

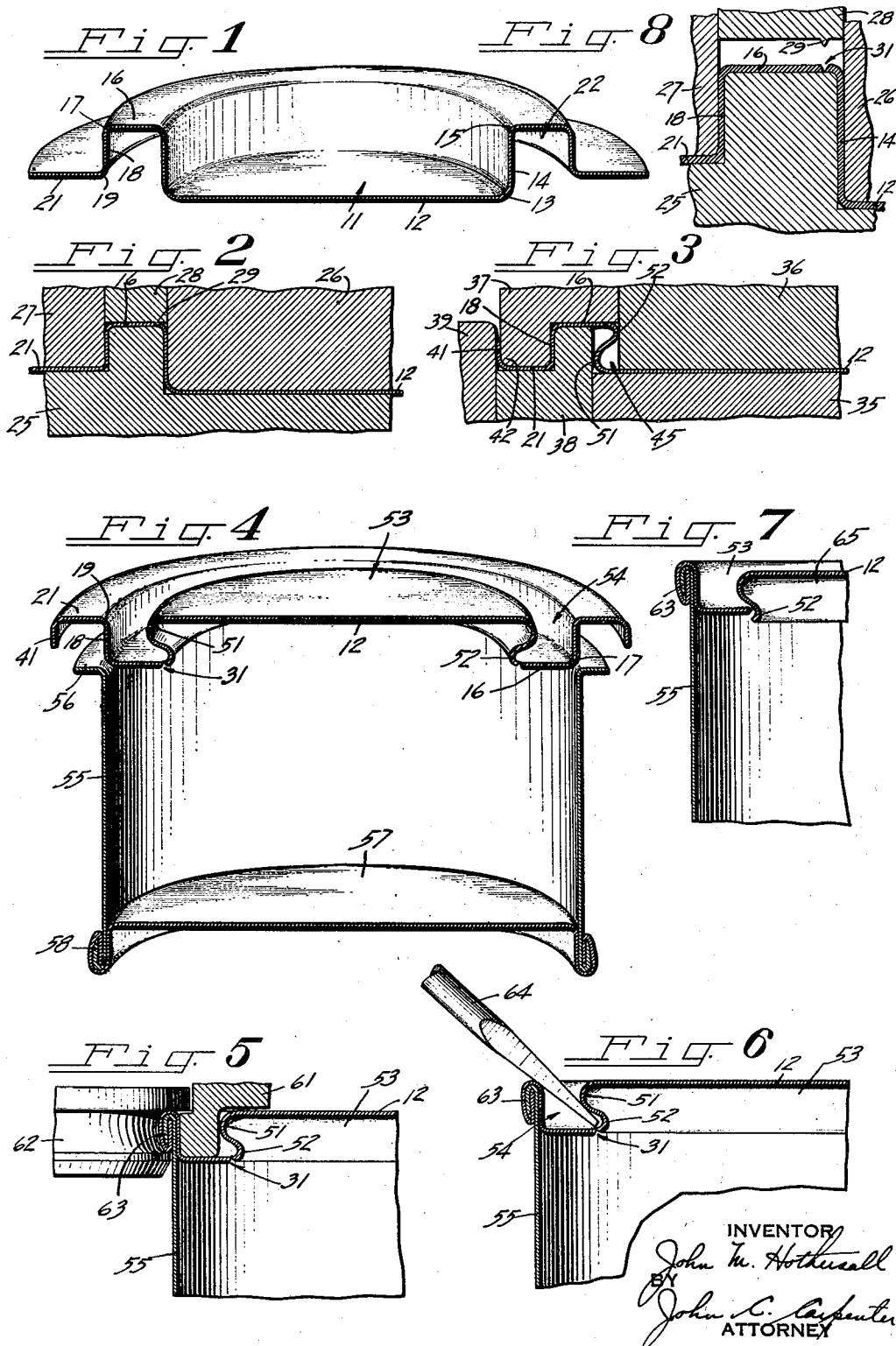
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CONTAINER AND METHOD OF MANUFACTURE

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CONTAINER AND METHOD OF
MANUFACTURE

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The present invention relates to containers and has for its object broadly improvement in the construction and manufacture of sheet metal containers adapted to be hermetically sealed and to be readily opened without the employment of tearing keys or other especially provided ripping devices, and known as easy-open containers. The invention concerns itself both with the construction of the can closure and the process of its manufacture, the latter being claimed herein.

