

Nov. 30, 1965

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3,220,599

RECEPTACLE AND COMBINED QUICK OPENING MEANS

Filed Dec. 17, 1958

3 Sheets-Sheet 1

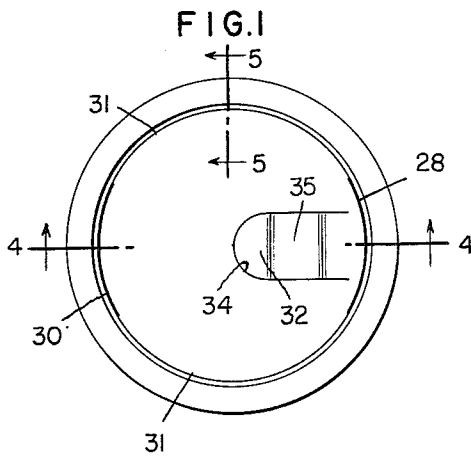
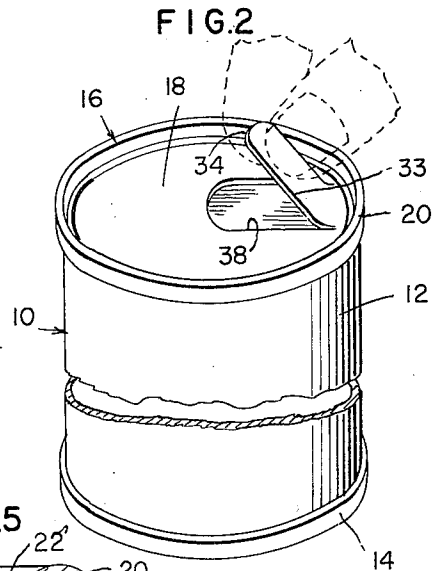
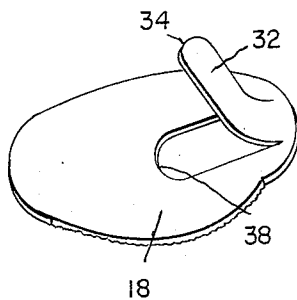
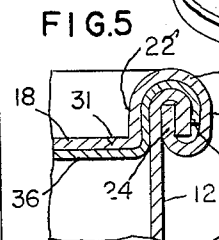
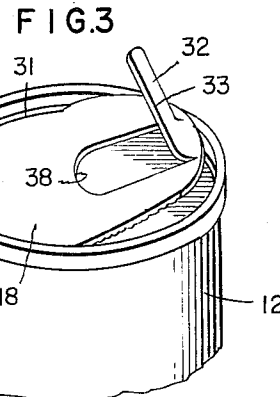
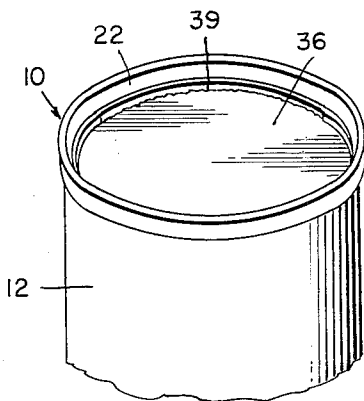
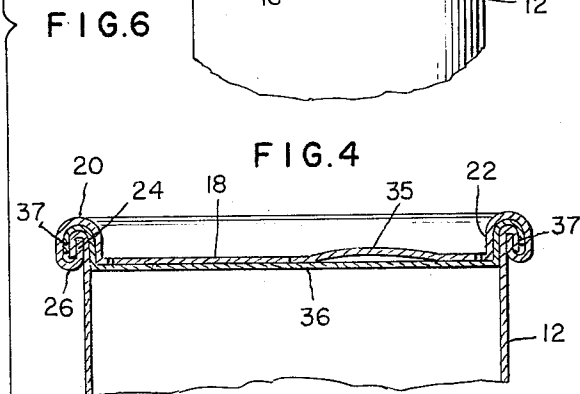


