Feb. 5, 1946. J. E. SOCKE 2,394,019

METHOD OF FORMING LEVER OPEN CONTAINERS

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Fig. 2

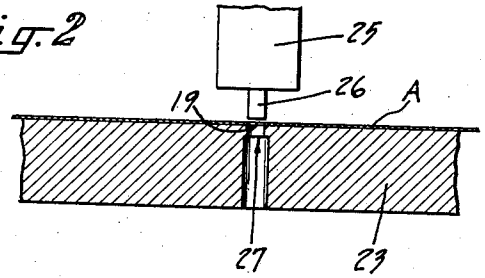

Fig. 1

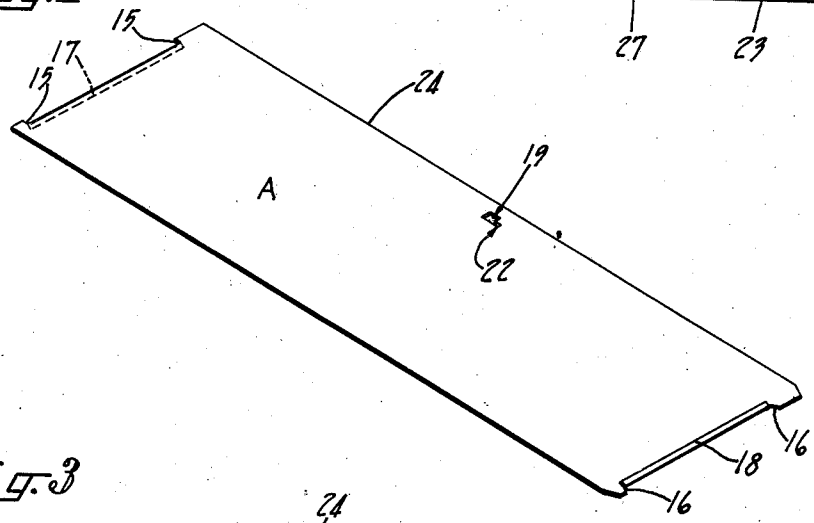

Fig. 3

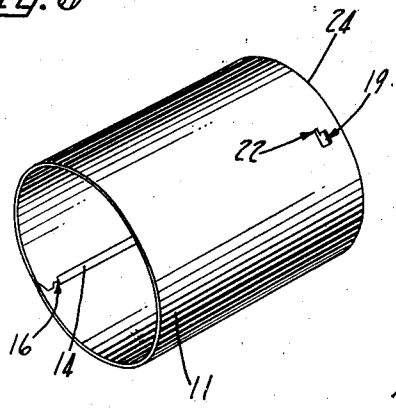

Fig. 4

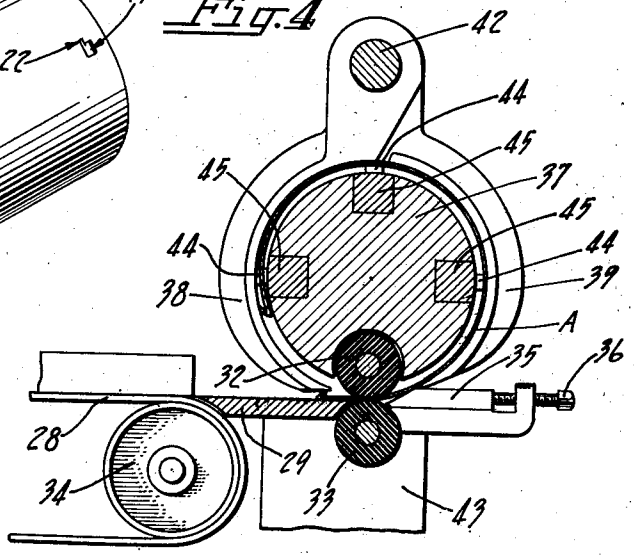

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Fig. 5

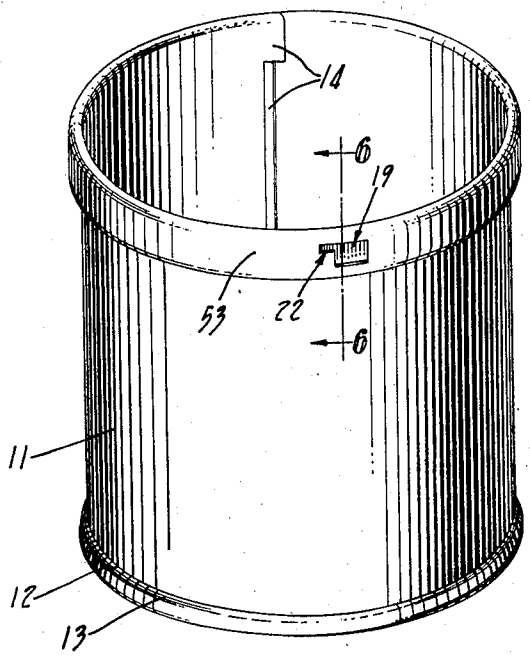


Fig. 6

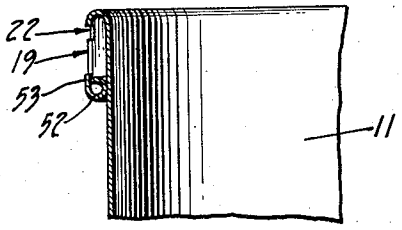


Fig. 7

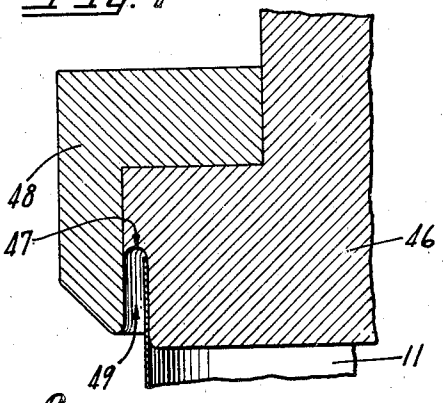


Fig. 8

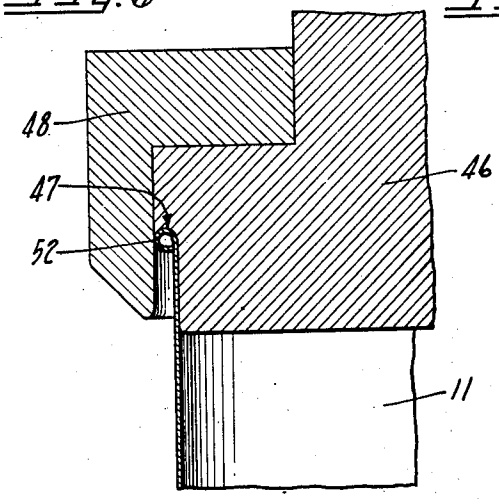
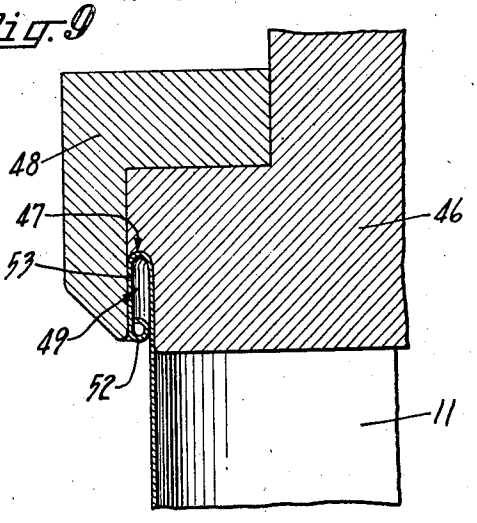


Fig. 9



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UNITED STATES PATENT OFFICE

2,394,019

METHOD OF FORMING LEVER OPEN CONTAINERS

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Application December 10, 1941, Serial No. 422,430

2 Claims. (Cl. 113—120)

This invention relates to a method of preparing flat container body blanks as an incident to the manufacture of pry-off lever type cans or containers and has particular reference to a method of cutting an opening in a container body blank adjacent an edge thereof, forming the cut blank into tubular shape with a marginal edge part of the formed body including the opening and then drawing the body wall outwardly and downwardly into an integrally spaced annular collar member having an opening for the reception of a lifting or prying-off lever. This invention is particularly directed to producing a container of the type disclosed in my copending United States application, Serial Number 422,429, filed December 10, 1941, and entitled "Lever open container."

An object of the invention is the provision of a method of preparing container bodies of pry-off lever style cans wherein an opening is cut or pierced in a flat container blank which then is formed into a tubular body having an annular spaced wall which includes an opening suitable for hingedly carrying a pry-off cover removing lever.

Another object of the invention is the provision of such a method of preparing containers from body blanks for pry-off lever cans wherein the container blank prior to being formed into tubular shape and prior to having opposite ends joined in a side seam, is cut or pierced adjacent an edge of the blank and after the body is formed with its side seam made secure the body end is edge curled and turned outwardly and downwardly, drawing the body wall with the cut opening into a closed and hollow surrounding collar member which is parallel with the body wall and in which a pry-off lever may have a hinging connection for prying off a cover used for closing the container.

