Aug. 22, 1967 J. S. SONG 3,337,084

CONTAINER END

Filed Feb. 19, 1965 2 Sheets-Sheet 1

FIG. 1

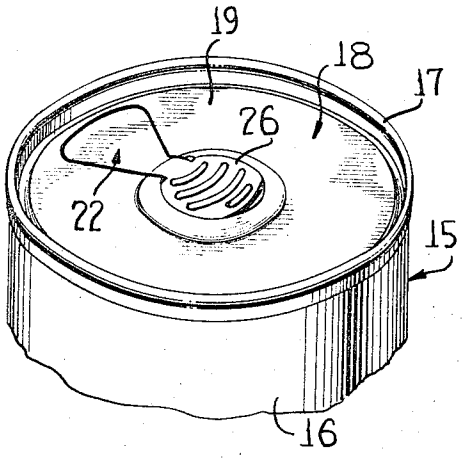


FIG. 2

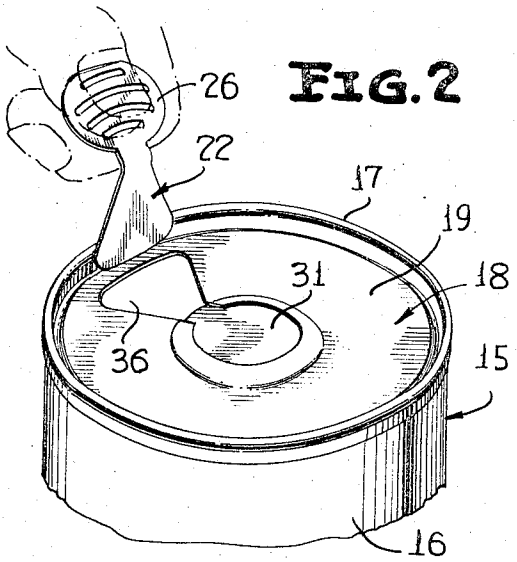


FIG. 3

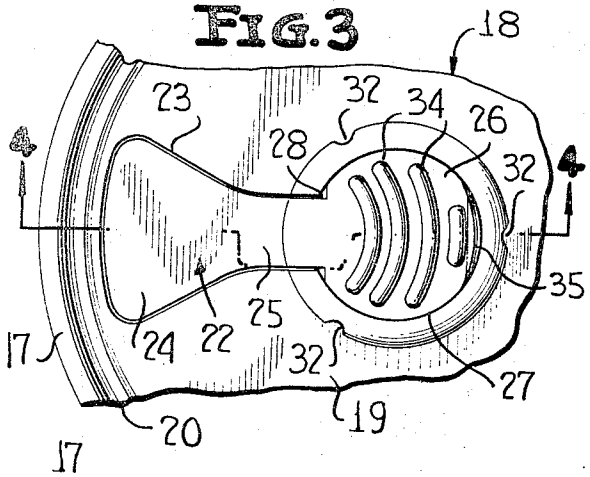
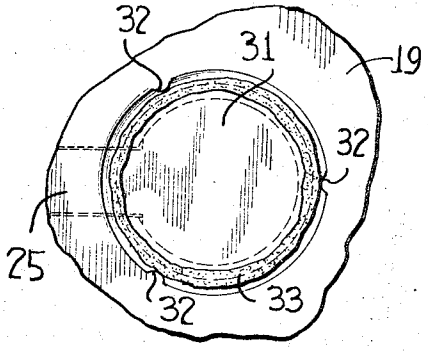


