

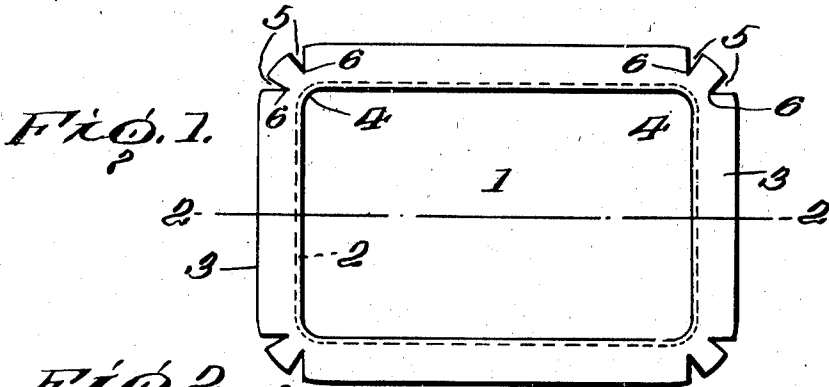
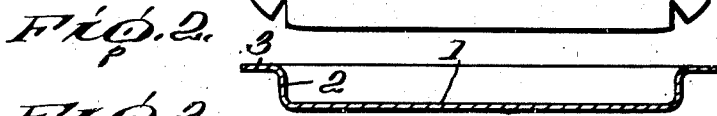
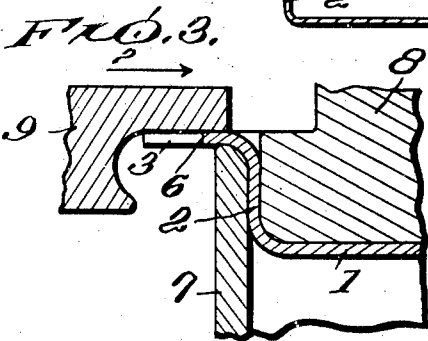
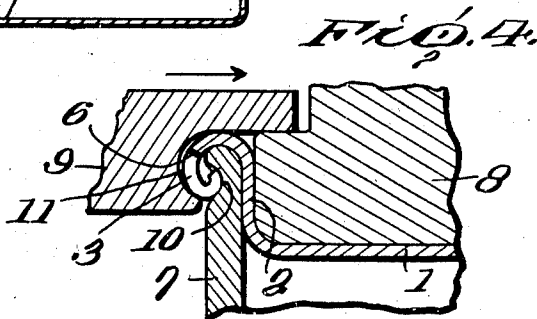
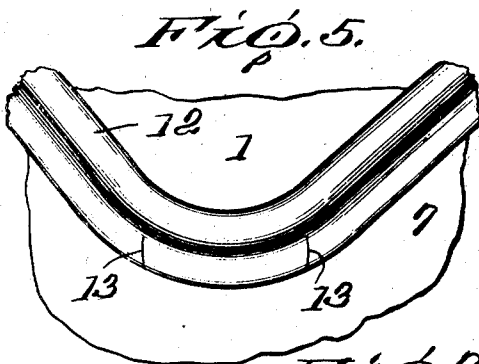
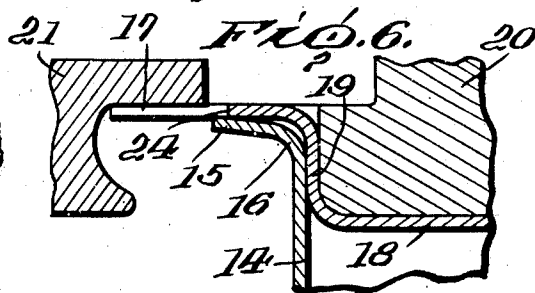
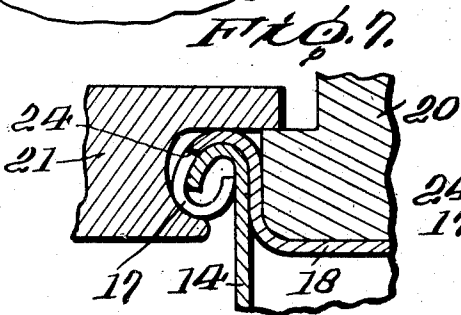
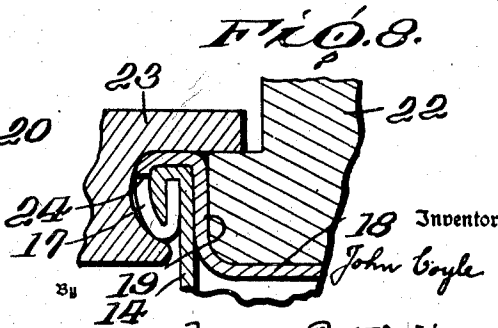
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METHOD OF ATTACHING METAL CLOSURES TO CONTAINERS

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METHOD OF ATTACHING METAL CLOSURES TO CONTAINERS

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1 Claim. (Cl. 113-120)

1

The invention relates to new and useful improvements in the method of making containers having flat sides and rounded corners and more particularly the attaching of metal end closures to the body of the container.

