

[54] **FULL OR PARTIAL OPENING EASY-OPEN CONTAINER END CLOSURE**

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[51] Int. Cl. **B65d 17/20**

[58] Field of Search **220/54, 48, 27, 44 R**

[56]

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UNITED STATES PATENTS

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Primary Examiner—George T. Hall

Attorney—Robert P. Auber et al.

[57]

ABSTRACT

A full or partial opening easy-open container end closure having indented into its central panel a large peripheral score pattern encompassing a smaller score pattern. A rivet secures an opening tab to the panel section defined by the smaller score pattern in a manner that allows the tab to be manipulated to initially rupture a portion of either score pattern and to effect a partial or full opening in the end.

4 Claims, 8 Drawing Figures

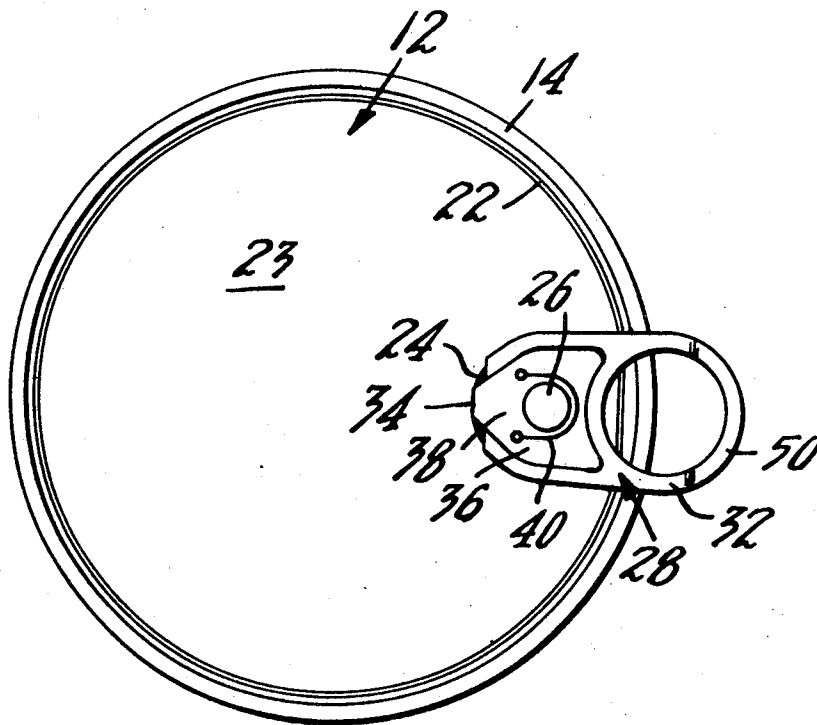


FIG. 1

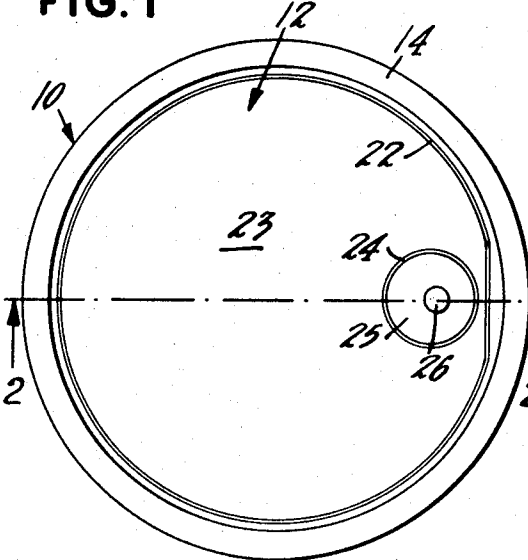


FIG. 3

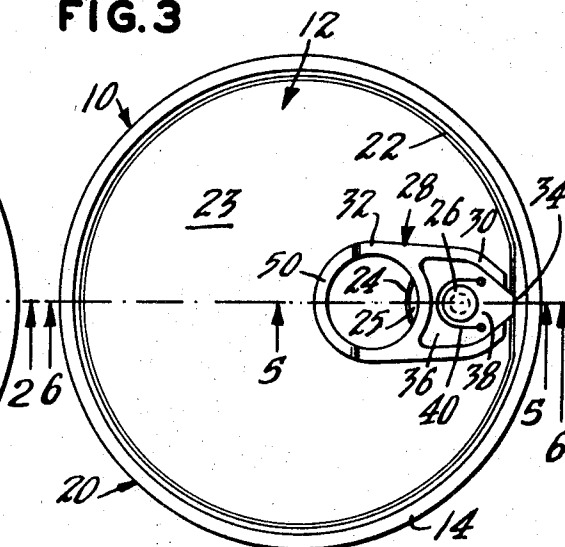


FIG. 4

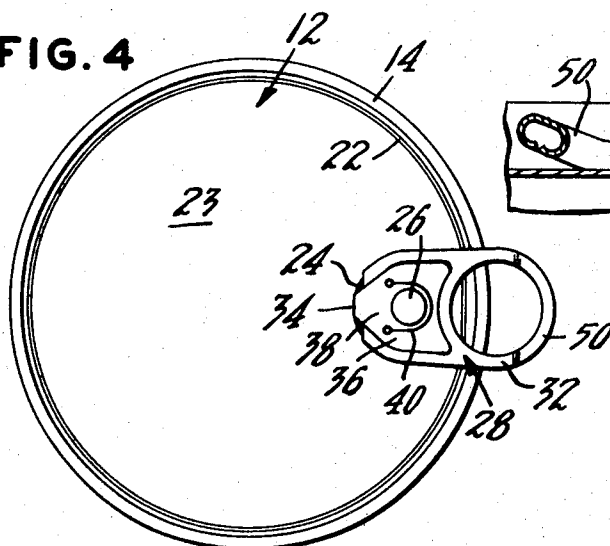


FIG. 5

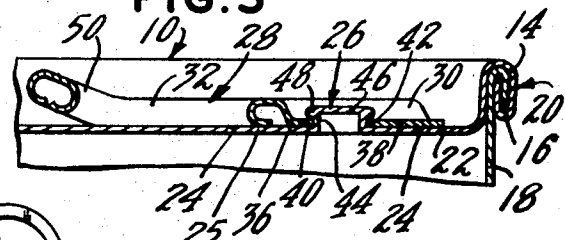


FIG. 2

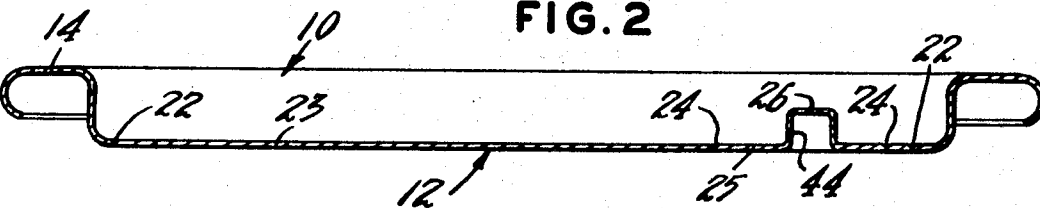


FIG. 6

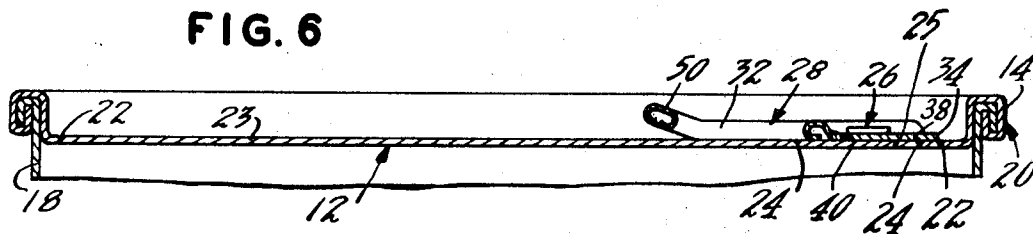


FIG. 7

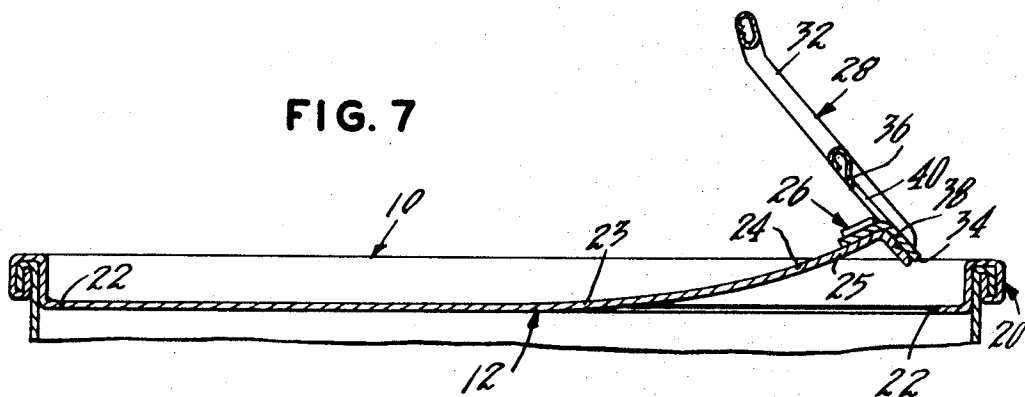
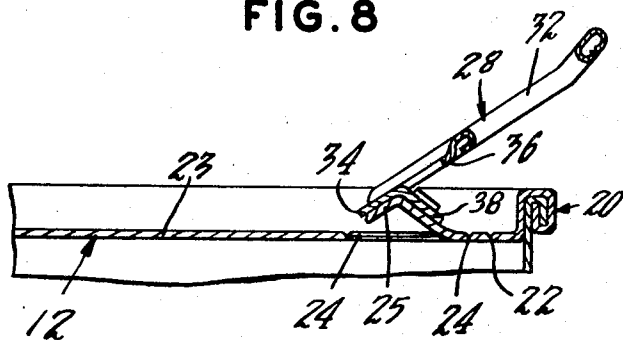


FIG. 8



FULL OR PARTIAL OPENING EASY-OPEN CONTAINER END CLOSURE

BACKGROUND OF THE INVENTION

