

Feb. 25, 1969

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3,429,481

END CLOSURE OPENING AND POURING MEANS

Filed March 23, 1967

Sheet 1 of 3

FIG-1

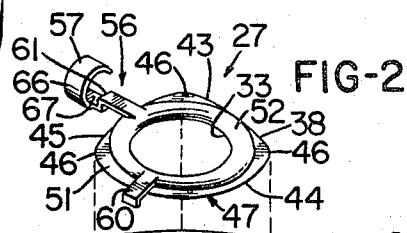
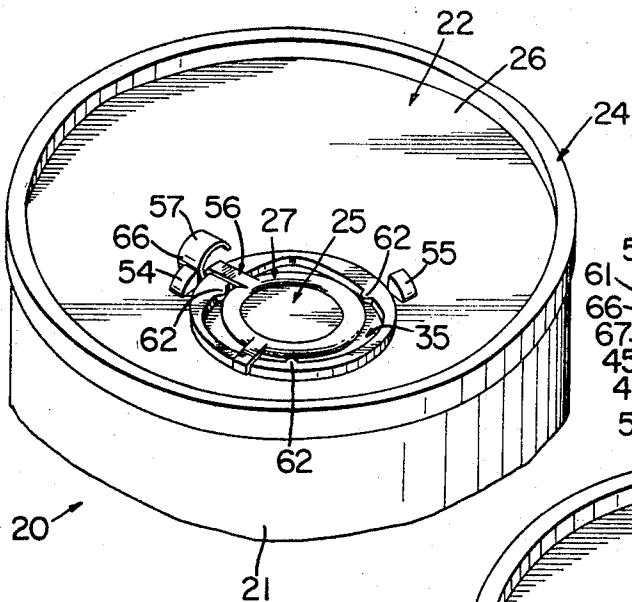
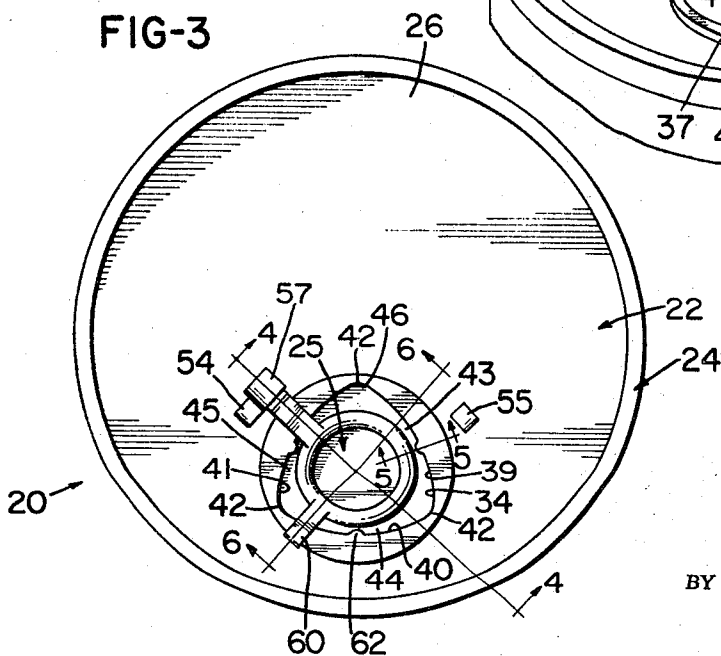


