent as the description proceeds, score line 22 is disposed substantially in alignment with the inner wall of container 18.

Connected to rim portion 14 and to shoulder portion 12 is a strip 25 that extends generally inwardly from rim portion 15 and terminates in a finger grip 26. Between strip 25 and depressed portion 13 is a further connection to provide a tamper-resistant feature. This is accomplished in accordance with the invention by provision of member 27 extending between and connected to depressed portion 13 as well as to strip 25. Member 27 is provided with notch portion 28 for a purpose which will become apparent as the description proceeds. As best shown in FIGURES 2 and 4, portion 28 extends from the innermost extremity of member 27 along the upper surface of depressed portion 13 and along the outer surface of shoulder portion 12, terminating substantially at the juncture between strip 25 and shoulder portion 12.

As best shown in FIGURES 2, 3, stiffening rib 27a is disposed substantially in alignment with member 27 and extends between shoulder portion 12 and score line 22 and depends downwardly from inner surface of rim portion 14.

From the foregoing, use and operation of the closure should be readily understandable. Container 18 is filled with its contents and closure 10 is positioned thereon with lower skirt portion 20 engaging the outer side wall of container 18 to effect a seal therewith. Skirt portion 20 may be sealed to the wall of the container by known sealing methods including heat sealing or welding or by use of a sealing compound which may be of the heat or pressure sensitive type or may be a suitable solvent. After the container has been filled and access thereto is desired, grip 26 is grasped and pulled upwardly so that strip 26 functions to break the tamper resistant connection provided by member 27. Notch 28 provides a weakened area in member 27 so that it may be readily broken or severed when it is desired to open the sealed container and yet provides sufficient strength to provide resistance to tampering or accidental breakage of the seal as well as to provide a visual indication of the integrity of the seal. After member 27 has been broken, the tear portion defined within score line 22 is then severed and removed by continued pulling on strip 25 until the central tear portion has been completely severed and removed. To facilitate removal of contents from the then opened container and to avoid partial trapping of such contents, score line 22 is disposed substantially in alignment with the inner surface of the side wall of container 18.

In accordance with the invention, means are provided to insure that tearing and severing of the tear portion of closure 10 will commence initially and will continue at and along desired locations, that is, along score line 22. This is accomplished by provision of not only a weak-

ened rim portion along the circumferential extent of score line 22 in rim portion 14 and by also providing a portion of rim 14 of even greater weakness at the location at which it is desired to have initial severance occur along score line 22. Accordingly, in accordance with the invention, the scored and unscored portions of rim 14 are of unequal thicknesses of material which, in turn, is achieved by scoring line 22 at differing depths throughout its extent. More specifically, score lines 22 extend into rim portion 14 to a depth which is substantially uniform throughout most of its circumferential extent. At a point aligned with the longitudinal axis of member 27, that is, along section line 3—3, scoring extends into rim portion 14 to a greater depth thereby leaving a minimum thickness of unscored rim material. On each side of the point of maximum depth of scoring, the depth of scoring is decreased until it reaches the desired depth of the uniform scoring. Thus, score line 22 provide a minimum thickness of unscored material of rim 14 at a location indicated at M. Between M and U1 and also between M and U2, the thickness of unscored material increases, and throughout the circumferential extent of score line 22, except between points U1 and U2, the uniform depth of scoring provides a uniform thickness of unscored material. Thus, it will be seen that rim 14 is provided with a weakened portion along score line 22 to facilitate tearing and severance of the central portion of the closure from skirt portion 15, and that the point of greatest weakness is in alignment with the longitudinal axis of member 27.

In opening the closure, as noted heretofore, strip 25 is grasped at grip portion 26 and lifted upwardly so that member 27 becomes separated from depressed portion 13 by tearing along notch 28 which terminates at the juncture between shoulder portion 12 and the underside of strip 25. As lifting of strip 25 is continued, the stiffening effect provided by rib portion 27a, which is also in substantial alignment with member 27, causes the combined strip 25 and rib 27a to pivot adjacent point M in a clockwise direction as viewed in FIGURE 3 because rim portion 15 remains relatively rigid, having previously been sealed to container 18. Since the point of greatest weakness or minimum thickness of the unscored portion of rim 14 is at point M, tearing and severing will first occur at that point and continued lifting of strip 25 will cause severance to progress more or less uniformly from point M to point U1 and U2, and thereafter from points U1 and U2 generally from right to left in FIGURE 1 until the portion of closure 10 encompassed by score line 22 has been severed.