Easy-open end closures for containers have become widely known and used on containers for beverages and solid foodstuffs. Such ends have typically included a substantially flat panel having a score line therein defining a removable portion of the panel, and a tab attached to a rivet in the removable portion, the tab being adapted to rupture the score line and to allow the removable portion to be torn from the remainder of the panel.

Easy-open ends have been either of the full-open or partial-open type, the former being characterized by a removable panel portion corresponding to substantially all of the central panel, and the latter by a removable portion somewhat smaller than the central panel. Typically, full-open ends have been used for containers for solid foodstuffs, while partial-open ends have been used for containers for beverages.

Presently, there is a need for a single easy-open end closure that would incorporate both of the aforementioned full-opening and partial-opening features. Such an end would provide heretofore unknown dispensing convenience, for it would provide consumers of for example beverages the option of quickly pouring the beverage from a large opening or more slowly dispensing it from a smaller opening in the end.

BRIEF SUMMARY OF THE INVENTION

The easy-open container end closure of this invention comprises a substantially flat central panel having therein a full-open first score line defining a removable first panel section and a partial-open second score line within or encompassed by the first score line, defining a removable second panel section. The end closure also includes an opening tab having a rivet hole therein and a nose at one end and a handle at the other end thereof. A rivet means integral with the second panel section secures the opening tab to the central panel. The rivet is equidistant from a portion of each of the first and second score lines so that when the tab is circumferentially horizontally rotated about the rivet, the tab nose can overlie, and when the tab handle is lifted and pivoted adjacent the rivet, the nose can rupture either of the portions of the first and second score lines. The end closure is designed such that the rupturing is meant to be effected when the tab is lifted in a direction substantially perpendicular to either of said portions of either of said first and second score lines.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a container end closure having a full-open score line and a rivet located within a partial-open score line.

FIG. 2 is an enlarged sectional view taken along line 2—2 of FIG. 1.

FIG. 3 is a top plan view of the end shown in FIG. 1 having an opening tab mounted on the rivet, the tab nose overlying a portion of the full-open score line.

FIG. 4 is a top plan view of the end shown in FIG. 3, the tab nose now overlying a portion of the partial-open score line.

