

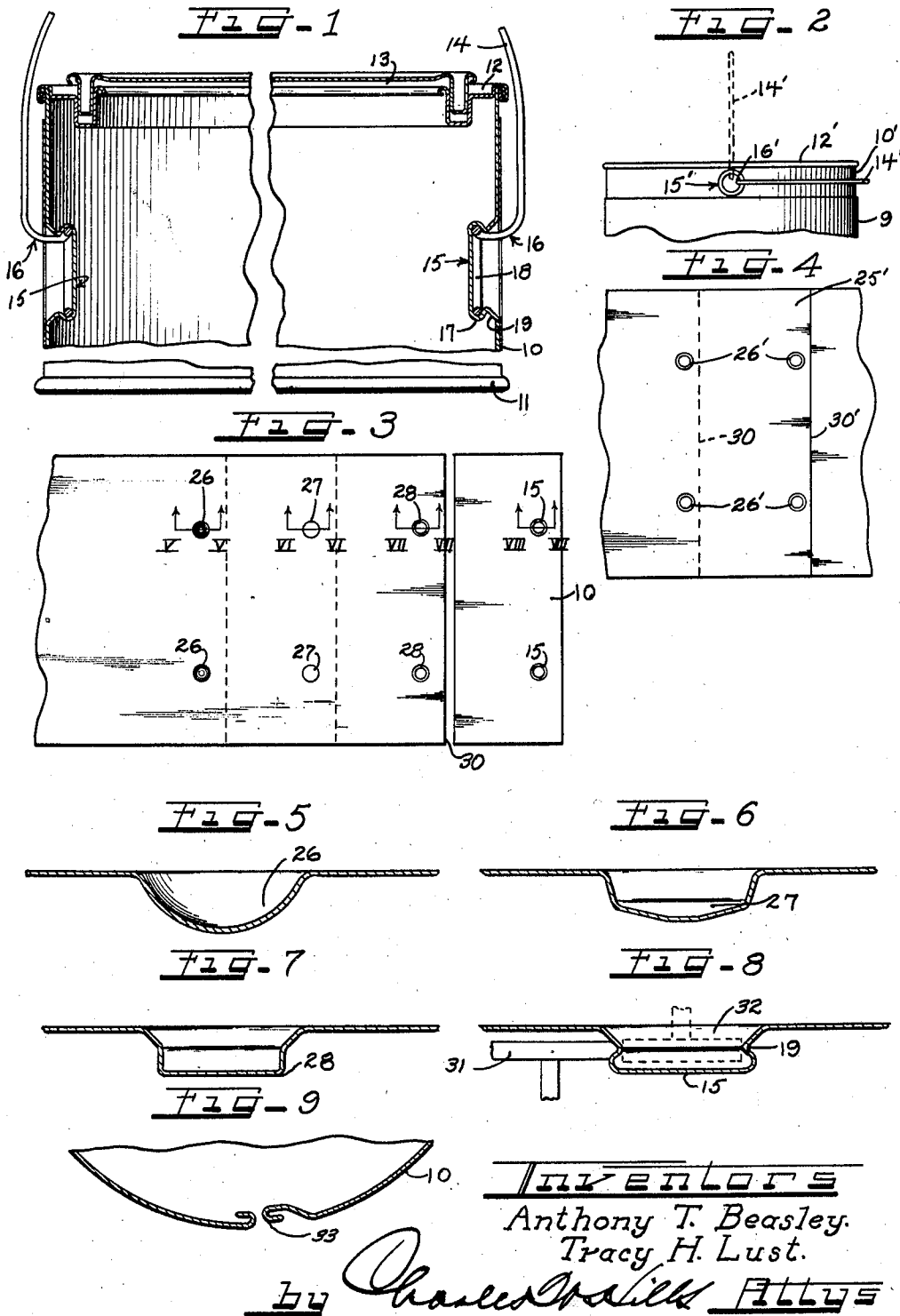
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METHOD OF FORMING RECEPTACLES

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METHOD OF FORMING RECEPTACLES

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1 Claim. (Cl. 29—148.2)

This invention relates to a method of forming receptacles of the type having bail receiving bosses, and more particularly to a novel way of providing the body of the receptacle with means for detachably receiving the ends of a bail or handle.

