April 16, 1963 D. G. NELSON 3,085,324

METHOD OF MAKING TWO-PIECE CLOSURE CAPS

Filed April 1, 1959

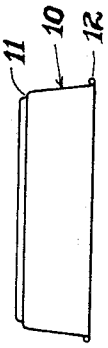


Fig. 1.

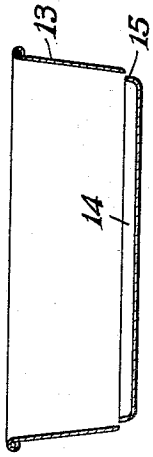


Fig. 2.

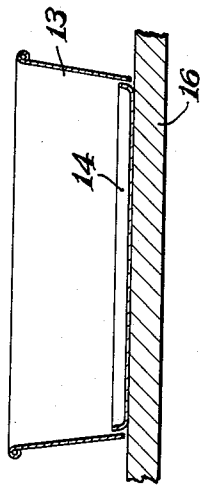


Fig. 3.

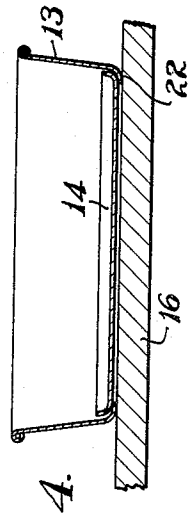


Fig. 4.

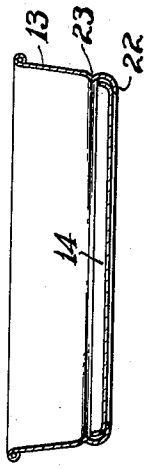


Fig. 5.

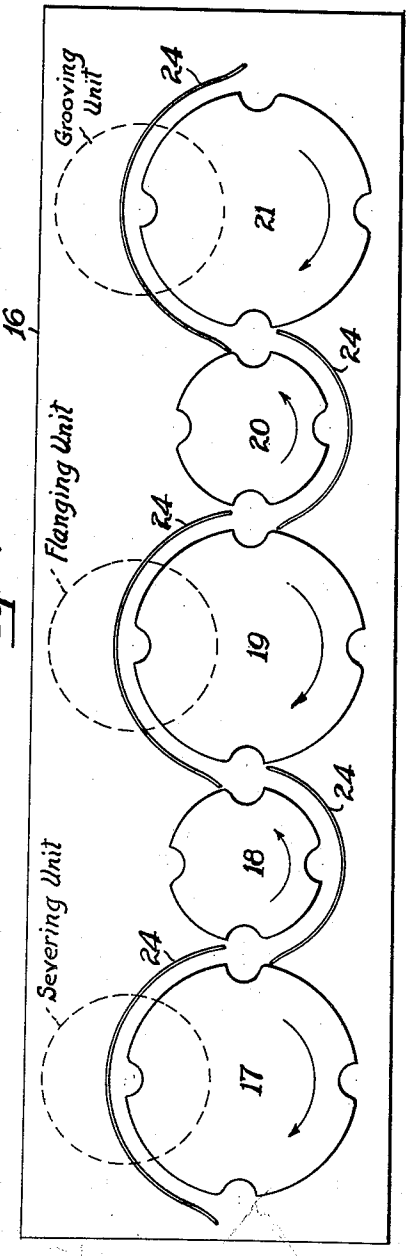


Fig. 6.

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METHOD OF MAKING TWO-PIECE CLOSURE CAPS

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3 Claims. (Cl. 29—416)

This application relates to the manufacture of two-piece container closures of the type comprising a closure disc with a turned-down edge and a flanged retaining collar, and particularly to the manufacture of such closures in which the two parts are made from a single blank by drawing the blank to form a shell having a top and a skirt, severing the skirt near its top to provide a collar and a closure disc with a turned edge and deforming the collar to retain the disc in place.

It is an object of this invention to provide an improved method for the manufacture of two-piece closures. More particularly, it is an object of the invention to simplify the manufacture of two-piece closures from a single blank. Specifically, the object of the invention is to provide an improved transfer of the articles after severing whereby the improved two-piece closures are made with fewer steps and, consequently, in less space. Other objects and advantages will appear from the following description of a preferred form of my invention, reference being had to the accompanying drawings, in which:

FIG. 1 is a vertical sectional view showing the drawn shell prior to severing the skirt;

FIG. 2 is a vertical sectional view showing the parts after severing the skirt of the shell;

FIG. 3 is a vertical sectional view showing the association of the parts as they leave the severing unit and, partly broken away, the press table on which the parts travel;

FIG. 4 is a similar view showing the parts as they leave the flanging unit;

FIG. 5 is a vertical sectional view showing the assembled parts as they leave the grooving unit; and

FIG. 6 is a schematic plan view illustrating the preferred installation for carrying out the method of my invention.