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

Referring to the drawings:

Figure 1 is a perspective view of a container body blank having an opening adjacent one edge thereof;

Fig. 2 is a fragmentary view partly in section of apparatus parts for cutting or piercing the opening in the blank of Fig. 1 as one step in the embodiment of the invention;

Fig. 3 is a perspective view of a container body after being formed into tubular shape with its opposite ends joined together;

Fig. 4 is a view in section of can body forming mechanism for effecting a further step in the method of this invention and showing a body being formed into tubular shape;

Fig. 5 is a perspective view of a pry-off lever type can having a body made from a blank prepared in accordance with the method steps of the instant invention;

Fig. 6 is an enlarged fragmentary sectional view of the can as taken substantially along the line 6—6 in Fig. 5; and

Figs. 7, 8 and 9 are enlarged fragmentary views in section of suitable apparatus parts for performing other steps in the embodiment of the invention.

In the instant invention the body is formed from a previously prepared blank which for the purpose of illustration comprises a substantially rectangular can body blank. Such a blank is shown in Fig. 1 as being formed with suitable notches and end hooks which are bent in opposite directions from the plane of the blank. The end hooks are interengaged in the usual manner to provide the side seam, as shown in Fig. 3 after which a combined curling and drawing action produces the container shown in Fig. 5.

The plain can body blank A first is subjected to a piercing step as in the apparatus shown in Fig. 2. In this step the blank has an opening of a desired outline cut or pierced in a definite relation to one of the edges (Fig. 1), that subsequently will form the top of the can. The pierced can body blank is then in condition for forming into tubular shape and for joining of its opposite hooked edges in a conventional, longitudinal side seam.

The apparatus shown in Fig. 4 may be employed for forming the can blank into its tubular shape. The pierced blank is fed along a conveyor and into a pair of feed rolls which direct it against a forming block in the usual manner. This shapes the blank which then passes around a forming horn while it is held on the horn by circumferential guides. The tubular body then is moved longitudinally along the forming horn to subsequent work stations wherein the interlocking of the end hooks and the soldering thereof may take place. This is a conventional forming step.

The completely formed tubular can body with its closed side seam (Fig. 3) is now in condition for the next step of reshaping. The end of the body which is adjacent the pierced opening is

positioned in suitable die forming apparatus (Figs. 7, 8 and 9) and is then subjected to a drawing operation in the die parts. The top edge of the body first is flared or turned outwardly, downwardly and inwardly to produce the curled edge shown in Fig. 8. Further die action against the curled edge causes a reshaping or drawing of the end part of the body wall, such a part being turned inside out as it flows into an integral outer spaced wall or hollow collar member. The previously cut opening (Fig. 6) is in this collar member and its shape and size are substantially unaltered.

Following the formation of the hollow collar member, a bottom end member is secured to the can body in the usual manner and a suitable pry-off lever may be inserted into the opening in the collar member. After the can is filled, a slip type cover may be applied over the collar to seal the mouth of the can.

Such a can (Fig. 5) comprises a tubular body 11 having a bottom end 12 which is secured to the body in a usual end seam 13. The opposite edges of the tubular body are joined together in a lock and lap side seam as at 14.

The body 11 of the can is formed from a blank A (Fig. 1) which is prepared in the usual manner on standard can making machinery. The blank is formed with notches 15, 16 and end hooks 17, 18, the hooks being bent in opposite directions from the plane of the body blank. These hooks when interengaged form the lock and lap side seam 14.

The can body blank A (Fig. 1) prior to being formed into tubular shape has an opening 19 pierced or cut through the blank stock. Ultimately, this opening appears in the outer spaced wall or collar member of the finished container. The opening 19 preferably is rectangular in outline having a slotted extension 22 at one corner.

The principal parts of one form of apparatus for cutting or piercing the opening 19 in the blank A is illustrated in Fig. 2. Such an apparatus includes a horizontally disposed die plate 23. The flat blanks A are brought into a definite position on the die plate. The opening 19 which is cut in this apparatus preferably is located midway between the hooked edges of the blank and is adjacent a blank edge 24.

A punch member 25 (Fig. 2) of the piercing apparatus is disposed above the die plate 23 and above the positioned blank. Member 25 carries a punch 26 which cooperates with the edges of a die opening 27 formed in the die plate. The punch 26 passes down through the blank stock and into the opening 27 in stamping the opening 19 in the blank A.