FIG-3



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Sheet 2 of 3

FIG-4

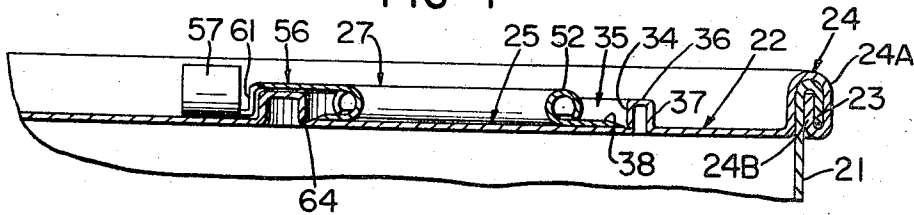


FIG-6

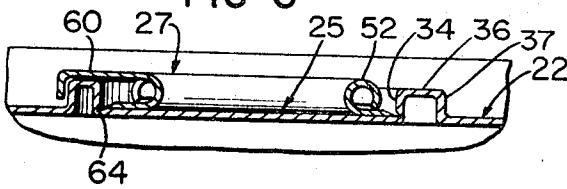


FIG-5

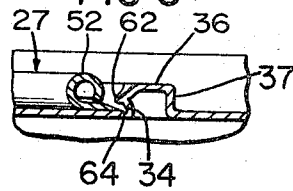


FIG-7

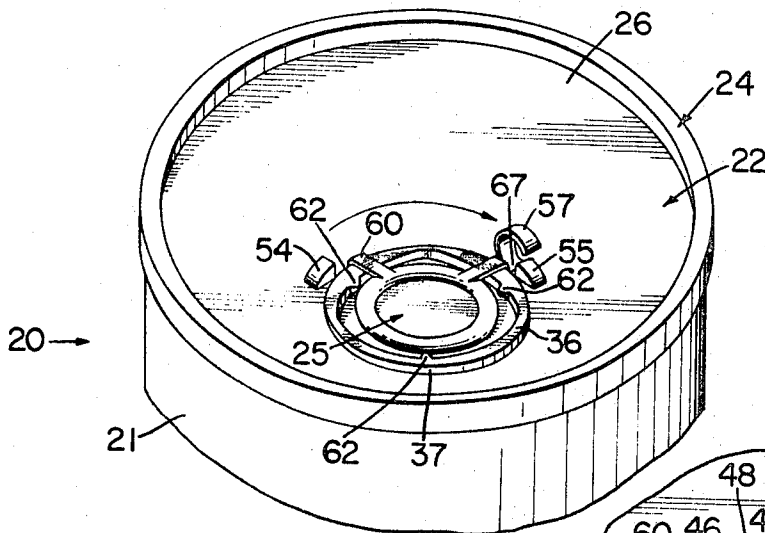


FIG-8

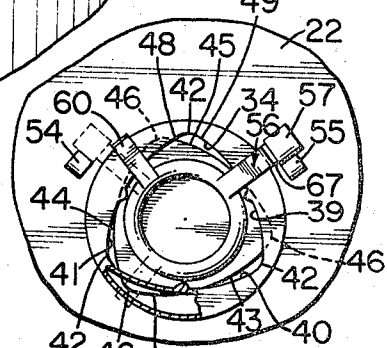
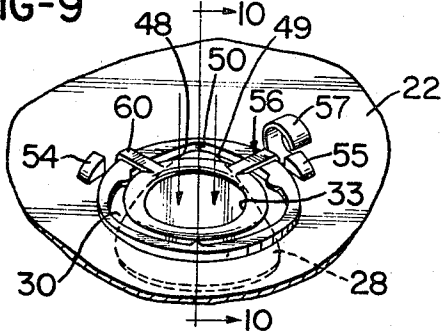


FIG-9



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END CLOSURE OPENING AND POURING MEANS

