May 30, 1933. J. COYLE 1,912,259

CAN BODY FOR SANITARY CANS

Filed July 26, 1932 2 Sheets-Sheet 1

Fig. 1

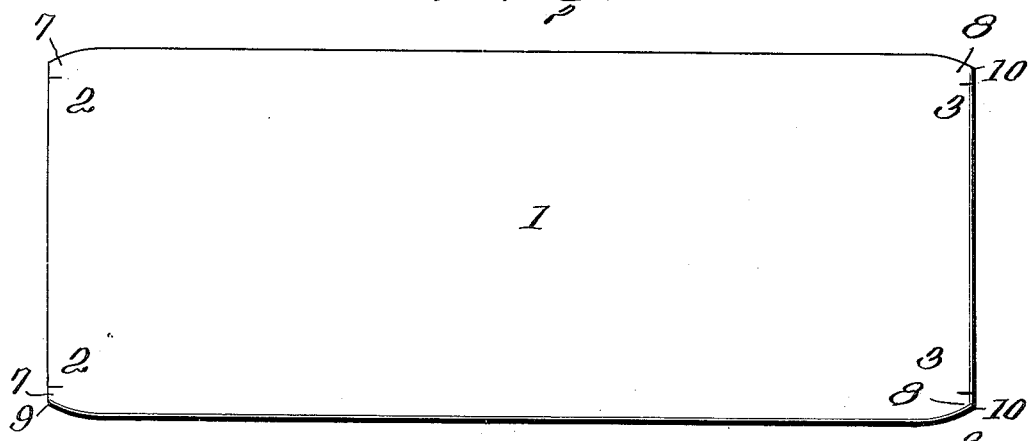


Fig. 2.

Fig. 3.

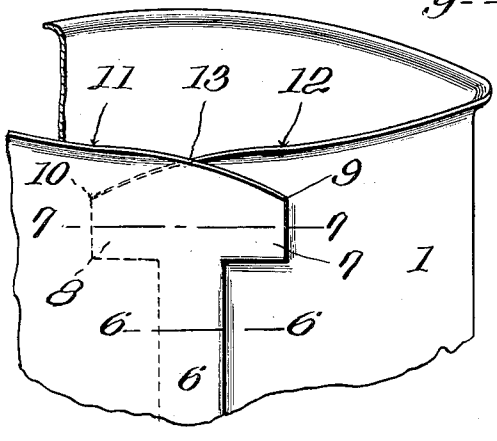
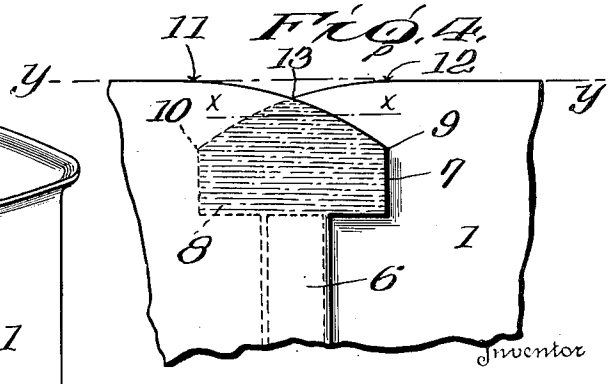


Fig. 4.



Inventor

John Coyle

By Sturtevant, Mason & Coler

Attorneys

May 30, 1933. J. COYLE 1,912,259

CAN BODY FOR SANITARY CANS

Filed July 26, 1932 2 Sheets-Sheet 2

Fig. 5.

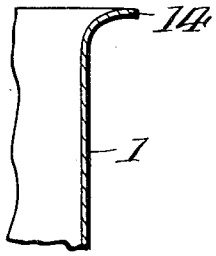


Fig. 6.

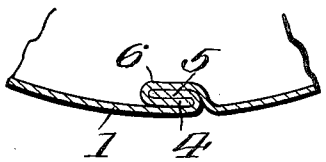


Fig. 7.

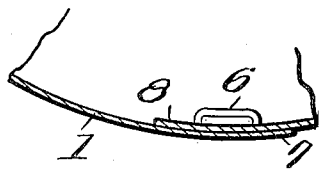


Fig. 8.