FIG. 4

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FIG.7

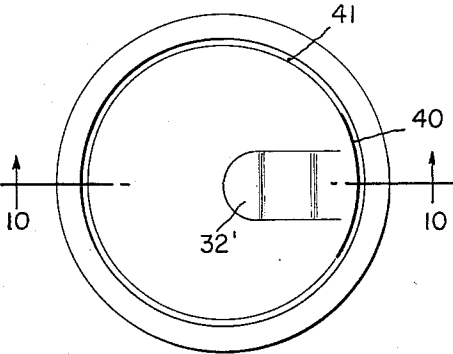


FIG.8

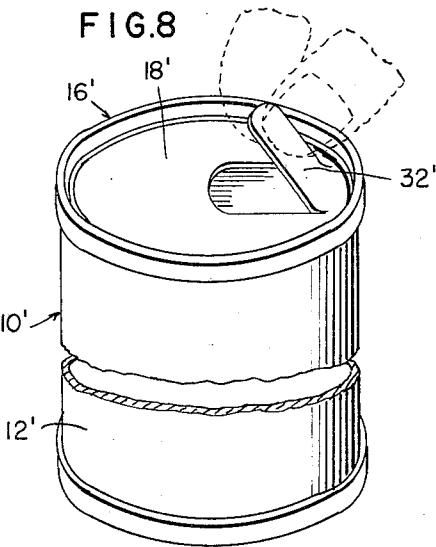


FIG.9

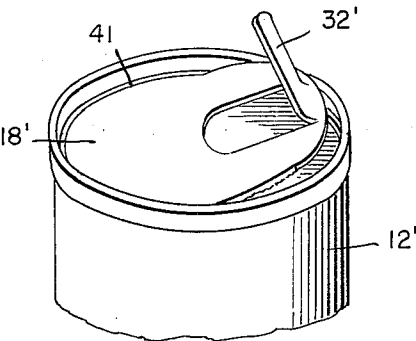


FIG.11

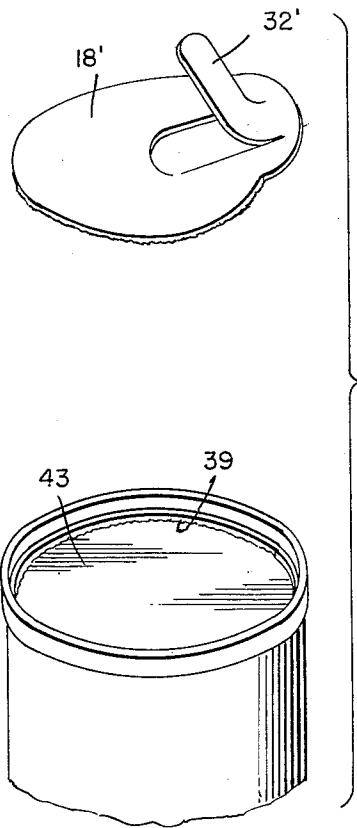
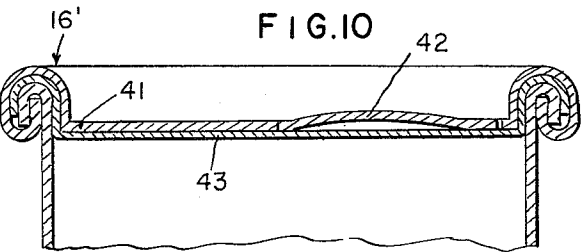