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Sheet 3 of 3

FIG-10

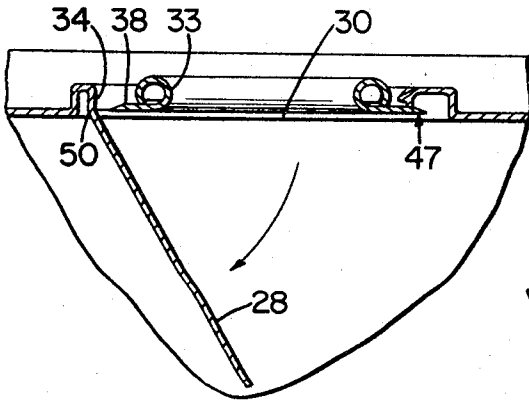


FIG-11

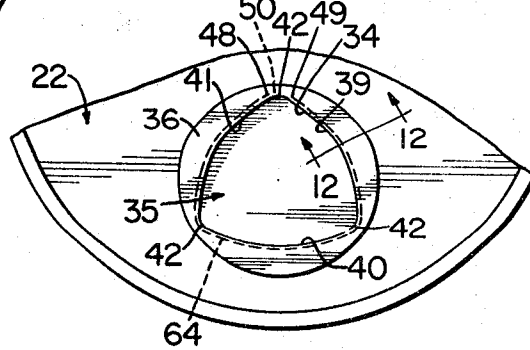
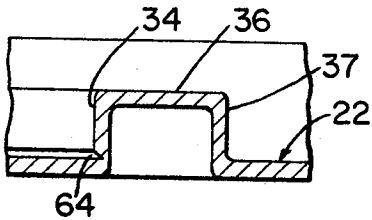


FIG-12



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FIG-13

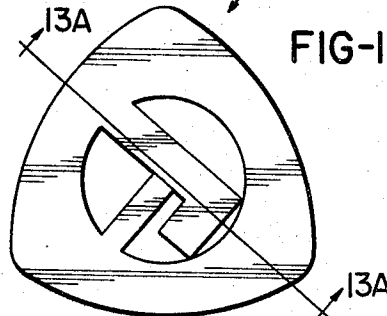


FIG-13A

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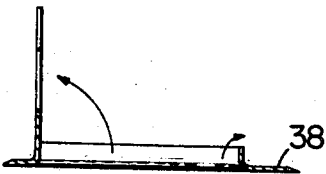


FIG-13B

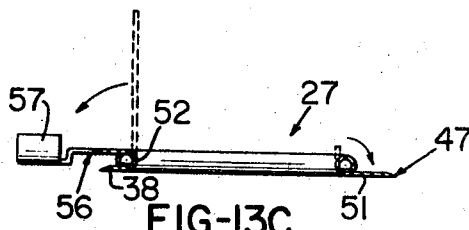


FIG-13C

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3,429,481

END CLOSURE OPENING AND POURING MEANS

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U.S. Cl. 222—83

6 Claims

Int. Cl. B65d 17/24

ABSTRACT OF THE DISCLOSURE

This disclosure relates to container means such as a beverage can, for example, having integral means for providing a dispensing opening in wall means thereof without completely tearing away a part of such wall means and which enables a person to drink directly from such can without engaging ones lips against sharp edges outlining such dispensing opening, further this disclosure relates to a method of making such container means, or the like.

This invention relates to container means and more particularly to easy-open means for container means.

It was previously proposed in copending patent application Ser. No. 570,625, filed Aug. 5, 1966, and now Patent No. 3,379,333, to provide an opening device for a metallic container such as a cylindrical metal can, or the like, which assured sharp edges formed in severing a portion of such can to provide a dispensing opening would not cause injury to a person drinking directly from such can; further, the severed portion remained attached to the can while extending outwardly therefrom. The force required to open a given can using such previously proposed device is comparatively high because the severing action is essentially caused by a tearing instead of a cutting action. In addition, the outwardly extending severed portion is rather annoying in drinking directly from a can. Further, the component parts of such previously proposed device are comparatively expensive to make.

Accordingly, it is a feature of this invention to provide an improved easy-open means for container means of simple and economical construction and which avoids the deficiencies of previously proposed devices, including the aboven mentioned previously proposed opening device.

Another feature of this invention is to provide an improved easy-open means for wall means of a metal can which providets a dispensing opening in such wall means with comparatively little force.

Another feature of this invention is to provide wall means defining a compartment for containing product means and having opening means movably carried on such wall means which enables provision of a dispensing opening therethrough for dispensing such product means by severing a predetermined severable portion in such wall means and moving such severable portion to an inaccessible and hence safe position within such compartment.

Another feature of this invention is to provide a simple and economically produced end closure adapted to be used on container means such as a cylindrical metal can, or the like.

Another feature of this invention is to provide an improved method of making an easy-open container.

Another feature of this invention is to provide an improved easy-open opening means for providing a dispensing opening in wall means of a metal can wherein such opening means is made simply and economically from a flat sheet of metal.

2

Therefore, it is an object of this invention to provide container means having improved easy-open means and a method of making same having one or more of the novel features of this invention as set forth above or hereinafter shown or described.