A principal object of the present invention is the method of providing an improved hermetic closure, a portion of which may be readily pried loose by any convenient or available tool.

The invention contemplates the provision of a sunken or annular channel in a can end at the base of which is provided a score line along which severance may occur by merely inserting a tool in the channel and prying up the central portion of the cover.

An important object of the invention is the construction of a cover of this character in such manner that operations performed upon it after scoring has been accomplished will not tend to produce severance along the score lines, more particularly such subsequent forming operations being accomplished through the compression of the metal parts of the cover at and about the score lines.

Another object of the invention is the method of providing a can end or cover scored to provide a radially removable part and so constructed and arranged that seaming of the cover to the can body may be accomplished without danger of severing along the score lines.

An important object of the invention is the method of providing a container cover of the character described wherein the severable part may be used as a reclosure after opening of the container.

Numerous other objects of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a perspective view of a partially formed container cover adapted for further formation into an improved closure embodying the present invention;

Fig. 2 is a fragmentary sectional detail of the principal parts of a scoring mechanism, adapted to produce the container cover of the instant invention;

Fig. 3 is a view similar to Fig. 2 illustrating parts of a shaping and flanging die for performing a subsequent operation on the scored cover in accordance with this invention;

Fig. 4 is a perspective view of a container and a formed cover shown in separated position;

Fig. 5 is a fragmentary sectional detail taken through an assembled container and cover, the view also illustrating parts of a mechanism for uniting them by double seaming;

Fig. 6 is a sectional view of the closed container and cover illustrating the opening operation wherein a part of the cover is being removed by the use of a suitable prying instrument or tool;

Fig. 7 is a view similar to Fig. 6 illustrating the severed cover part used as a reclosure; and

Fig. 8 is an enlarged sectional detail illustrating parts of the scoring mechanism shown in Fig. 2.

The preferred embodiment of the present invention as illustrated in the drawing comprises the method of producing a metallic container cover which is formed in a series of step operations one of which cuts or impresses a weakened score line so as to circumscribe a portion of the cover and to set it off as a removable part. After this scoring of the cover a further forming or shaping operation is performed wherein a shoulder is provided in the severable part, the cover adjacent the weakened scored line at such time being backed up and supported so as to prevent fracture. There need be no particular construction of the body part where the opening features are thus confined within the cover. A cover construction of this nature obviates the necessity of a tearing strip and opening key.

A cover as initially formed or shaped for use by the method steps of the present invention is illustrated in Fig. 1 and comprises a central cupped or drawn portion 11 having a wall or face 12 bounded by an annular rounded corner 13 merging into a cylindrical wall or shoulder 14 offsetting the cup portion 11, this wall being substantially at right angles to the wall 12.

The cylindrical wall 14 is connected through the intermediacy of an annular rounded corner 15 with a flat median section 16 which is parallel to the wall 12 and forms a depressed part or shoulder to fit within the container body against the wall thereof as seen in Fig. 7. The section 16 is also connected, by means of an annular rounded corner 17, to a cylindrical wall 18 merging into a rounded annular corner 19 extending outward-

ly into a flange 21. The walls 14, 18 are parallel and define an annular channel 22.

