

Nov. 30, 1937.

A. S. HIRSHMAN

2,100,480

METHOD OF MAKING CONTAINERS

Filed Jan. 14, 1937

Fig. 1

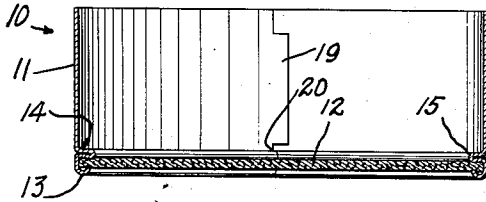


Fig. 2

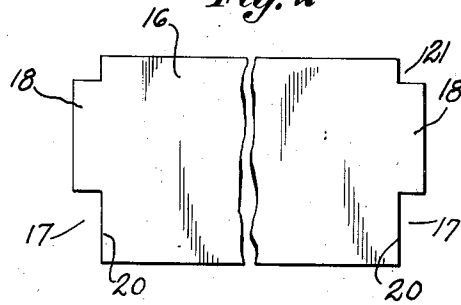


Fig. 3

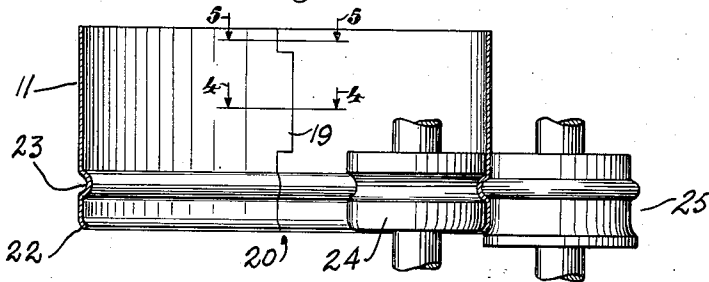


Fig. 4

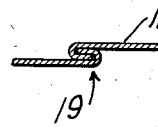


Fig. 6

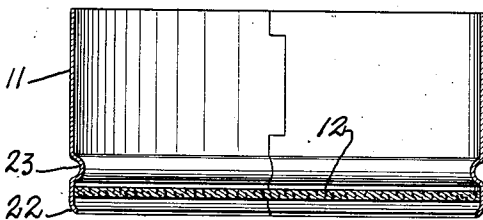


Fig. 5

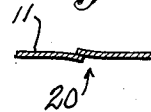


Fig. 7

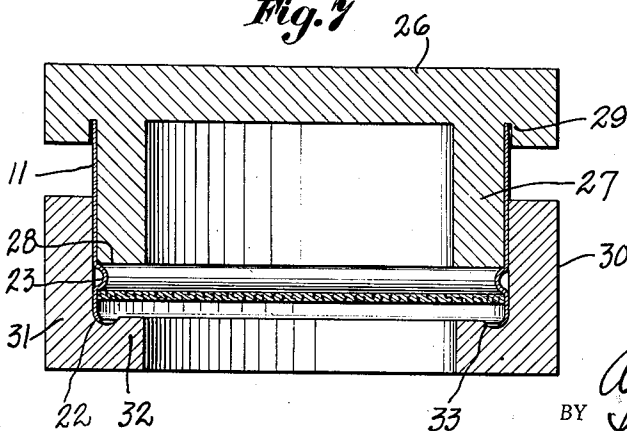


Fig. 8

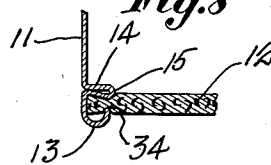
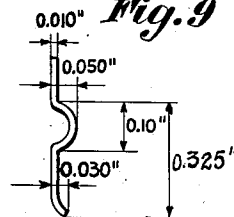


Fig. 9



BY

Abram S. Hirshman INVENTOR.
Miss Chumacher ATTORNEY.

UNITED STATES PATENT OFFICE

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METHOD OF MAKING CONTAINERS

Abram S. Hirshman, Brooklyn, N. Y., assignor
to Cordiano Can Co., Inc., Brooklyn, N. Y., a
corporation of New York

Application January 14, 1937, Serial No. 120,481

2 Claims. (Cl. 113—120)

This invention relates to containers and methods for making the same.

One object of the invention is to provide an improved method adapted for the inexpensive quantity production of a container having a side wall consisting of thin sheet metal, and an end or bottom wall consisting of a disc of cardboard-like material.

