April 14, 1942. A. L. FORSBERG 2,279,667

CAN BODY

Filed Nov. 16, 1939 2 Sheets-Sheet 1

Fig. 1.

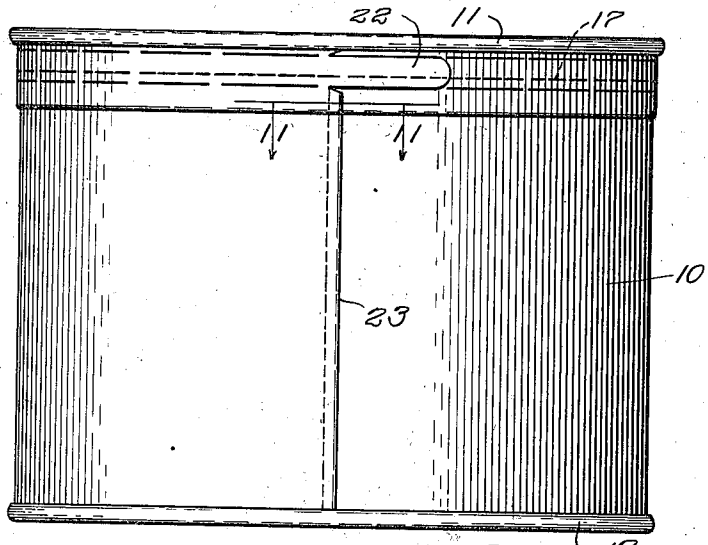


Fig. 2.

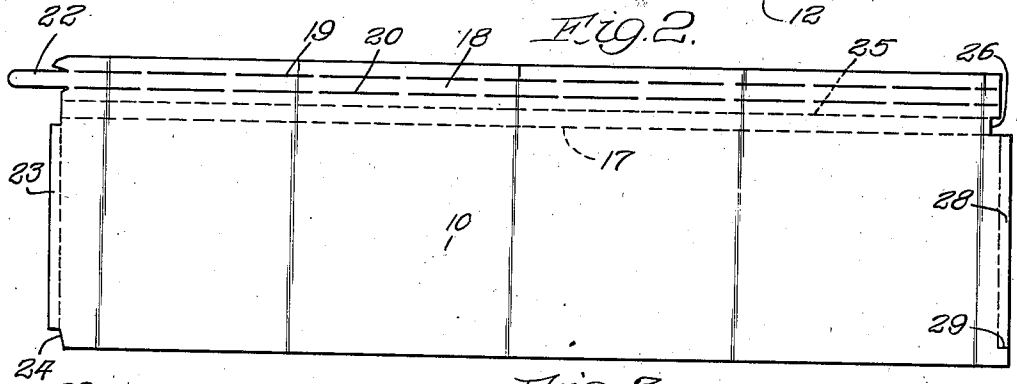


Fig. 3.

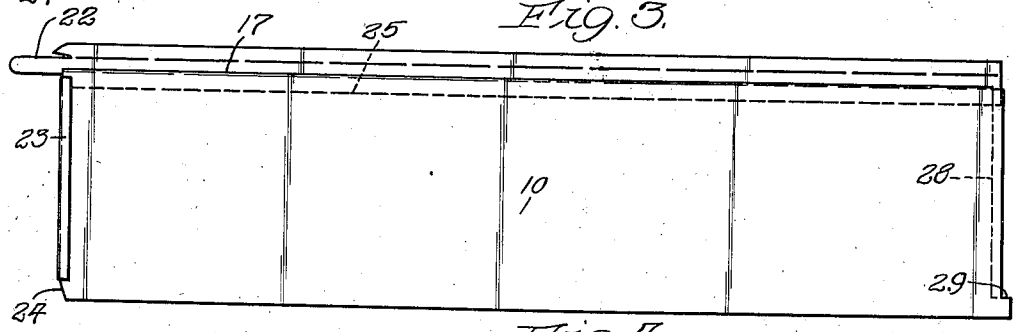
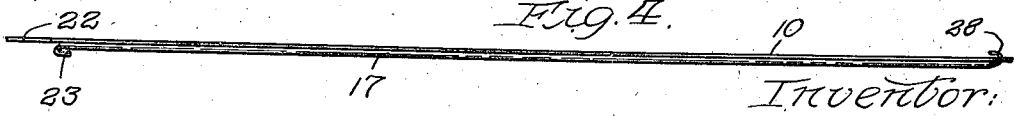


Fig. 4.



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Fig. 5.