In the modification shown in FIGURES 5-7, like elements bear like designations and certain elements have been simplified and/or eliminated. For example, portions 16, 19, internal rib 17 or lower portion 20 are eliminated and the closure has a skirt portion 15a sealed to container 18. Similarly, rib 27a is eliminated and modified means are provided to insure that tearing and severing of the tear portion of closure 10a will commence at and continue along desired locations.

For example in FIGURES 5-7, as in FIGURES 1-4, annular score line 22 is disposed along the under surface between shoulder 12 and substantially in alignment with the inner wall of container 18 but is of uniform depth throughout its extent. The upper surfaces of strip 25a and grip portion 26a are spaced below the upper surface of rim 14. Notch 28a extends from the innermost end portion of member 27b along its lower edge and adjacent center portion 13 and terminates when it reaches the lowermost portion of shoulder 12. On the upper surface of rim 14, there is provided a weakening groove 29 of limited circumferential extent and concentrically disposed and of substantially equal radius relative to annular score line 22. As shown in FIGURE 7, groove 29 extends in opposite directions from its midpoint Ma to its terminal points Ua, Ub. The circumferential extent of groove 29 is at least, and preferably greater than, the width of strip 25a at its outermost end.

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As noted in connection with FIGURES 1-4, grip portion 26a is lifted upwardly which results in member 27b tearing along notch 28a which terminates at its juncture with shoulder 12. After such tearing, as is best shown in FIGURE 6, strip 25a and the unsevered portion of member 27b are still joined with shoulder 12 and thus constitute therewith a relatively stiff and strong section of closure material as compared to the very thin and weak section of such material disposed between score 22 and groove 29. Thus, continued lifting of grip portion 26a initially causes severance and tearing along groove 29 which then continues along score 22.

In FIGURES 8-12, there is shown a modified embodiment wherein the severable portion of the closure is the lowermost portion of the skirt and which, when severed and removed, leaves a closure portion that is useful for reclosing a container.

In FIGURES 8-10, closure 10b comprises a top 11 having an annular shoulder 12, a depressed center portion 13 and a raised rim portion 14 which is placed and secured in closing relation over the open end of container 18. Closure 10b also has a skirt 15 having therein an integral rib 17a and a lower severable skirt portion 20a having therein another internal rib 17b. As best shown in FIGURE 9, closure 10b is sealed to container 18 by a sealing compound 21 disposed between the outer wall of container 18 and the inner wall of severable skirt portion 20a and also between ribs 17a and 17b. Annular score line 22b is disposed and provides a weakened section between the lowermost portion of skirt 15 and the uppermost portion of the severable skirt portion 20a. Another weakened section is provided by groove 23 which extends downwardly from within score 22b to the bottom edge of skirt portion 20a.

Connected to skirt portion 20a is a strip 25b that extends generally outwardly from skirt portion 20a and terminates in a finger grip portion 26b. As best shown in FIGURE 10, the innermost side of strip 25b joins with the outer wall of skirt portion 20a at a location substantially aligned with groove 23.

When access to the sealed container is desired, grip portion 26b is grasped and strip 25b is pulled outwardly which results in rupture of the wall of skirt portion 20a along a line corresponding to the weakened section provided by groove 23. Thereafter, continued pulling of strip 25b causes lower skirt portion 20a to be severed from the remainder of closure 10b along the weakened section, provided by score 22b. Skirt 15 then may be easily lifted to remove the remaining portion of closure 10b from container 18 and such remaining portions are useful for reclosing the container if desired.