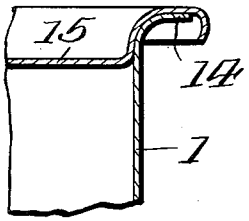


Fig. 9.

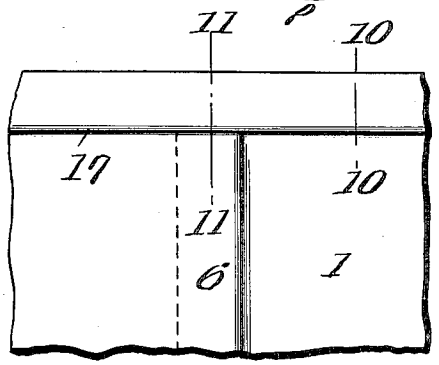


Fig. 10.

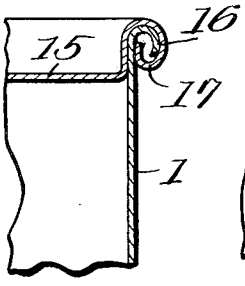


Fig. 11.

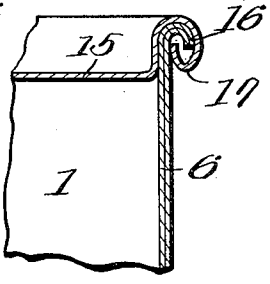
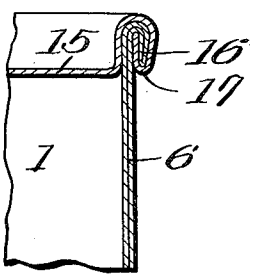


Fig. 12.



Inventor

John Coyle

By Sturtevant, Mason & Porter

Attorneys

Patented May 30, 1933 1,912,259

UNITED STATES PATENT OFFICE

JOHN COYLE, OF BALTIMORE, MARYLAND, ASSIGNOR TO CONTINENTAL CAN COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

CAN BODY FOR SANITARY CANS

Application filed July 26, 1932. Serial No. 624,869.

The invention relates to new and useful improvements in a can body for a sanitary can, that is, a can wherein end closures are joined to the body by a double seam.

An object of the invention is to provide a construction of can body having a lock and lap side seam wherein the solder bond joining the lap sections is extended at each side of the interlocked portions of the side seam, and the lap sections are so shaped that the solder bond is relieved from all strain during the initial turning of the flange, and wherein the strain on the solder bond during the completion of the formation of the flange is a shifting strain.

A further object of the invention is to provide a can body of the above type wherein the outer edges of the lapping portions are so shaped that during double seaming, a space is provided for the expansion of the lapping portions rolled into the double seam, so that the double seam throughout its entire length may be uniform in cross section.

In the drawings:

Figure 1 is a view showing more or less diagrammatically, and on a small scale, a blank which has been provided with slits and shaped to as to form the improved can body;

Fig. 2 is a similar view of a portion of the blank with the hooks bent and positioned for interlocking;

Fig. 3 is a view of one end of the can body embodying the improvements, with the side seam completed and flanged;

Fig. 4 is an enlarged view of a portion of one end of the side seam;

Fig. 5 is a vertical sectional view of a portion of one end of the flanged can body;

Fig. 6 is a sectional view on the line 6—6 of Fig. 3;

Fig. 7 is a sectional view on the line 7—7 of Fig. 3;

Fig. 8 is a view showing diagrammatically a portion of a can body with an end closure applied thereto preparatory to double seaming;

Fig. 9 is a side view of a portion of a can body with the closure end secured thereto by double seaming;

Fig. 10 is a sectional view on the line 10—10 of Fig. 9, through the can body after the first seaming operation has rolled the closure end and the flange into a partially formed double seam;

Fig. 11 is a similar view on the line 11—11 of Fig. 9; and

Fig. 12 is a view similar to Fig. 11, but showing the completed double seam.