FIG. 5



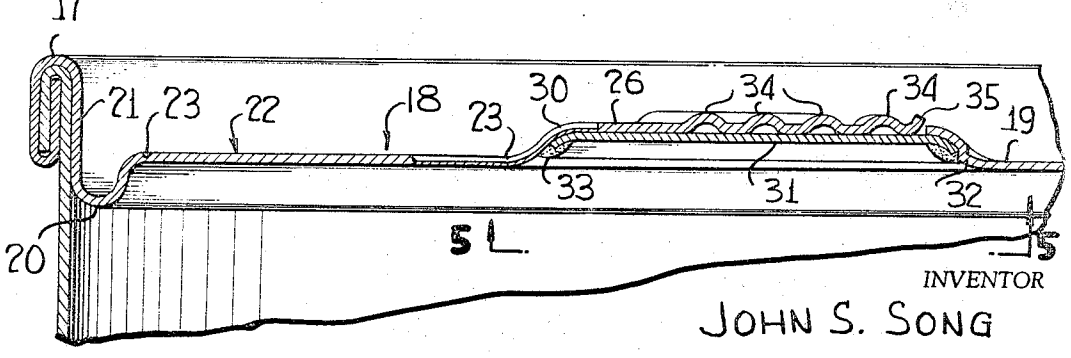


FIG. 4

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FIG. 6

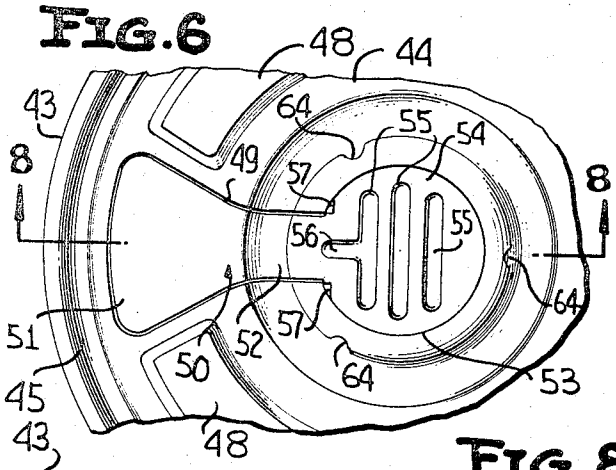


FIG. 7

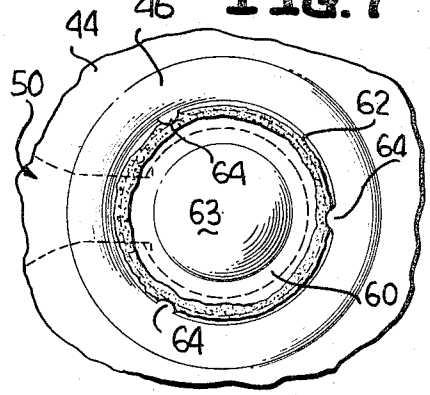


FIG. 8

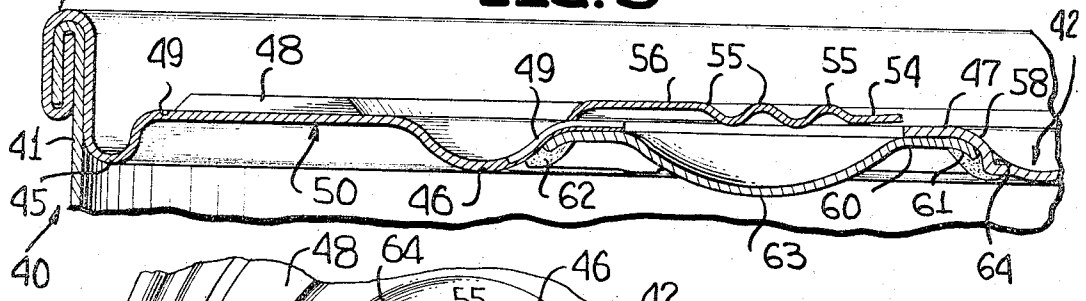
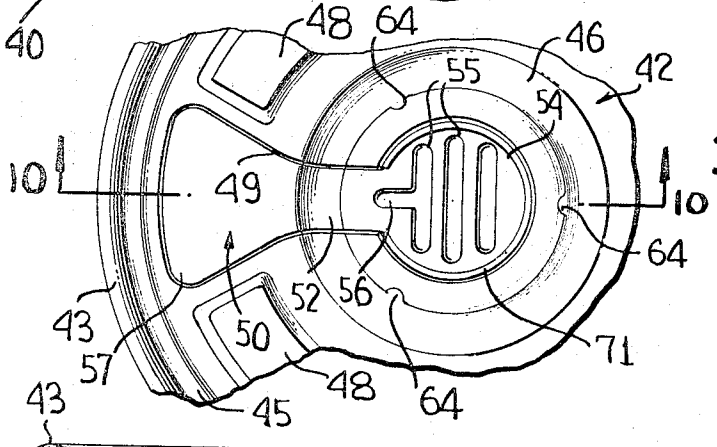


