Sept. 14, 1937. W. G. PLUMB 2,093,056

SHEET METAL CAN BODY

Filed April 6, 1937

FIG. 1.

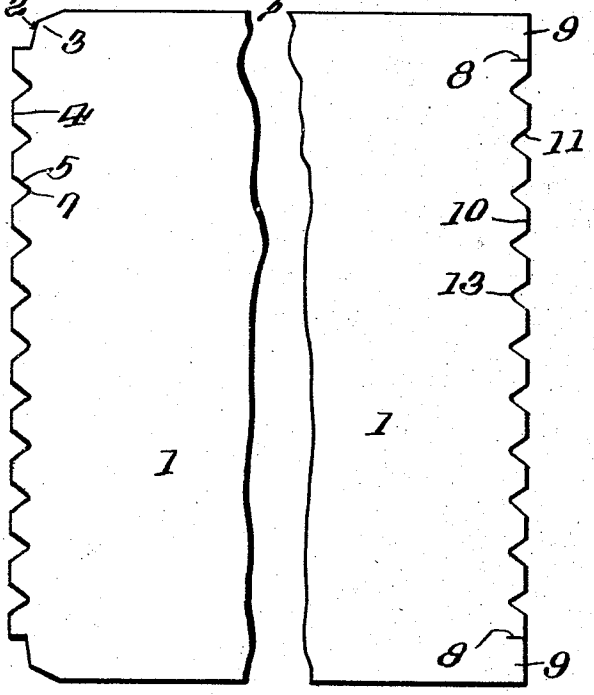



FIG. 4.

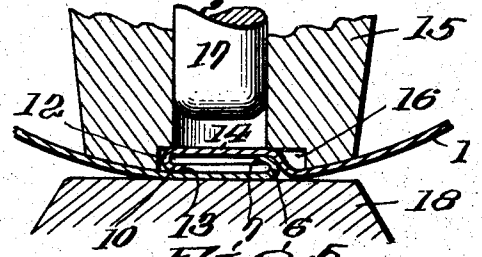



FIG. 5.

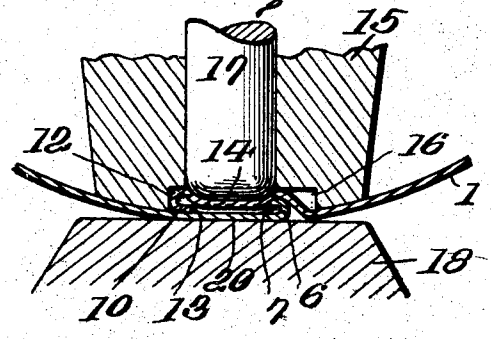



FIG. 6.

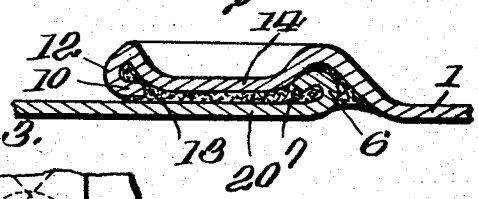



FIG. 2.

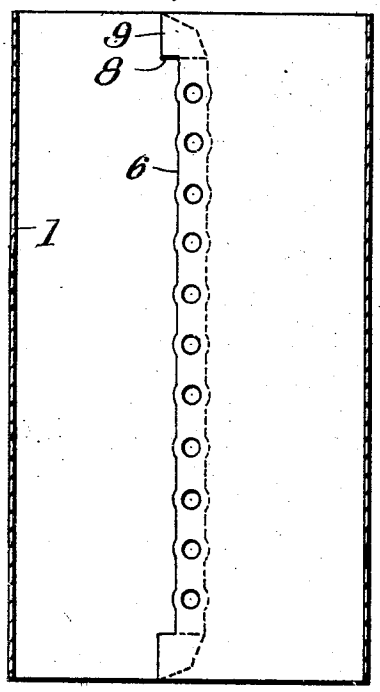



FIG. 3.