The invention has to do with a can body which is particularly adapted for the forming of the so-called sanitary can, that is, a can wherein the end closures are secured to the flanged body by double seaming. It is a common expedient to form a can body for such a can by uniting the ends of the body blank by a lock and lap side seam. Throughout the greater portion of the side seam, the edge portions are interlocked. At the ends of the side seam, however, the metal parts are merely lapped so that they may be turned into a flange and the ends secured thereto by double seaming. This lock and lap seam is bonded by solder which joins the lapping portions at the ends of the side seam, as well as the interlocked portions. A great deal of difficulty has been experienced in the forming of the flange without rupturing the solder bond uniting the lapping portions of the side seam. Difficulty has also been experienced in forming a double seam without rupturing this solder bond. The present invention has particularly to do with the shaping of the metal parts forming the lap sections of the side seam. The body blank is slit or notched so as to form hooks, with a portion of the body blank at each end thereof extending beyond the formed hook, so that when the hooks are interlocked at the ends of the body blank, the lapping portions of the side seam will extend for a distance at each side of the interlocked portion of the side seam. This increases the width of the solder bond at the lap section of the side seam. While it is desirable to extend the width of the solder bond immediately at the end of the interlocked portions of the side seam, this would make an objectionable portion to flange or roll into an end seam, and therefore, the outside edges of the lapping sections of the side seam are cut away

and curved so that they intersect at a point well back from a line containing the extreme edges of the body blank, but within the limits of the flange to be formed on the can body. This extending of the lapping portions and the curving and shaping of the outer edges thereof produces a side seam which is very strong at the lapping sections thereof, and wherein the strain on the solder bond is entirely relieved during the initial turning of the flange, and is a shiftable strain during the completing of the flange, so that the solder bond is not ruptured, and this shaping of the edges of the lapping portions also produces a space in the double seam into which the lapped portions of the metal may expand or flow during the forming of the double seam, and therefore, a double seam which is uniform in cross section throughout may be produced.

Referring more in detail to the drawings, the can body is formed from a blank indicated at 1. The blank is provided with slits 2, 2 at one end thereof, and slits 3, 3 at the other end thereof. Between the slits 2, 2 the metal is turned into a hook 4, and between the slits 3—3 the metal is turned into a hook 5. The hook 4 faces in one direction and the hook 5 in the other, so that when the blank is bent into a cylindrical shape, these hooks may be interlocked, and this will form the interlocked portion of the side seam 6. In Fig. 6 of the drawings, a sectional view is shown through the side seam 6, and showing the interlocked hooks 4 and 5. At the ends of the hook 4 are the lapping portions 7, 7 of the side seam, and at the ends of the hook 5 are the lapping portions 8, 8 thereof. When the hooks are interlocked, the portion 7 will overlie or lap on to the portion 8, as shown in Figures 3, 4 and 7. The portion 7 extends to one side of the interlocked portion of the side seam a distance substantially equal to the length of the hook 4. The portion 8 extends to the other side of the side seam at a similar distance. The metal parts at the ends of the side seam overlap from the point 9 to the point 10. The two lapping portions at the end of the side seam are similar in construction, and the description of one will answer for the other. The edge of the lapping portion 7 is curved from this point 9 to the point 11. The edge of the lapping portion 8 is curved from the point 10 to the point 12. These curved edges of the lapping portions intersect at the point 13. The line of the edge of the can body is indicated at *y—y* in Fig. 4, and it is noted that the edges of the lapping portions curve away from this line gradually until the points 9 and 10 are reached.

After the body blank has been shaped and the hook portions interlocked and bumped together, then solder is applied throughout the entire length of the side seam, which solder will bond together the lapping portions 7 and 8 at the ends of the interlocked portions, as well as the interlocked portions. The can body is then ready for flanging, and a flange indicated at 14 is formed on the can body 1 preferably by a flanging die which enters the cylindrical can body and will gradually expand and turn the end portion of the can body into the flange 14. This is a progressive turning action which produces the flange. The die contacts with the can body along the line *y—y*, Fig. 4, and the metal will be gradually turned and expands to produce the flange, said metal being turned outwardly substantially to the line *x—x* in Fig. 4. During this turning of the flange there is a single thickness of metal which is being turned until the point 13 is reached, so that during the initial turning of the flange, there is little or no strain on the solder bond joining the lapping portions 7 and 8. Whatever strain may be imposed on the solder bond is a pulling strain distributed over the entire solder bond. Likewise, the strain on the metal forming the flange is not localized, but distributed, and therefore, all likelihood of fracturing the metal is avoided. The strain along the curved edge gradually approaches the intersecting point 13 and continues to shift along said curved edge until the flange is completed. The metal in the initially formed portion of the flange is expanded to a much greater extent than that portion of the flange where it joins the can body. Not only is a comparatively small portion of the lapping metal sections forced outward into the flange, but the strains thereon are shifting strains and well within the elasticity of the metal, thus reducing the strain on the solder bond so that it is not ruptured.