FIG. 9



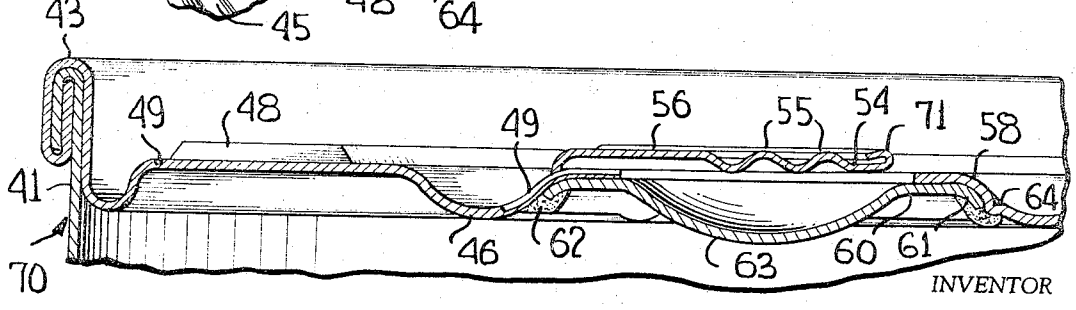


FIG. 10

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3,337,084

CONTAINER END

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Filed Feb. 19, 1965, Ser. No. 434,059
9 Claims. (Cl. 220—54)

This invention relates in general to new and useful improvements in container constructions, and more particularly to a novel container end of the easy opening type.

The customary easy opening container end includes a removable tear strip which is defined by weakening lines and which has a starting end to which a separate pull tab is secured. The attachment of the pull tabs to the tear strips has presented manufacturing problems and accordingly, it is the primary object of this invention to provide a novel easy opening container end wherein the pull tab is formed as an integral part of the tear strip with the pull tab being formed from the metal of the container end and being cut therefrom.

Another object of this invention is to provide a novel container end of the easy opening type which includes an integral pull tab and tear strip formed from the material of the container end, the tear strip remaining an integral part of the container end and being defined by weakening lines, and the pull tab being totally severed from the surrounding material of the container end and remaining attached thereto only by its connection with the tear strip, the container end being sealed around the pull tab by means of a sealing disc suitably sealed to the underside of the end panel.

Another object of this invention is to provide a novel container end of the easy opening type which is particularly adapted for the dispensing of liquids which may be packaged under pressure, the container end including a tear strip having an outer generally triangular portion and an inner connecting strap portion, the tear strip having attached thereto an integral pull tab formed from the material of the container end, the pull tab being generally circular in outline and being positioned centrally of the container end, the container end being sealed surrounding the pull tab by means of a sealing disc suitably bonded thereto.

Still another object of this invention is to provide a container end of the type set forth above wherein the sealing disc is downwardly bowed so as to resist pressures from within the associated container whereby the pressure within the container will have no effect whatsoever on the sealing of the container end by the sealing disc.

A further object of this invention is to provide a novel container end of the easy opening type which includes a tear strip having an integral pull tab cut from the material of the container end, the material of the container end containing the pull tab being outwardly offset so as to define a seat, a sealing disc positioned within the seat and means bonding the sealing disc to the offset portion of the container end to seal the opening formed in the formation of the pull tab.

A still further object of this invention is to provide a novel container end of the type set forth above wherein the container end is provided with locking projections which permit the sealing disc to be snapped into place and retained mechanically in place during the application of the necessary sealing compound.

Yet another object of this invention is to provide a novel container end of the easy opening type which includes a tear strip having an integral pull tab, the pull tab being formed from the material of the container end, with the pull tab being integrally connected to the tear strip by means of a connecting strap portion of the tear strip, the pull tab being provided with transverse ribbing to both reinforce the pull tab and facilitate the gripping thereof, the pull tab being further provided with longitudinal ribbing adjacent the connecting strap portion and extending towards the connecting strap portion so as to stiffen the connection between the pull tab and the tear strip.

With the above, and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a top fragmentary perspective view of a container having the upper ends thereof closed by means of a container end formed in accordance with this invention.

FIGURE 2 is a perspective view similar to FIGURE 1 and shows the container immediately after it has been opened by the removal of the tear strip thereof.

FIGURE 3 is an enlarged fragmentary plan view of the container end of FIGURE 1 and shows further the details thereof.

FIGURE 4 is an enlarged fragmentary vertical sectional view taken along the line **4—4** of FIGURE 3 and shows further the details of the container end.