The modification of FIGURES 11, 12 differs from that of FIGURES 9-10 by the additional provision of one or more tamper resistant members 27c joined to strip 25b and also joined to the outer wall of skirt portion 20a along notches 28c. As best shown in FIGURE 12, the innermost end of notches 28c is disposed substantially in alignment with groove 23. Access to the sealed container is obtained substantially as described in connection with FIGURES 9-10. However, in FIGURES 11, 12, upon pulling strip 25b, rupture of member or members 27c and the outer wall of skirt portion 20a occurs first at the outer ends of notches 28c. Continued pulling of strip 25b results in member or members 27c severing along the extent of notches 28c. Continued pulling of strip 25b after members 27c have been so severed to the innermost ends of notches 28c then results in rupture along groove 23 and thereafter along score line 22b as in FIGURES 9-10.

In FIGURES 13, 14, 15, closure 10c is essentially like the embodiment of FIGURE 1 except for slight modifications in the strip 25c, the tamper-resistant connection member 27d, and the provision of an additional score line 22d. In the interest of clarity, score lines 22c, 22d are shown in the upper surface of top 11.

In FIGURES 13-15, strip 25c is disposed at an angle relative to the disposition of strip 25 in FIGURE 1. Additionally,

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the connecting edge portions thereof, 25d, 25e, are curved to blend smoothly into score lines 22c, 22d, respectively, so that severing forces resulting from a lifting action applied to strip 25c are necessarily directed at the respective junctures between portion 25d and score 22c and also between portion 25e and score 22d. Member 27d is connected between top 11 and strip 25c as is best seen in FIGURE 14.

Access to a container having a closure 10c sealed thereto is accomplished as before, by grasping strip 25c and pulling it outwardly which results initially breaking of the tamper resistant connection provided by member 27d and continued pulling results in severance of the tear portions defined by score lines 22c, 22d.

What is claimed is:

1. In a closure comprising several portions including a top portion and a skirt portion depending therefrom for engaging a wall of a container in sealed relationship, opening means comprising in combination a severable closure portion including a wall having opposed surfaces and joined to other portions of the closure and having an annular groove in one of said surfaces at the juncture of said wall and said other portions defining in said wall an annular weakened section, means for severing said severable portion from said other portions, said means including a member having an end portion joined to said wall adjacent said juncture and having other portions thereof spaced from said wall, a tamper-resistant means including a second wall joined to said spaced portion of said member and to said first-mentioned wall and a second groove in at least one of the surfaces forming the juncture between said second wall and said first-mentioned wall.

2. Structure according to claim 1 wherein said annular groove is of substantially uniform depth and said weakened section is further weakened locally by a groove segment of differing depth and superimposed on said annular groove.

3. Structure according to claim 2 wherein said annular groove and said groove segment are disposed on opposite sides of said first mentioned wall.

4. A package comprising a closure according to claim 3 and additionally including a container sealingly engaged by said closure.

5. A package comprising a closure according to claim 2 and additionally including a container sealingly engaged by said closure.

6. In a closure comprising several portions including a top portion and a skirt portion depending therefrom for engaging a wall of a container in sealed relationship, opening means comprising in combination a severable closure portion including a wall having opposed surfaces and joined to other portions of the closure and having an annular groove in one of said surfaces at the juncture of said wall and said other portions defining in said wall an annular weakened section, means for severing said severable portion from said other portions, said means including a member having an end portion joined to said wall adjacent said juncture and having other portions thereof spaced from said wall, a tamper-resistant means including a second wall joined to said spaced portion of said member and to said first mentioned wall, said first mentioned wall being part of said skirt portion and said groove is disposed between the upper and lower ends of said skirt portion, and said weakened section additionally includes a second groove angularly disposed relative to and extending from said annular groove toward the lower end of said skirt portion.

7. Structure according to claim 6 and additionally including a third groove in at least one of the surfaces forming the juncture between said second wall and said first mentioned wall.

8. A package comprising a closure according to claim 7 and additionally including a container sealingly engaged by said closure.

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9. A package comprising a closure according to claim 6 and additionally including a container sealingly engaged by said closure.

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U.S. Cl. X.R.

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