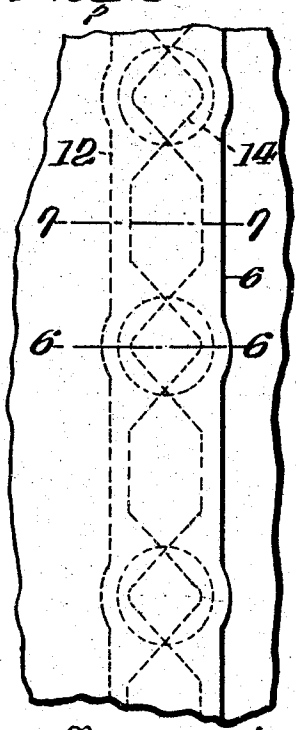
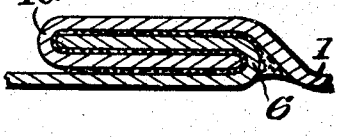



FIG. 7.




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# UNITED STATES PATENT OFFICE

2,093,056

## SHEET METAL CAN BODY

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Application April 6, 1937, Serial No. 135,337

2 Claims. (Cl. 220—76)

The invention relates to new and useful improvements in a sheet metal can body. It is a common practice in making can bodies from sheet metal to prepare the blank by shaping the ends thereof to provide hooks which are interlocked in the forming of a side seam. These hooks usually extend from one end of the can body to the other, terminating short of the end where there are lap sections only to facilitate the flanging of the can body. After the hooks have been formed and interlocked and bumped, then solder is applied to the side seam for the solder bonding of the same.

An object of the present invention is to provide a side seam of the above type wherein the walls of the body within the limits of the side seam are more efficiently tied together by the solder bond so as to give strength to the side seam to resist internal pressure.

In the drawing—

Figure 1 is a plan view of a body blank embodying the invention;

Fig. 2 is a vertical sectional view through the can body showing the formed and solder bonded side seam as viewed from the inside of the can body;

Fig. 3 is a view on an enlarged scale showing a portion of the side seam and indicating by broken lines, the position and the shaping of the hooks;

Fig. 4 is an enlarged sectional view through a portion of the side seam as it is submitted to the bumping mechanism and prior to the operation of the bumping mechanism thereon;

Fig. 5 is a view similar to Fig. 4, but showing the bumping iron as having contacted with the can body and the bumping of the side seam completed;

Fig. 6 is a sectional view on the line 6—6 of Figures 2 and 3, and

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

In carrying out the invention, a sheet of metal is cut so as to provide a body blank which is indicated at 1 in Fig. 1 of the drawing. The body blank is cut at one end thereof as indicated at 2, so as to provide the usual lap sections 3 and hook sections 4. The hook section 4 is notched at spaced intervals as indicated at 5. These notches are preferably V-shape, that is, the side walls of each notch intersect substantially at an angle of ninety degrees, and the vertex of the angle lies within the hook, but close to the base of the hook, that is, where the metal is folded to form the hook. This hook 4 is the outside hook as shown in Fig. 6, and the base of the hook is indicated at 6. The vertex of the triangular notch is also indicated in this Figure at 7. The other end of the blank is provided with slits 8 forming the usual lap sections 9, 9, and also forming a hook section 10 therebetween. This hook section, before the metal is bent to form the hook, is provided with a series of spaced notches 11 which are similar in shape to the notches 5. This hook 10 is the inner hook, that is, it is carried by the body wall which forms the inside of the side seam. The base of the hook is indicated at 12 in Fig. 5, and the vertex of the notches 10 is indicated at 13.

After the metal has been notched and shaped as shown in Fig. 1, then the hook portions are folded back and the body is shaped and the hooks are interlocked. The notches 5 and 11 are not only similar in shape, but they are directly opposed to each other, so that when the hooks are interlocked, one notch overlies the other notch, thus forming a substantially rectangular recess 14 as shown in Fig. 3. While these notches are referred to as having the side walls intersecting to form substantially a right angle, they are preferably curved at the vertex of each notch as shown on an enlarged scale in Fig. 3, to facilitate the cutting of the notches. The recess 14, however, is substantially rectangular when the side walls of the notches are arranged at the angle stated. This recess extends through both of the hooks, from the body wall carrying the outer hook to the body wall carrying the inner hook. The recess is wholly within the limits of the side seam where the base of the outer hook is indicated by the full line 6 in the drawing, and the base 12 of the inner hook is indicated by broken lines.