Other objects, uses, and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

10 FIGURE 1 is a fragmentary top perspective view of an improved container such as a cylindrical metal can of this invention.

FIGURE 2 is an exploded view illustrating the top end portion of the container of FIGURE 1 and opening means provided therefor.

FIGURE 3 is a top plan view of the container of FIGURE 1.

FIGURE 4 is an enlarged fragmentary cross-sectional view on the line 4—4 of FIGURE 3.

20 FIGURE 5 is an enlarged fragmentary cross-sectional view on the line 5—5 of FIGURE 3.

FIGURE 6 is an enlarged fragmentary sectional view on the line 6—6 of FIGURE 3.

25 FIGURE 7 is a top perspective view illustrating the manner of rotating opening means movably mounted on the top end closure of the metal can of FIGURE 1 to provide a dispensing opening therein.

FIGURE 8 is a fragmentary plan view particularly illustrating the cutting action of such opening means.

30 FIGURE 9 is a fragmentary perspective view illustrating hinged flap means defined by the severing action of the opening means means as illustrated in FIGURE 8 and particularly illustrating the manner of simply pushing such hinged flap means to an inaccessible position within the cylindrical can.

FIGURE 10 is a fragmentary cross-sectional view particularly illustrating such hinged flap means pushed inwardly within the metal can of FIGURE 1 to a position substantially transverse to its adjoining wall means.

40 FIGURE 11 is a fragmentary plan view particularly illustrating the configuration of recess means such as is well defined in the top end closure of the metal can of FIGURE 1.

FIGURE 12 is an enlarged sectional view on the line 12—12 of FIGURE 11.

FIGURE 13 is a plan view of a flat sheet metal blank used to define the opening means more clearly illustrated in FIGURE 2.

50 FIGURE 13A is a sectional view on the line 13A—13A of FIGURE 13.

FIGURE 13B illustrates a first step in forming such opening means wherein a central portion of the blank of FIGURE 13A is first moved substantially normal to the plane of such blank.

FIGURE 13C illustrates the manner of forming such central portion to define the final configuration of such opening means.

60 While the various features of this invention are hereinafter illustrated and described as being particularly adaptable for providing container means, such as a cylindrical beverage can, or the like, having easy-open means and to an improved method of making such easy-open means, it is to be understood that the various features of this invention can be utilized singly or in any combination thereof to provide opening means for other types of container means, as desired.

70 Therefore, this invention is not to be limited to only the embodiment illustrated in the drawings, because the drawings are merely utilized to illustrate one of the wide variety of uses in this invention.

In the exemplary embodiment of this invention as particularly illustrated in FIGURE 1 of the drawings, an improved container means such as a cylindrical can designated generally by the numeral 20 is illustrated. Can 20 of this example is preferably a right circular cylindrical can having a cylindrical side wall 21 and a top end closure designated generally by the numeral 22.

As seen particularly in FIGURE 4 of the drawings, the upper end of cylindrical side wall 21 has a downwardly hooking flange designated by the numeral 23. Top closure 22 has peripheral flange means shown as a suitably curved peripheral flange designated generally by the numeral 24 which comprises a downwardly opening portion 24A of roughly U-shaped cross section which defines a chime end for can 20. Portion 24A has an upwardly hooking terminal leg 24B which is adapted to be hooked around downwardly hooking flange 23 and crimped or mechanically swaged in position in any suitable manner to seal top closure 22 in position on container 20.

The opposite end portion of can 20 is not illustrated and may comprise a suitable separate end closure or it may comprise integral bottom wall means which is formed as an integral part of cylindrical side wall 21 in a known manner.

Top end closure 22 has means enabling easy opening thereof to provide a dispensing opening for dispensing a product such as a beverage carried within can 20 by pouring directly from such dispensing opening or to enable drinking directly from such can while assuring that a person drinking directly from can 20 will not have his lips come into contact with sharp edges.