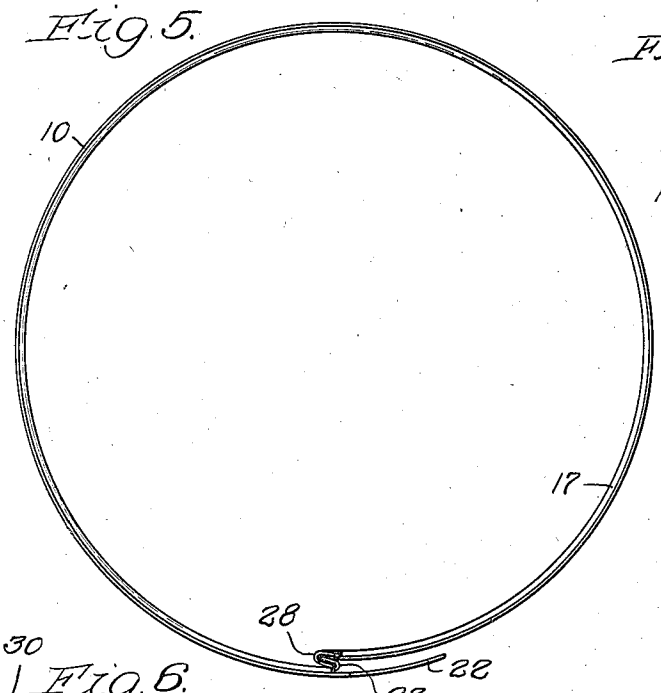


Fig. 7.



Fig. 8.

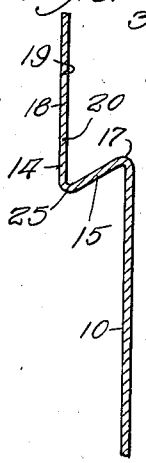


Fig. 9.

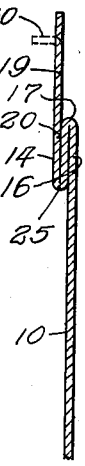


Fig. 6.

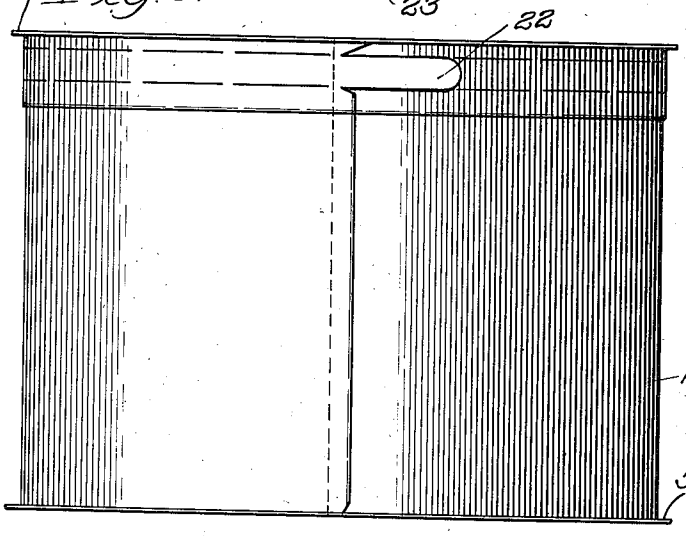


Fig. 10.

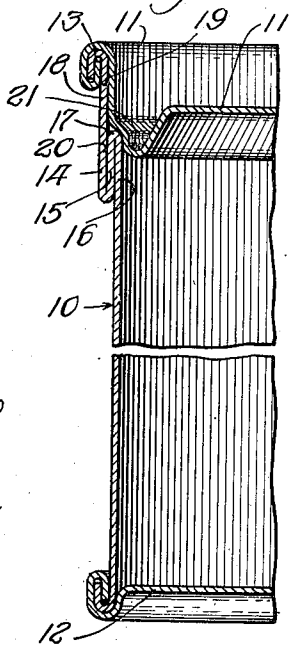
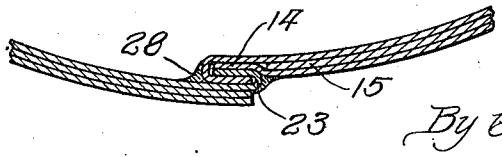


Fig. 11.



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UNITED STATES PATENT OFFICE

2,279,667

CAN BODY

Albin L. Forsberg, Chicago, Ill., assignor to The Warfield Company, a corporation of Illinois

Application November 16, 1939, Serial No. 304,823

2 Claims. (Cl. 220—54)

This invention relates to a can body, and more particularly to an improved tubular body for a can of the type provided with a tear strip.

