Feb. 17, 1925. 1,526,827

G. F. BOUCHER

SOLDERLESS SEAM FORMER FOR CAN BODIES

Filed Feb. 27, 1924 2 Sheets-Sheet 1

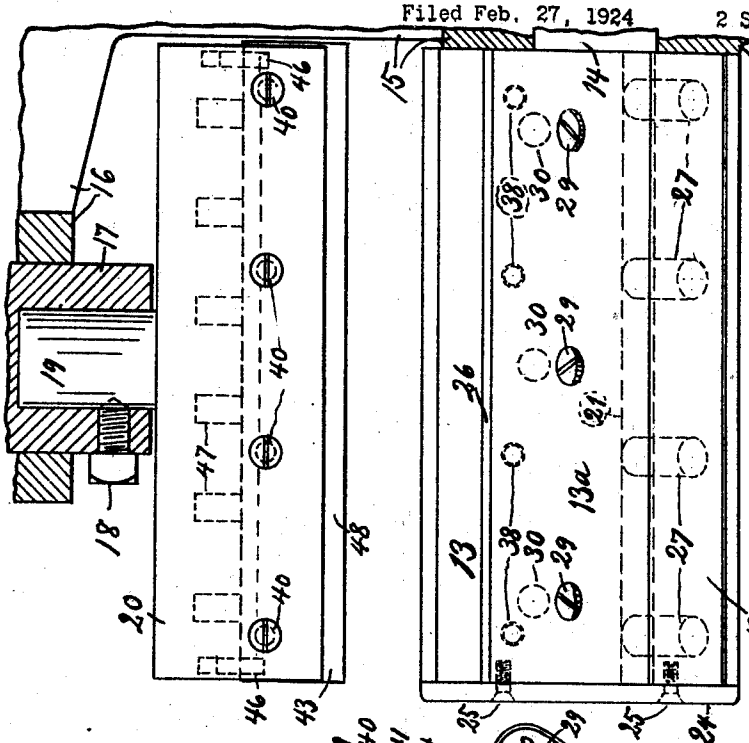


FIG. 4.

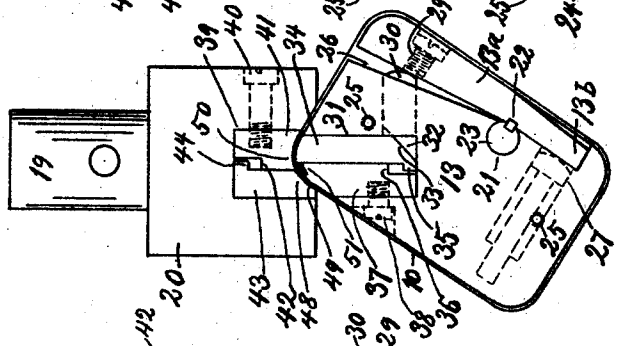


FIG. 3.

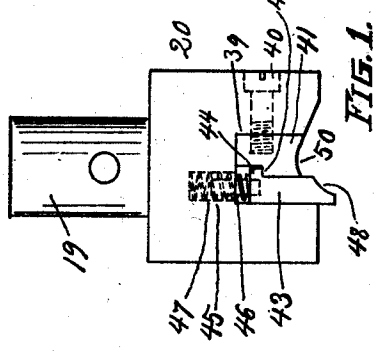


FIG. 1.

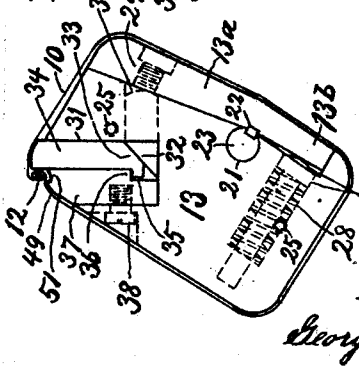


FIG. 2.

