

July 28, 1964

L. FRIED ETAL

3,142,411

CONTAINER STRUCTURE AND OPENING MEANS THEREFOR

Filed Dec. 17, 1958

3 Sheets-Sheet 1

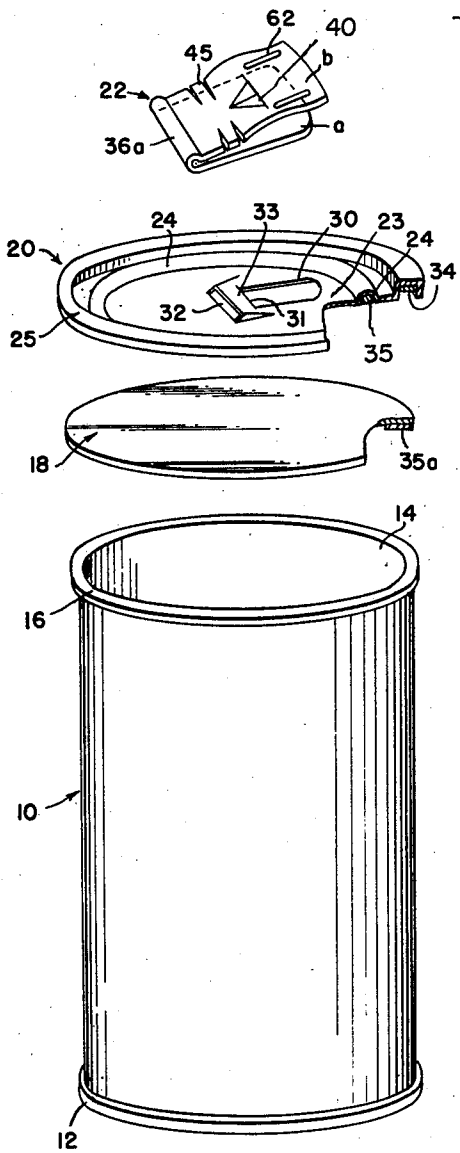


FIG. 1.

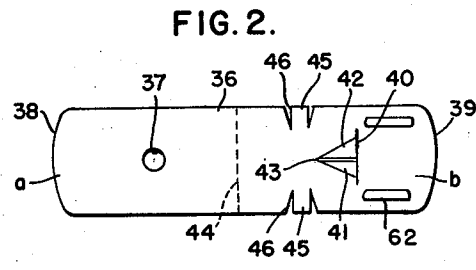


FIG. 2.

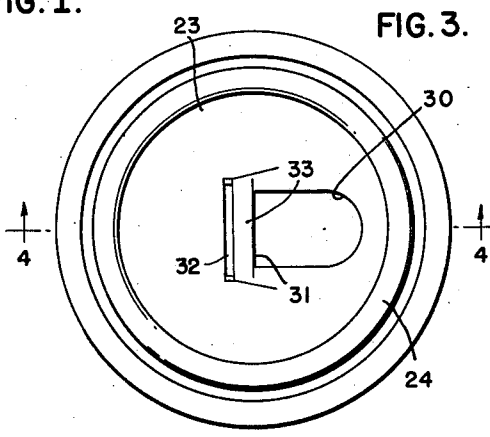


FIG. 3.

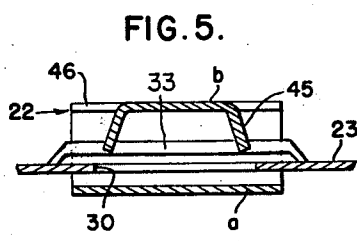


FIG. 5.

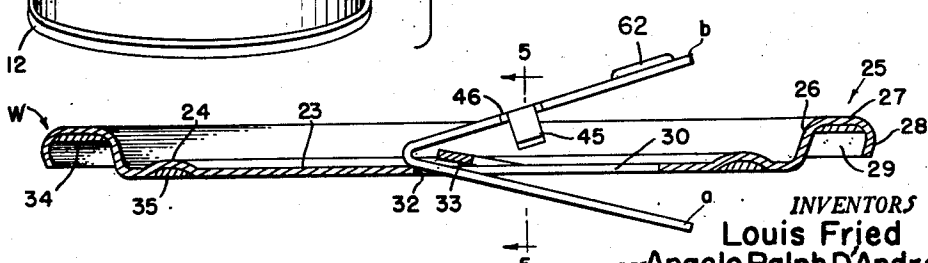


FIG. 4.

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3 Sheets-Sheet 2

FIG. 6.

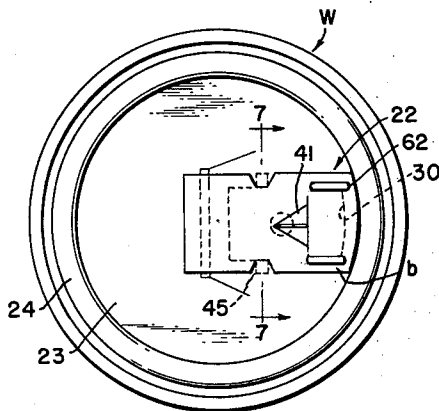


FIG. 7.

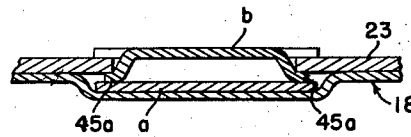


FIG. 8.

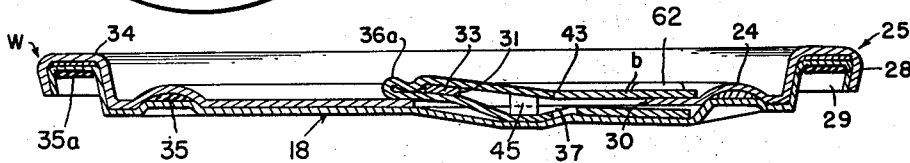


FIG. 9.