FIGURE 5 is a fragmentary bottom plan view of the container end with the view taken generally along the line **5—5** of FIGURE 4.

FIGURE 6 is an enlarged fragmentary plan view similar to FIGURE 3 and shows a modified form of can end construction.

FIGURE 7 is a fragmentary bottom plan view of the central portion of the container end of FIGURE 6 and shows the details of the sealing thereof.

FIGURE 8 is an enlarged fragmentary vertical sectional view taken along the line **8—8** of FIGURE 6 and shows further the details of construction of the container end.

FIGURE 9 is another fragmentary plan view similar to FIGURE 3 and shows still another form of container end construction.

FIGURE 10 is an enlarged fragmentary vertical sectional view taken along the line **10—10** of FIGURE 9 and shows the details of the container end construction.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURE 1 a container which is generally referred to by the numeral **15**. The illustrated container is in the form of a conventional can and will be so described hereinafter although the container may be of any type of construction. The container **15** includes a conventional can body **16** to which there is secured by means of a conventional double seam **17** a container end which is formed in accordance with this invention, the container end being generally referred to by the numeral **18**.

Referring now to FIGURE 4 in particular, it will be seen that the container end **18** includes an end panel **19** which is surrounded by a downwardly recessed shock absorbing bead **20** which, in turn, is connected to a chuck wall **21**, the chuck wall **21** forming part of a peripheral attaching portion of the container end **18** and being a portion of the conventional double seam **17**.

In order to facilitate the easy opening of the container **15**, the end panel **19** of the container end **18** is provided with a removable tear strip which is generally identified by the numeral **22**. The tear strip **22** is defined by a generally U-shaped weakening line **23** which is illustrated as being in the form of a score line formed in the end panel **19**, but which may be of other construction. It is also pointed out at this time that although the weakening line **23** is herein described as being generally U-shaped, it could be considered as being formed of a plurality of

individual weakening lines which are interconnected and joined together at their ends.

The tear strip **22**, which is particularly shaped for the dispensing of liquids, includes an outwardly flaring generally triangular outer portion **24** and an inner connecting strap portion **25**. The connecting strap portion **25** has integrally connected thereto a pull tab **26** which is generally circular in outline and which is formed from the material of the end panel **19**, the pull tab **26** being defined by a cut line **27** which is joined to the ends of the weakening line **23**. If desired, the pull tab **26** may be notched, as at **28**, at its juncture with the connecting strap portion **25**.

Referring now to FIGURE 4 once again, it will be seen that the portion of the end panel **19** containing the pull tab **26** is upwardly offset so as to define a socket-like seat **30**. A sealing disc **31** is snapped into the socket-like seat **30** and is mechanically retained therein by a plurality of locking ears or dimples **32** pressed downwardly from the material of the end panel **19** at circumferentially spaced positions surrounding the socket-like seat **30**.

It is to be noted that the peripheral configuration of the disc **31** corresponds to that of the socket-like seat **30** and the seat **30** forms a good support for the disc **31**. At the same time, an effective seal is formed between the disc **31** and the seat **30**. However, in order to assure the sealing of the disc **31** with respect to the end panel **19**, sealing compound **33** is applied around the peripheral edge of the disc **31** and bonded to the underside of the panel **19**, as is clearly shown in FIGURE 4.

In order to effect the reinforcing of the pull tab **26** and to facilitate the gripping thereof, the pull tab **26** is provided with generally transversely extending ribbing as at **34**. Also, it will be noted that the pull tab **26** has an edge portion **35** remote from the pull tab **26** which is upwardly folded so as to facilitate the initial lifting of the pull tab **26** out of the plane of the end panel **19**.

It is to be noted that the connecting strap portion **25** of the tear strip **22** extends into overlying relation to the sealing disc **31**. When it is desired to open the container **15**, one's finger is engaged beneath the upturned edge **35** of the pull tab **26** and the pull tab lifted upwardly. This initial upward movement of the pull tab **26** does not break the seal of the container **15**. After the pull tab **26** has been lifted upwardly a sufficient distance, it is gripped between one's fingers in the manner generally shown in FIGURE 2 and an upwardly and outwardly directed pull is applied thereon so as to effect the tearing of the end panel **19** along the score line **23** so that the tear strip **22** may be completely torn from the container end **18**, as is shown in FIGURE 2. The sealing disc **31** remains in place after the tear strip **22** has been removed, but since it is centrally located, it in no way interferes with the pouring of a liquid from the container **15** through a dispensing opening **36** which is formed in the end panel **19** after the removal of the tear strip **22**. It is to be understood that tear strip **22** may be shaped in accordance with the desired dispensing opening **36**.