FIG.10



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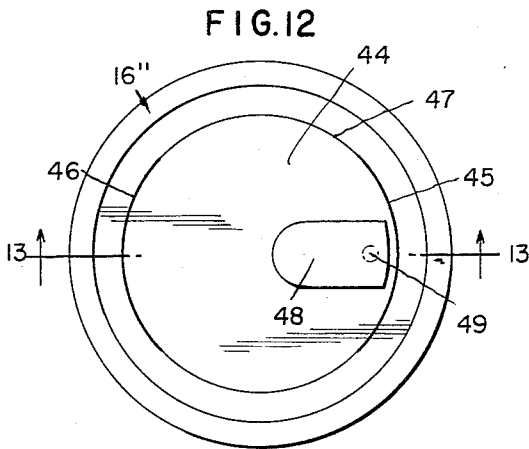
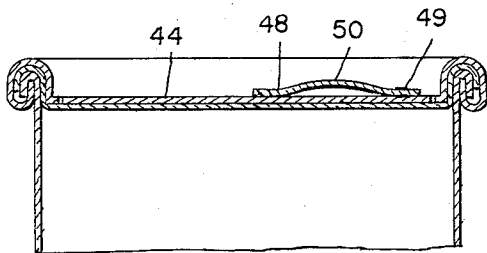
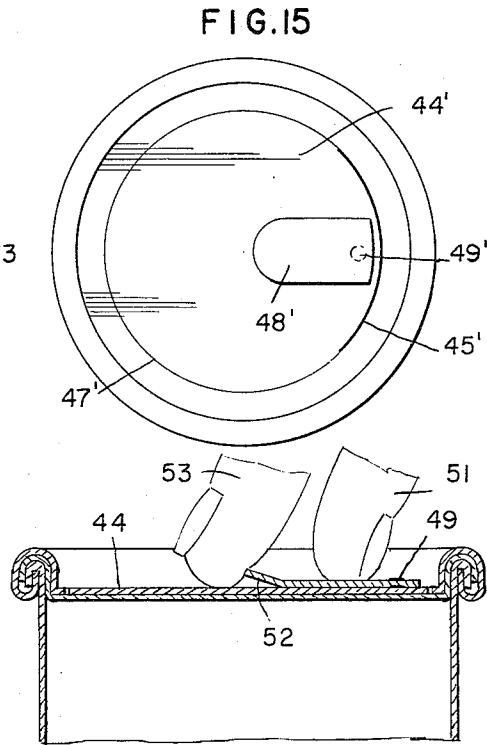
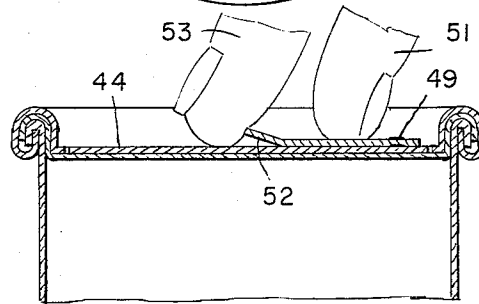
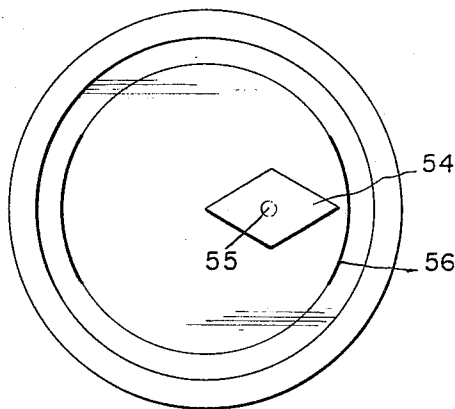
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RECEPTACLE AND COMBINED QUICK OPENING MEANS

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3 Sheets-Sheet 3



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3,220,599 RECEPTACLE AND COMBINED QUICK OPENING MEANS

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Filed Dec. 17, 1958, Ser. No. 781,023
5 Claims. (Cl. 220—54)

This invention relates to the class of receptacles in general, and is directed particularly to improvements in means for effecting quick and easy opening of the same.

While the present invention is applicable to an infinite variety of receptacles of any size or shape, and constructed from metal or fiber board lined with metal, plastic or any other suitable material, it is particularly and primarily designed for or applicable to receptacles of metal or other material suitable for merchandising fluent commodities, either dry or liquid or semi-solid or semi-fluid materials, as for example, canned fruits or vegetables where solid particles and liquid may be together.

