United States Patent [19]

Westphal

[11] **3,724,709**

[45] **Apr. 3, 1973**

[54] **PULL TAB ARRANGEMENT FOR AN EASY OPEN END**

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[73] Assignee: **Hughes Aircraft Company**, Culver City, Calif.

[22] Filed: **Jan. 19, 1972**

[21] Appl. No.: **219,013**

[52] **U.S. Cl.** **220/54**

[51] **Int. Cl.** **B65d 17/24**

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

[56] **References Cited**

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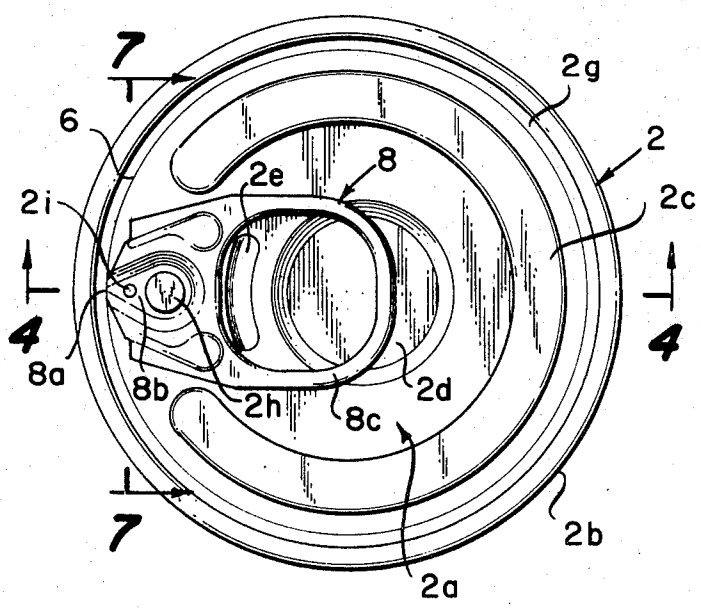
3,532,248	10/1970	Ruekberg	220/54
3,593,877	7/1971	Khoury	220/54

Primary Examiner—George T. Hall
Attorney—Lawrence E. Laubscher

[57] **ABSTRACT**

An improved pull tab arrangement for an easy open end closure member, characterized by the provision of improved pull tab positioning means for positively maintaining the pull tab in a desired orientation relative to the panel-defining scoreline not only during the initial opening period when the pull tab is listed to effect rupturing of the scoreline, but also during the subsequent opening period when a pulling force is applied to the pull tab to tear the removable panel from the end member along the scoreline. To this end, the retaining means are arranged solely between the free extremity of the pull tab nose portion and the rivet means that secures the tab to the end closure member.