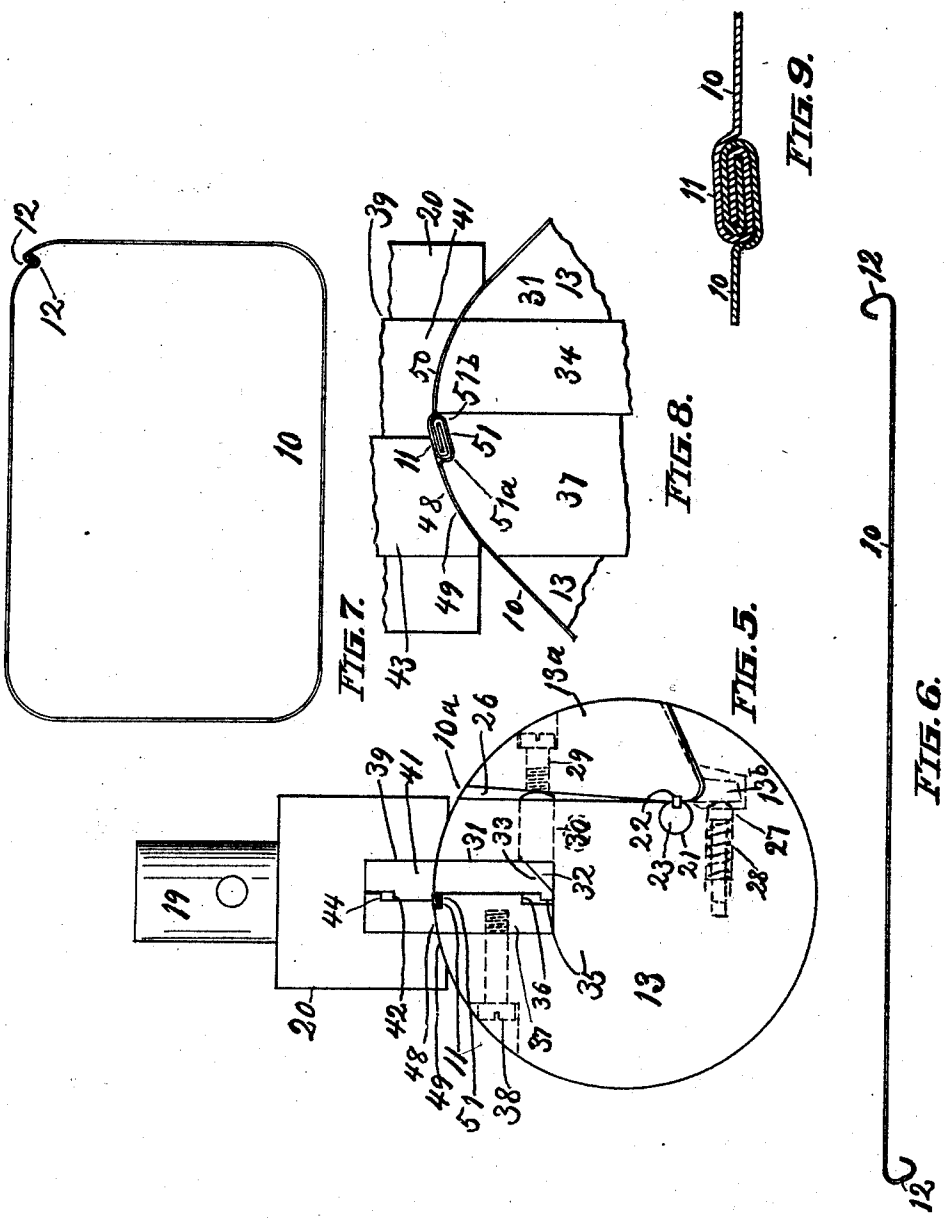
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SOLDERLESS SEAM FORMER FOR CAN BODIES

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UNITED STATES PATENT OFFICE.

GEORGE F. BOUCHER, OF ST. PAUL, MINNESOTA.

