Feb. 20, 1973 L. M. PATARINI ET AL 3,717,279

NONDETACHABLE TEAR STRIP WITH WING TAB

Filed Jan. 27, 1972 2 Sheets-Sheet 1

Fig. 1.

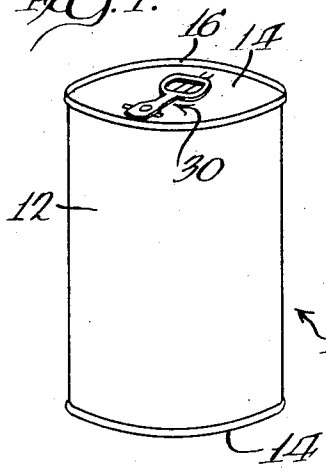


Fig. 2.

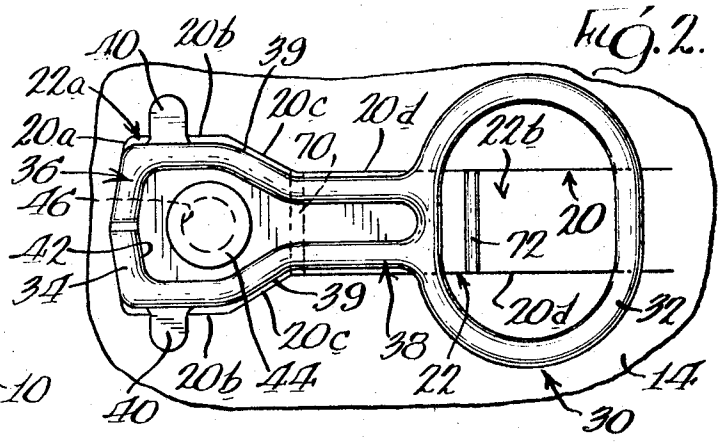


Fig. 3.

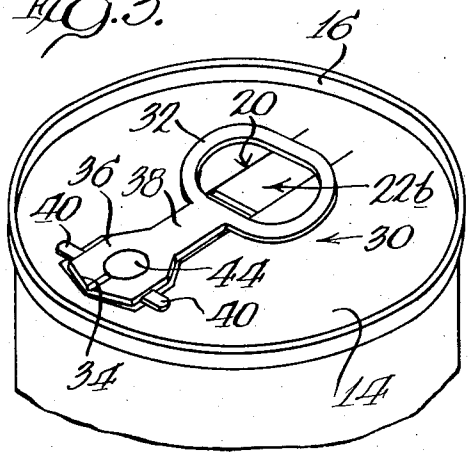
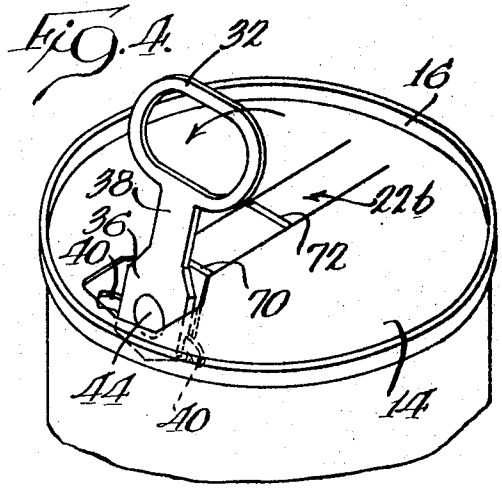


Fig. 4.



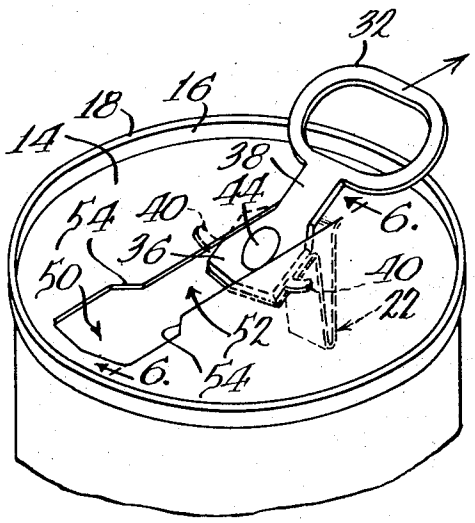


Fig. 5.