5 Claims, 7 Drawing Figures



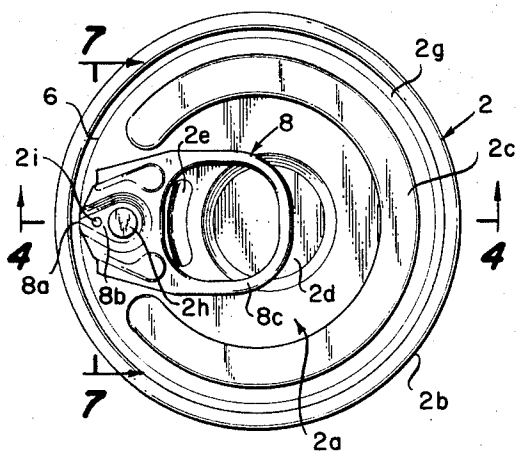


Fig. 1

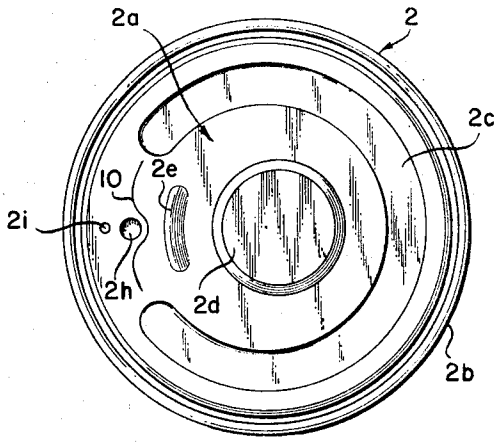


Fig. 2

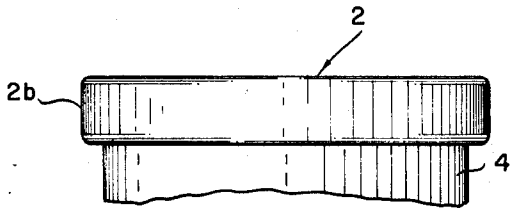


Fig. 3

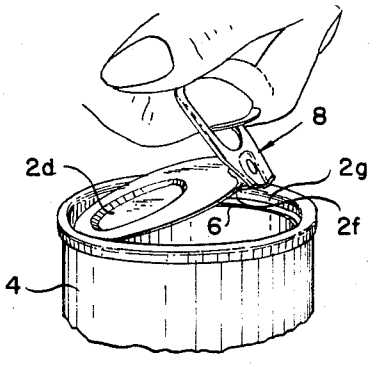
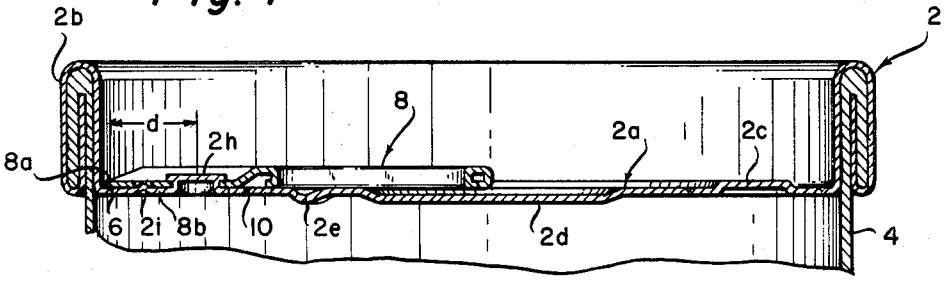


Fig. 5

Fig. 4



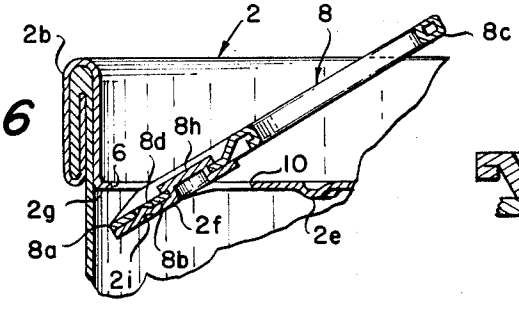
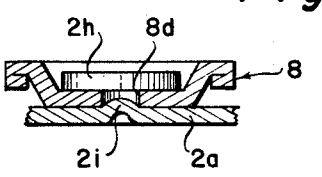


Fig. 6

Fig. 7



PULL TAB ARRANGEMENT FOR AN EASY OPEN END

It has been proposed in the patented prior art to provide metal end closure members having pull tab or tear strip means for removing from the members panel portions that are defined therein by continuous scorelines. In order to retain the pull tab members in a desired initial orientation relative to the scoreline, various retaining means have been proposed in the patented prior art (as evidenced, for example, by the U.S. Pats. to Hendrickson No. 3,338,463, Fraze No. 3,250,426, Saunders Nos. 3,437,228 and 3,450,300, and Khoury No. 3,593,877, and the Canadian Pat. No. 750,222). In the Khoury end closure arrangement, the pull tab means is of the "lance"type including a pull tab member having an attachment portion that is connected with the metal end by a rivet, said attachment portion containing a U-shaped cut (i.e., "lance") arranged between the rivet and the finger grip portion of the tab, whereby during opening, the tab is elevated relative to the rivet to cause the nose portion of the tab to rupture the adjacent portion of the scoreline. In order to prevent rotation of the tab about the rivet when the tab is in the initial opening position parallel with the end, retaining means are provided on the side of the rivet remote from the tab nose portion, said retaining means including a dimple that extends upwardly from the end into engagement with a corresponding slot formed in the U-shaped lance cut. While this specific location of the retaining means is suitable for use with "lance" type pull tab opener means, it would not operate satisfactorily when used with other types of openers in which the pull tab is rigidly connected with the rivet for simultaneous tilting movement therewith during the end opening procedure. More particularly, owing to the vertical pivotal movement of the lanced tab means relative to the rivet and to the end member, the dimple and slot retaining means would be automatically disengaged upon initiation of the opening procedure, thereby permitting undesirable rotation of the tab relative to the rivet. The present invention was developed to avoid the above and other drawbacks of the known prior devices and to provide means for positively and continuously maintaining the proper pull tab orientation throughout the panel removing procedure.

