Aug. 4, 1931. C. H. ROLLASON 1,817,710

METHOD OF ATTACHING BAIL EARS TO PAILS

Filed May 1, 1930

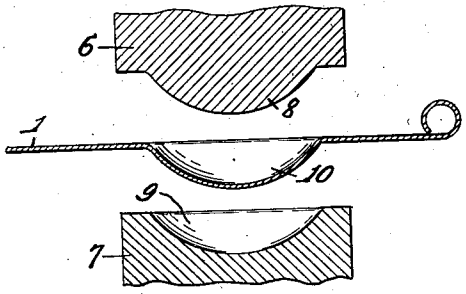


FIG 3

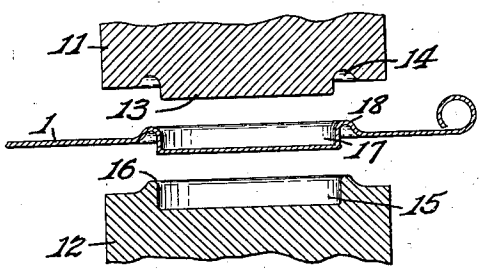


FIG 4

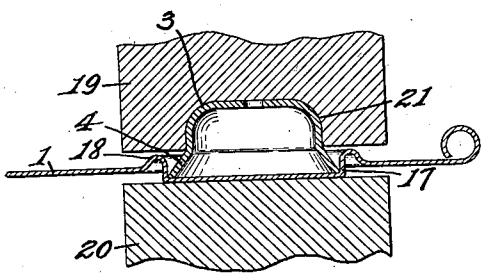


FIG 5

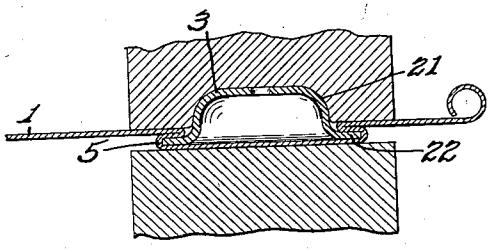


FIG 6

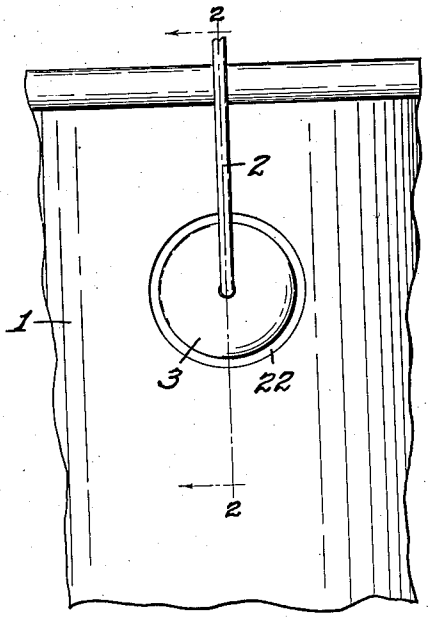


FIG 1

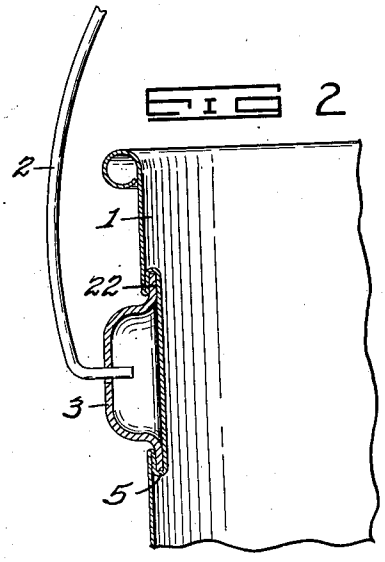


FIG 2

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UNITED STATES PATENT OFFICE

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METHOD OF ATTACHING BAIL EARS TO PAILS

Application filed May 1, 1930. Serial No. 448,892.

This invention relates broadly to sheet metal pails, and more specifically to a bail ear for such pails, and to the method of attaching such ear to a pail body.

The primary object of the invention is to provide a pail embodying bail ears which are attached rigidly to the body without the provision in the latter of apertures for their reception and without the use of solder or other separate attaching devices.