The subject matter of this application has been divided from our copending application Serial No. 319,244, filed February 16, 1940.

For years it has been the practice in the tin can industry to form the body of a can with diametrically opposite bail ears or bosses secured by solder or other means to the wall of the can. In so adding bosses to the receptacle, the cost of the receptacle is necessarily increased by the additional material in the bosses. Moreover, this cost has been further augmented by the cost of soldering or securing the bosses to the wall of the can.

In such previous constructions, due to the bosses extending beyond the outer surface of the wall of the can, the can has taken up more room in packing and has thus added to the cost of packing and shipping the can. Then, too, these outwardly extending bosses or protuberances have interfered with the application of labels to the cans and have necessitated that provision be made in the labeling process to take into consideration the outwardly extending bosses.

An object of this invention is to provide a method of forming a bail construction on a can which eliminates entirely the necessity for having protuberances or bosses on the outer wall of the can, and which at the same time lends itself to the economical manufacture of the can on a large production basis.

A further object of the invention relates to the forming of the bail bosses on the can in such a manner that they are disposed wholly within the confines of the body or wall of the can and in reality constitute portions of the material in the can body.

In accordance with the general features of this invention, there is provided a novel method of forming the wall of a receptacle which includes the steps of pressing imperforate insets in a sheet of metal, which insets are spaced apart a distance sufficient to cause them to be diametrically opposite each other in the completed can, shaping each inset so as to have an angular bail receiving and retaining portion, and then forming the sheet into a cylindrical body with the insets on the inner side of the body and within the confines of the body and in position to receive the ends of the bail; the abutting edges of the sheet being there-

after locked together so as to form a unitary one-piece can body.

Other features and objects of this invention will more fully appear from the following detailed description taken in connection with the accompanying drawing which illustrates a can made in accordance with my invention, which shows the steps involved in the manufacture of this can, and in which:

Figure 1 is a fragmentary vertical sectional view of a can made in accordance with the features of this invention, the lower part of the can being shown in elevation;

Figure 2 is a fragmentary view of the top end of a modified form of can showing bail bosses positioned directly below the rim of the can and illustrating in dotted lines how the bail or handle may be turned to a vertical position;

Figure 3 is a fragmentary plan view of a sheet of material illustrating how end portions thereof may be severed from the strip or sheet after insets have been formed therein and showing progressively the working of the insets;

Figure 4 is a view similar to Figure 3 and showing how the insets are formed in close proximity to the line on which the end portions are cut and from which end portion the modification shown in Figure 2 can be constructed;

Figure 5 is an enlarged fragmentary cross sectional view taken on the line V—V of Figure 3, and showing the condition of the inset after the first blanking operation;

Figure 6 is a view similar to Figure 5 taken on the line VI—VI of Figure 3, and showing the condition of the inset after the second forming operation;

Figure 7 is a view similar to Figures 5 and 6 taken on the line VII—VII of Figure 3 looking in the direction indicated by the arrows, and showing the condition of the inset after the third operation;

Figure 8 is a view similar to Figure 7 taken on the line VIII—VIII of Figure 3 looking in the direction indicated by the arrows, and showing the condition of the set after the final operation during which the inset is provided with an internal annular shoulder to define an annular seat for the bail eye; and

Figure 9 is a fragmentary horizontal cross sectional view taken through a portion of the sheet after it has been severed from the strip shown in Figure 3 and preparatory to the lock seaming of the abutting edges to form the end portion into a can body.

As shown on the drawing:

The reference character 10 (Figure 1) designates generally a can body which is made from suitable sheet material such as 100 lb. tinplate. This is the type of material that is commonly used in the manufacture of paint cans. It is, of course, to be understood that the type of sheet material may be varied in accordance with the use to which the can is to be put.