In the art of metallic receptacles a number of different ways have heretofore been devised for effecting the opening of the same and such ways of opening have also had as a particular object to effect the opening operation quickly and easily. Such opening devices embody the use of keys employed for removing tear strips, or metal cutting instruments for cutting away a portion of the wall of the receptacle to provide an opening therein through which the contents might be discharged. In those devices for effecting the opening of a can or other type of receptacle where a tear strip is provided for the use of a key to effect its removal, various types of construction have been resorted to avoid the formation of a raw metal edge which might present a hazard to the user, and one such device involves a special formation of the wall which provides a lip or smooth edge portion with which the lid can be engaged to keep the receptacle closed after some of the contents have been removed as, for example, in the well known coffee can. However, a construction of this character involves considerable expense in the manufacture of the can.

In the light of the foregoing, one object of the present invention is to provide a can or other receptacle wherein means is provided for opening the same with a minimum of effort and at the same time form a large opening through which the contents of the receptacle can be readily dispensed.

In the use of cutting and punching openers where some form of metal cutting implement is employed, only a small part or section of the receptacle wall is cut away and while this provides a sufficient opening for dispensing liquid material from the receptacle, such an opening is not satisfactory for dispensing heavy or thick commodities or commodities in which there are large pieces, such as vegetables and the like.

Another object of the invention accordingly is to provide a receptacle having a means whereby substantially the entire end wall of the receptacle can be removed easily and quickly so that no difficulty will be encountered in removing the contents even though the same include large bodies.

Still another object of the invention is to provide a new receptacle structure wherein a substantial portion of a wall thereof may be easily and quickly removed by one quick motion or jerk applied to a tongue or finger piece carried by the wall.

Still another object of the invention is to provide an improved receptacle structure in the form of a can wherein an end wall is partially cut through and partially scored, with a tongue member attached thereto in a prescribed

relationship to the cut portion so that upon grasping the tongue between the fingers and applying a quick pull outward or jerk to the latter, the cut portion will be bent out and force will be applied on opposite sides of the cut portion to effect the easy and rapid tearing of the material of the wall along the score lines to permit the entire end wall to be removed and the invention further embodies the inclusion of an auxiliary wall sheet or membrane lining the under side of the removable wall in such a manner as to prevent leakage of the contents of the receptacle through the cut portion of the removable wall, such auxiliary wall lining being thin and easily ruptured or cut away after the outside wall is removed. Such lining may be in the form of metallic foil such as aluminum or the like, or it may take the form of a suitable plastic.

Another object of the invention is to provide a receptacle, particularly a metal receptacle such as the conventional tin can, with an improved end wall structure carrying a tongue member and cut and scored in a new and novel manner whereby, by the application of a quick pull to the tongue portion, the metal wall will be torn through the major portion of its circumference, in close proximity to the rim of the can and removed with a minimum of effort to give access to the underlying inner or auxiliary thin protective sheet of metal foil such as aluminum or of suitable plastic which is adapted to be easily broken or cut out.

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 is a view in top plan of a receptacle wherein the end wall is shown constructed with a double slit in accordance with one embodiment of the present invention;

FIG. 2 illustrates a receptacle in perspective, with the middle portion thereof being broken away and showing the manner of grasping the tongue after the same has been bent up, preparatory to applying the necessary quick pull for effecting the removal of the major portion of the end wall;

FIG. 3 is a perspective view corresponding to the upper portion of the structure shown in FIG. 2, and illustrating the manner in which the wall is bent transversely in tearing it out;

FIG. 4 is a sectional view on an enlarged scale taken substantially on the line 4—4 of FIG. 1;

FIG. 5 is a fragmentary section on an enlarged scale taken on the line 5—5 of FIG. 1;

FIG. 6 is a perspective exploded view illustrating the end wall removed, showing the underlying inside frangible sheet or auxiliary wall formed of aluminum foil or plastic;

FIG. 7 is a view in top plan of a metallic receptacle showing the top or end wall thereof constructed with a single slit in accordance with a second embodiment of the invention;

FIG. 8 is a view corresponding to FIG. 2 to show the manner of tearing out the end wall;

FIG. 9 illustrates the manner in which the end wall is bent and partially torn away;

FIG. 10 is a sectional view on an enlarged scale taken substantially on the line 10—10 of FIG. 7;