Top closure 22 has a severable portion comprising a substantially planar severable surface means or severable surface designated generally by the numeral 25 and such severable surface is arranged essentially in the same plane as, while comprising a small portion of, a planar surface designated by the numeral 26 and comprising the major portion of top closure 22. Severable surface 25 is adapted to be engaged and severed about its outer edge by opening means designated generally by the numeral 27 and shown arranged above top closure 22 in the exploded view of FIGURE 2. Opening means 27 is adapted to be rotatably moved relative to surface 26 of top closure 22 to sever severable portion 25 to define hinged flap means comprised of severable portion 25 and designated by the numeral 28 in its severed condition for ease of description, see FIGURES 9 and 10.

Upon severing severable portion 25 to define hinged flap 28 a dispensing opening 30 is provided through top closure 22 for dispensing product means such as a beverage therethrough in a simple manner. Opening device 27 also has substantially centrally arranged passage means or a passage 33 extending therethrough. After rotating opening means or device 27 and forming opening 30, as will be subsequently explained, it will be seen that opening 30 and passage 33 are substantially aligned one above the other enabling a beverage, for example, to be easily dispensed through dispensing opening 30 and through passage 33.

As seen particularly in FIGURES 4 and 6 of the drawings, top closure 22 has transverse surface means shown as a transverse surface 34 which extends upwardly above planar surface 26 about the outer periphery of severable portion 25 and defines recess means such as a well designated generally by the numeral 35 within top closure 22. Opening device 27 is adapted to be received within well 35 substantially in nested relation and such opening device is carried within well 35 so as to enable rotary movement thereof yet device 27 is suitably held within well 35 to prevent it from being lifted away from top closure 22.

Top wall means or closure 22 also comprises an inverted substantially L-shaped wall means or L-shaped portion having one leg designated by the numeral 36 adjoining top edge means or the top edge of transverse surface 34 and the other leg designated by the numeral 37

arranged parallel to transverse surface 34. Leg portion 37 defines a substantially right circular cylindrical guide surface means and the structural arrangement of surfaces 34, 36 and 37 defines an integral structure of substantially U-shaped cross-sectional outline (see FIGURES 4-6) which extends above planar wall portion 26.

Transverse surface 34 of this example comprises a vertical wall portion of uniform height and of substantially triangular outline as will be apparent from FIGURES 2 and 11 of the drawings. Similarly, it will be seen that opening device 27 has peripheral outer edge means which is also of corresponding substantially triangular outline and designated by the numeral 38. Upon placing opening device 27 in nested relation within well 35 the three sides of its triangular edge means 38 are adapted to be placed immediately adjacent associated sides of transverse surface 34, as will be presently described in detail.

As seen particularly in FIGURES 2, 8 and 11 transverse surface 34 is of equilateral triangular outline and its three vertical side portions are designated by the numerals 39, 40 and 41 respectively. Side portions 39-41 are interconnected by substantially identical rounded wall means or corner portions each designated by the same numeral 42.

Peripheral outer edge means 38 of opening device 27 is also of equilateral triangular outline corresponding to transverse surface 34. As best seen in FIGURES 2, 3 and 8, outer edge means 38 has its three side portions designated by the numerals 43, 44 and 45 respectively. Side portions 43-45 are interconnected by substantially identical rounded corner portions each designated by the same numeral 46. The terminal edge of edge means 38 is preferably formed to define a knife-like edge and such knife edge is designated generally by the numeral 47 and extends continuously around the entire periphery of edge means 38 including its side portions 43-45 and corner portions 46.

Thus, it is seen that with the exception of its guide means and handle means, to be later described, outer edge means 38 comprises the outermost part of opening device 27.

Opening means 27 is placed within recess means or well 35 in nested relation so that its side portions 43, 44 and 45 are arranged immediately adjacent side portions 39, 40 and 41 respectively of transverse surface 34. The opening action or severing of severable portion 25 is provided by rotating opening means 27 clockwise from the dotted line position of FIGURE 8 to the solid line position of such figure.

During such rotary movement, each corner portion 46 engages and severs a portion of transverse surface means while lies immediately to its right as viewed looking normal to the exterior surface of top closure 22 and each side surface 43, 44 and 45 engages and severs an associated side surface 39, 40 and 41 respectively of transverse surface means 34 to provide a continuous cut which extends clockwise from a point designated by the numeral 49 in FIGURE 8 to a point designated by the numeral 48 to define the previously mentioned hinged flap means or flap 28. Flap 28 is provided with hinge means or a hinge 50, see FIGURE 9, defined by uncut or unsevered metal between points 48 and 49.