The initially formed cover of Fig. 1 is next subjected to a scoring operation performed by a suitable mechanism the principal parts of which are schematically indicated in Fig. 2. Such mechanism may comprise a die member 25 on which the cover is placed, the upper surface of which is formed to support the different wall parts of the cover. A holding punch 26 may now be inserted inside of the cupped portion 11 of the cover, this punch member clamping the central part of the cover in its position on the die 25. An outer holding punch member 27 may also be used in a similar manner for clamping the flange 21 on the holding die.

The active scoring element of the scoring mechanism comprises an annular die ring 28, the lower face of which is formed with an annular projecting ridge 29 constituting a scoring die element. This die ring 28 is moved downwardly toward the holding die 25 and its ridge 29 is forced into the wall 16 of the cover as it is held in position on the holding die. An encircling score line 31 (Fig. 8) results, this constituting a weakened section of the container cover, the score line being preferably located close to the rounded corner 15.

The scored cover is then subjected to a shaping operation, the principal operating parts of a mechanism adapted to perform such operation being schematically illustrated in Fig. 3. These parts may comprise a supporting member 35 against which the wall 12 of the cup portion 11 rests. A clamping member 36, which may be part of a suitable punch mechanism is then brought into position to hold the cover against the supporting member 35 during the subsequent shaping operation. A secondary punch member 37 is provided of a form to engage both walls 14, 16 and to engage a part of the flange 21 and this member cooperates with other die elements, one of which is a die member 38 located adjacent to and outside of the member 35.

Members 37, 38 confine the wall 18 but engage only a part of the cover sections 16, 21. Engagement of only a part of the flange 21 permits the use of an outer die 39 located adjacent the die 38 and this outer die 39 cooperates with the member 37 to turn up the outer edge of the flange 21 into a partial curl 41 (see also Fig. 4). Such a curling action takes place during movement of the members 37, 38 relative to the die 39, a rounded corner 42 formed in the member 37 providing a shaping anvil for this corner.

At the same time a further forming or shaping action is taking place. To effect the proper shaping results the outer diameter of the member 36 (Fig. 3) is made less than the inner diameter of the member 38 and this provides an annular space 45 in which a bending or telescoping of the wall 14 takes place during the relative movement between the members 37 and 35. Fig. 3 illustrates the results of this bending movement under the end thrust of the die parts, the wall 14 being buckled both inside and outside and forming in cross-section a cyma curve (see also Fig. 4). The annular cover corners 13, 15 adjacent the wall 14 start and direct this line of bend.

The resulting cyma curve comprises a rounded shoulder 51 and a relatively smaller inner connecting grooved or curved wall 52, the latter terminating substantially at the score line 31. The severable part (designated by the numeral 53) is now completely formed. During this shaping

operation the wall 16 containing the score line 21 is rigidly supported by the member 37 and the parts are formed by a compressive action so that no tearing strains are imposed upon the weakened part of the metal of the cover at the score line. The proper support of the wall 16 at this time is vital as otherwise a premature severing would take place at the weakened score line.

A channel 54 confined between the outer cylindrical wall 18 and the curved walls 51, 52 result during the shaping operation just described, this channel being located substantially in the same position as the channel 22 between the parallel walls 14, 18 of the initially formed cover. Protection of the central severable part of the cover to prevent accidental opening of the container is provided for, the wall 12 being preferably brought into the same plane as the wall 21.

The completely formed container cover resulting from the operation just described (Fig. 4) is now in proper condition for application to the container. Such a container may assume various forms and may comprise a body 55 terminating in an open end preferably bounded by an outwardly projecting flange 56, this container having a bottom or end 57 secured in suitable manner as by a double seam 58. When a container body with an attached bottom is used, it is filled with the desired product and then closed by the fully formed cover. This is the usual procedure, although, if desired the cover 53 may first be secured to the container body and form a bottom in which case the end 57 could be used as a cover.

The formed cover 53, whether used as bottom or top, is preferably secured to the container in a double seam. Fig. 5 illustrates schematically the essential seaming parts for performing such an operation, these comprising a chuck 61 formed to enter into the channel 54 of the cover and to provide a backing or support for a seaming roller 62 of the proper contour to effect the uniting of the cover and the container in a double seam 63.