SOLDERLESS-SEAM FORMER FOR CAN BODIES.

Application filed February 27, 1924. Serial No. 695,471.

To all whom it may concern:

Be it known that I, GEORGE F. BOUCHER, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Solderless-Seam Formers for Can Bodies, of which the following is a specification.

My invention relates to tools for making solderless, watertight seams on tinware. The main object is to provide a so-called bumping horn and top die to be used in a press for forming and closing tight the side seam of can bodies made of sheet metal. The double locking seam itself, which is best shown in Fig. 9 of my drawing, I do not claim to be new, but my invention provides means for forming and finishing such a seam with the fewest possible operations so as to reduce costs.

In the accompanying drawings:

Fig. 1 is a front elevation of the so-called bumping force carried by the slide of a seaming press.

Fig. 2 is a front end view of my improved bumping horn with its front plate 24 (see Fig. 4) omitted, and a can body in position to be seamed on the horn.

Fig. 3 is a front end view of the bumping horn with the bumping force in pressing position upon the horn.

Fig. 4 is a side elevation of Figs. 1 and 2 with the can body omitted and fragments of a press holding said parts shown partly in section.

Fig. 5 is a modification of Fig. 3 showing my improvements applied to bumping horn and bumping force adapted for seaming cans of cylindrical or polygonal form.

Fig. 6 is an edge view of a can body blank before it is bent as in Fig. 7.

Fig. 7 shows a can body blank bent into shape to be put upon the bumping horn.

Fig. 8 is an enlarged portion of Fig. 3 showing more clearly how the seam is formed and pressed.

Fig. 9 is a sectional end view of the completed seam.

Referring to the drawing by reference numerals, 10 designates a sheet metal blank to be formed into a four-cornered can body as in Figs. 2, 3 and 7, or a circular or similar shaped body as 10^a in Fig. 5 and has its ends or two opposite edges formed into a double-locked seam 11 which is water tight without the use of solder.

In this special form of seam I first provide a sheet metal blank of plane form as in Fig. 6 with two opposite edges curved into hooks, as 12, by any suitable edging tool. I then bend the blank by suitable tools until the hooks 12 are engaged into each other as in Fig. 7. The body thus formed is then placed upon the bumping horn, as in Fig. 2. In said view and in Figs. 3 and 4 the bumping horn consists of a horizontally elongated body 13 having a reduced rear end portion 14 secured in the body 15 of a seaming press in the upper portion 16 of which is a vertically movable slide 17. In the latter is secured by a set-screw 18 the stem 19 of the bumping force or upper die 20, to be presently further described.

The horn 13 has a longitudinal bore 21 open in one side for a rib 22 of a pintle 23 which is retained in the bore by a plate 24 secured by screws 25 (see Fig. 4). To said rib 22 is secured an auxiliary member 13^a of the horn 13. Said member 13^a is thus tiltable on the pintle and the part 13 is given a clearance 26 to allow the member 13^a to tilt inward with its upper portion and thus allow the can body to be more easily placed upon and removed from the horn. Said tilting is automatically caused by a series of inserted slidable plugs 27 having springs 28 pushing them continuously against the lower wing 13^b of the member 13^a. The latter member has several adjustment screws 29 touching with their inner ends the outer ends of several inserted slidable actuators 30, which extend into a vertical groove 31 in the upper side of the body 13 and there have their ends formed with inclines 32 which are always in contact with the beveled bottom edge 33 of a vertically movable flat bar 34 which is retained in the groove 31 by having a lateral rib 35 arranged to stop under a shoulder 36 of a strip 37 rigidly secured by screws 38 in the groove. The strip 34 is normally held in raised position by the bevels 32—33, actuators 30, screws 29, tilting piece 13^a and the springs 28.