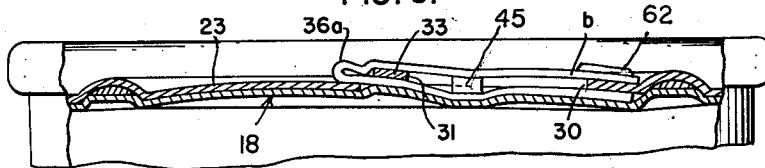


FIG. 10.

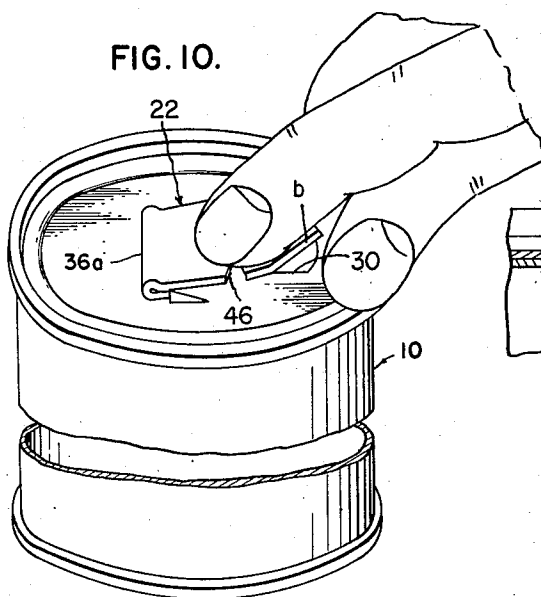
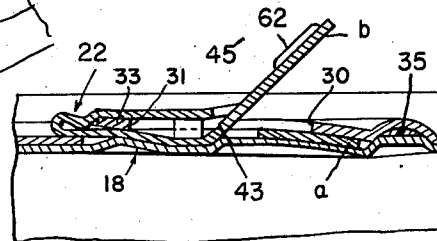


FIG. 11.



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3,142,411

CONTAINER STRUCTURE AND OPENING MEANS THEREFOR

Filed Dec. 17, 1958

3 Sheets-Sheet 3

FIG.12

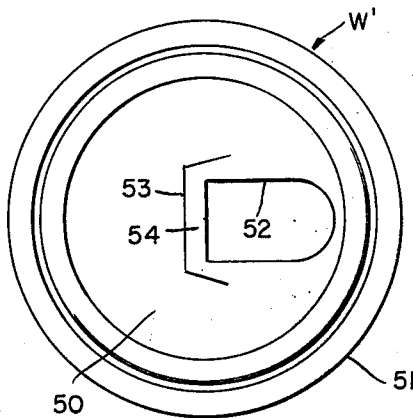


FIG.13

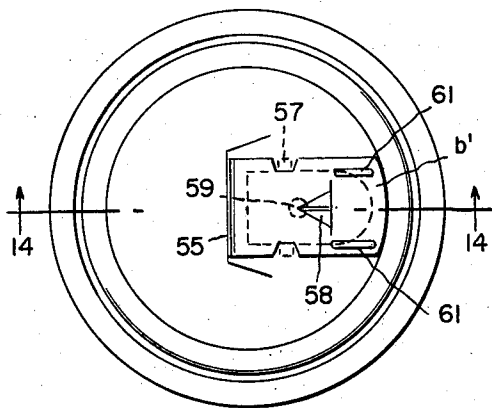


FIG.14

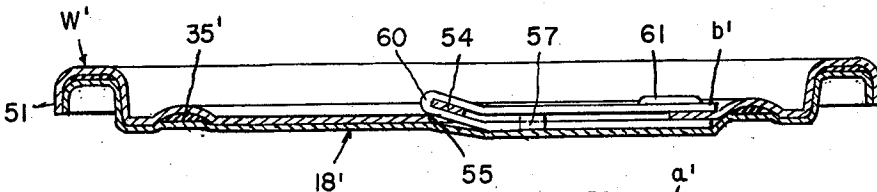


FIG.15

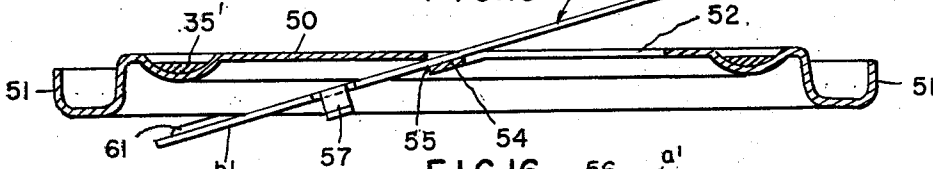


FIG.16

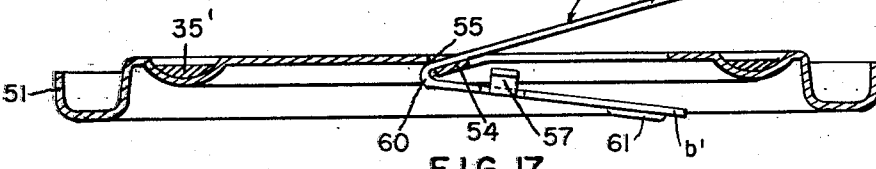
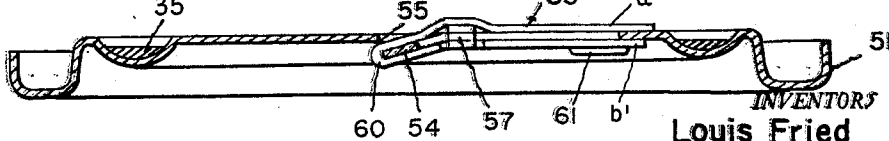


FIG.17



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1

3,142,411

## CONTAINER STRUCTURE AND OPENING MEANS THEREFOR

Louis Fried, East Orange, N.J., Angelo Ralph D'Andrea, New York, N.Y., and John Keith Browning, Cincinnati, Ohio, assignors, by direct and mesne assignments, of 82.443% to Angelo R. D'Andrea and 17.557% to Herbert M. Beitel, Chicago, Ill.