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Fig. 6.

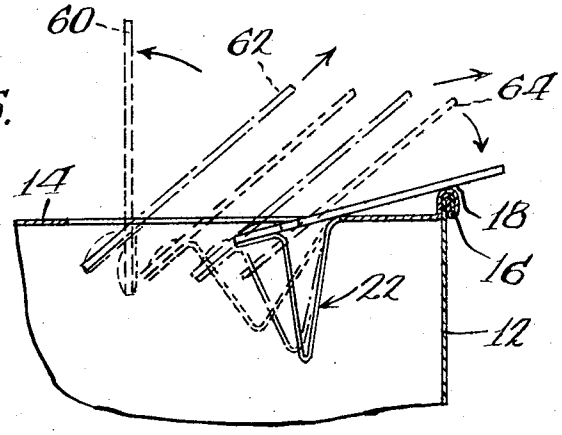
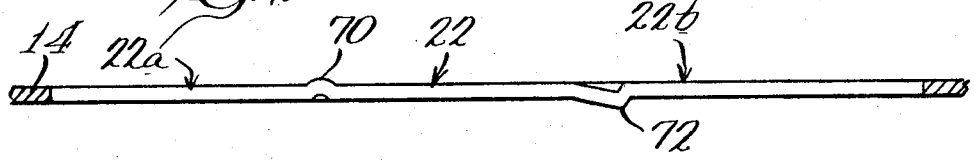


Fig. 7.



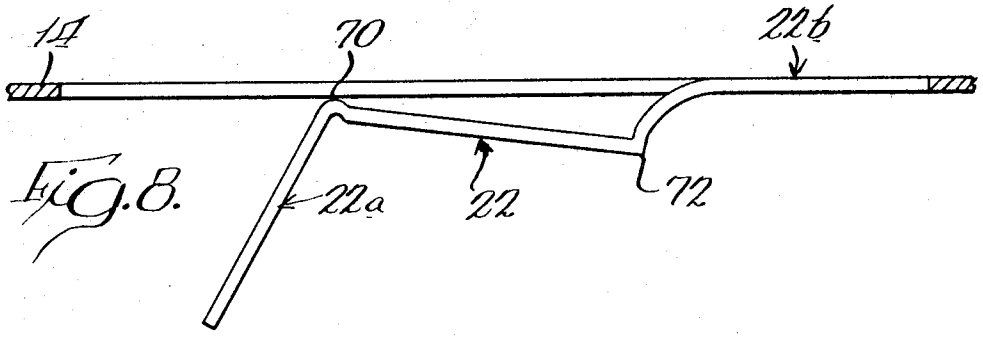
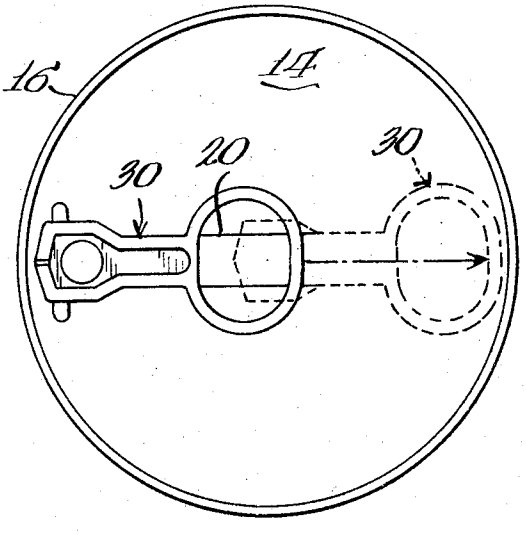


Fig. 8.

Fig. 9.



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NONDETACHABLE TEAR STRIP WITH WING TAB

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Int. Cl. B65d 17/24
U.S. Cl. 220—54 15 Claims

ABSTRACT OF THE DISCLOSURE

A container end panel is formed with a score line defining a tear strip permanently attached at one end to the panel. A tab has deflectable fingers extending laterally outwardly along opposite sides adjacent the connecting means to maintain the connecting end of the tab within the container after pivotal movement of the tab to institute severing of the score line. The opening in the panel created by the score line has a reduced portion adjacent the permanent connection between the panel and the tear strip while the tab has an enlarged portion on the connecting end and a reduced portion intermediate the ends that is received into the reduced portion of the opening so that the tab is guided along the opening to a stored position adjacent the permanent connection while the tear strip is bent intermediate its ends and is essentially folded upon itself to be located within the container when the panel has been fully opened.