FIG. 11 is a view corresponding to FIG. 6 and show-

ing the completely removed end wall and the inner frangible lining wall;

FIG. 12 is a view in top plan of a receptacle showing another embodiment of the invention in which the tab to be grasped for facilitating the removal of the wall is a separate, applied piece of metal or other material;

FIG. 13 is a sectional view on an enlarged scale taken substantially on the line 13—13 of FIG. 12;

FIG. 14 is a sectional view corresponding to FIG. 13 and illustrating the manner in which the end of the tongue or pulling tab is made to rise by applying thumb pressure to the middle portion thereof;

FIG. 15 is a top view corresponding to FIG. 14, but showing the use of a single slit in the end wall in place of the double slit shown in FIG. 12;

FIG. 16 is a plan view illustrating another manner of attaching a pulling tongue or tab.

The invention in each of the forms shown is illustrated as embodied in a conventional cylindrical metal can of the type which may be used for merchandising various food products, which products may be either completely liquid in character or semi-solid, or liquid with solids therein. While the illustration of the invention is, as stated, of a cylindrical can and the description following will be directed to a can of this form, it is to be understood that the invention is not necessarily limited in its use to any specific type of receptacle, but can be embodied in a receptacle of any form or shape wherein a substantial portion of a wall, such for example, as the end wall of the can illustrated, can be torn or pulled out so as to form a dispensing opening of substantial size. Also it will be obvious that the invention may be applied to receptacles designed for merchandising fluent dry, or semi-solid substances, as well as liquids.

In addition to the foregoing, the construction of the receptacle in accordance with the invention is such that it may be used for merchandising carbonated liquids or liquids in which gases are dissolved and as a result of which the receptacle will be subjected to considerable internal pressure. In addition to the construction enabling the receptacle to withstand internal pressure as stated, it has been found that a high degree of vacuum can be established within the receptacle without rupturing the liner underlying the end wall. The construction illustrated has been found to withstand a vacuum or reduced pressure within the receptacle of 16 inches which is the highest commercial vacuum obtainable and is considerably more than that to be found in the so-called vacuum packed receptacles.

Now referring more particularly to the drawings wherein the description will first be directed to the embodiment of the invention illustrated in FIGS. 1 to 6, the numeral 10 generally designates a cylindrical receptacle or can, the body of which is designated 12 and one end is designated 14 and is of the usual disc form having its periphery joined to an end of the body wall 12 by conventional means such as a rolled seam or it may be joined in any other desired or suitable manner.

The numeral 16 generally designates the opposite end wall of the receptacle, constructed in accordance with the present invention. This end wall 16 embodies the flat disc-like central portion 18 which is joined to the wall 12 in the usual manner as by rolling or seaming the edge of the disc to the end of the wall as indicated at 20. This end wall 16 is pressed as an integral one-piece unit from a sheet of metal or other suitable material and in desired size and in the pressing operation it is shaped to form the disc-like central piece or plate 18 encircled by the peripheral wall 22 which in the seaming operation attaching the end wall or head to the can body is interfolded as at 24 with an outwardly and downwardly folded peripheral portion 26 of the can wall 12 in the accepted or conventional manner.

The disc portion 18 which lies inside of and joins the encircling wall portion 22 is cut through on a circular

line in close proximity to the wall portion 22, in two places. These two cut portions or slits are designated 28 and 30 and are at diametrically opposite sides of the disc or head 18 and have only a short radial extent as compared with the intervening circular portions between their ends.

These arcuate slits 28 and 30 extend equidistantly on opposite sides of a diametrical line which coincides with the section indicating line 4—4. Between the adjacent ends of the two slits the metal of the disc or head 18 is deeply scored as indicated at 31 in FIG. 5. These score lines 31 continue a circle of which the slits 28 and 30 form parts, as is clearly illustrated in FIG. 1. In the operation of stamping the wall 16 to form the slits, the score lines and the flange portion 22, the disc body 18 is cut through to form a tongue or tab 32. This tongue 32 in the illustration of the embodiment of the invention under consideration is formed with the longitudinal side edges 33 which terminate in close proximity to the slit 28 as shown, while the inner end of the tongue is formed with the rounded edge 34 which joins the side edges 33, as shown. Also the tongue 32 is formed with its side edges 33 equidistantly spaced on opposite sides of the diametrical line hereinbefore referred to and bisecting the slits 28 and 30.