Filed Dec. 17, 1958, Ser. No. 781,022

11 Claims. (Cl. 220—48)

This invention relates generally to the class of receptacles and is directed particularly to improvements in receptacles or containers having as a part of a wall structure thereof a new means for facilitating the opening of the same for the withdrawal of the contents of the receptacle.

Many receptacles, such, for example, as cans of sheet metal in which liquids or other fluent materials are marketed, and in which a permanent closure forms a part thereof, require the use of some type of cutting or punching implement for the formation of an opening in a wall through which the contents of the receptacle may be withdrawn. Various means or implements have been heretofore devised for opening metal receptacles, as, for example, in the Fried Patent 2,790,577 and in application Serial No. 407,934, filed February 3, 1954, now abandoned, there is disclosed a container top construction embodying as a part thereof an opener means adapted for rupturing a frangible sheet of material disposed on the inner side of an end wall of the receptacle and covering a pour opening in such end wall and such opener means embodies an inner part covering the pour opening on the inner side of the end wall between the latter and the frangible sheet, and an outer part lying over the pour opening on the outer side of the end wall.

A particular object of the present invention is to provide an opener of the above described general character wherein novel means is embodied for securing the said outer part to the end wall of the receptacle.

Containers or receptacles of the type referred to are used not only for the marketing of various types of foods but are also used for marketing beverages of various kinds and this includes beverages of the carbonated variety which are under high pressure and in which, as a result, the receptacle itself is subjected to considerable internal pressure, and in those receptacles which are under internal pressure, as stated, such pressure effects the outward bowing or bulging of the receptacle end walls.

It is another object in view of the foregoing to provide an opener of the general character above referred to associated with a wall structure and frangible liner sheet, as stated, which embodies a means for maintaining the outer part in close association with the outer surface of the wall on which it is carried whereby upon the outward bulging or bowing of the wall as a result of pressure within the receptacle, the said outer part of the opener will be held closely thereagainst, or in other words, will be prevented from springing outwardly away from the supporting wall.

Another object of the invention is to provide an opener of the character hereinbefore stated which is mounted upon the wall of a receptacle, more particularly the end wall of a can, over a pour opening therein, with means forming a part of the outer half of the opener which lies against the outer face of the can wall, for locking the opener to the wall in such a manner as to prevent the opener from shifting from position during the handling of the can wall prior to its application to the can body or afterwards, in those cases where the can is employed for merchandising non-carbonated liquids where no internal pressure exists in the receptacle.

2

Still another object of the invention is to provide a means for maintaining the outer part of the opener device firmly in such a position against the outer surface of the wall upon which it is mounted as to preclude the possibility of the device accidentally catching on some object and thereby being pulled away from or loosened on the supporting wall.

Still another object of the invention is to provide a receptacle wall, or can end, with an opener device mounted thereon in the manner stated, with a means for firmly maintaining the outer part of the opener device in position and against accidental displacement by utilizing pressure within the receptacle, together with or in combination with a means for effecting the release of such pressure whereby the subsequent release and removal of the opener device is made easy.

Still another object of the invention is to provide a receptacle wall and opener thereon, as above set forth, in association with a removable opener device wherein a frangible sheet is positioned against the inner side of the wall in covering relation with the opening and wherein such sheet is coextensive with the wall to be secured with the wall to an adjacent wall of the receptacle and wherein in addition to the securing of the frangible sheet to the said adjacent wall, such sheet is adhesively bonded to the inner face of the wall around the opening to prevent passage of gas or fluid from the receptacle between the wall and the frangible sheet in the event that the said sheet becomes damaged adjacent the periphery thereof in the operation of applying such wall to the receptacle body.

As hereinbefore stated, the opener of the present invention is mounted upon an end wall of the receptacle with an inner part which overlies a pour opening in the end wall and an outer part positioned against the outer side of the wall and overlying the pour opening, and said inner part is interposed between the inner side of the wall and a frangible sheet of sealing material which also covers the pour opening and is secured to the inner side of the wall. The present invention contemplates in association with this structure the provision of an element or elements carried by the outer part of the opener which extends through the pour opening and lies between the inner side of the wall and the frangible sheet and which, where the receptacle is used for carbonated beverages, is subjected to pressure within the receptacle whereby the easy release or extraction of such element from between the wall and the frangible sheet and its withdrawal through the pour opening is prevented until the pressure within the receptacle is reduced or completely eliminated. More specifically the invention contemplates the provision in such an opener of tongues cut out or formed from opposite edges of the outer parts and which tongues are bent down and extended through the pour opening to the underside of the wall on which the opener is mounted, as stated. The means for releasing the pressure from within the receptacle whereby to facilitate the release of the inwardly extended tongues embodies a spur member carried by the outer part of the opener, which, when the said outer part of the opener has its free end portion forcibly pulled away from the wall, and is bent as a result thereof, will enter an aperture formed through the inner part of the opener device and puncture the underlying frangible sheet thereby effecting the release of gas pressure from within the receptacle.