The upper die 20 has a groove 39 in which is secured by screws 40 a steel bar 41 having a side shoulder 42 preventing escape of a flat steel bar 43 having a side shoulder 44 normally resting on the shoulder 42 because constantly pressed downward by springs 45 encircling guiding pins 46 fixed in the bar 43 and sliding with their upper portions in

the springs and the springs fitting snugly in holes 47 in the piece 20, or as in Fig. 4, the guiding pins 46 may be independent of the spring pockets 47. The lower edge of bar 43 has a face 48 so shaped as to fit and press upon the portion 49 of the can body and also form an extension of the curved face 50 of the bar 41 for forming and pressing the seam 11 to a finish in a groove 51 in the upper edge of the bar 37. It will be best seen in Fig. 8 that said groove 51 is of a special rounded form at 51^a and 51^b so as to co-act with the curved faces 48 and 50 in rolling and pressing the hooks 12 in Fig. 2 into the completed double seam 11 in Figs. 3, 8 and 9.

In the operation, when the can body is placed on the horn and the press is started and makes a single stroke, the face 48 first reaches the blank and under pressure of the springs 45 prevents outward bulging of the blank at the part 49 while the seam is being formed and pressed as already stated. During the last part of said pressing of the seam the face 50 presses at the top of the bar 34 and causes it to act on the inclines 32 and thus by means of the sliding plugs 30 spread the member 13^a to the position shown in Fig. 3 whereby the can body is given its proper form and size because all slack in the sheet metal adjacent the seam is taken up. As the slide of the press ascends again the springs 28 cause the member 13^a to tilt or close again toward the horn 13, leaving the can body loose for removal from the horn.

The modified form in Fig. 5 although indicating the application of the inventive features to polygonal and cylindrical cans is so near like the other figures that no need is seen of using different reference characters. In Fig. 9 is shown the most preferable form of the seam, namely to have it project about equally beyond each side of the sheet 10 as this makes it easiest to remove from the machine.

What I claim is:

1. In a machine for making a double lock sheet metal seam on can bodies, a bumping horn having a main body member and an auxiliary member hinged thereto, said main member having in its top a longitudinal groove, a steel bar fixed in one side of said groove and having near its bottom edge a lateral recess forming a downwardly facing shoulder and in its upper edge a groove in which to form and press the seam, a vertically slidable horizontal, flat steel bar in the groove close by the fixed bar and normally projecting above the horn but having a lateral projection to engage with the shoulder of the fixed bar to limit said slidable bar projecting above the horn; said slidable bar having at its lower edge a lateral incline, a series of slidable plugs inserted in transverse horizontal bores in the main horn member and having each of them one end beveled to fit against the incline of the slidable bar and the other end projecting beyond one side of the main horn member; the auxiliary horn member being tiltingly pivoted to said side of the main member, springs arranged to hold the auxiliary member normally closed to the adjacent side of the main member and in contact with the slidable plugs and thereby the upper part of the horn reduced in cross section, an upper die arranged to descend upon the horn and having a curved face adapted to press the sheet metal down upon the vertically slidable bar in the horn and to help form the seam and adjacent part of the can body, and an upwardly yieldable downwardly spring-pressed bar retained in the upper die and having its downwardly projected portion formed with a laterally curved face adapted to press on the can body near the seam and also to press on the seam to form it in the groove.

2. The structure specified in claim 1 and adjustable means carried by the auxiliary horn member for pressing on the slidable plugs.

3. The structure specified in claim 1, in which the groove in the horn is of such transverse curvature as to co-act with the upper die in rolling the seam into a double lock or six-ply seam before pressing it into a hermetically tight condition by the same stroke.

4. The structure specified in claim 1, in which the groove in the horn is of such transverse curvature as to co-act with the upper die in rolling the seam into a double lock or six-ply seam before pressing it into a hermetically tight condition by the same stroke, and the groove in the horn is of such depth that the finished seam projects about equally beyond the inner and the outer sides of the can body.

In testimony whereof I affix my signature.

GEORGE F. BOUCHER.