In addition to the stamping of the central disc portion 18 of the end to form the tongue, the tongue itself is pressed so as to have a slight longitudinal bow 35 midway of its ends as is clearly shown in FIG. 4. This very slight longitudinal bow causes the side edges 33 of the tongue to lie slightly above the top of the disc portion 18 thereby making it easy for the person opening the can to grasp the tongue and bend it outwardly in the manner shown in FIG. 2.

The inner or under side of the end wall 16 is covered by a sheet of any suitable frangible material such as aluminum foil, plastic or the like and this sheet of material is designated 36. The sheet 36 is imperforate and is initially of sufficient size that when it is placed against the under side of the end wall 16 or lid of the can, it will extend outwardly beyond the wall flange 22 and thus be folded into the seam 20 as indicated at 37, when the end wall, top or lid of the can is applied by conventional top or lid applying machinery.

Also in the procedure of applying the lid and the foil or frangible sheet 36 a suitable adhesive or cement is interposed between the peripheral portion of the frangible sheet and the lid and on the under side of the frangible sheet at the periphery so as to form a hermetic seal or bond in the seam.

The frangible sheet 36 is drawn tightly against the under surface of the lid or end wall 16 through the area of the same as shown in FIG. 4 and being imperforate it forms a leak-proof seal over the opening 38 which is formed in the operation of stamping the tab 32. Thus it will be seen that liquids within the receptacle, even those under heavy pressure, will be prevented from escaping by reason of this frangible liner sheet, but since the frangible sheet is thin and easily cut away when the central or disc portion of the lid is removed, any suitable means may be used to puncture the foil or cut it out of the opening which will be formed. Even though the frangible sheet is of relatively thin character, it will not only withstand the outwardly directed forces applied thereto as a result of high pressures within the receptacle, but, as hereinbefore stated, a high degree of vacuum can be established in the receptacle without rupturing the frangible sheet, thereby making the receptacle particularly well adapted for use in the merchandising of vacuum packed commodities, such as coffee, to give only one example.

In the operation of opening the receptacle, the tongue or tab 32 is grasped as shown in FIG. 2 and bent upwardly and then by applying a sharp pull or jerk to the tab, the portion of the removable disc part 18 lying with-

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in the extent of the slit 28 and to which the outer end of the tab is attached, will easily come away and due to the centralization of the outer end of the tab between the ends of the slit 28, a balanced and equal pull will be applied at the ends of the slit 28 to the scored part of the metal and the metal will readily tear along and around the score lines to the ends of the other slit 30 which lies opposite to the slit 28.

FIG. 3 illustrates the manner in which the disc portion 18 will bend up as it tears and FIG. 6 illustrates the large open area which is formed in the end wall or lid when the central disc portion 18 is completely removed, thus forming the pour or discharge opening 39 and exposing the frangible liner sheet 36 which can then be readily cut out as previously stated.

Referring now to the second embodiment of the invention illustrated in FIGS. 7 to 11, the structure hereinbefore described is substantially repeated except for the manner in which the central part of the end wall, which is to be opened, is formed. In this second embodiment the can as a whole is designated 10' and the end wall corresponding to the wall 16 is generally designated 16', while the central part or disc portion of the end wall or lid which is to be removed is generally designated 18'.

In the shaping of this wall 16' the pull tab or tongue 32' is cut or stamped out in the same manner and in this stamping operation the metal sheet from which the wall is stamped is slit in one place only, as indicated at 40. This arcuate slit joins at its ends with the circular score line 41 which extends from the end of the slit completely around the disc portion 18' to the opposite end of the slit as shown in FIG. 7.