FIG. 5 is an enlarged sectional view taken along line 5—5 of FIG. 3.

FIG. 6 is an enlarged sectional view taken along line 6—6 of FIG. 3, the rivet here shown in elevation.

FIG. 7 shows the full-open panel of the end closure of FIG. 6 being removed along its score line.

FIG. 8 is a sectional view showing the tab lifted and rotated 180° from the position shown in FIG. 6, and starting to open the partial-open panel along its score line.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings in detail, FIG. 1 shows a container end closure generally designated 10, having a substantially flat imperforate central panel 12 and an edge-curved peripheral flange 14 adapted, as shown in FIG. 5, to be interfolded with an end flange 16 of a can body 18 to form a double seam 20. Central panel 12 has impressed or indented in its upper surface, a pair of continuous score lines 22 and 24 which respectively form a substantially peripheral first score line 22 defining a removable first panel section 23 and a second score line 24 encompassed by first score line 22 and defining a removable second panel section 25. Removable sections 23 and 25 are detachable from end closure 10 and central panel 12 when the respective score lines are completely ruptured. FIG. 1 shows that score lines 22 and 24 can be substantially circular and that a portion of score line 22 adjacent score line 24 and rivet 26 can be substantially straight and substantially tangential to the circumferential arc of score line 22 and central panel 12 for a reason to be explained hereinafter.

FIG. 2 is an enlarged sectional view of end closure 10 taken along line 2—2 of FIG. 1 and shows the edge-curved peripheral flange 14 of FIG. 1. FIG. 2 also shows rivet 26 before opening tab 28 is placed thereon and shows first score line 22, adjacent the periphery of central panel 12 and defining a removable first panel section 23 which, when removed from an end closure secured to a container body, provides a full-open area for large scale removal of container contents from the container. Score line 24 defines a removable second panel section 25 that is somewhat smaller than section 23, which, when removed, provides the container with a partial-open area for limited or small scale removal of container contents. FIG. 2 further shows that the distance from rivet 26 to a portion of score line 24 to the left of rivet 26 is equal to the distance between the rivet and a portion of score line 22 to the right of rivet 26.

FIG. 3 shows the end closure of FIG. 1 seamed to a can body (not shown) in a manner such as shown in FIG. 5. End closure 10 has affixed thereto an opening tab 28 preferably non-bendable, having a front portion 30 at one end towards score line 22 and a handle portion 32 at the other end near the center point of central panel 12. Front tab portion 30 has adjacent its extremity a nose portion 34 and a web section 36 within which there is a hinged area 38 defined by C-shaped cut score 40. Opening tab 28 is affixed to removable second panel section 25 by means such as rivet 26 formed integral with panel section 25 and extending through a circular rivet hole 42 (FIG. 5) formed in hinged area 38 of web section 36 of opening tab 28.

FIG. 4 is a plan view of end closure 10 of FIG. 3, showing handle 32 of tab 28 lifted slightly and tab 28 rotated 180° so that handle 32 overlies peripheral

flange 14. FIG. 4 shows nose portion 34 overlying a portion of score line 24, that portion of the line being most adjacent the center point of central panel 12 of first removable panel section 23. Whereas in FIG. 3, the terminal portion of tab nose 34 directly overlies a substantially straight portion of score line 22, in FIG. 4, tab nose 34 overlies an arcuate portion of score line 24. Thus, as will be more fully explained later, tab 28 is adapted and is so affixed to first removable panel 23 of central panel 12, that the tab can be manipulated to effect rupture of either score line 22 to obtain a fully opened end closure, or score line 24 to obtain a partially opened end closure. The end closure, especially its tab, rivet and score lines, is designed such that rupturing of portions of the score lines is meant to be effected when the tab handle is lifted in a direction substantially perpendicular to the portions of the score lines.

When tab 28 is in the position shown in FIG. 3, C-shaped cut score 40 in web section 36 faces score line 22, but in FIG. 4, cut score 40 faces toward the center point of central panel 12.