A further novel feature of the invention resides in the novel formation of a slit in the can top or top construction to which the opener device is attached, whereby in the operation of cutting the slit adjacent to the pour opening the material between the slit and the pour opening is pressed out beyond the outer or top surface of the wall to simultaneously provide an opening, or slot, for receiving

ing an inner end portion of the opener device, in the operation of assembling the device and the can top and to also provide, at the same time, an inclined separating portion of the material between the slot and the pour opening which is made use of to effect the desired firm attachment of the opener device in position on the can top.

The opener-carrying can top or top wall construction has, as hereinbefore stated, a frangible liner sheet disposed across its inner surface. This liner sheet is cemented around its periphery in an encircling channel of the top which is employed in the beading operation in connection with the fastening of the top to the can or receptacle body. In addition, the said top or top construction is formed inside of the channeled part used in beading the top to the wall body, with an outwardly pressed rib forming a channel on the inner side of the top and a bonding or adhesive material is located within this second channel and the sheet of frangible material is pressed thereinto. This provides a second seal between the frangible sheet and the top whereby in the event of the frangible sheet becoming punctured in or adjacent to the peripheral channel of the top during the beading operation of securing the top to the wall body, fluid cannot pass from the receptacle between the frangible sheet and the top to escape through the pour opening.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming part of the specification, with the understanding, however, that the invention is not confined to a strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

FIG. 1 illustrates in perspective a can having an open top and showing in association therewith the frangible sheet, the end wall of the can having the pour opening therein, and the improved opener device which is, in the completed article, secured to the end wall;

FIG. 2 is a view in plan and on an enlarged scale of a blank from which the finished opener is fashioned, the blank being stamped and perforated prior to bending;

FIG. 3 is a top plan view of the end wall of the can to which wall the opener is attached;

FIG. 4 is a sectional view taken substantially on the line 4—4 of FIG. 3, and showing in addition the opener device incompletely attached thereto;

FIG. 5 is a sectional view taken substantially on the line 5—5 of FIG. 4;

FIG. 6 is a view in top plan of the receptacle having the end wall secured thereto and in which the opener device and other parts are completely attached to the end wall;

FIG. 7 is a partial sectional view taken on the line 7—7 of FIG. 6;

FIG. 8 is a transverse sectional view on an enlarged scale through the end wall of the receptacle illustrating the manner in which the opener device is closed with its inner and outer parts against the inner and outer sides of the wall and showing the end wall substantially flat in the middle portion thereof;

FIG. 9 is a view taken in a corresponding plane to that of FIG. 8, but illustrating the end wall in its attached position on the can body and illustrating the manner in which the wall is outwardly bowed by pressure from within the can;

FIG. 10 is a view in perspective illustrating the manner in which the outer end portion of the outer part of the opener device is first manipulated in the process of rupturing the frangible liner sheet;

FIG. 11 is a sectional view illustrating in detail the

manner in which the spur of the outer part of the opener punctures the liner sheet;

FIG. 12 is a view in top plan of the can end wall or top, corresponding to FIG. 3 and showing the slit which is cut in the material of the wall adjacent to the pour opening as an alternative construction to that shown in FIG. 3 where a slot is formed;

FIG. 13 is a top plan view of the can top corresponding to FIG. 6 and illustrating the opener device applied thereto;

FIG. 14 is a sectional view taken substantially on the line 14—14 of FIG. 13 through the can top only and the opener device;

FIG. 15 is a sectional view taken through the can top diametrically thereof and centrally of the pour opening, showing the top in inverted position in which it is maintained while the cutter device is being inserted through the receiving slot according to one method of assembling the parts;

FIG. 16 is a sectional view corresponding to FIG. 15 but showing the strip of material forming the cutter device in partially folded or formed condition;

FIG. 17 is a view corresponding to FIG. 15 and showing the cutter device folded to its final position preparatory to the application of the frangible sheet to the bottom side of the wall.

Referring now more particularly to the drawings, and more especially referring to FIG. 1, the numeral 10 generally designates a conventional type of can or container of sheet metal, the attached bottom thereof being designated 12 while the open top 14 is shown with the out-turned lip 16 with which the end wall is coupled in the usual or conventional manner. The numeral 18 generally designates the sheet of frangible material hereinafter described while the numeral 20 generally designates the end wall to be secured to the can in cooperation with the lip 16 in the conventional manner while the numeral 22 generally designates the opener device.

For convenience of illustration, the end wall 20 and attached parts will be referred to as the can top or top construction although in actuality in the filling of the cans, this wall is first applied to the can body and becomes the bottom wall of the can and the filling of the can takes place through the opposite end thereof which is eventually closed by the wall 12.

The top construction which includes as one of its parts the wall 20 is, when applied to that end of the can body having the lip 16, secured thereto by a conventional top or end wall securing machine. This part 20 is stamped from a single sheet of the desired metal and in the stamping is formed with the flat central wall portion 23 which is defined by a pressed out stiffening channel bead 24 of shallow height, the channel being on the inner side of the wall. Outside of the bead 24 the metal is shaped to form an encircling flange generally designated 25 and which embodies the inner upwardly and outwardly sloping wall portion 26, the outwardly projecting substantially flat top portion 27 and the down-turned peripheral flange part 28. In the application of the completed top wall which in FIGS. 4, 8 and 9, is generally designated W, the flange which forms the encircling downwardly opening channel 29 is disposed over the can lip 16 and bent or beaded in the conventional manner to secure the wall in hermetically sealed relation with the body of the can.