It will be seen in this second embodiment that the single slit extends equal distances beyond the longitudinal sides of the tongue 32' as is the case with respect to the slit 28 and the tongue 32 so that when the tongue 32' is bent up and given a sharp pull, the strain applied to the metal equal distances on opposite sides of the tongue will pull up the metal disc through the extent of the slit 40 and cause the scored portion to tear along the score line 41 at the same rate from the two ends of the slit and around the disc portion 18' so that the latter will come away cleanly, as illustrated in FIG. 11.

In this second embodiment as shown particularly in FIG. 10, the pull tongue or tab 32' is bowed slightly intermediate the free and attached ends thereof as indicated at 42 so that the tongue can be readily grasped and bent upwardly in the manner illustrated in FIG. 8.

In this second embodiment the frangible liner sheet which covers the under side of the end wall or lid 16' is designated 43 and is folded in and cemented to the periphery of the end wall or lid and the turned down edge of the can wall 12' in the same way as described in connection with the first embodiment.

When the major portion of the lid has been removed by the tearing away of the central disc portion 18', the large pour opening 39 remains, exposing the frangible sheet for removal by a suitable means, as hereinbefore described.

FIGS. 12 to 16 illustrate a third embodiment of the invention wherein the removable disc-like central portion of the end wall is differently constructed from the central portions 18 and 18' shown in the preceding figures.

In FIG. 12 the removable central disc portion of the can end wall, here generally designated 16'', is designated 44. This disc portion 44 is provided with the diametrically opposite relatively short slits 45 and 46 corresponding to the slits 28 and 30, and these two slits are separated by the arcuate shore lines 47, which with the arcuate slits, complete the circular periphery of the part 44 of the wall which is removable.

The pull tongue for removing the part 44 is here designated 48 and as shown this tongue, instead of being cut or stamped from the metal of the removable disc portion 44, constitutes a separate strip of metal which lies upon

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the top of the portion 44 and is secured by spot welding as at 49, or in any other suitable manner, to the end which lies closely adjacent to the slit 45. The tongue extends radially toward the center of the removable portion 44 as shown and as in the other cases, it is equidistantly spaced at its sides from the adjacent ends of the slit 45 so as to apply the desired balanced strain upon the metal when the tongue is lifted up and pulled outwardly so that the tearing of the metal will take place evenly along the two score lines 47 lying between the slits 45 and 46.

In FIG. 15 the removable central disc portion of the end wall is designated 44' and here only a single slit 45' is employed as in the case of the second embodiment illustrated in FIG. 7. The score line completing the circular periphery of the removable portion 44 is designated 47' and the pull tongue 48' which lies upon the top surface of the removable portion 44, as in the structure illustrated in FIG. 12, is secured by spot welding as at 49' or in any other suitable manner.

The tongues 48 and 48' here illustrated are, like those previously described, bowed slightly intermediate their ends and FIG. 13 illustrates the tongue 48 which is bowed as at 50 so as to be elevated slightly from the surface of the removable portion 44. While no illustration is given, it is to be understood that the tongue 48' will be bowed outwardly slightly away from the removable portion 44' in the same manner. This out-bowing of the tongue 48 not only facilitates grasping the tongue so as to pull outwardly upon the removable part of the end wall or lid, but it will be seen upon reference to FIG. 14 that such grasping of the end of the tongue is facilitated by applying downward pressure to the bowed portion 50 by a thumb 51, which will cause the end of the tongue to rise up slightly as indicated at 52 so that the elevated end 52 can be caught by the tip of a finger 53 and the tongue then readily bent upwardly to the necessary angle to enable the person opening the receptacle to apply the desired pull or jerk to the tongue and this pull or jerk must be directed upwardly and inwardly with respect to the removable portion to thereby raise the peripheral part of the removable portion bordering the slit nearest to where the tongue is attached.

In the formation of the slits and the score lines for the removable portions of the can tops or lids, it is important that the attached end of the pull tongue be exactly centered between the ends of the slit nearest thereto so that as previously stated, the strain which will be applied through the tongue to the removable portion of the lid will be transmitted with equal force or intensity to the metal at the ends of the score lines where the latter join the ends of the slit. By this arrangement the easy and complete removal of the removable portion of the wall will be accomplished without difficulty.