One feature of this invention is that it provides an improved seam construction for a can body having a band of a plurality of layers near one end; another feature of this invention is that it insures the desired leak-proof body seam for cans having the contents thereof sealed therein under vacuum; a further feature of this invention is that it enables a strip to be readily torn away from the remainder of the can body without resulting in any substantial change in the position of the lid when it is in closing position on the top of the can body; a still further feature of this invention is that it provides improved means for interlocking the edges of the can body where the body comprises a plurality of layers; other features and advantages of this invention will be apparent from the following specification and the drawings, in which:

Figure 1 is an elevation of a finished can embodying this invention; Figure 2 is a view of the sheet metal blank cut to the desired shape for forming the can body; Figure 3 is a view of the same blank after certain folds have been made therein; Figure 4 is a top edge view of the folded blank shown in Figure 3; Figure 5 is a transverse sectional view of the blank with its locking edges hooked; Figure 6 is a side elevation of the can body with the upper and lower ends flanged outwardly; Figure 7 is a detailed sectional view of a portion of the blank before folding; Figure 8 is a detail sectional view of the first operation in the provision of the triple layer band; Figure 9 is a fragmentary sectional view through the completed triple layer band portion; Figure 10 is a partial vertical sectional view of the finished can; and Figure 11 is a horizontal detail sectional view along the line 11—11 of Figure 1.

A great many food products are today packed, frequently under vacuum, in a tin can provided with a circumferential tear strip near the upper end, so that the can is opened by tearing this strip away. It is generally desirable to have some means to enable the lid to be replaced and held frictionally on the can body after the strip has been torn away and part of the contents of the can removed; and it is desirable that no raw edges be left which might injure the housewife, and that the position of the lid when it is replaced on the can be substantially the same as its position before the tear strip was removed. This is particularly true in cans containing a large amount of liquid, or where only a small amount is removed when the can is first opened, as is the case with a can of coffee, for example.

Cans have heretofore been made with an annulus of metal forced into the body after seaming it, to provide a shoulder for frictionally retaining the lid after the tear strip has been removed; and cans have heretofore been provided with bands of triple layer thickness near the upper end so that the upper fold of this band becomes the shoulder on which the lid rests after the can is opened. The first type of can, with the annulus forced in after seaming of the can body, is open to the objection that this is a difficult operation; and that parts of the tin coating on the body are chipped off frequently during the insertion of the annulus. The type of can body with the triple layer band has presented considerable seaming troubles, only one such can body having received commercial acceptance, even though the idea of a triple layer band is quite old.

The problem with this latter type of can is in providing a leak-tight mechanically strong seam through the band, since it would be obviously impracticable to bend over three layers and hook them into three other similarly bent layers. The can of this type now on the market provides a locked seam for its body only up to the bottom of the triple layer band, and uses a simple overlapping seam from the bottom of the band to the top of the can. A simple overlapping seam is, of course, much weaker mechanically than a locked seam; and soldering by a rapid passage of the can body over soldering rolls does not result in certain sealing of the seam at the overlap portion where there are so many thicknesses of metal.

My invention obviates these and other objections by carrying the lock seam completely through the triple layer thickness band of the can body, so that the only portion of the body held together by a simple overlapping seam is the single thickness relatively narrow part between the top of the band and the top of the can. I have solved the problem of carrying the lock seam through the band by having one of the layers at each edge of the band project beyond the others, so that the interlock is between single layers of metal only even at the band portion where there is a plurality of layers; by cutting away at least one of the layers at least one of the edges to reduce the number of thicknesses under the hooked layers; and by having one of the interlocking edges project above the other, so that the two hooking portions do not terminate at the same point.

The particular embodiment of my invention illustrated herewith is a can of the type commonly used for packing coffee, for example, under vacuum. The can comprises as its principal parts a tubular body 10, a lid 11, and a bottom 12. As may be best seen in Figure 10, the lid is sealed to the upper end of the can body 10 by any desired means, as by a sealing compound 13; and the bottom is similarly attached to the lower end of the body.

Still referring to Figure 10, it will be seen that near the upper end of the can body there is provided a band of plurality of layers of metal, here shown as three layers 14, 15 and 16. The upper fold 17 joining the layers 15 and 16 provides a smooth rounded upper edge for the can body when the tear strip 18, defined between the score lines 19 and 20, is removed; and an annular depending groove 21 in the lid 11 provides means for frictionally engaging this shoulder to retain the lid in place after the tear strip has been removed.