Accordingly, the primary object of the present invention is to provide an improved pull tab arrangement for an easy open end wherein the retaining means for properly orienting the pull tab member in the opening position relative to the panel-defining scoreline is located solely between the nose portion of the pull tab and the associated rivet fastener, thereby to assure continuous operation of the retaining means not only during the initial opening period when the pull tab is pivoted upwardly to depress the nose portion and thereby initially rupture the scoreline, but also during the final opening period when the pull tab is subjected to a pulling force to tear the panel from the end member. In the preferred embodiment, the pull tab opening means is of the "vent scoreline" type wherein the portion of the pull tab member between the rivet fastener and the finger grip portion of the pull tab is imperforate and wherein the removable panel portion contains a mustache-shaped vent scoreline adjacent the rivet fastener and on the remote side thereof relative to the pull tab nose portion. The dimple retainer is deformed from the removable panel portion and extends upwardly within a corresponding opposed opening contained in the pull tab between the nose portion thereof and the rivet fastener means.

Other objects and advantages of the invention will become apparent from a study of the following specification when viewed in the light of the accompanying drawing, in which:

FIGS. 1 and 2 are top and bottom plan views, respectively, of the improved easy open end and pull tab arrangement according to the present invention;

FIG. 3 is a side elevation view of the easy open end of FIG. 1;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 1;

FIGS. 5 and 6 are perspective and detailed section views, respectively, illustrating the continuous operation of the pull tab retaining means during removal of the panel from the metal end; and

FIG. 7 is a detailed sectional view taken along line 7—7 of FIG. 1.

Referring first more particularly to FIGS. 1–4, the metal end member 2 of the present invention includes a substantially planar base portion 2*a*, and an annular flange portion 2*b* adapted for sealed connection with one end of a container 4 formed of metal, paperboard, composite or synthetic plastic material, or the like. If desired, the base portion may be provided with conventional strengthening rib means 2*c*, 2*d* and 2*e*, as is known in the art.

As shown more clearly in FIGS. 1 and 4, the upper surface of the end member 2 contains a conventional continuous scoreline 6 that defines within the base portion 2*a* a centrally arranged removable panel portion 2*f* (see FIG. 5) and a residual lip portion 2*g* (FIGS. 5 and 6) adjacent the annular flange portion 2*b*.

Connected in contiguous engagement with the upper surface of the base portion 2*a* by means of a rivet 2*h* (which, in the case of an end formed of aluminum or other suitable material, is formed by deformation from said base portion) is a conventional rigid pull tab member 8 having nose, intermediate and finger grip portions 8*a*, 8*b* and 8*c*, respectively. The intermediate portion 8*b* of the pull tab contains an opening for receiving the upwardly extending stem portion of the rivet means, the portion of said intermediate portion between said rivet means and the finger grip portion 8*c* being imperforate to provide the desired end opening operation set forth below.

Contained in the upper surface of the removable panel portion between the rivet portion 2*h* and the adjacent downwardly depending reinforcing rib 2*e* is a conventional mustache-shaped vent scoreline 10 which is initially ruptured upon initiation of the container opening operation to vent the container chamber to atmosphere.

As shown in FIGS. 1 and 4, the rivet 2*h* is so positioned relative to the scoreline 6 that when the pull tab member 8 is in the illustrated opening position, the free extremity of the pull tab nose portion 8*a* is directly above the scoreline (i.e., the free extremity of the nose portion 8*a* and the corresponding adjacent point on the scoreline 6 are spaced a common distance "*d*" from the axis of the rivet means). In accordance with the present invention, in order to assure that the pull tab member

will always retain this given orientation throughout the complete opening procedure, tab retaining means are provided that are located solely between the free extremity of the nose portion **8***a* and the rivet means **2***h*. More particularly, the retainer means comprise a dimple portion **2***i* that is deformed upwardly from the removable panel portion **2***f* and extends within a corresponding aperture **8***d* contained in the pull tab between the extremity of the nose portion **8***a* and the rivet means.