While the tongues 48 and 48' which are applied to the top surface of the removable portions 44 and 44' have been shown in FIGS. 12 and 15 as being in the form of straight strips of metal of substantially constant width throughout, it is not essential to the proper operation of the invention that the tongues be so formed, but the tongues may take other forms, such for example, as that shown in FIG. 16 where the tongue, which is generally designated 54, is substantially lozenge shaped and is attached by spot welding or the like approximately at its center as indicated at 55. Regardless of the form or shape of the tongue it is, as previously stated, important that it lie exactly midway between the ends of the slit which is adjacent thereto and which slit in FIG. 16 is designated 56.

From the foregoing it will be seen that the present invention provides in the several forms thereof here illustrated a novel means for opening a receptacle or for forming a pour opening in a receptacle wall, particularly a can, wherein the opening means is embodied in an integral major portion of the end wall and, due to the novel

arrangement of the pull tabs with respect to the slits in the removable portion, the latter can be quickly and completely removed with one quick snapping or jerking motion after the tab has been grasped. The underlying frangible sheet may then be readily cut out or removed either by using an edge portion of the removed metal piece or by means of any other suitable cutter so as to give access to the interior of the receptacle.

We claim:

1. In a receptacle, a wall having a contour defining perimeter, the wall portion circumscribed by said perimeter being of a relatively thin tearable material, said material being structurally modified along a full circular line lying closely adjacent to said perimeter in a manner to facilitate complete removal of the major part of the wall lying within said perimeter, said structural modification along said line consisting of a weakened reduced thickness of the material through the major extent of said line and a slit through the material along a minor extent of the line, and pull tab means carried by the wall material within the area circumscribed by said line for exerting a manual tear-out pull upon the material between the ends of said slit whereby the entire wall portion lying within said circular line is removable by one quick pull thereon, attachment of the pull tab being between the center of the wall and the slit and centrally between the ends of the slit whereby upon application of an outward pull to the tab tearing strain will be applied simultaneously and with equal force to the weakened thickness of the material at the ends of the slit.

2. A cap for closing an end of a receptacle such as a can, said cap comprising a plate having a peripheral flange adapted for beading joinder to an edge of a wall of a receptacle, said plate being of relatively thin tearable material, said material being structurally modified in the area of the cap circumscribed by said flange by a continuous line defining a disc part of the wall to be removed, and said structural modification along said continuous line consisting of a weakened reduced thickness of the material through a major extent of the line and a slit extending entirely through the plate material along a minor extent of the line, and a pull tab attached to the wall within the area circumscribed by said line and close to the slit, attachment of the pull tab being between the center of the wall and the slit and centrally between the ends of the slit whereby upon application of the outward pull to the tab tearing strain will be applied simultaneously and with equal force to the weakened thickness of the material at the ends of the slit.

3. A receptacle having a first wall defined by a flange, the wall flange comprising a locking bead between the

said first wall and another wall of the receptacle, said first wall having a structural modification along a line circumscribing a section thereof intended for removal to provide an access opening into the can, the said modification of the first wall through a major part of said line being in the form of a weakened thickness of the material of the wall and a pair of slits extending through the wall in diametrically spaced locations, and a pull tab attached to said section closely adjacent to one of said slits.

4. A receptacle having a first wall defined by a flange the wall flange comprising a locking bead between the said first wall and another wall of the receptacle, an imperforate sheet of thin frangible material secured over the inner surface of said first wall, said first wall having a structural modification along a line circumscribing a section thereof intended for removal to expose said imperforate sheet, the said modification of the first wall through a major part of said line being in the form of a weakened thickness of the material of the wall and a pair of slits extending through the wall in diametrically spaced locations, and a pull tab attached to said section closely adjacent to one of said slits.

5. The invention according to claim 4, wherein the said tab comprises in the major part thereof a cut out portion of the wall section, the remaining part of the tab forming the attachment of the tab to the wall section.

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50 THERON E. CONDON, *Primary Examiner*.

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