Containers of this type have certain distinct advantages, since they are cheaper because less metal is used; they have less weight; and the painting of such a container is simplified, because the end disc can be cut out of colored paper, and in fact, advertising matter may be cheaply printed on the paper before it is assembled as a part of the container. Obviously these operations are considerably more expensive to perform on metal.

In containers of this kind it has been known to secure the cardboard bottom to the side wall between suitable annular beads and lips. However, it has not been known how to cheaply produce such a container, and the methods heretofore available have been so expensive as to vitiate any savings that might be obtained by the use of the cardboard bottom.

Although reference is made herein to cardboard-like material, this term is intended to include any non-metallic material having a suitable degree of stiffness combined with pliability, as may be required by the practice of the invention hereinafter described and claimed. Thus the term may include various fibrous, pressed, or composition materials. In certain of its aspects, the invention may also be applicable to bottom discs that lack pliability, including materials such as metal, wood, compositions and the like, especially where decorated before the assembling. It will be understood that the invention applies to end discs whether used as tops or bottoms, these terms being merely illustrative.

It is therefore an object of the invention to provide a new and improved method which shall realize all of the advantages hereinbefore noted, and which shall require relatively few steps, and be adapted for efficient operation in quantity production.

It will be understood that the various steps of the method are herein disclosed merely as illustrative, and are susceptible of variation and substitution and interchange in respect to the order thereof.

It is a further object of the invention to provide a container having a cardboard bottom secured by opposed annular lines of pressure that clamp

into the bottom to lock the same against forcible removal in either direction.

The drawing, which is intended to aid in the disclosure of the process, is submitted merely in an illustrative and not in a limiting sense.

In the drawing:

Figure 1 is a view in vertical section showing a container produced according to the invention.

Fig. 2 is a view of a blank of which the side wall may be made.

Fig. 3 is a sectional view of the side wall being subjected to a spinning operation according to one step of the invention.

Figs. 4 and 5 are sectional views taken on the horizontal lines 4—4 and 5—5, respectively, of Fig. 3.

Fig. 6 is a vertical sectional view showing the next succeeding step of the invention.

Fig. 7 is a vertical sectional view showing the final step of the invention for producing the container of Fig. 1.

Fig. 8 is an enlarged fragmentary sectional view showing how an end wall is clamped.

Fig. 9 is a sectional view showing dimensional details.

Generally described, the invention contemplates subjecting a circular or cylindrical side wall to a single spinning operation to slightly inturn an edge of the wall and to simultaneously infold the wall in relative proximity to said edge, according to a comparatively gradual or shallow shape or curvature. According to the second step a snug fitting cardboard disc is inserted in the side wall and snapped over the fold to lie between the latter and the inturned edge. The third, final step requires that the side wall shall be subjected to axial pressure to cause said fold to be flattened and the slightly inturned edge simultaneously formed into a lip for clamping the disc between the latter and the flattened fold.

Referring in detail to the drawing, 10 denotes a container made according to the invention. The same may include a side wall of any suitable shape, for example, circular or cylindrical as shown. This side wall may consist of any suitable metal, for instance, of the type generally used in making of small packages or cans and adapted to be readily worked by spinning and pressing operations. The container 10 may include an end wall or bottom disc 12 which may be made of like material but preferably consists of cardboard or similar materials. This cardboard may be moisture proof or may have been otherwise treated as desired. For connecting the disc 12 to the side wall 11, the latter may have

at its end or bottom edge an annular lip 13, and a flattened annular fold or bead portion 14 integral with the wall 11. Between the inward extending lip and fold the disc 12 is annularly tightly clamped. The fold 14 may lie in a generally horizontal plane, and the lip 13 preferably extends inward and upward in snug line contact with the disc 12. In course of flattening the fold 14 against the disc 12, the inner edge portion 15 of the fold presses into the disc 12 to likewise afford a tight line contact therewith, as will be hereinafter described. The close proximity of the lip 13 and fold 14, with the disc 12 clamped therebetween, provides a strong reenforced structure. The side wall 11 may consist of a blank 16 which may have corner cut outs as at 17 to provide projecting portions 18 at opposite sides thereof. These projections may be beaded or seamed as at 19 in the usual manner, except at the cut outs 17, where the edges 20 merely slightly overlap each other as shown in Fig. 5. This facilitates the forming of the fold 14 and lip 13. Similar shorter cut outs may be provided at 21 to permit the upper edge of the container wall to be readily beaded over, if desired.