The can includes the usual bottom 11 which may be secured or lockseamed in any suitable way to the bottom of the wall 10. The can also has a top beading 12 lockseamed to the can in any desired way and adapted to receive in the usual way a lid or closure 13.

The present invention is concerned with the manner in which the bail or handle 14 is detachably connected to the body 10 of the can.

Instead of providing the can with outwardly projecting bumps or protuberances which detract from the smooth external appearance of the can, we have in accordance with the features of this invention provided integral imperforate diametrically opposed insets or depressions 15-15, which are identical in construction and are adapted to cooperate with oppositely facing but otherwise identical ends 16 of the bail or handle 14. The bail or handle 14 may be made of any suitable material such, for example, as spring wire; and as a matter of fact, due to the ends 16 of the bail extending into the confines of the can body 10 and thus being closer to the center of the mass to be lifted, the wire may be made of a smaller diameter wire than that of wire bails used with external bosses.

Each inset 15 is formed by depressing the side portion of the can body 10 in a direction so as to be within the confines of the can body and includes an annular seat 17 for receiving the eye 18 on an inwardly offset end 16 of the bail. This annular seat 17 is provided by grooving the external surface of the depression as indicated at 19, thus forming an inwardly extending annular shoulder inside of the recess defined by the inset.

In the application of the bail to the can body, it will be appreciated that normally the ends of the bail are spaced apart a distance slightly less than the external diameter of the can, so that they must be sprung over the can in order for the eye portions 18 to be brought into register with the openings defined by the insets in the can body. Thereafter, due to the resiliency of the offset portions 16, as well as the resiliency of the eyes 18, these portions may be easily pressed over the shoulders 19, and thereafter the eyes expand outwardly into tight and gripping engagement with the seat 17. The bail ends may be removed from the insets 15 by pulling the offset ends 16 in directions to separate them or, in other words, in a direction away from the can body.

It is, of course, evident that the resiliency of the offset ends 16 of the bail 14, as well as that of the eye portions 18, enables these bail ends to be easily attached to or detached from the insets 15 formed integral with the can body 10. Then, too, due to the fact that the eye portions 18 are seated within the confines of the can body 10 when they are in retained position, they are closer to the center of the mass being lifted and are not subjected to the same amount of leverage tending to release them as they are in the case where bail ends are disposed around protuberances beyond the side wall of the can body.

In Figure 2, we have illustrated a modification

of the invention wherein the imperforate insets 15' are formed in close proximity to and directly below the top edge 12' of the can body 10'. This arrangement enables the bail 14' to have its ends 15' connected to the can body above a label 9 applied to the can body. When the bail is in a lifting position, it is in the dotted position shown in Figure 2. When the bail is not in use, it may be disposed in a horizontal position directly below the edge 12' and above the label 9. This arrangement enables the label 9 to be applied, even though the bail is attached to the can, by simply disposing the bail in the full line position shown in Figure 2 and then rolling the label 9 on the can body 10'. Such an arrangement lends itself well to the easy and unhampered application of labels to cans such as paint cans. With previous constructions having external bosses, it has been necessary to split the label at diametrically opposite points and to provide notches in the label for the bosses. As a result, unless the label is properly lined up with the protuberances in such previous constructions, it is not easily and smoothly applied to the can body.

In the form of the invention shown in Figure 1, the label may be easily applied to the entire side of the can wall 10 by simply providing two opposite die cuts in the label which may be brought by suitable mechanism into register with the insets 15; this label applying operation taking place prior to the application of the bail to the can body.

In some instances the can bodies are shipped without the bails applied thereto. In that event, cans embodying our invention can be shipped much more economically and with greater facility due to the fact that no provision has to be made in handling for any protuberances on the side wall of the cans. The elimination of protuberances also makes it easier to package the cans before shipping, as well as the handling of the cans both prior to and subsequent to shipping, since the cans can be easily rolled along an incline or the like.