A further object of the invention is to provide a method or process of applying an ear to a pail body in such manner that all possibility of leakage of the contents of the pail at or adjacent to the ear is positively eliminated, and also that no extraneous parts or material are required to maintain the attached relation between the ear and the body.

In describing the invention in detail, reference is herein had to the accompanying drawings, in which—

Figure 1 is a fragmentary side elevation of a pail embodying the invention;

Figure 2 is a section on line 2—2, Fig. 1;

Figures 3 and 4 are sectional views of the pail body and of two sets of dies illustrating the two successive steps employed in preparing said body for the reception of an ear;

Figure 5 is a similar view illustrating a third set of dies positioned in initial ear-attaching position; and—

Figure 6 is a similar view showing said third set of dies in final ear-attaching position.

Referring to said drawings, 1 designates the body of a sheet metal pail, and 2 a bail of usual form designed to be attached to said body through the intermediacy of oppositely disposed ears, as hereinafter set forth. The bail ear, indicated generally by the reference numeral 3, is formed of sheet metal which, for reasons which will hereinafter be made apparent, is preferably of heavier gauge than that of which said pail body is formed.

The ear 3, as initially formed for attaching to the pail body, is of substantially bell shape, comprising a shallow concave, or cup-like, body having a circumferential outwardly flared skirt 4, as shown in Fig. 5. Said initially formed ear is designed to be seated in a socket-like cavity provided therefor and preferably pressed inwardly in the pail body, following which it and the pail body are simultaneously subjected to the action of companion dies or die members whereby the flared skirt 4 thereof is flattened out into annular flange form or caused to assume a position at a right angle to the ear body, and, in so assuming its flattened form, said flange expands the cavity-forming walls by which it is encircled and disposes itself within the close embrace of a circumferential fold which preferably lies inwardly of and substantially parallel to the body wall of the pail, as also in more or less closely seated relation to the interior wall of said pail, as shown in Figs. 2 and 6.

To prepare the pail body 1 for the application thereto of the bail ear, upper and lower die members 6 and 7 are provided, the former having thereon a projecting knob 8 of approximately semi-spherical form and the latter having therein a seat or socket 9 of corresponding form, as shown in Fig. 3. Said die members are employed for forming in the pail body at each of two appropriately located diametrically opposite points an inwardly indented or concave portion 10, such formation of the concave portion 10 constituting the first operation. Following this first operation, the metal of said body at and adjacent to said concave portion is subjected to a second pressing, or drawing, operation in which are employed upper and lower die members 11 and 12, the former having on its face a short and substantially cylindrical projecting portion 13 and having formed in its said face in encircling relation to the base of said portion 13 a shallow groove or channel 14. The face of the lower die member 12 is provided with a shallow cylindrical socket 15 substantially corresponding in form and size to the portion 13 of the upper die 11, and formed on said face in encircling relation to said socket 15 is a projecting circular rib 16 which substantially corresponds in shape and size with the channel 14 of the upper die. In the second operation above referred to, the form of the socket 9 and the adjacent mar-

ginal portion of the wall 1 are altered to the extent that there is formed a shallow inwardly directed cylindrical depression 17 having a substantially flat bottom and defined at its open end by an outwardly pressed circular rib or bead 18, as shown in Fig. 4.

The interior diameter of the depression 17 corresponds substantially with that of the outer edge of the skirt 4 of the ear 3, which latter is adapted to be seated in said depression, as shown in Fig. 5, preliminary to subjecting the above-described parts of the structure to the action of upper and lower die members 19 and 20. Said upper die member has formed in its face a socket 21 adapted to conformably receive therein the body of the preliminarily shaped ear 3, the depth of said socket being such that, when the die member assumes the position shown in Fig. 5, the angle formed between the substantially flat face and the socket 21 of said die member engages the ear approximately at the line of junction between the ear body and the skirt. The face of the lower die member 20, herein shown as flat, has the metal constituting the flat bottom of the depression 17 resting thereon as it is approached by the descending upper die member 19, as shown in said Fig. 5. As said ear body is depressed by the said descending die member, the flared skirt 4 of said ear is gradually thrust outward until, in the fully seated position of said die members, it assumes a flattened position at a right angle to the axis of said ear body, forming a flange 22, as shown in Fig. 6. As it is thus thrust outward, the metal forming said flange 22 gradually forces in advance thereof the cylindrical depression-defining wall of the pail body and utilizes a portion of the metal of the rib 18, as also the increased tendency of the metal embodied in said rib to bend by reason of its curved bead formation. At the limit of the descending stroke of the die member 19, the flange 22 has its opposite surfaces closely embraced by the inner and outer members of the fold 5, which latter is preferably seated against the adjacent ear-encircling wall of the pail body, as shown in Fig. 6. Moreover, the cooperating die members act at the limit of the ear-attaching reciprocation of the upper of said members to completely return the remainder, or any unutilized, portion of said rib 18 to the plane of the body wall of the pail.