The method of making the container 10 will now be described. After the blank 16 has been formed into a cylindrical wall 11, the latter is subjected to deformations in any suitable manner, as by spinning or rolling operations to slightly annularly inturn the lower edge of the wall 11 as at 22 and to form the annular reverse fold 23. These operations may be simultaneously performed as by means of the tools or rollers 24, 25. It will be noted that the edge 22 extends inward and downward so as to be substantially readily shaped into the lip 13. The fold 23 extends inward and is of gradual shape or curvature; it may be of generally V-shape in cross section and is open outwardly; but in fact, any shape may be used which can be easily produced by rolling or spinning. The fold 23 is subsequently formed into the part 14.

As the second step of the method, the snug fitting disc 12 is inserted in the wall 11 and is pressed downward to snap over the fold 23 so as to lie between the latter and the inturned edge 22 as shown in Fig. 6. This action is facilitated by the slope of the fold 23.

As the third step of the method, the wall 11 is subjected to axial pressure to flatten the fold 23 to produce the fold or bead 14, and to complete the inturning of the edge 22 to produce the lip 23. This action may be supplemented by axial pressure on the fold 23 and edge 22 such as to aid in producing the parts 14 and 13. At the same time, the wall 11 may be outwardly supported against collapse or unintended deformation. These different actions may be effected simultaneously.

For example, a forming die may be used which may include a die member 26 having a cylindrical wall 27 fitted in the wall 11, the lower annular edge 28 of said wall being adapted to exert pressure on the fold 23. The die member 26 may also have a grooved portion 29 for receiving and annularly supporting the upper free edge of the wall 11 against collapse or distortion. A second die member 30 may have a cylindrical wall 31 surrounding the wall 11 to inwardly support the same especially at the region of the fold 23, and an inward extending annular flange 32 grooved as at 33 to form the edge 22 into the lip 13. It will

now be apparent that upon pressing the die members 26, 30 toward each other, the parts 13, 14 are directly formed with the cardboard squeezed and clamped therebetween to thus produce the container 10.

The method described results in a double line contact of the wall 11 with the disc 12 as indicated in Fig. 8, at the bight or edge 15 of the fold 14, and at the edge 34 of the lip 13, so as to prevent the disc 12 from being pulled out of engagement.

The dimensions of the several parts may be significant in the practice of my method and hence are indicated in Fig. 9, but only in an illustrative and not in a limiting sense. The thickness of the cardboard disc 12 may be approximately 0.055 inch. The thickness of the fold 14 near the edge 15 is slightly greater than three times the thickness of the metal. The width of the fold 14 is approximately fifty percent greater than that of the fold 23, due to the flattening. If the thickness of the metal of the wall 11 be increased, the fold 23 and inturning of the edge 22 may be correspondingly increased. The compressive strength of the material of the disc 12 may also be a factor, because it may assume considerable stress, whereas if unduly weak, it may become cut unless the axial stress is taken up mainly by the metal of the wall 11.

It will now be seen that my invention fulfills the objects stated and is well adapted for practical use.

I claim:

1. The method of making a container including subjecting the circular wall thereof to a forming action to simultaneously partially form an inward extending annular lip at one end thereof and an inward extending annular reverse fold to constitute a bead, inserting into said wall through the other end thereof a snug fitting disc of a relatively stiff but somewhat yielding material and pressing said disc to snap over said bead so as to lie between the latter and the lip, and finally subjecting said wall to axial pressure so as to flatten the bead to project further inward and to simultaneously cause said lip to be curled to thus secure said disc to said wall.

2. The method of making a container having a cylindrical side wall of pliable sheet metal and a bottom wall consisting of a disc of cardboard-like material, including forming a blank having cutouts leaving projecting portions at opposite edges thereof, beading together the projecting portions to form the said wall with said cutouts located at the lower portion and lower edge of said wall, annularly forming a gradual reverse inward extending fold in said lower portion of said wall in spaced relation to the lower edge thereof and simultaneously annularly inturning said lower edge, inserting said disc in snug fitting relation in said wall and pressing said disc downward over said gradual fold so as to lie between the latter and said inturned edge, and finally exerting axial pressure on said wall including subjecting said fold and said inturned edge to generally axial forming pressure to flatten the fold and to further inturn said inturned edge to thus simultaneously provide annular projections between which said disc is tightly annularly secured.

ABRAM S. HIRSHMAN.