The usual shipping, storage and distribution may be performed relative to the sealed container and when access to the product is desired, the severable cover part 53 is broken away along the score line 31. To perform such opening, it is merely necessary to insert the end of any suitable prying tool, designated by the numeral 64, into the channel 54. In this position the tool engages beneath the shoulder 51 and rests upon the rim of the double seam 63 which is then used as a fulcrum. Only a slight prying action of a tool is necessary to tear the severable portion of the cover along the score line 31, after which, it is easily and completely removed to expose the opening bounded by the fractured scored line.

When desired, the severed cover part 53 may be replaced and used as a temporary reclosure. In such use the lower rim or edge of the torn wall 52 is inserted within the opening bounded by the broken score line in the remaining cover part, this reclosing position being illustrated in Fig. 7. Such a reclosure is not hermetically tight but answers the purpose required in a reclosure of this character.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and steps of procedure without departing from the spirit and scope of the invention or sacrificing all of its material advantages.

the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. The method of producing an easy-open container adapted to be opened by severance of a part along a score line, which comprises scoring a cover blank circularly and thereafter forming said blank into a can end by compression of the parts at and adjacent said score lines so as to form a depressed shoulder and a seaming flange at the outer side of said line.
2. The method of producing an easy-open container adapted to be opened by severance of a part along a score line which comprises, providing a container body, providing a container cover with a central, cupped portion, scoring the said cover to provide a weakened line of tear encircling said cupped portion, shaping said cover by pushing back the outer face of said cupped portion so as to bend its side walls into a cyma curve in cross section while holding said scored parts to prevent fracture thereof and uniting said shaped cover with said container body.
3. The method of producing an easy-open container adapted to be opened by severance of a part along a score line which comprises, providing a container body, providing a container cover with a central, cupped portion extending beyond a flanged part thereof, scoring the said cover to provide a weakened line of tear adjacent said cupped portion, shaping said cover by pushing back the outer face of said cupped portion into a plane substantially co-extensive with said flanged part so as to bend the side walls of said cupped portion into a cyma curve in cross section while preventing fracture along said weakened line and uniting said shaped cover with said container body.
4. The method of producing an easy-open container adapted to be opened by severance of a part along a score line which comprises, providing a container body, providing a container cover with a central, offset portion, a surrounding intermediate channel section and a laterally extending

tending flange, scoring the said cover channel section to provide a weakened line of tear encircling said offset portion, pushing the outer face of said offset portion backward so as to buckle its side walls and produce a prying shoulder for tearing off said offset portion along said score line, and double seaming said cover flange with said container body.

5. The method of producing a scored, severable cover for an easy-open container which comprises, providing a cover with a drawn cupped portion and a surrounding laterally extending flange, scoring the cover outside of and adjacent to the side walls of said cupped portion, and backing up said scored part to prevent fracture while shaping said cupped portion by bulging a part of its side walls to provide an engaging shoulder for a prying tool used in severing the cupped portion from the rest of the cover in the opening of the container.

6. The method of producing a scored, severable cover for any easy-open container which comprises, providing a cover with a drawn cupped portion connecting with an intermediate section which is joined by a connecting wall to a surrounding laterally extending flange, scoring the cover in its intermediate section outside of and adjacent to the side walls of said cupped portion, and supporting said scored part to prevent fracture while shaping said cupped portion by bulging a part of its side walls to provide an engaging shoulder for a prying tool used in severing the cupped portion from the rest of the cover in the opening of the container.

7. The method of producing an easy-open container adapted to be opened by severance of a part along a score line, which comprises scoring a cover blank circularly and thereafter forming said blank into a combined can end and reclosure member by compression of the parts at and adjacent said score lines so as to form a depressed shoulder and a seaming flange at the outer side of said line.

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