The rotary movement of opening device 27 is limited by stop means, to be described later, to assure the provision of hinge 50. Also, outer edge means 38, in effect, engages severable portion 25 about its outer periphery by severing it at its junction with transverse surface means 34.

Opening device 27 has a substantially planar main portion designated by the numeral 51 and its passage means 33 extending through main portion 51 is preferably of substantially circular peripheral outline. Passage 33 is defined by raised surface means shown as a raised surface 52 which is arranged with the outline of peripheral outer edge means 38 and its knife edge 47.

With device 27 within its well 35 raised surface 52 provides spacing means for spacing the lips of a user desiring to drink directly from can 20 away from the main planar portion 26 of top closure 22 to thereby assure that such lips do not come into contact with sharp edges formed upon severing portion 25 to define flap 28. Raised surface 52 is of smooth contour and is formed so that its upper portion is substantially toroidal in configuration.

As previously mentioned, stop means is provided to control the severing action of opening device 27 by limiting its rotary movement and such stop means preferably comprises first and second spaced apart stop means shown as a pair of stops 54 and 55 arranged immediately adjacent well 35. Stops 54 and 55 are preferably spaced apart approximately 100 degrees to assure complete severing of flap 28 except at hinge means 50.

Stops 54 and 55 may be provided in top closure 22 in any suitable manner and such stops may comprise separate units or members which are suitably attached to top planar surface portion 26 of end closure 22. However, it is preferred that stops 54 and 55 be provided by indentations or the like extending from interior surface means of planar wall 26 outwardly so as to define stops 54 and 55 essentially as outwardly extending integral projections in planar wall portion 26 of closure 22.

Opening device 27 of this example of the invention preferably has an actuating handle or lever 56 which extends outwardly beyond the outer periphery of peripheral outer edge means 38, previously described. Lever 56 has an arcuate or contoured terminal end 57 which is adapted to be engaged by a finger or the like to permit rotation of device 27 relative to planar wall 26 easily and without discomfort. Actuating handle 56 together with its terminal end portion 57 is preferably formed as an integral part of opening means 27 in a simple and inexpensive manner as will be described in detail subsequently.

Opening means 27 also has integral guide means comprising a substantially inverted L-shaped guide arm 60 extending beyond peripheral outer edge 38 and in angular spaced apart relation from actuating handle 56. Actuating handle 56 also has an angled offset portion shown at 61 which is also substantially L-shaped to correspond to lower surface of arm 60. Arm 60 and offset portion 61 engage cylindrical guide surface 37 during rotary movement of opening means 27 and, in effect, assure that the rotary movement of opening means 27 is effectively produced for controlled cutting action.

Holding means is provided for holding opening means 27 in nested relation within recess or well 35, i.e., to prevent opening means 27 from being lifted vertically away from top closure 22. In this example of the invention such holding means comprises forming integral projections each designated by the numeral 62 at a plurality of, three in this example, spaced apart locations along transverse surface 34.

Projections 62 may be defined by a deforming or staking type of operation and are preferably defined in transverse surface 34 after installing opening means 27 in position and then deforming selected portions of transverse surface 34 over the outer periphery 38 of opening means 27. Thus, opening means 27 is held in nested relation while allowing rotary movement thereof to enable severing portion 25 about the major portion of its outer periphery to define hinged flap means 28.

Severable portion 25 of this example of the invention has weakening means adjoining the major portion of its terminal outer edge and preferably defined by score means shown as continuous score means 64. As seen in FIGURE 11 score means 64 extends in a continuous manner between points 48 and 49 thereby leaving an intact section or part 50 which defines hinge means for flap 28 as previously described in connection with the description of the manner of severing portion 25.

In this example of the invention knife edge 47 of peripheral outer edge means 38 is adapted to engage and sever severable portion 25 essentially along score means 64. Thus, score means 64 not only provides a wall portion of reduced thickness for easier severing but score means 64 also effectively guides knife edge 47 to provide a better controlled severing action.