BACKGROUND OF THE INVENTION

This invention relates to a container having a portion of its end wall weakened to serve as a tear strip with a tab attached to the tear strip to serve as manual means for severing the tear strip to form an opening for access to the contents of the container.

The wide spread acceptance of containers that can be opened without the normal can opener has resulted in a rather serious ecology problem. In containers for soft drinks, beer and other beverages, it has become customary to have a weakened score line that serves as a tear strip that can be completely removed by the manipulation of a tab connected thereto. The tear strips with tabs attached thereto are commonly discarded at random and are not as readily gathered up as the containers themselves. As a consequence, the discarded members accumulate in large proportions in areas such as beaches, picnic areas and major highways.

Because of the size of the removed portion of the container, most mechanical cleaning equipment that is normally utilized in beach or picnic areas cannot pick up the tabs and/or tear strips. Thus, in such areas, the tabs and tear strips accumulate in large numbers. Such a condition is not only unattractive but also presents a serious health hazard because the severed edge of the tear strip is normally rather sharp and can cause injury to users of the beach area that are normally bare footed. In fact, the troublesome accumulation of the discarded tear strips and tabs in many beach and picnic areas has led to the consideration of local and state laws prohibiting this type of easy opening container.

SUMMARY OF THE INVENTION

The present invention overcomes the troublesome accumulation of discarded tear strips and tabs by producing a tear strip that is permanently attached to the end panel of a container and has a tab connected thereto that is positioned in an out-of-the-way position for consumption of the contents.

More specifically, the easy open end panel has a generally U-shaped score line defining an elongated tear strip with a permanent connection between one end of the tear strip and the end panel. The tear strip has an enlarged segment on the opposite end and a reduced segment adjacent the permanent connection which defines an opening of reduced width adjacent the permanent connection when the score line is severed.

An elongated tab is conected at one end to the enlarged segment of the tear strip and has a handle means on the opposite end with a reduced portion intermediate the two ends that is capable of being received into the reduced width of the opening. The tab also has integral fingers extending outwardly from opposite sides of the enlarged portion of the tab that have free ends which extend beyond the lateral edges of the tear strip. The fingers or deflectable means are capable of being temporarily deflected to pass thorugh the opening created by the tear strip when the score line is severed by pivotal movement of the handle means away from the end panel. After the fingers pass through the opening in the end panel, the resiliency of the material which opposes the deflection causes the fingers to extend outwardly beyond the lateral edges of the opening and thus prevent the enlarged portion of the tab from being pulled through the opening.

The tab and end panel also have cooperating guide means that guide the tab along the elongated opening during movement of the tab to its open or second position. More specifically, the marginal edges of the reduced potrion of the opening act as guides for tapered edges between the enlarged portion and reduced portion of the tab.

In order to minimize the amount of material that is located outside the container, it is desirable that the entire tear strip and a major portion of the tab be located below the end panel when the container has been completely opened. To accomplish this, the tear strip is folded transversely at spaced locations during the opening process to produce bend lines that extend across the tear strip. The deformed portions cause the tear strip to be initially bent in one direction between the enlarged segment and the reduced segment during initial pivotal movement of the handle away from the end panel and produce a folding between the first bend line and the permanently connected end of the tab so that the reduced section of the tear strip is folded upon itself and is located below the end panel.

With this arrangement, the entire tear strip and a major portion of the tab are located within the container after it has been opened and the tab does not obstruct consumption of the contents. In one embodiment, the entire tab is located within the confines and below the free end of the rim extending beyond the end panel.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF DRAWINGS

FIG. 1 is a perspective view of a container having the end panel and tab constructed according to the present invention;

FIG. 2 is an enlarged fragmentary plan view of the end panel;

FIGS. 3, 4 and 5 are fragmentary perspective views of the container showing the various stages of tear strips and tab during the opening process;

FIG. 6 is a fragmentary vertical section showing the position of the tear strip and tab during the various stages of opening;

FIG. 7 is an enlarged side elevation view of the elongated tear strip showing the tear strip prior to being severed from the end panel;

FIG. 8 is a view similar to FIG. 7 showing the tear strip in a partially severed condtion; and

FIG. 9 is plan view of the end panel showing a slightly modified form of tab construction.

DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention and modifications thereof, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

FIG. 1 shows a container, generally designated by the reference numeral **10**, usually found of metal and including a cylindrical body portion or wall **12** and a pair of end panels **14** connected to opposite ends of the cylindrical body **12** through the usual double seam **16**. Each double seam **16** produces a rim that extends beyond the surface of the end panel **14** and terminates in a free edge **18** spaced therefrom.

One of the end panels is designed for opening to remove the contents. For this purpose, the end panel has a weakened or score line **20** produced therein to define a tear strip generally designated by the reference numeral **22** (see FIG. 8). The weakened score line is of generally U-shaped configuration and has an end segment **20***a*, a pair of spaced parallel segments **20***b*, inwardly tapered planar segment **20***c* and parallel segments **20***d*. The base segments **20***a* and parallel segments **20***b* define an enlarged segment **22***a* for the tear strip while the parallel segments **20***d* define a reduced segment **22***b* on the tear strip which is permanently connected to the end panels by having the segments **20***d* terminate at spaced locations.

The tear strip is severed from the remainder of the end panel along the score or weakened line **20** by a tab **30** that has a handle end **32** and a tear initiating end **34**. The tab has an enlarged portion **36** that corresponds substantially to the enlarged segment **22***a* of the tear strip and a reduced portion **38** between the enlarged portion and the handle **32**. The enlarged portion **36** merges with the reduced portion **38** along tapered planar walls **39**, for a purpose that will be described later, while the reduced portion **38** has a transverse dimension that is slightly less than the transverse spacing between score line segments **20***d*.

The tab **30** further includes deflectable means or fingers **40** that extend outwardly from opposite side walls of the enlarged portion **36** adjacent tear initiating end of the tab. The deflectable fingers have free ends that extend beyond the opposite sides of the enlarged segment of the tear strip as is clearly shown in FIG. 2.

The tab **30** is preferably formed of sheet metal, such as aluminum or steel, and is reinforced throughout its length and width by deforming the sheet metal downwardly to produce a dished portion **42** that extends substantially the entire length of the enlarged portion **36** and the intermediate portion **38**. Also, the edge of the sheet

metal is reversely bent in the handle area **32** as well as along the intermediate area and the tapered walls **39**. Along the enlarged portion **36**, it is preferable that the lateral edges be bent downwardly in the entire area with the exception of location of the fingers **40** so as to produce a downwardly directed wall of flange extending from the main body of the sheet material. The enlarged portion **36** of the tab is permanently connected to the enlarged portion of the tear strip by connecting means that have been illustrated as a rivet **44** integral with the tear strip and extending through an opening **46** in the dished portion of the tab.

Before proceeding with the description of the opening of the end panel, it should be noted that in the finally opened condition, the tear strip defines an opening in the end panel (FIG. 5) that has an enlarged area **50** and a reduced area **52** that has a common transverse dimension between opposed edges of the end panel defined by severing the score line. In addition, the enlarged area **50** merges with the reduced area **52** along tapered planar edges **54**.

To initiate severing of the score line **20**, the handle end **32** of the tab is grasped and pulled away from the end panel to initiate severing of the score line along the segment **20***a* as well as the segments **20***b* and **20***c*. During such pivotal movement of the tab, the integral fingers **40** engage the lateral edges of the enlarged area **50** of the opening so that their free ends are deflected toward each other sufficiently to allow the entire fingers to pass through the enlarged area of the opening. After the fingers pass through the opening, the resiliency of the material, such as aluminum or steel or other suitable material having an elastic memory that causes the material to return toward its undeformed condition after being deflected, will cause the free ends of the fingers or deflectable means to assume a position where they are located beyond the opposed lateral edges of the enlarged area **50** of the opening in the end panel **14**.

During the first stage of opening, the tab and tear strip are moved from the position shown in FIG. 3 to that shown in FIG. 4. During this pivotal movement of the tab, at least a portion of the segments **20***d* of the score line are severed, as will be described in more detail hereinafter.