The solder bond at the lapping portion is indicated by the broken shade lines in Fig. 4. It will be noted from Figs. 3 and 4 that the lapping portions of the side seam have been constructed so as to extend the solder bond in that portion where the metal is not turned into the flange, and at that portion which is turned into the flange, the strain on the solder bond has been reduced to a minimum.

After the body has been formed and flanged, then the closing end indicated at 15 is placed thereon, and this closing end has a portion thereof extending across and around the edge of the flange of the can body. A sealing material is placed in the channel thus formed in the closing end. The end is chucked on the can body, and either the body and end with the chuck are rotated, or the seaming rolls are caused to travel about the can body for rolling the can end and the body flange into a double seam.

Figure 10 is a sectional view through the seam at the end of the first seaming opera-

tion, and at one side of the double seam there is only a single thickness of metal in the flange. Figure 11 is a similar view centrally of the side seam and through a double thickness of the metal in the flange. It will be noted that there is a greater space or void between the end 16 of the flange and the lower part 17 of the rolled cover at the side seam where there are two thicknesses of metal. This is due to the cutting away of the overlapping sections as described above. In Figure 12 of the drawings, there is shown a section through the double seam after the completion of the second operation, and on a line centrally through the side seam. The pressure of the second operating roll causes the metal in the overlapped portions of the body to flow, and this will fill the space or void, but will not contact with the rolled portion 7 of the cover so as to enlarge the double seam where it crosses the side seam. In other words, the double seam is substantially uniform in cross section. If, due to variations in the thickness of metal, there are still voids in this region where the lapped sections are cut away, the sealing material will be caused to flow into and fill said voids, and a double seam is formed not only of uniform dimensions throughout, but wherein there is a tight seal throughout.

During the seaming operation, the metal parts are gradually rolled to their final position, as shown in Figures 10, 11 and 12. The pressure of the seaming roll first contacts with the curved edge of the lapping portions at a distance back from the center of the side seam. The pressure along the edge gradually shifts along the curved edge all the way to the finishing of the double seam. The maximum rolling or bending action in the metal is at the outer edge thereof where there is a single thickness of metal. The parts of the lapped portions of the side seam which are rolled into the double seam are caused to flow to a less extent, and the strain is well within the elasticity of the metal. This, together with the shifting point of application of maximum strain distributes the strain on the solder bond so that there is no likelihood of rupturing the solder bond during seaming.

From the above it will be apparent that by the construction of the lapping portions of the side seam described, there is little liability of disturbing the solder bond or causing a leak during double seaming.

It is obvious that minor changes in the shaping of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is—

1. A can body consisting of a metal blank having the ends thereof joined to form a lock and lap side seam and the end portions of the formed body flanged, the lapping portions at the ends of the side seam being extended each side of the locking portions and the outer edges of said lapping portions being gradually curved away from a line containing the edge of the blank and intersecting at a distance from said line and within the limits of the flange whereby the strain on the solder bond joining the lapping sections is relieved during the initial turning of the flange and is a gradual shifting strain during the completing of the turning of the flange.

2. A can body consisting of a metal blank having the ends thereof joined to form a lock and lap side seam and the end portions of the formed body flanged, the lapping portions at the ends of the side seam being extended at each side of the locking portions a distance substantially equal to the length of the interlocking hooks, and the outer edge of said lapping portions being gradually curved away from a line containing the edge of the blank, each curved edge beginning at a point at one side of the maximum lapping region extending to the other side thereof, and intersecting at a distance from said line within the limits of the flange, whereby the strain on the solder bond during flanging and during double seaming is reduced to a minimum and is a gradual shifting strain.

In testimony whereof, I affix my signature.

JOHN COYLE.