An object of the invention is to provide a method of seaming a metal end to a container body having flat sides and rounded corners whether said body be of fiber or of metal so that the seam connecting the metal end to the body is of uniform tightness along the flat sides of the container and also along the rounded corners.

A further object of the invention is to provide a method of the above type, wherein the flange of the closure end at the rounded corners is so treated before curling the same that said flange may be rolled downwardly and inwardly into a smooth curl uniformly gripping the wall of a fiber container body.

A further object of the invention is to provide a method of the above type wherein the flange of the closure end at the rounded corners is so treated before seaming that said flange may be rolled with the flange of the metal can body into a tight double seam at the rounded corners as well as along the flat sides of the container.

These and other objects will in part be obvious and will in part be hereinafter more fully explained.

In the drawings, Figure 1 is a plan view of a closure end after it has been formed with the flange and the rounded corners of the flange notched;

Figure 2 is a sectional view on the line 2-2 of Figure 1;

Figure 3 is a view showing more or less diagrammatically and in section the initial step in the method of attaching a metal end to a fiber body;

Figure 4 is a view showing the flange curled into gripping engagement with the fiber body, the view being taken at the rounded corner and at one of the notches in the flange;

Figure 5 is a view on an enlarged scale showing a portion of a container having the metal end secured to the fiber body;

Figure 6 is a view showing the initial step in the method as applied to the securing of a metal end to a flanged metal can body;

Figure 7 is a view similar to Figure 6 but showing the completion of the first seaming operation; and

Figure 8 is a view similar to Figure 7 but showing the final seaming operation, the view being

2

taken at the rounded corner and through a slit formed in the flange of the metal end closure.

While the improved method may be employed for the securing of a metal end to either a fiber body or to a metal body, it is especially adapted for the connecting of a metal end to a fiber body having flat sides and rounded corners. The method will, therefore, be described in detail in connection with the forming of a fiber container body having metal ends secured thereto.

The metal end, whether it be attached to a fiber body or to a metal can body, is initially constructed in the same way except perhaps as to dimensions. A metal blank is die-shaped so as to provide a metal end having a bottom portion, surrounded by a substantially vertical wall 2 from which projects a flange 3. The metal end as shown in Figure 1, has parallel side walls and parallel end walls and these side and end walls are joined by rounded corners indicated at 4 in the drawings. The flange at each rounded corner is cut so as to provide V-shaped notches 5. Each rounded corner, as shown in Figure 1, is provided with two V-shaped notches. These V-shaped notches extend only part way across the flange, terminating at the points indicated at 6-6.

The fiber can body indicated at 7 may be of any desired construction, but is preferably formed by convolutely winding a fiber strip on a mandrel into a tube and the tube is then cut into body lengths. The fiber body, however, may be spirally wound if desired. The depression in the metal end closure is dimensioned so that it fits snugly within the container body with the flange of the metal end resting on the end of the wall of the container body. After the parts have been assembled as shown in Figure 3, a chuck 8 conforming in shape to the recess in the can end is placed in engagement with the end, and a seaming die 9 is brought into engagement with the flange 3 for curling the same. This seaming die is made up of sections which are moved radially and inwardly for the curling of the flange. Sectional dies of this type are well known in the art and a detailed description thereof is not thought necessary.

The sections of the die, however, are so dimensioned that the curled surface is substantially continuous when the curl formed in the flange is completed. The inward movement of the sections of the curling die will roll the outer edge of the flange into a curl, indicated at 10, and will roll the flange downwardly and inwardly as indicated at 11 so as to press this curled edge 10

3

against the outer wall of the fiber body. The pressure of the seaming die will cause this curled edge 10 to be embedded in the fiber body as shown in Figure 4.

Various efforts have been made heretofore to curl the flange of a metal end having flat sides and rounded corners so that said curled edge will snugly grip the wall of a fiber body. It is, however, difficult to roll the flange at the rounded corners so that it will grip the body due to the fact that the flange as it is curled inwardly and downwardly is continuously moving to a shorter radius and this results in a puckering of the intumed part of the flange so that it does not lie smoothly in contact with the body wall. Applicant, in his new method, has constructed the flange of the metal end at its rounded corners with notches and thus takes out sufficient metal so that the metal parts remaining can be curled into a smooth substantially continuous contact with the body wall. These notches are so dimensioned and extend into the flange a sufficient extent so that when the flange is curled, the side edges of the notches will be brought into contact and therefore the inner curled part 16 which is embedded in the fiber body makes a continuous line contact therewith.