Reference is now made to FIGURES 6, 7 and 8 of the drawings, wherein there is illustrated a modified form of container which is generally referred to by the numeral **40**. The container **40** includes a container body **41** to which there is secured a container end **42** by means of a conventional double seam **43**.

The container end **42** is of the same general construction as the aforedescribed container end **18** and includes an end panel **44** which is recessed with respect to a peripheral attaching portion which forms a part of the double seam **43**. The end panel **44** is surrounded by a shock absorbing bead **45** which is inwardly directed, as is shown in FIGURE 8. The end panel **44** is provided with an intermediately positioned downwardly offset bead **46** so as to define an upwardly offset central portion **47**. In addition, the end panel **44** is reinforced by an outer upwardly offset reinforcing or stiffening rib **48** which is generally

C-shaped and has opposed ends there in spaced relation, as is clearly shown in FIGURE 6.

The end panel **44** is provided with a generally U-shaped weakening or score line **49** which defines a removable tear strip **50**. The tear strip **50** includes an outwardly flaring outer generally triangular portion **51** and an inwardly extending connecting strap **52**. It is to be noted that the tear strip **50** is positioned between the ends of the reinforcing ribbing **48** and the connecting strap **52** extends across the bead **46** into the offset central portion **47**.

The central portion **47** has a generally circular cut line **53** which defines a pull tab **54** cut from the material of the container end **42** and integrally connected to the connecting strap **52**. It is to be noted that the pull tab **54** is partially struck out of the plane of the offset central portion **47**, as is illustrated in FIGURE 8 to facilitate the lifting thereof.

The pull tab **54** is reinforced by transversely extending ribbing **55** which also facilitates the gripping of the pull tab **54**. In addition, the pull tab **54** has a longitudinally extending rib **56** which extends into the connecting strap portion **52** of the tear strip **50** so as to reinforce the connection between the pull tab **54** and the tear strip **50**. Incidentally, it is also pointed out that the pull tab **54** may be notched, as at **57**, at its intersection with the connecting strap **52** to facilitate the lifting of the pull tab **54** out of the plane of the offset portion **47**.

The forming of the end panel **44** with the offset portion **47** automatically defines a socket-like seat **58** surrounding the pull tab **54**. A sealing disc **60** is seated within the offset portion **47** and has a peripheral edge portion **61** of a configuration corresponding to that of the seat **58** so as to permit the tight engagement of the sealing disc **60** with the seat **58**. In addition, the sealing disc **60** is sealed relative to the offset portion **47** by a ring of sealing compound **62**.

It is to be noted that unlike the sealing disc **31**, which is substantially flat, the sealing disc **60** is downwardly bowed as at **63**. It will be readily apparent that when the container **40** has a liquid under pressure therein, the gaseous pressure exerted against the sealing disc **60** will not result in the upward bowing thereof into undesired pressure contact with the overlying pull tab **54**. The bowing of the sealing disc **60** permits the sealing disc **60** to withstand pressures of the type normally applied within the container **40**. This bowing of the sealing disc **60** greatly enhances the retention of the seal between the sealing disc **60** and the surrounding portion of the end panel **44**.

It is also pointed out at this time that the sealing disc **60** is retained in place within the offset portion **47** by a plurality of circumferentially spaced ears or dimples **64**. The ears or dimples **64** are formed from the material of the end panel **44** and are pressed inwardly so as to have the configuration generally shown in FIGURES 7 and 8. It is to be understood that the sealing disc **60** will have a snap fit past the ears or dimples **64**.

The container **40** will be opened in the manner set forth above with respect to the container **15** and therefore, further description is believed to be unnecessary.

Referring now to FIGURES 9 and 10, it will be seen that there is illustrated a slightly modified form of container construction which is generally referred to by the numeral **70**. The container **70** is identical to the container **40** in all aspects with the exception of a minor change in the pull tab **54**. Accordingly, like parts will be identified with like numerals as described above with respect to the container **40**. The pull tab **54** illustrated in FIGURES 9 and 10 differs from that illustrated in FIGURES 6, 7 and 8 in that the peripheral edge thereof is reversely turned, as at **71**, to further reinforce the pull tab, to eliminate the undesired free raw edge, and to facilitate the lifting of the pull tab.