Thus, opening means 27 is placed within recess means or well 35 in nested relation and effectively held in position by deforming portions of transverse surface 34 at three locations 62 to define holding means therefor. Opening means 27 is held by holding means 62 so that it can be readily moved in a rotary manner upon actuating handle or arm 56 in a clockwise direction from stop 54 toward and against stop 55.

Opening means 27 has cooperating surface means shown as a surface portion 66 on curved end portion 57 of actuating handle or arm 56 and a surface portion 67 arranged on handle 56 at a position opposite from surface portion 66. Handle 56 is normally arranged with its surface portion 66 against stop 54. Handle 56 and opening means 27 is rotated clockwise until surface portion 67 is moved against stop 55 to thus define hinged flap 28 and assure that portion 25 is not severed completely away.

The severing action provided by the opening means of this invention is a clean cutting action provided by knife edge 47. Therefore, the amount of force required to be exerted against actuating handle 56 is comparatively small.

As opening means 27 is rotated clockwise to define dispensing opening 30 the peripheral outer edge 38 of opening means 27 severs through transverse wall 34 and as the severing action continues hinged flap 28 is severed and partially pushed within cylindrical can 20 by opening means 27. It is a simple matter to continue pushing hinged flap 28 inwardly, see FIGURE 9, so that it is pushed to an inaccessible position substantially transverse to top closure 22 in a manner as illustrated in FIGURE 10 of the drawings to enable easy dispensing of beverage or the like therethrough. With flap 28 within can 20 it is easier to drink directly from such can and the exposed edges of flap 28 are also placed where they can not be contacted, thereby eliminating any possibility that a person would be injured by coming into contact therewith.

Opening device 27 of this invention provides an efficient severing action which in this example is produced with the aid of score means 64 reducing the effective thickness of transverse surface means 34. However, device 27 may be utilized to sever portion 25 and define hinged flap 28 without providing score means, if desired, and the severing force would still be quite small as compared with previously proposed opening means.

Opening means 27 is of simple and economical construction and is preferably formed from a single sheet of metal designated by the numeral 70 in its flattened condition, see FIGURES 13 and 12A-C. It may be desirable, for example, as illustrated in FIGURE 13, to form a flat sheet of metal in substantially triangular form by shearing or similar cutting action to simultaneously define not only the outer peripheral edge means 38 of opening means 27 but also define integral means within the outer peripheral outline to enable forming actuating handle 56 and guide 60 in a simultaneous manner. Also, the technique selected to form outer edge means 38 may be such as to also define knife edge 47 about the terminal outer periphery of edge means 38 in basically one operation.

The preferred manner of then forming blank 70 is to fold or form the inner or central portion thereof as illustrated in FIGURES 13B so that such central portion is arranged substantially normal to the original plane of blank 70. The central portion is then further formed to define toroidal raised surface 52 as well as actuating handle 56 and guide 60. The arcuate end 57 of handle 56 is defined by forming the terminal end of handle 56 in a smooth arcuate path as shown in FIGURE 13C.

In this example of the invention opening means 27 has its peripheral outer edge means 38 which is of substantially triangular outline. Similarly, transverse surface means 34 is also of corresponding substantially triangular outline; however, it will be appreciated that opening means 27 may have an outer configuration other than triangular as long as the cooperating transverse surface defining an associated well similar to well 35 is also of corresponding peripheral outline. Thus, irrespective of the peripheral outline of opening means 27 the proper arrangement of stop means will enable the provision of a proper dispensing opening through top closure 22 in a simple manner by rotating opening device 27 through a predetermined travel.

Top end closure 22 is preferably formed of metallic material, such as aluminum-containing metallic material, or the like, so as to enable the forming of recess means or well 35 therein in a simple manner by stamping, drawing, or the like. Further, such top end closure may be made using standard equipment.

It has been found that top end closure 22 may be formed of aluminum-containing metallic material of approximately .015 of an inch thick and that knife edge 47 may be used to sever completely through such material with comparative ease. However, in providing score means 64 in top end closure 22 the depth of the score may be approximately .011 inch thereby leaving only .004 of an inch of material which remains unscored and is more readily severed by knife edge 47.