In the stamping operation to form the part 20 in the manner stated, there is at the same time cut in the central flat portion 23 thereof the pour opening 30 which, as shown, has an inner end edge 31 which is located approximately at the center of the wall body and extends radially outwardly, terminating adjacent to the stiffening bead portion 24.

Also in the stamping operation a narrow strip of metal is cut out of the middle or central part 23 to form a narrow slot 32 which is spaced slightly from the inner end edge 31 of the pour opening and extends transversely

5

of the opening and is of a length materially greater than the pour opening and the slot is located so that a portion of each end extends beyond the line of the adjacent side edge of the opening 30. Also in this stamping operation the narrow portion or strip 33 lying between the slot and pour opening is pressed outwardly beyond the outer side of the wall portion 23 to locate it in a plane which slopes downwardly toward the pour opening 30. In other words, this out-pressed and sloping strip portion 33 has that edge which forms one side of the slot 32 raised or elevated above the opposite edge which forms the inner end edge 31 of the pour opening 30.

At a suitable period prior to the application of the completed end wall to the end of the can body, a suitable bonding agent or cement is placed in the bottom of the channel 29 as indicated at 34. Also there is applied in the channel side of the bead a layer of suitable adhesive or cement as indicated at 35.

The frangible sealing disc 18 may be formed of a suitable synthetic resin plastic which will be unaffected by, and which will have no effect upon, the material placed in the receptacle or may comprise a thin sheet of aluminum foil and the over-all size of this disc is such that it can be pressed against and sealed to the under surface of the body 20 and have a peripheral portion extending into or lying within the channel 29 to cover the entire inner surface of the channel so that it will be folded in with the portions of the flange 25 and the lip 16 when the end wall is sealed to the can.

When the frangible sealing disc 18 is applied to cover the entire inner surface of the wall, it will be pressed into the channel of the bead 24 against the cement 35 so as to be tightly bonded thereby to the wall.

In addition to the foregoing, it is preferred that the under side of the frangible disc 18 have applied thereto at the periphery thereof a narrow band or strip 35a of suitable bonding cement so that when the wall is sealed onto the can body the portions of cement designated 34 and 35a will be firmly pressed against the adjacent areas of the wall and the can lip and further insure the formation of an hermetic seal.

It will be apparent from the foregoing that in providing the second seal between the frangible disc and the wall, in addition to the sealing of the peripheral portion of the disc in the channel 29, additional protection is had against the escape of gases or liquids from the receptacle by the same passing in between the frangible sheet and the wall and out of the pour opening in the event that in the lidding operation the frangible sheet be punctured in that portion lying in or closely adjacent to the channel 29.

Where the frangible sealing disc covers the entire inside surface of the wall structure, no preliminary coating of the wall is employed, that is, the wall surface need not be lacquered or otherwise coated since it will be protected against contact with the contents of the receptacle by the frangible sealing disc.

Where the sealing disc may be of metal such as aluminum foil, a lacquer coating may be applied to the inner surface of the foil to thereby prevent the contents of the receptacle contacting the metal where this may be desirable to prevent any interaction or any chemical action between the metal foil and the material in the receptacle.

In other instances the use of a lacquer coating on the inner surface of the wall structure may be made as, for example, where use may be made of a frangible sealing sheet over the pour opening in the form of a patch which does not extend to the periphery of the wall and into the beading channel, in the manner illustrated in the Fried Patent No. 2,821,326. In such case the frangible sheet would be bonded to the wall around the pour opening as shown in the patent and then suitable lacquer coating would, if necessary, be applied to the uncovered surface of the metal wall.

The opener device which is generally designated 22 in

6

FIG. 1 is formed from a strip or ribbon of suitable metal such as aluminum. In this view the opener device is shown in the folded condition substantially corresponding to that which it has when fixed or applied to the can top. In our prior application hereinbefore referred to, there is disclosed a method of applying the opener device which embodies inserting an end portion of the metal ribbon into place after necessary cutting operations have been performed thereon and after insertion the desired length of material is cut off and folded into the form shown in FIG. 1. The strip of metal ribbon may also be cut in suitable lengths to form or provide blanks such as that shown in FIG. 2 where the straight piece or blank from which the opener is formed is designated 36. At a suitable stage in the operation of forming the blank 36, there is formed therethrough adjacent to one end thereof an aperture 37. The end adjacent to which this aperture 37 is located constitutes the inner end edge of the opener and is designated 38. This edge 38 is the cutting edge, and may be given any of several forms best calculated for its use in cutting away the frangible liner sheet as hereinafter described. The opposite end edge designated 39 forms the outer end edge of the device.

Adjacent to the outer end edge 39 a transversely directed score line is impressed in the metal of the blank 36 as indicated at 40. The score line terminates at its ends short of the longitudinal side edges of the blank and it forms the base of a triangular spur 41, the convergent sides of which spur are defined by cut lines 42 which extend away from the end edge 39 and form at their intersection, a point 43 employed for puncturing the frangible liner sheet 18 in the manner hereinafter described.

Inwardly of the point 43 of the spur 41 and located in alignment transversely of the blank between this pointed end and the transverse center of the blank which is designated by the broken line 44, there are formed the outwardly directed or laterally directed locking tongues 45. These tongues are produced, as will be obvious, upon an examination of FIG. 2, by cutting the spaced V-slots 46 in the longitudinal edges of the blank 36.

The cutter device as illustrated in FIG. 1 has the top portion longitudinally bowed from the points adjacent to the forward notches 46 to the end edge 39 thereof. Where the can end walls are to be applied to cans designed for merchandising beer and other carbonated beverages which have the effect of bowing the end walls, this longitudinal curvature performs a special function or has a particular advantage, as hereinafter pointed out.