FIG. 5 is an enlarged sectional view taken along a portion of line 5—5 of FIG. 3 and shows opening tab 28 secured to and mounted upon end closure 10 through rivet hole 42 in web section 36 by means of rivet 26 whose cylindrical shank 44 merges at its top into a transverse top wall 46 having about its periphery an annular bead 48 which extends over the portion of hinged area 38 of tab 28 around hole 42, to thereby secure the tab to removable second panel section 25 of central panel 12. FIG. 5 shows that tab handle 32 can be turned upwardly into a raised section 50 to facilitate placing of a finger within the aperture of handle 32 for grasping and lifting of tab 28. FIG. 5 also shows that the equal distances from rivet 26 to portions of score lines 22 and 24 previously mentioned are equal to the length of web section 36 of front portion 30 of tab 28 from rivet hole 42 to the tip of nose portion 34. Thus, when tab 28 faces in the direction shown in FIG. 3, the tip of nose 34 directly overlies the substantially straight portion of score line 22 to the right of rivet 26 and, when tab 28 is rotated 180° as in FIG. 4, the tip of nose 34 directly overlies a portion of score line 24 to the left of rivet 26.

FIG. 6 is an enlarged sectional view of end closure 10 taken along the full length of line 5—5 of FIG. 3 and shows rivet 26 in elevation. FIG. 6 clearly shows that tab nose 34 overlies and is in position to rupture the substantially straight portion of full-open score line 22.

As shown in FIG. 7, when handle 32 is raised or pulled upwardly relative to central panel 12, the handle being pulled in a direction substantially perpendicular to the underlying portion of score line 22, web section 36 separates along C-shaped cut score 40 (not shown) and allows stiff tab 28 to hinge or pivot adjacent rivet 26 and cause its nose 34 to initially rupture a portion of underlying score line 22. After initial rupture, further pulling of tab 28 substantially diagonally upwardly and backwardly away from the initial point of rupture, causes a tearing of score line 22 which continues rather simultaneously and gradually back along the semicircular arc on either side of removable first panel section 23 until the entire roughly 360° of score line 22 is torn and tab 28 and removable panel section 23 are detached

and removed from container body 18. Removable second panel section 25, defined by score line 24, remains integral with and is removed with first panel section 23.

FIG. 8 is a sectional view of the end closure of FIG. 6, its tab 28 having been rotated 180° to the FIG. 3 position. Tab handle 32 is shown raised, tab nose 34 having initially ruptured a portion of score line 24. Again, pulling of tab 28 diagonally upwardly and backwardly away from the initial point of rupture of score line 24 effects removal of removable second panel section 25 and provides a partial opening in end closure 10. The surrounding and major portion of first panel section 23 remains integral with central panel 12 and end closure 10.

The score lines indented into end closure 10 can be in any suitable pattern or configuration to promote or facilitate initial rupturing of portions thereof. For example, portions of the score line defining the smaller removable panel can be straightened to be substantially tangential to the arc of rotation described by tab nose 34 when it is rotated about rivet 26.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. An easy-open container end closure comprising:

a substantially flat central panel;
a substantially peripheral first score line in said central panel defining a removable first panel section;
a second score line in said central panel positioned wholly within said first score line and defining a removable second panel section;
an opening tab having a rivet hole therein, a nose at one end and a handle at the other end thereof; and
rivet means integral with the second panel section extending through said tab rivet hole and securing said tab to said second panel section, said rivet means being substantially equidistant from a portion of said first score line and from a portion of said second score line, said distance from said rivet to said portions of said score lines being substantially equal to the distance from said rivet hole to said tab nose, and

said rivet means and said tab means being adapted to permit circumferential rotation of said tab about said rivet, said rivet being positioned such that said tab can be positioned so that its nose can overlie either of said portions of said first or second score lines whereby said nose is capable of rupturing either of said portions of said first or second score lines when said handle is lifted and said tab is pivoted adjacent said rivet means, said end closure being designed such that said rupturing is meant to be effected when said handle is lifted in a direction substantially perpendicular to either of said portions of said score lines.

2. The end closure of claim 1 wherein said second score line is substantially circular.

3. The end closure of claim 1 wherein said portion of said first score line is a substantially straight line substantially tangential to the arc of rotation of said tab nose portion.

4. The end closure of claim 2 wherein said portion of said first score line is a substantially straight line substantially tangential to the arc of rotation of said tab nose portion.

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