It is preferable that two-piece closures be made from a single blank, since this results in less scrap loss than blanking the collar and disc from separate sheets, and this has been done by severing the top and part of the skirt of a drawn shell from the remainder of the skirt to provide an edged disc and a collar and sizing the disc to assure passage within the collar. It is also preferable that two-piece closures be assembled so as to permit relative movement of the parts when being removed from a container, yet securely enough to permit further handling as units, and attempts toward this result have been made by flanging the collar above the disc and deforming the collar, as by forming a groove therein, below the disc. Since my invention is not concerned with the particular known means for severing, flanging and grooving, none are shown in the drawings.

It is preferred for the practice of my invention that the shell **10** be drawn with a shoulder **11**. The shell may be provided with a beaded edge **12** and any required knurling and decorating operations may, if desired, be carried out before feeding the shell, by any suitable means, such as star wheel **17**, to the severing means. After the shell **10**, which may be inverted as shown, is severed as by pinching or shearing at the shoulder **11** to form a collar **13** and a separate disc **14** with a turned edge **15**, the disc is placed within the collar by the axial or telescoping movement illustrated by FIGS. 2 and 3

and the collar **13**, with the disc **14** therein, is moved on the flat surface of table **16**, as by star wheels **17**, **18** and **19**, to the flanging unit where a suitable curling die turns the edge of the collar to form a flange **22** under the disc. The collar, with the disc resting on this flange, is then moved further on the table by the star wheels **19**, **20** and **21** to the grooving unit where the groove **23** is formed in the collar on the opposite side of the disc from the flange **22**, so that the disc is held between the flange and the groove. It will be understood that transfer from one to another of the star wheels **17**, **18**, **19**, **20** and **21** is assured by cooperation of the guide strips **24** and that the star wheels move the parts laterally over the surface of the table **16**.

The assembly shown in FIG. 5 can be fed as a unit to subsequent operating stations, such as, for example, to equipment for placing a liner therein, which may be done by flowing liner material and molding it in place, so long as the thickness of the flowed material does not exceed the depth of the turned edge of the disc, or treated as a finished product for sale to packagers who provide the sealing liner and apply the closure to a container by reforming the collar below the groove to conform to closure-retaining formations on a container.

It will be understood that it is within the concept of my invention to carry out the steps without inverting the shell, since any of the usual dies for severing, flanging and grooving can be inverted and it is necessary only that the parts be upright for transfer in accordance with my invention. It is also immaterial when such operations as beading and knurling take place. In fact, since the groove is preferably formed by a rotary operation, and a bead and a flange can be spun, combination of these three operations, in making a closure of sufficient height to allow room for the tools, would be within the skill of those practicing the closure making art, and, if the knurling is to be placed below the groove, suitable tools might be developed to add this fourth operation at a single rotary work station, requiring my improved transfer only for moving the parts from the severing unit to the four-operation unit. Resort to any of these alternatives or to any combination of them would not remove the method from the scope of the appended claims.

I claim:

1. The method of making a two-piece container closure from a single blank comprising providing a shell having a top and a skirt, completely severing the skirt on a plane parallel to and below the top to form a collar and a separate disc with an integral turned edge extending toward said collar, maintaining the severed collar and disc in their initial axial alignment, placing said disc within said collar by relative axial movement of the disc and collar, moving the collar with the disc therewithin, upon and relatively to a flat surface to prevent accidental separation of the disc from within the collar during such movement, into position for deforming the collar, and deforming the collar above and below the disc to retain the disc between the deformations.

2. The method of making a two-piece container closure from a single blank comprising providing a shell having a top and a skirt, completely severing the skirt on a plane parallel to and below the top to form a collar and a separate disc with an integral turned edge extending toward said collar, maintining the severed collar and disc in their initial axial alignment, placing said disc within said collar by relative axial movement of the disc and collar, moving the collar with the disc therewithin, upon and relatively to a flat surface to prevent accidental separation of the disc from within the collar during such movement, into position for deforming the collar, deforming the collar to provide a support beneath the disc, moving the collar with the disc resting on the support

into position for further deforming the collar, and deforming the collar above the disc to retain the disc against the support.

3. The method of making a two-piece container closure from a single blank comprising providing a shell having a top and a skirt having an outward shoulder, completely severing the skirt at the shoulder to form a collar and a separate disc with an integral turned edge extending toward said collar, reducing the diameter of the disc while maintaining the severed collar and disc in their initial axial alignment, placing said disc within said collar by relative axial movement of the disc and collar, moving the collar with the disc therewithin, upon and relatively to a flat surface to prevent accidental separation of the disc from within the collar during such movement, into position in a flanging unit, forming a flange on the collar beneath the disc, moving the collar with the disc resting on the flange into position in a grooving unit, and forming an annular groove in the collar to retain the disc between the flange and groove.

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