Referring now more particularly to Figures 2, 3 and 4, it will be seen that the flat sheet of metal, such as tinned sheet iron, is provided at its upper end with a tongue 22 and a pair of parallel score lines, or lines of weakening, 19 and 20, defining the strip 18 adapted to be torn out of the can when it is desired to open it. Small notches are provided adjacent the juncture of the tongue 22 with the blank to facilitate starting of the tearing operation, and to insure that adjacent portions of the blank will not be torn away as the strip 18 is pulled loose.

Speaking first of the tongue edge of the can body (the left side in Figure 2) the edge extends down in a straight line slightly past the line 17, which is to be the top fold of the triple layer band. A slight distance below this band, perhaps an eighth of an inch, the edge projects outwardly and then straight downwardly to provide one of the projecting portions 23 adapted to be later interlocked to form the hook seam. The bottom lefthand edge of the blank may be cut away somewhat, as at 24, to facilitate forming the bottom flange and placing the bottom in attached position on the body. Referring now to the other edge of the blank (the right hand edge in Figure 2), it will be seen that this extends down straight to the line 25 which is to be the fold line joining the layers 14 and 15. A square-edge notch 26 is then cut back in this edge, the notch having a width equal to the spacing between the fold lines 25 and 17 and a depth slightly greater than the depth of interlock at the lock seam. A projecting portion 28, extending out beyond the upper edge on this side, provides the portion adapted to interlock with the portion 23 on the other edge. A cut 29 near the bottom of the can enables this portion to be folded or bent back without bending the lowermost portion of the edge.

After the blank has been cut out in the shape just described and scored along the lines 19 and 20, it is first bent to provide the triple layer band near the upper end. The manner in which this is accomplished is shown in detail in Figures 7, 8 and 9. The first die or stamping operation forms the flat blank shown in Figure 7 into the zigzag or Z shape shown in Figure 8. It is then bumped on a closing die to force the three layers 14, 15 and 16 into close parallel relationship. The hook edges 23 and 28 are then folded in opposite directions, as may be best seen in Figure 4.

The next step in the manufacturing process is to form the blank into a cylinder or tube by appropriate automatic machinery, and to hook the edges 23 and 28. A cross-sectional view through the can body at this stage is shown in Figure 5. A bumping or stamping die then locks the seam tight, and the seam is then passed over a solderer. The can edges are thus joined together by a lock seam extending from the bottom through, or at least partly through, the triple layer band; and by a simple overlap seam from that point up, joining the parts where the tear-off strip is to be removed. The lock seam from the bottom of the can up to the bottom of the band is of the single layer type; the lock seam at the band portion is shown in section in Figure 11. It will be noted that the notch 26 provided in the blank results in the intermediate layer 15 on one edge not extending into the locked portion. That is, the portion 28 is only hooked around two layers, one of them being the edge of the hooked portion 23 and the other being the outer layer 14 of the band. The fact that the edge 23 terminates medially of the band, slightly lower than the edge 28, results in a slight overlap in the seam, also tending to facilitate a leak-proof junction through the band.

After the body has been formed into tubular shape and seamed, the upper and lower ends are flanged or spun outwardly, as at 30 and 31. After the lid and bottom of the can are placed in position these ends are then again forced over to provide the connection in the finished can, as shown best in Figure 10.

By having only one layer of the band project beyond the others for interlocking purposes, and by cutting at least one edge still further back, I enable the lock seam to be carried through the triple layer band without undue difficulty, in a manner enabling a tight seam to be readily formed on automatic machinery. The resulting can body is mechanically stronger than those heretofore in use, and has a lesser percentage of rejects because of pinhole leaks in the band portion of the seam.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A can body of sheet metal having a circumferential band of a plurality of layers near one end, the means joining the edges including a lock seam extending from one end uninterruptedly into and substantially through the band, the seam from the band to the other end of the can being of the simple overlapping type, the locking engagement at the band being only between single layers of the band extending beyond the edges of the other layers, one of the interlocking layers terminating slightly short of the other.

2. A can body formed by joining the edges of a sheet of metal, the sheet being for the major part in a single layer but folded upon itself to provide a circumferential band of a plurality of layers near one end, the outer of said layers being circumferentially scored to provide a tear strip having a tongue extending beyond the edge, the means joining the edges including a lock seam extending into the band and uninterruptedly substantially therethrough, at least one of said score lines lying between the folds forming said circumferential band of a plurality of layers, all of the layers of said band seam being in overlapping relation and only the inner layer on one edge being in interlocking engagement with a single layer on the other edge, and a simple overlapping seam of single layers of metal from the band to the nearest end of the can.

ALBIN L. FORSBERG.