The next step in the opening process is to pivot the tab in the opposite direction from the dotted line position shown at **60** in FIG. 6 to the dotted line position **62**, likewise shown in FIG. 6. The second position **62** for the tab assumes a small acute angle with respect to the end panel so that a pulling force applied by a person will produce a force component that is substantially parallel to the elongated dimension of the elongated tab. During this pulling force, the walls **39** engage the inclined edges **54** of the opening to guide the enlarged portion of the tab below the end panel and insure that a major portion of the tab and all of the tear strip are located inside the container. During this pulling movement, the reduced intermediate portion **38** of the tab is guided into the reduced area or width **52** of the opening and is ultimately located in close proximity to the permanent connection between the tear strip and the end panel. This position is indicated by the reference numeral **64** in FIG. 6.

The last step in manipulation of the tab is to produce a pivotal force in a general clockwise direction as shown in FIG. 6 to position the tab to its final solid line position shown therein where the lower surface of the handle end of the tab engages the free end **18** of the rim **16**. It will be seen that in its final or fully opened position (see FIG. 5), the tab has a major portion thereof located inside the container while the portion that is located outside the container is in the area of the rim at a location diametrically opposed from the enlarged area **50** of the opening. This places the tab in an out-of-way position for direct consumption of the contents through the enlarged area **50** of the opening without any obstruction being created by the tab.

During the opening process, it is also desirable to insure that the entire tear strip is maintained within the container to prevent any sharp edges, produced by severing the score line, from being located outside the container. To insure that the tear strip is located entirely within the container, the tear strip includes means for causing transverse bending of the tear strip between opposite ends thereof during the opening process. This means has been illustated as a first deformed portion or upwardly directed bead **70** (FIG. 7) and a second deformed portion or downwardly directed bead **72**.

The first deformed portion or bead **70** extends across the entire width of the tear strip in the area between the enlarged portion **36** and the intermediate portion **38** of the tab. Stated another way, the first deformed portion or bead is located between the enlarged segment **22***a* and the reduced segment **22***b* of the tear strip The second deformed portion or bead **72** is located substantially midway between the first bead **70** and the permanently connected base end of the tear strip.

The upwardly directed bead **70** will insure a transverse bend across the entire tear strip during the initial pivotal movement of the tab with respect to the end panel. During this pivotal moevment, it is also desirable to insure that the score line segments **50***d* are severed at least back beyond the second deformed portion or bead **72** to approximately the position shown in FIG. 8. To insure that this occurs, the bead **72** may be of a substantially V-shaped configuration as shown in FIG. 7 so that the pivotal movement of the tab or lever **30** will sever the score line to the desired point. This may further be assisted by making one leg of the V-shaped bead extend substantially vertical and the second leg substantially horizontal, as shown in FIG. 7. The V-shaped deformed portion insures that the tear strip will be folded upon itself to the solid line position shown in FIG. 6 during the pulling phase of the opening operation.

It will be appreciated that several of such bend lines may be defined in the reduced segment of the tear strip so that the tear strip is folded into an accordion pleat configuration.

A slightly modified form of the invention is shown in FIG. 9 and is substantially identical to the container just described with the exception that the tab has an elongated dimension between opposite ends thereof that is substantially equal to the radius of the circular end panel. With this arrangement and by properly configuring and locating the tear strip, the tab may be maintained within the confines of the rim **16** in its final or second position shown by the dotted lines in FIG. 9. Thus, all of the tear strip and tab can be located below the free edge of the rim and yet produce an unobstructed enlarged area similar to the area **50** for consumption of the beverage within the container.

We claim:

1. In an easy open end panel having a generally U-shaped score line defining an elongated tear strip with a permanent connection between one end of said tear strip and the end panel, said tear strip defining an elongated opening in said end panel upon severing of said score line; a tab having opposite ends with handle means on one end; connecting means interconnecting the opposite end of said tear strip and the opposite end of said tab with said tab extending generally parallel along one side of said panel; and deflectable fingers extending from opposite sides of said tab adjacent said opposite end, said fingers having free ends extending beyond opposite edges of said tear strip and being temporarily deflected to pass through the opening created by severing said score line upon pivotal movement of said handle means away from said panel, said fingers extending beyond opposite edges of the opening on the opposite side of said panel after severing of said score line.