In the body forming operation the stamped body blank A preferably is fed endwise by means of a conveyor belt 28 over a bracket 29 and between feeding rollers 32, 33 (Fig. 4). These rollers are preferably formed of flexible material, such as rubber or the like, to permit passage of the end hooks 17, 18 without distortion between the rollers. The rollers are driven continuously at a high rate of speed in any desirable manner, either independently of or in timed relation with a pulley 34 over which the conveyor belt 28 passes.

When the forward end of the blank A is drawn through the rapidly rotating rollers 32, 33, it engages a forming block 35 adjustably held on the upper surface of the bracket 29 by a bolt 36. The blank A is given a suitable bend by cooperation of the rollers 32, 33 and the forming block 35, this being a usual body forming operation. The curving blank thereafter passes around a horizontal forming horn 37 which is supported above the bracket 29.

A pair of wings or guides 38, 39 are pivoted on a shaft 42 extending longitudinally over the forming horn 37. Such a shaft may be mounted at its ends in supports extended from the main frame of the apparatus, the latter being designated broadly by the numeral 43. The guides 38, 39 extend partially around the horn 37 and form a confining space for the blanks as they move up and over the horn from the forming rollers 32, 33.

The formed blanks A, positioned on the horn 37, are moved longitudinally of the horn by means of feed fingers 44, carried by feed bars 45 which slide in grooves in the forming horn. The blanks usually are fed intermittently along the horn to subsequent work stations where the edge hooks 17 and 18 are interlocked and bumped in the conventional manner. For many types of cans the bumped edges are soldered to provide the side seam 14. The blank A has now become a tubular can body as shown in Fig. 3.

In order to produce a smooth uninterrupted mouth edge on the upper end of the can and to bring the opening 19 in a surrounding outer spaced body wall (Figs. 5 and 6), the can body of Fig. 3 is subjected to a reshaping operation as will be explained in detail.

The end 24 of the tubular body which is stamped with the opening 19 is positioned in suitable die forming apparatus. Fig. 7 shows this perforated end portion of the tubular body 11 as it is engaged by an inner reshaping die part 46. The upper edge of the can body in this position is disposed just below a rounded annular channel 47 formed on the inner die part.

The die part 46 is surrounded by an outer reshaping die part 48. The parts when thus combined form an annular recess or groove 49. As the inner and outer die parts move relative to the can body 11 the upper edge of the body passes into the recess 49, the body edge turning outwardly and downwardly in the channel 47 thus producing a reenforcing edge curl 52 (Fig. 8).

Continued relative movement between the can body and the inner and outer die parts forces the body which is disposed adjacent the curl 52, around the channel 47. The curl thereupon is pushed down through the forming groove 49 as the upper portion of the body wall including the opening 19 is reshaped by drawing action as the body is turned inside out and into the final shape shown in Fig. 9. This forms the spaced annular double wall part which constitutes a hollow collar or flange member 53.

The can body 11 is thereby reenforced at the top as best illustrated in Fig. 5. The opening 19 generally is of the same shape and size even though the surrounding metal wall was drawn in different directions as the opening was moved from its inner wall position into an outer wall position. In its outer position, the opening is adapted for the reception of a lever opener, as hereinbefore explained.

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 steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore de-

scribed being merely a preferred embodiment thereof.

I claim:

1. A method of making containers, which comprises cutting an opening in a flat container blank along a marginal portion thereof, forming the said blank into a tubular container body with the marginal portion containing the opening disposed at one end of the body, longitudinally compressing and contracting the end of the body containing the opening to turn the outer edge of the body outwardly and thence inwardly toward the body side wall to produce an outwardly extending reenforcing edge curl on the body, and further longitudinally compressing and contacting the end of the body in the same direction while confining said edge curl to reshape the body by moving said edge curl inwardly along the side of the body wall while maintaining the dimensions of said opening substantially unchanged, whereby to produce an outer flat collar flange surrounding said body in spaced and substantially parallel relation thereto, said collar flange including said opening in an intermediate part thereof and terminating in said edge curl.

2. The method of making containers, comprising first longitudinally compressing and contracting an end of a tubular container body having an opening therein to turn the end of the body outwardly and thence inwardly toward the body side wall to produce an outwardly extending reenforcing annular edge curl on the body, and then further longitudinally compressing and contracting said end of the body in the same direction to produce a collar flange while confining said edge curl to reshape the body by moving said edge curl inwardly along the side of the body wall to position said opening in an intermediate part of the collar flange while maintaining the dimensions of said opening and the configuration of said edge curl substantially unchanged, whereby to produce said outer collar flange surrounding said body in spaced and substantially parallel relation thereto.

JOHN E. SOCKE.