OPERATION

Assume that the pull tab member is in the initial position illustrated in FIGS. **1** and **4** whereupon rotation of the tab member **8** about the vertical axis of the rivet means **2***h* is prevented by the cooperation between the dimple **2***i* in the removable panel portion **2***f* and the corresponding aperture **8***d* contained in the intermediate portion **8***b* of the pull tab member.

To remove the panel portion **2***f* from the end member, an initial lifting force is applied to the finger grip portion **8***c* of the rigid pull tab member **8**, whereupon the rivet portion is tilted forwardly to rupture vent scoreline **10** (as shown in FIG. **6**), and the pull tab nose portion **8***a* is simultaneously forced downwardly to rupture the adjacent portion of the scoreline **6**. During this initial opening operation, the nose portion **8***a* remains in contiguous engagement with the upper surface of the removable panel portion, thereby causing the retaining dimple **2***i* to continue to extend within the corresponding aperture **8***d* in the pull tab member. Following this initial pull tab lifting and scoreline rupturing operation, a pulling force is applied to the finger grip portion **8***c* to effect progressive tearing of the scoreline **6** and attendant removal of the panel portion **2***f* as shown in FIG. **5**. Upon completion of the tearing of the continuous scoreline **6**, the resulting panel **2***f* is removed to afford free access to the container chamber.

As shown in FIG. **7**, the tab nose portion **8***a* has in transverse cross-section an upwardly divergent V-shaped configuration the lower linear edge portion of which contains the dimple-receiving aperture **8***d*. It is apparent that the cooperation between the dimple **2***i* and the aperture **8***d* affords a more positive locking action with the illustrated tab member than would be achieved by means of a pair of laterally spaced raised dimples arranged to engage the sides of the nose portion, as suggested in the patented prior art.

While in accordance with the provisions of the Patent Statutes the preferred form and embodiment of the invention has been illustrated and described, various changes may be made without deviating from the inventive concepts set forth above.

What is claimed is:

1. End closure means for a container, comprising

a. a metal end closure member having a generally planar base portion containing a scoreline that defines a removable panel portion;

b. pull tab means for rupturing said scoreline and for at least partially removing said panel portion from said metal end member, said pull tab means including

1. a rigid pull tab member having integral nose, intermediate and finger grip portions, said pull tab member being arranged adjacent and generally parallel with said base portion opposite said removable panel portion; and

2. rivet means connecting said pull tab intermediate portion with said removable panel portion, said rivet means being so arranged relative to said scoreline that when said pull tab member is in a given position relative to said scoreline, the free extremity of said nose portion is directly opposite the corresponding portion of said scoreline; and

c. retaining means arranged solely between the axis of said rivet means and the free extremity of said nose portion for preventing rotation of said pull tab member about said rivet means from said given position relative to said end member not only during the initial opening period when the finger grip portion is elevated and said nose portion is depressed to rupture the adjacent scoreline portion, but also during the subsequent period when the finger grip portion is subjected to a pulling force to tear the scoreline to remove said panel portion from said end member, said retaining means comprising dimple means defined on one of said removable panel and nose portions for cooperation with a corresponding recess contained in the other of said panel and nose portions.

2. Apparatus as defined in claim **1**, wherein said removable panel portion contains a vent scoreline adjacent said rivet means on the opposite side thereof from said retaining means.

3. Apparatus as defined in claim **2**, wherein said nose portion includes a linear surface in continuous contiguous engagement with said removable panel portion, said nose portion linear surface containing an aperture defining said recess, said dimple means being formed in said removable panel portion for engagement with said recess.

4. Apparatus as defined in claim **3**, wherein the portion of said pull tab member between said intermediate and finger grip portions is imperforate.

5. Apparatus as defined in claim **4**, wherein said nose portion has in transverse cross-section a V-shaped configuration that diverges outwardly from the side thereof that is remote from said end member.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,724,709 Dated April 3, 1973

Inventor(s) Teddy M. Westphal

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Heading:

[73] Assignee: Boise Cascade Corporation,
Boise, Idaho

Signed and sealed this 12th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.