Opening means 27 may be formed of any suitable material but is preferably formed of a metallic material containing aluminum. It has been found that it is preferable to form opening means 27 from an aluminum material which is comparatively hard which thereby enables easier forming of sharp edge 47 which provides an easier cutting action.

Opening means 26 of this invention thus makes possible provision of a dispensing opening 30 in top end closure 22 with a minimum application of opening force. Further, the hinged flap 28 defined by the action of a peripheral outer edge 38 is initially partially forced within cylindrical can 20 upon moving opening means 27 clockwise between stops 54 and 55. Flap 28 is then simply pushed to an inaccessible position substantially transverse to top end closure 22 so that it does not interfere with a later pouring or drinking action directly from can 20.

Term such as "top," "top end closure," "side wall," "upwardly," "downwardly," "outwardly," "inwardly," and the like, have been used in this disclosure of the invention for ease of description to correspond to the arrangement of components as illustrated in the drawings and such terms should not be considered as limiting the scope of this invention in any way.

Thus, it is seen that an improved easy-open container means has been provided by this invention.

This invention also provides an improved method of making such container means.

Further, this invention provides improved opening means made from a flat sheet of metallic material.

While the form of the invention now preferred has been disclosed as required by statute, other forms may be used, all coming within the scope of the claimed subject matter which follows.

What is claimed is:

1. An easy-open end closure for a container comprising a well in said end closure, said well being defined by a substantially planar severable portion and transverse surface means of noncircular outline extending upwardly from the outer periphery of said severable portion to the closure, opening means movably carried in nested relation means extending therethrough and being arranged immediately above said severable portion and having peripheral knife edge means defining outer edge means thereof, said knife edge means having a noncircular per-

ipheral outline corresponding to and being of slightly smaller size than said noncircular outline of said transverse surface means, and said knife edge means being adapted to engage said transverse surface means except for a hinge portion and sever said severable portion upon moving said opening means relative to said transverse surface means to define hinged flap means, said flap means being adapted to be moved independently of said opening means to an inaccessible position substantially transverse to said end closure and within said container to define a dispensing opening therethrough which is arranged in aligned relation with said passage means to enable easy dispensing through said dispensing opening and said passage means.

2. An end closure as set forth in claim 1 in which said opening means comprises raised surface means of smooth substantially toroidal outer outline defining said passage means and arranged within the outline of said peripheral outer edge means, said raised surface means providing spacing means for spacing the lips of a user away from said wall means to thereby avoid sharp edge means formed after severing said severable portion.

3. An end closure as set forth in claim 1 in which said end closure further comprises holding means for holding said opening means in said nested relation within said well while allowing rotary movement thereof to sever said severable portion, such that upon rotating said opening means relative to said end closure said knife edge means severs said severable portion to define said hinged flap means and simultaneously moves said flap means a small distance beneath said opening means and end closure thereby making it easier to continue the inward movement of said flap means to said inaccessible position substantially transverse to said end closure.

4. An end closure as set forth in claim 3 and further comprising first and second spaced apart stop means adjacent said well and said opening means has cooperating surface means adapted to be rotated from said first stop means toward and against said second stop means to sever said severable portion and define said flap means.

5. An end closure as set forth in claim 4 and further comprising inverted substantially L-shaped wall means arranged with one leg adjoining top edge means of said transverse surface means and the other leg arranged parallel to its transverse surface means, said parallel leg defining a substantially right circular cylindrical guide surface means, and said opening means having guide means extending therefrom and adapted to engage said guide surface means and guide the rotary movement of said opening means between said stop means.

6. An end closure as set forth in claim 5 having common score means defining terminal edge means of said substantially planar severable surface means and bottom edge means of said transverse surface means and having an intact section defining hinge means for said hinged flap means, and said knife edge means being adapted to engage and sever through said transverse surface means essentially along said score means, whereby said score means effectively guides said knife edge means to provide an easier severing action along wall means of reduced thickness.

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U.S. Cl. X.R.

222—89