Manifestly, due to the relatively heavy gauge of the metal of which the ear 3 is formed, the formation of the fold 5 as the skirt 4 is flattened into flange form is readily effected.

It is to be noted that the herein described shaping of the pail body preliminary to applying the ear thereto requires but two simple pressing operations, and also that the act of applying the ear is accomplished in a single operation. Moreover, as is apparent, the ear as herein set forth is so rigidly and permanently attached as to resist practically any ordinary force tending to detach it, applied in any direction, since the ear is secured to the pail wall throughout the entire circumference of the ear.

What is claimed is—

1. The method of applying a sheet metal bail ear to a sheet metal wall, which consists in forming in the wall a circular inwardly pressed imperforate seat, placing on said seat a bail ear having an annular flared skirt, and then depressing said bail ear with respect to said seat whereby said skirt is flattened into annular flange form and is caused to expand the circumferential defining wall of said seat to form a flange-embracing fold which occupies seated relation to the adjacent ear-encircling portion of the sheet metal wall.

2. The method of applying a sheet metal bail ear to the body of a sheet metal pail, which consists in forming in the wall of said body an inwardly depressed circular seat, disposing upon said seat the flared skirt portion of a preliminarily shaped bail ear, then depressing said ear with respect to said seat whereby said skirt is flattened into annular flange form and is caused to expand the surrounding metal of said seat to form a fold which occupies embracing relation to said flange and seated relation to the adjacent inner surface of the pail body.

3. The method of applying a sheet metal bail ear to the body of a sheet metal pail, which consists in forming in the wall of said body an inwardly depressed circular seat, disposing upon said seat the flared skirt portion of a preliminarily shaped bail ear, then depressing said ear with respect to said seat whereby said skirt is flattened into annular flange form and is caused to expand the surrounding metal of said seat to form a fold which occupies embracing relation to said flange.

4. The method of applying to the body of a sheet metal pail a sheet metal bail ear, which consists in preliminarily forming a bail ear with an annularly disposed flared skirt, pressing said pail body to form a relatively shallow circular inwardly directed indentation and an outwardly directed rib, the latter defining the entrance to the former, seating within said indentation the skirt of said ear, and then depressing said ear to produce flattening of said skirt into annular flange form and the simultaneous expansion of the defining wall of said indentation for forming an internal circular fold by which said flange is embraced.

5. The method of applying to the body of a sheet metal pail a sheet metal bail ear, which consists in preliminarily forming a concave bail ear with an annularly disposed flared skirt, pressing said pail body to form a rela-

tively shallow circular concave socket, repressing said body to convert said socket into a seat of cylindrical form and to form a circular outwardly directed rib at the entrance to said seat, disposing upon said seat the flared skirt of said ear, then depressing said ear with respect to said seat to produce flattening of said skirt into annular flange form and to effect expansion of the metal defining said seat into the form of a fold which embraces said flange, and finally flattening said fold against the interior surface of the pail body.

6. The method of applying to the body of a sheet metal pail a sheet metal bail ear, which consists in preliminarily forming a concave bail ear with an annularly disposed flared skirt, pressing said pail body to form a relatively shallow circular concave socket, repressing said body to convert said socket into a seat of cylindrical form and to form a circular outwardly directed rib at the entrance to said seat, disposing upon said seat the flared skirt of said ear, then depressing said ear with respect to said seat to produce flattening of said skirt into annular flange form and to effect expansion of the metal defining said seat into the form of a fold which embraces said flange.

In testimony whereof, I affix my signature.

CHARLES H. ROLLASON.