As hereinbefore stated, the cutter device may be applied to the can end wall according to different procedures and at this point in the description of the invention it will be assumed that the necessary length of material will be separated from the metal ribbon and be shaped as an individual piece, as shown in FIG. 2.

In assembling the cutter unit and the body 20 of the can end wall or top wall, the blank, such as is shown in FIG. 2 and designated 36 may first be bent transversely on the line 44 so as to bring the end portion carrying the spur 41 and the locking tongues 45 into position over the opposite portion in which the opening 37 is formed. FIG. 1 and FIG. 4 show the blank bent in this manner but without having the two portions flattened down one upon the other and the portions which are hereinafter referred to as the inner portion and outer portion of the cutter are designated respectively *a* and *b*. In following the procedure of first bending the blank 36 into the shape or form shown in FIG. 1, the inner end portion *a* would be inserted through the slot 32 under the sloping strip 33 and in the direction to bring the portion *a* into position beneath the opening 30. The locking tongues 45 previously would be bent downwardly into the position shown in FIG. 5 so that their free ends will be brought sufficiently close together to permit the tongues to be passed through the pour opening 30.

It will, of course, be obvious, and it is clearly shown

in FIGS. 5 and 6 particularly, that the width of the blank 36 is materially greater than the width of the pour opening 30 but is only slightly less than the length of the slot 32. Thus when the portion *a* is inserted through the slot the blank or the partly folded cutter will be relatively snugly received and held in the slot and when the job of completing the assembling of the parts is accomplished, the width of the parts *a* and *b* will result in complete covering of the pour opening through its width and length.

After the partly bent or folded blank 36 is introduced into the slot 32, as shown in FIG. 4, with the tongues 45 angled downwardly so that they will pass easily through the opening 30, by then forcibly pressing the two parts *a* and *b* together, it will be seen that the tongues 45, due to the way in which they are angled or extend in diverging relation toward the inner or under part *a*, will be cammed laterally and reversely bent in their end portions as indicated at 45*a* in FIG. 7 against the under side of the adjacent portion of the top body.

As an alternative method of applying the opener to the top body 20 the straight blank may have the end edge 38 slid across the surface of the portion 23 of the top and under the strip 33 which, because of its slope will guide the end of the blank through the slot 32, and by suitable manipulating means while the inner end portion of the blank is held, the outer end portion may then be folded over and bent down to pass the tongues 45 through the opening 30 in the manner just described.

Whichever of the two methods thus far described is selected for attaching the opener device to the top member 20, it will be seen that when the parts *a* and *b* are in final position against the bottom and top sides of the end wall, the operation of fringing them into this position will effect the bending of the tongues and compress them between the inner end part *a* and the under side of the wall portion 23.

In FIG. 8 the outer end part *b* is not illustrated as being longitudinally bowed but as being straight and lying flat against the wall portion 23. An end wall construction of this character would be applied to cans or receptacles of non-carbonated beverages. However, for cans destined to contain beer and other carbonated beverages, the outer end part *b* of the device would be bowed longitudinally to obtain the action hereinbefore described where, as will be seen upon reference to FIG. 9, when the central portion of the end wall is outwardly bowed or bulged by the pressure, the longitudinal curvature of the outer end portion of the opener device will cause it to maintain its place against the curved outer surface of the wall.

In the initial formation of the blank 36, that is, in the stamping operation for forming the aperture 37 and the spur 41, these parts are properly related so that when the two parts *a* and *b* are bent into locking engagement with the top as shown in FIG. 8, the point 43 of the spur will lie directly over the center of the aperture 37, the purpose for this being hereinafter set forth.

In the bending or forming of the opener to bring its inner and outer end portions *a* and *b* toward one another, with the wall portion 23 therebetween the folding action is controlled so that the portion of the metal adjoining the two portions *a* and *b* will be bowed upwardly slightly from the plane of the inner end portion or bottom portion *a* as indicated at 36*a*, thereby providing, instead of a sharp bend, such as would be formed if the bend were flattened down, a rounded rib which extends transversely of the two portions as illustrated. By forming this rounded rib at the bight between the end portions *a* and *b*, the upper or outer end portion may be bent or swung away from the inner end portion in the operation of bending the outer portion, as shown in FIGS. 10 and 11, for the purpose of opening the receptacle without breaking the metal since the rounded rib will tend to straighten out instead of breaking as would be likely if the metal had been pressed down into a sharp flat bend.

Also it will be noted that in closing together the two portions of the cutter device and in which operation the bowed rib is produced, the device at the bight will extend slightly beyond the slot 32 so as to lie on the top of the wall and in this way it has a bearing on the wall which further facilitates the bending necessary to the manipulation of the cutter either for the purpose of releasing gas pressure from within the receptacle or for facilitating the detachment of the outer end portion to permit the removal of the cutter from the wall.

As hereinbefore stated, the frangible sealing or liner sheet 18 of the selected material is pressed tightly against and caused to adhere to the under surface of the body 20, by being pressed into the channelled underside of the rib 24 against the binding cement 35. It is also pressed into the channel 29, as clearly shown in FIG. 8, to be bonded to the channel wall by the adhesive 34. It will be clear from the illustration, that the sealing sheet forms a protective covering over the inner part *a* of the opener and due to the fact that this part completely covers the pour opening 30, there is no danger of the protective sheet being forced through the pour opening or through the slot 32, regardless of any pressure which may be applied to the inner side of the can top.

When the end wall is applied to the end of the can body 10 and the flange 16 and the encircling parts of the end wall are rolled together or beaded according to conventional practice, it will be seen that an hermetic seal will be effected.