The bumping mechanism is slightly different from that used on an ordinary lock and lap side seam. The spline 15 is provided with the usual recess 16 to receive the interfolded parts during the bumping operation, and at spaced intervals, the spline is provided with anvil pins 17. The bumping iron 18 is of the usual construction and has a smooth face. When the bumping iron is brought into contact with the outer wall of the can body, the interfolded parts are forced into the recess and against the pins which project into the recess. The corners of the pins are rounded and are dimensioned so that when the metal parts are forced against the pins, the metal in the inner body wall, that is, the body wall carrying the inner hook, will be de-formed and forced into the recess in the outer hook and

part way into the recess in the inner hook, as clearly shown in Fig. 5 of the drawing. The outer face 19 of the body wall carrying the inner hook, and the inner face 20 of the body wall carrying the outer hook, are adjacent each other, but slightly spaced. The distance between these faces of the walls is less than the thickness of the metal forming the can body. The walls are sufficiently close so that the solder will flow by capillary attraction throughout the entire region of the recess and the side seam. In this recess is formed a pillar of solder which is fused to the inner and outer walls of the body so that said walls at spaced intervals are tied together by these pillars of solder.

It is well known that when internal pressure is exerted against the side seam, that the weakest part of the side seam is midway the length of the side seam. The outward pressure on the side seam tends to cause the hooks to turn like hinges, rupturing the solder bond by a tension strain thereon. These solder pillars at intervals will bind together the inner and outer walls of the side seam and thus resist this strain which tends to rupture the solder bond and initiate the unhinging action which destroys the side seam.

While the notches are shown as V-shaped, it is understood that they may be otherwise shaped, but it is essential that there shall be a notch in each hook, and that these notches shall be so disposed as to provide a recess extending from the body wall carrying the inner hook to the body wall carrying the outer hook, and it is also essential that the metal of at least one of the walls shall be deformed so as to be brought sufficiently close to the metal of the other wall within the recess that the solder will flow by capillary attraction throughout the entire limits of the side seam and form these pillars of solder which tie together the inner and outer walls of the side seam.

It will be noted that the bumping iron has a smooth face, and therefore, the outer wall of the can body will be smooth and free from deformation, while the pins in the spline will deform the inner wall of the can body. The bumping pins may be placed in the horn and the spline smooth, if it is desired that the inner wall of the can body shall be smooth. In fact, both the spline and the bumping iron may have projecting portions at spaced intervals for de-forming both the inner and outer walls. It is essential, however, that both hooks shall have notches, thus forming a recess extending all the way from one body wall to the other at spaced intervals, and that the body walls shall be brought sufficiently close together to insure a solder bonding pillar joining said walls in the region of the recess.

It is obvious that minor changes in the details of construction and 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 metal can body having its edge portions joined in a side seam, said side seam including interlocking hooks and a solder bond for uniting said interlocking hooks, each hook being cut away at spaced intervals to form notches extending substantially to the base of the hook, said notches in the interlocked hooks being disposed one opposite the other thereby forming a recess extending through both hooks at spaced intervals and within the limits of the side seam, the metal in at least one of the body walls in the region of each recess being de-formed into said recess so as to lie close to but spaced from the other body wall, whereby the solder bond will form a pillar in each recess joining the body walls.

2. A metal can body having its edge portions joined in a side seam, said side seam including interlocking hooks and a solder bond for uniting said interlocking hooks, each hook being cut away at spaced intervals to form V-shaped notches extending substantially to the base of the hook, said notches in the interlocked hooks being disposed one opposite the other thereby forming a recess extending through both hooks at spaced intervals and within the limits of the side seam, the metal in at least one of the body walls in the region of each recess being de-formed into said recess so as to lie close to but spaced from the other body wall, whereby the solder bond will form a pillar in each recess joining the body walls.

WALTER G. PLUMB.