2. An easy open end as defined in claim **1**, in which said strip has an enlarged segment on said opposite end merging with a reduced segment, said reduced segment having means for causing said reduced segment to bend intermediate opposite ends thereof.

3. An easy open end as defined in claim **2**, in which said strip further includes means for causing said strip to bend along a transverse bend line between said enlarged segment and said reduced segment during pivotal movement of said tab.

4. An easy open end as defined in claim **1**, in which said tab includes an enlarged portion on said opposite end and a reduced portion between said handle means and said enlarged portion, and means for guiding said tab along the opposite side of said panel when said tab is moved along the elongated opening.

5. An easy open end as defined in claim **4**, in which said opening has a portion of reduced width adjacent the permanent connection, said portion of reduced width having a transverse dimension less than the transverse dimension of the enlarged portion of said tab and greater than the transverse dimension of reduced portion so that opposed edges of said reduced portion of the opening define said means for guiding said tab.

6. An easy open end as defined in claim **5**, further including means for causing a transverse bend in said tear strip between opposite ends of said tear strip.

7. An easy open end as defined in claim **6**, in which said means for causing a transverse bend in said tear strip includes a first deformed portion extending across said strip adjacent said enlarged portion of said tab and a second deformed portion between said first deformed portion and said permanent connection.

8. An easy open end as defined in claim **7**, in which first deformed portion is deformed toward said one side of said panel and said second deformed toward opposite side of said panel.

9. An easy open end as defined in claim **1**, in which said end panel includes a rim around the periphery thereof and extending beyond said one side and terminating in a free end spaced from said end panel and in which said tab is located within said rim and below the free end in the closed and open condition for said end panel.

10. An easy open container including a container wall having a weakened line defining an elongated tear strip permanently connected at one end to said container wall, said tear strip having an enlarged segment adjacent its opposite end defining an opening in said container wall when said weakened line is severed; a tab having a handle end and a tear initiating end; connecting means interconnecting said enlarged segment of said tear strip and said tear initiating end of said tab; and deflectable means extending from opposite side walls of said tear initiating end, said deflectable means having free ends normally extending beyond opposite sides of said enlarged segment of said tear strip and being temporarily deflected to pass through said opening during severing of said weakened line along the enlarged segment of said tear strip and engage an inside surface of said wall to maintain said tear initiating end of said tab in said container.

11. An easy open container as defined in claim **10**, in which said tab includes an enlarged portion on said tear initiating end merging along tapered walls with a reduced portion intermediate said enlarged portion and said handle end and in which said opening defined by said tear strip includes a portion of reduced width adjacent the permanent connection tapering outward into an enlarged portion adjacent said opposite end, said inward taper of said tab engaging said outward taper of said opening to guide said reduced portion of said tab into the portion of reduced width of said opening when a pulling force is applied to said tab after initial rupture of said score line.

12. An easy open end container as defined in claim **10**, in which said tear strip has a first transverse upwardly deformed portion adjacent said enlarged segment and a second transverse downwardly deformed portion between said

upwardly deformed portion and the permanent connection, said deformed portions producing bend lines for said tear strip during opening of said container to maintain said tear strip within said container in the open condition.

13. An easy open container as defined in claim **12**, in which said second deformed portion is substantially V-shaped in cross-section.

14. An easy open container as defined in claim **10**, further including a rim extending beyond said container wall and terminating in a free end and in which said tab is located with said rim below said free end in the closed and open condition for said container.

15. A tab attachable to a tear strip defined in an end panel of a metal container by a score line comprising an elongated sheet metal member having a handle end and a tear initiating end, said tear initiating end having means adapted for connection to the tear strip, and integral deflectable fingers extending from opposite sides of said tear initiating end adjacent said means adapted for connection to said tear strip, said fingers having free ends extending beyond the tear strip so that rupture of the score line by the tab will cause said fingers to deflect temporarily to pass through the opening created by the tear strip and extend beyond the opening inside the container.

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GEORGE T. HALL, Primary Examiner

U.S. Cl. X.R.

220—48