As before described, when the two portions *a* and *b* of the device are closed together in final gripping relation with the central part 23 of the end wall, the tongues 45 will effectively lock the device in place. Two effects are obtained by this arrangement, the first being that when the ends or lids are stacked in the lidding machine and are being fed to the can bodies for application thereto, these tongues will prevent any loosening of the device and its detachment from the supporting lid. The second effect is produced in connection with the bulging or out-bowing of the end walls in those receptacles which may be filled with carbonated beverages where high pressure of gas exists within the receptacle, which effect is that due to the locking engagement of the tongues with the underside of the central portion 23 of the can top, when this outward bowing or bulging occurs, the tongues will hold the outer portion *b* against the surface of the supporting portion of the top whereas without the locking arrangement, when the outward bowing of the can top occurs, there would be a tendency for the free end of the portion *b* to move away from the wall and thus establish a condition which might result in the opener being accidentally caught and pulled loose.

It will also be apparent that due to the internal pressure which is applied to the frangible sheet 18, the inner part *a* of the opener will be pressed tightly against the out-turned end portions 45*a* of the tongues and thereby clamp the tongues firmly in place. As a result of this firm clamping effect on the tongues, considerable difficulty would be experienced in pulling the outer part *b* away from the supporting surface but this action can be very easily accomplished when the pressure within the can is released and this releasing action is brought about by puncturing the frangible liner sheet 18 by the extension of the point of the spur 41 through the aperture 37.

In order to accomplish the puncturing of the liner sheet the outer end edge is engaged from the under side by the finger nail or some other means and the part *b* is bent transversely on the score line 40. When this bending is accomplished, which, of course, results in turning up the outer end portion of the part, the spur will swing down so that the point thereof will enter the aperture 37 lying directly therebeneath and passing through will penetrate through the sealing liner 18 so that the gas can escape from within the container. As soon as this escape of the

gas comes about, then the pressure upon the tongues 45 will be released and the part *b* can then easily be pulled up and the tongues will at the same time be pulled out through the pour opening 30 and the inner part *a* of the device can then be withdrawn from the slot 32.

After the opening device has been removed from the slot 32, one of the corners thereof may be used to cut or slit the frangible liner sheet 18 around the edge of the pour opening 30.

If preferred, the inner end edge 38 of the opener, instead of being shaped as illustrated, may be cut to form a pointed cutting edge, such as is illustrated in the Fried patent hereinabove referred to, or such edge may be provided with corner cut-outs as well as a central cut-out portion to form several cutter points as illustrated in pending application Serial No. 407,932, hereinbefore referred to.

In connection with the foregoing description of the manner in which the opener device is employed, reference is had to FIGS. 10 and 11, where, in FIG. 10, there is an illustration of the preliminary bending of the outer end portion of the outer part *b* and in FIG. 11 is illustrated the manner in which, when this outer end portion of the part *b* is bent up, the point 43 of the spur 41 will swing down and form an opening 47 in the frangible liner sheet 18 to permit the gases to escape.

In the embodiment of the invention illustrated in FIGS. 1 to 11, the slot 32 provided for the reception of the inner end portion of the opener device is formed by cutting out or removing a narrow strip of the metal across the inner end of the pour opening.

FIGS. 12 to 17 illustrate another construction wherein the opening in the wall for receiving a portion of the opener device is formed in another manner or by another procedure. In this second embodiment of the invention the end wall is generally designated *W'* and it is formed by stamping or otherwise shaping the necessary metal body as in the case of the first described construction, and as shown, it embodies the circular central portion 50 and the bordering channeled flange 51 which is formed as hereinbefore described to facilitate its application to the conventional can body. The central portion 50 has the pour opening 52 therein as in the prior construction.

In this second embodiment, instead of cutting out a strip of metal across the inner end of the pour opening 52, a suitable slitting tool is provided which, in the stamping or shaping operation of the wall, merely slits the metal across and in spaced relation with the inner end of the pour opening, as indicated at 53. This slitting tool is also designed to apply pressure against the portion of the metal lying between the slit 53 and the inner end of the pour opening 52 so as to force this portion away from the outer surface of the top, thereby angling the intermediate portion between the pour opening and the slit as indicated at 54. There is thus provided by this operation and without removing any metal, an opening 55 for the reception of an end of the opener device.

The lid or top, formed either with the slot 32 hereinbefore referred to, or the slit 53 and the subsequent opening 55, will be maintained in the inverted or upside-down position shown in FIG. 15 in carrying out the method set forth in our copending application hereinbefore referred to. In this method the end of the metal ribbon from which the opener is to be formed is extended into the opening 55, or into the slot 32, at an oblique angle from the underside of the lid, as shown in FIG. 15. In this figure the straight piece or section of the metal ribbon is shown as having been detached from the supply reel and constitutes a blank which is generally designated 56 and substantially corresponds to the blank shown in FIG. 2. The portion of the blank designated *a'* is subsequently pressed against the inner face of the top and the outer portion designated *b'* is subsequently bent around and pressed against the outer side of the top and this outer portion has its opposite edges cut to provide

the tongues 57 corresponding to the tongues 45 hereinbefore referred to.

As will be seen upon reference to FIG. 13 where the cutter device is shown in its final position on the lid, the outer portion *b'* is slit to provide the puncturing spur 58 and the inner end portion *a'* has an opening 59 lying beneath the point of the spur 58 to be punctured when the free end of the outer end portion is bent up in the manner illustrated in FIGS. 10 and 11.

In this second embodiment it will be seen upon reference to FIGS. 16 and 17 that the two portions of the opener device are bent toward one another so as to engage flat against the upper and lower faces of the portion 50 of the can top and the bend is formed to lie across that edge of the sloping or inclined portion 54 which is remote from the pour opening instead of having a portion of the opener at the bend lying upon the outer side or outer surface of the top.