While we have in Figure 1 illustrated the eye at each end of the bail as being an open ended eye, it will, of course, be appreciated that the eye may be closed if it is so desired. All that is necessary in this respect is that the offset ends 16 of the bail be provided with a retaining formation adapted to be resiliently snapped through the opening of the inset and back of the shoulder defined by the groove 19 which, as we shall describe hereinafter, may be spun in the inset.

In Figures 3 and 5 to 9 inclusive, we have illustrated somewhat diagrammatically the manner in which the can body of our invention may be formed. A sheet of suitable metallic material 23, which may be either a continuous form or in separate sheets, is fed to a press station in the can body forming apparatus. In this station four different operations may be performed on the inset, in addition to a severing operation. The first operation consists in forming in the forward end of the strip spaced depressed portions 26. These depressions are spaced apart a distance sufficient to cause them to be diametrically opposite each other when the severed end portion of the sheet is rolled or formed into the can body. In the first operation, which may be performed by any suitable press equipment, the depression has the arcuate configuration shown in Figure 5. Then, the sheet is moved forward a given distance and the depressions 26 are subjected to a further press operation, so that they will each have the

shape illustrated in Figure 6, in which the bottom of the inset or depression is flattened as shown at 27. At the same time that this operation is being performed, two additional insets 26 are being formed in the sheet at the first work performing station.

The sheet is then advanced to the third work performing station, where the previously formed insets 27 are each flattened into the cap-like construction shown in Figure 7 at 28. At the same time, additional previous operations are being performed on other insets to the rear of this third position.

In the fourth position, the depressions or insets are spun to provide the groove or shoulder indicated at 19 in Figures 3 and 8, and the insets are each given their final shape corresponding to the insets 15 shown in Figure 1. This step of providing a groove may be effected in any suitable manner, although we have found that it may be formed satisfactorily by using a single spinning wheel which rotates bodily about an axis corresponding to the central axis of the inset. Such a spinning wheel is illustrated diagrammatically in Figure 8 and is designated by the reference character 31. In addition, a limiting roll or wheel may be disposed inside of the inset so as to limit the extent to which the metal is spun in to form the groove 19. Such a limiting roll is shown diagrammatically at 32.

Immediately after this operation, the end portion of the strip is severed along the line 30 as shown in Figure 3. The dotted lines indicate the other lines of severance as the sheet is progressively advanced. The end portion that is severed corresponds to the can body 10 previously described, and it will be noted that the insets or depressions 15—15 are disposed in slightly spaced relation from one edge of the can body or portion 10.

Then, the severed end portion of the strip is advanced to a body forming station wherein the body is rolled or turned to bring its ends to-

gether as shown in Figure 9, and the ends may be lockseamed together at 33. It will be appreciated that prior to this operation the edges or ends of the sheet 10 may be provided with turned edges to enable the seam connection 33. When the can body is thus formed, the two insets 15—15 are diametrically opposite each other and are ready to receive the ends of a bail 14. Subsequent thereto, the top of the can body may be formed by the usual operations, and likewise the bottom may be applied by the usual operations.

In Figure 4, we have illustrated a modification of the invention with regard to the process for forming the can body shown in Figure 2. This process is the same as the one described in connection with Figure 3, with the exception that the insets 26' are formed closer to the line of severing 30' in the sheet 25'.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted thereon otherwise than necessitated by the scope of the appended claim.

We claim as our invention:

In a method of forming a receptacle including a bail having resilient eyes at its ends, the steps of progressively forming insets in flat receptacle sheet stock on the same side thereof to form recesses having one wall remote from the opening thereof and another wall between the first named wall and the remaining stock, collapsing a portion of the depth of said other wall to form a shoulder defining the outer limit of a bail receiving chamber in said inset and to form the final shape of the inset, forming said stock into a cylindrical body having a pair of said insets diametrically opposed, and subsequently inserting the resilient bail eyes of the bail into said insets.

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