It is to be understood that although the pull tab and tear strip arrangements illustrated in the drawings are all

directed to the type primarily adapted for dispensing liquids, the invention is not intended to be so limited. It is to be understood that the tear strip could be of the circumferential type wherein the major portion of the end panel of the associated container end is removed. It is to be understood that such a peripheral tear strip could have an inwardly directed extension which would correspond to the connecting straps of the illustrated and described tear strips.

Although only several preferred embodiments of the invention have been specifically illustrated and described herein, it is to be understood that minor changes may be made in the invention without departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. An easy opening container end comprising an end panel and peripheral attaching means, said end panel having lines of weakening defining a removable tear strip which when removed defines a dispensing opening, a cut line in said end panel joining ends of said weakening lines and defining a pull tab formed from the material of said end panel and integral with said tear strip at one end thereof, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, said pull tab being downwardly bowed for resisting pressure which may exist in an associated container.

2. An easy opening container end comprising an end panel and peripheral attaching means, said end panel having lines of weakening defining a removable tear strip which when removed defines a dispensing opening, a cut line in said end panel joining ends of said weakening lines and defining a pull tab formed from the material of said end panel and integral with said tear strip at one end thereof, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, said end panel being offset surrounding said pull tab to define a seat for said disc.

3. An easy opening container end comprising an end panel and peripheral attaching means, said end panel having lines of weakening defining a removable tear strip which when removed defines a dispensing opening, a cut line in said end panel joining ends of said weakening lines and defining a pull tab formed from the material of said end panel and integral with said tear strip at one end thereof, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, said end panel being offset surrounding said pull tab to define a seat for said disc and having a plurality of ears underlying said seat to retain said disc in place.

4. An easy opening container end comprising an end panel and peripheral attaching means, said end panel having lines of weakening defining a removable tear strip which when removed defines a dispensing opening, a cut line in said end panel joining ends of said weakening lines and defining a pull tab formed from the material of said end panel and integral with said tear strip at one end hereof, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, said end panel being deformed at spaced intervals around said pull tab to provide mechanical locks retaining said disc in place.

5. The container end of claim 2 wherein the bonding of said disc to said end panel is effected by a ring of sealing compound.

6. An easy opening container end particularly adapted for the dispensing of liquids, said container end comprising an end panel and a peripheral attaching portion, said end panel having generally U-shaped line of weakening defining a removable tear strip which has an outwardly flaring generally triangular outer portion and an inwardly extending connecting strap portion, a cut line in said end panel joining the ends of said weakening line and defining a pull tab formed from the material of said end panel and integrally connected to said connecting strap, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, that portion of said end panel containing said pull tab being upwardly offset relative to the adjacent portion of said end panel to define a socket-like seat for said disc.

7. The container end of claim 6 wherein said disc is downwardly bowed for opposing pressure which may exist in an associated container.

8. An easy opening container end particularly adapted for the dispensing of liquids, said container end comprising an end panel and a peripheral attaching portion, said end panel having generally U-shaped line of weakening defining a removable tear strip which has an outwardly flaring generally triangular outer portion and an inwardly extending connecting strap portion, a cut line in said end panel joining the ends of said weakening line and defining a pull tab formed from the material of said end panel and integrally connected to said connecting strap, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, said pull tab being transversely ribbed to both reinforce said pull tab and to facilitate the gripping thereof, said ribbing also including a longitudinal rib adjacent to and projecting towards said connecting strap.

9. An easy opening container end particularly adapted for the dispensing of liquids, said container end comprising an end panel and a peripheral attaching portion, said end panel having generally U-shaped line of weakening defining a removable tear strip which has an outwardly flaring generally triangular outer portion and an inwardly extending connecting strap portion, a cut line in said end panel joining the ends of said weakening line and defining a pull tab formed from the material of said end panel and integrally connected to said connecting strap, and a separate disc underlying said pull tab and being bonded to said end panel surrounding said cut line, that portion of said end panel containing said pull tab being upwardly offset relative to the adjacent portion of said end panel to define a socket-like seat for said disc, and a peripheral rib in said end panel surrounding said seat and reinforcing said end panel outwardly of said seat, said peripheral rib being discontinuous and having opposed ends on opposite sides of said generally triangular outer portion.

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