The top construction of this second embodiment of the invention is adapted for use upon containers of all types, whether intended for the marketing of carbonated or non-carbonated liquids. However, in this second embodiment, by forming the opening to receive the inner portion of the opener, by making merely a slit in the metal and bending outwardly the portion of the metal between the slit and the pour opening instead of cutting out a section of the metal as in the first embodiment, the top portion of the opener can be bent up and the inner portion easily withdrawn since the part of the opener at the bend cannot butt against the underlying edge of the slit. In the first described embodiment where the part of the metal of the lid is cut out to form the opening 32, the fold between the portions *a* and *b* of the opener rests upon the top of the lid adjacent to the opening 32 and thus when the outer portion is bent up the folded part cannot drop down and engage the edge of the opening 32 and thus interfere with the easy removal of the inner portion *a* of the opener.

In order to further strengthen the material of the cutter between the spur 41 or the spur 58 and the free end of the portion *b* or *b'* from which the spur is formed, such portion is preferably provided with the out-struck reinforcing ribs designated respectively 62 and 61. Thus when the outer portion of the opener is bent up in the manner illustrated in FIGS. 10 and 11, such portion will be given added stiffness and this will permit the use of a relatively light or thin material for the remaining portions of the opener.

We claim:

1. A container having a wall thereof provided with a material discharge opening, a lining sheet of frangible material lying against the inner side of said wall and covering said opening, a member positioned within the container between the wall and the frangible sheet and covering said opening and having a portion thereof located outside of the container, and means connected with said portion and having releasable locking engagement in said opening.

2. The invention according to claim 1, wherein the said means embodies a part of the said portion secured between the inner side of the wall and the frangible sheet.

3. A container having a wall thereof provided with a material discharge opening and having a second opening adjacent to the first, a lining sheet of frangible material lying against the inner side of said wall and covering said openings, a member extending through the second opening into the container and covering the first mentioned opening, said member having a portion lying over a part of the wall upon the outer side of the latter, and deformable means forming a releasable locking connection between said portion and an edge of the first mentioned opening.

4. The invention according to claim 3, wherein said deformable means comprises a tongue integral with said



portion and extending through the first mentioned opening and laterally across said edge and to the underside of the wall.

5. A container having a wall thereof provided with a material discharge opening and having a second opening adjacent to the first, a lining sheet of frangible material lying against the inner side of said wall and covering said openings, a device adapted for cutting away the frangible sheet through said first opening and comprising two superposed joined together members with one member extending through the second opening and covering the first opening upon the inner side of the wall, the other one of said members being disposed against the outer side of the wall, and means detachably securing said other member to and against accidental separation from the wall, which comprises at least one tongue forming an edge portion of said other member and engaging across an edge of the first opening and against the underside of the wall.

6. A container having a wall thereof provided with a material discharge opening and having a second opening adjacent to the first, a lining sheet of frangible material lying against the inner side of said wall and covering said openings, a device adapted for cutting away the frangible sheet through said first opening and comprising two superposed joined together members with one member extending through the second opening and covering the first opening upon the inner side of the wall, the other one of said members lying over and closing the said material discharge opening upon the outer side of the wall and lying upon the wall, and means carried by said other member extending into said material discharge opening and releasably securing the device against displacement with respect to the openings.

7. The invention according to claim 6, wherein the said means comprises a pair of tongues formed integrally with opposite edges of said other member and extending therefrom through the said opening and laterally from said edges to and engaged against the underside of the wall.

8. A container having a wall thereof provided with a material discharge opening and having a second opening adjacent to the first, a lining sheet of frangible material lying against the inner side of said wall and covering said openings, a device adapted for cutting away the frangible sheet through said first opening and comprising two superposed joined together members with one member extending through the second opening and covering the first opening upon the inner side of the wall, the other one of said members lying over and closing said first mentioned opening upon the outer side of the wall and lying upon the wall, the said other one of said members being of greater overall dimensions than the said first mentioned

opening and extending beyond all sides of said first mentioned opening, said other one of said members having an edge portion provided with two relatively closely spaced inwardly extending cuts forming between them a tongue, and said tongue extending through the adjacent opening and laterally across the adjacent edge thereof and engaging the underside of the wall to lock the member of which it forms a part against ready separation from the wall.

9. As a new article of manufacture, a container lid comprising a wall body having an inner side and an outer side and having a peripheral formation for facilitating its attachment to a container wall, said wall body having therein a material discharge opening, a flat member lying against the inner side of said wall body and fully covering said opening, a second member connected to the first member and positioned at the outer side of the wall body and at least in part overlying said opening, means joined to the second member and extending through the material discharge opening and releasably engaging the said inner side of the wall body to secure the second member to the wall body, and a sheet of frangible lining material secured against the inner side of the wall body over and fully covering the first named member and opening.

10. The invention according to claim 9, wherein the second member is of an overall size greater than the opening and extends throughout the major extent of its periphery beyond the edge of the opening, the said means lying in the remaining minor part of the periphery of the second member and comprising a tongue forming a part of the second member.

11. A container having one wall thereof provided with a material discharge opening, said one wall being peripherally joined and hermetically sealed to an adjacent wall, a sheet of frangible material disposed against the inner surface of said one wall and covering said opening, a cutting member positioned within the container between said one wall and said frangible sheet and covering said opening and having a portion thereof located outside of the container, means connected with said portion and having locking engagement in and with the edge of said opening, and a fluid tight bond between said sheet and the inner surface of said one wall encircling the pour opening and lying within the area defined by the said sealed periphery.

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