These slots in the finished curl do not interfere with the sealing of the end of the body wall as they terminate at the point indicated at 8 in Figure 4. The metal of the end directly above the end wall of the container body is unbroken all the way around and therefore a very tight seal can be obtained. Likewise, a very tight grip can be obtained between the curled portion and the body wall which is likewise substantially continuous all the way around the container end. This produces a seam wherein the metal is smoothly and uniformly rolled into gripping contact with the body wall with a resulting tight seam which firmly joins the metal end to the fiber body. In Figure 5 the end seam is indicated at 12 and the contacting edges of the V-notches are indicated at 13, 13.

It will be noted from the above that the flange on the metal end is not precurled but is die-shaped from its straight horizontal position shown in Figure 3 to the curled position shown in Figure 4 and the seam completed by one set of dies which are curved on their operating faces so as to conform to the curvature of the flange in its final form as shown in Figure 4.

As has already been noted, the improved method may be applied to the double seaming of a metal end to a metal body of a container having flat sides and rounded corners. The container end will be shaped the same as shown and described in connection with Figures 1 and 2. However, the flange will be of slightly greater width in order to provide sufficient metal to form the interlocked hooks of a double seam. In Figure 6 of the drawing there is shown a metal can body 14 which is provided with a flange 15 joined to the body wall by a curved section 16. The flange 17 of the closure end 18 overlies the flange 15 of the container body. The closure end has a recess surrounded by a substantially vertical wall 19 which carries the flange 17. After the parts have been assembled as shown in Figure 6, a chuck 20 is inserted in the closure end and a seaming roll or a series of seaming rolls 21 are preferably used for the forming of the double seam. Either the seaming rolls or the can body with the closure end clamped thereto are rotated. The seaming rolls as they travel relative to the

4

closure end being seamed to the can body are gradually moved inwardly until the flange on the closure end is curled about the flange on the body wall, as shown in Figure 6. The flange of the closure end is rolled downwardly and inwardly and this causes the flange on the container body likewise to be rolled downwardly and inwardly. In this figure there has been illustrated the first seaming operation which is a loose joining of the closure end to the container body.

The container with the end thus attached is then submitted to a second seaming operation. In this second seaming operation a chuck 22 is inserted in the end and a second seaming operation roll 23 is caused to engage the partially formed seam and roll the parts into a tightly interlocked double seam, as shown in Figure 8. These seaming operations are of the usual character and further detailed description thereof is not thought necessary.

The flange of the closure end is provided with the V-shaped notches 17. There are two notches at the rounded corners. This may be varied and more than two used if desired. The notches are so dimensioned that when the flange is rolled into the double seam, the side edges of the notches are brought into close contact, as indicated at 13 in connection with the seaming of a closure end to a fiber body. The closed up notch extends to a point indicated at 24 in Figures 7 and 8. This does not interfere with the seal as the metal parts are brought into intimate contact throughout the upper portion of the double seam and the notches are closed up so that the lower part of the double seam is substantially one continuous wall.

It has been found very difficult to roll the flange of a metal end into a tight double seam at the rounded corners of a container having flat sides and ends for the reason that the radius of curvature of this rounded end is very small. The rolling of the flange downwardly and inwardly results in a shortening of the radius of the outer portion of the seam with the result that on this short radius of curvature of the rounded end the metal will be gathered or puckered, which interferes with the tightness of the seam. With these V-shaped notches, however, the flange may be rolled radially at all points inwardly into a very tight smooth uniformly curled double seam.

While it is preferred in the securing of the metal end to the metal body to use seaming rolls traveling about the end, it will be understood from certain aspects of the invention that a sectional die such as described above in connection with the fiber container body, may be used for curling the flange of the metal end into a relatively tight seam with the flange of the metal can body. Such a seam may be sufficiently tight for many purposes, but when it is desired that a very tight seam shall be produced, then it is preferred to use the seaming rolls.

It is obvious that many changes in the details of construction may be made without departing from the spirit of the invention as set forth in the appended claim.

I claim:

The method of attaching metal closure ends to container bodies having flat sides and rounded corners consisting in forming a metal closure end with a depression surrounded by a wall adapted to fit within the flat sides and rounded corners of the container body, and a flange extending outwardly all the way around the closure end, which flange overlies the body wall when

the closure is placed therein, cutting the flange at each corner so as to provide two V-shaped notches located at the end of the straight side portions of the flange and terminating in the flange at the outside of the body wall, said notches being of a size so that the sides of the retained portions of the flange at the rounded corners are substantially parallel, placing said metal closure end on the container body and curling the flange downwardly and inwardly into locking engagement with the body member to provide a smooth substantially continuous portion with the side edges of the notches in contact.

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