

April 9, 1940.

C. A. ARNESEN

2,196,181

CONTAINER

Filed Jan. 8, 1936

Fig. 1.

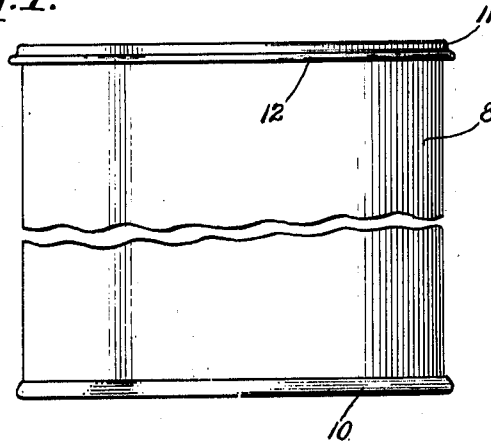


Fig. 2.

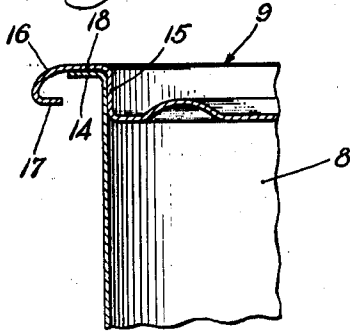


Fig. 5.

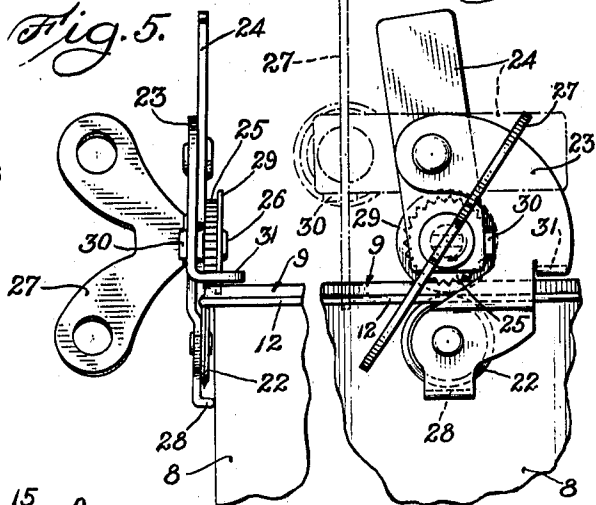


Fig. 6.

Fig. 3.

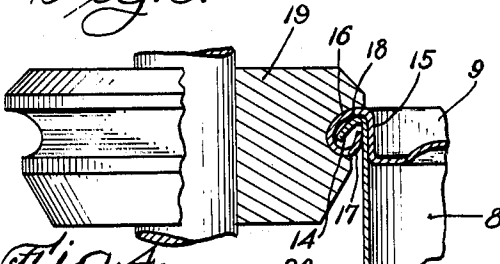


Fig. 4.

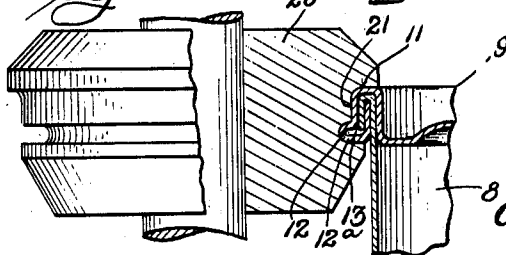
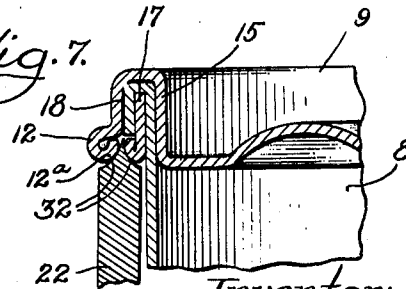


Fig. 7.



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UNITED STATES PATENT OFFICE

2,196,181

CONTAINER

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Application January 8, 1936, Serial No. 58,089

8 Claims. (Cl. 220—48)

The invention pertains to sheet metal cans used as containers for food products and other commodities, and has for its primary object the provision of a can of a practical construction capable of being opened through the medium of a cutter in a manner such as to avoid the danger of metal particles and other foreign matter entering the can.

Another object is to provide a can having at least one end wall united to a cylindrical body wall by means of a double interlocking seam having formed therein an annular space disposed externally of the can and adapted to promote the circumferential severance of the seam by means of a cutting implement, whereby to permit removal of the end wall.

A further object is to provide a can of the type in which the top wall is united to the upper end of a cylindrical body wall by means of an upstanding interlocking double seam which is of standard construction except that the flange on the top wall which is interlocked with the flange on the body wall in the usual manner is modified to provide a vertically narrow and outwardly protruding bead adapted to be severed circumferentially by a cutting implement having guide means engaging with the upper and inner faces of the seam and a cutting element engaging with the underside of the bead to penetrate it in a relative circumferential movement between the implement and the can.

Another object is to provide a container of the foregoing character, wherein as an incident to the formation of a double seam an annular bead is formed providing a downwardly facing shoulder and defining an annular space adapted for the reception of the cutting edge of a suitable implement penetrating through said shoulder in the operation of opening the container.

A further object is to provide for the severance of the end member or cover in such a way as to avoid the production of sharp or ragged protruding edges.

The objects of the invention thus generally stated together with other and ancillary advantages are obtained by the construction and arrangement illustrated in the accompanying drawing showing the invention in a preferred embodiment.

In the drawing:

Figure 1 is a fragmentary side elevational view of my improved container.

Fig. 2 is a fragmentary vertical sectional view showing one end portion of the container body

and an associated end member in assembled relation but before being secured together.

Fig. 3 is a fragmentary sectional view illustrating the first step of the double seaming operation, the roller being shown partially in elevation.

Fig. 4 is a similar view showing the final seam forming operation and illustrating the formation of an annular bead providing the aforesaid severing operation.

Fig. 5 is an edge elevational view of a cutter applied to the container in position to perform the severing operation.

Fig. 6 is a side elevational view of the same.

Fig. 7 is a fragmentary vertical sectional view on a somewhat larger scale than Figs. 2, 3 and 4, and showing the manner in which the cutter operates to avoid the formation of sharp or rough edges.

In the embodiment of my invention illustrated, my improved container comprises a cylindrical body 8 with end members 9 (one only being shown). The bottom end member may be united with the body in the usual manner by means of a seam 10. As shown, the other member, herein forming the top wall of the container, is permanently united to the upper end of the side wall 8 of the can body by means of an upstanding interlocking double seam 11. Such seams are of well known character and the usual construction is herein employed with the vital exception, however, that the seam structure is modified first, to promote the circumferential severance of the seam externally of the cylindrical body, and, second, to sever the seam in such manner that a removable slip cover is formed for the can. In the attainment of these results, the outer layer of the seam is fashioned so as to define an annular space adapted to receive the point of a cutting implement, so that in opening the can it is only necessary to penetrate a single layer of metal without obstruction to the cutter from any other part of the seam. Also, the outer layer of the seam is shaped to provide an annular bead projecting radially from the outer peripheral face of the seam so as to provide a downwardly facing shoulder adapted to be severed along a line disposed externally of said face whereby to permit removal of the end member without obstruction by any interengagement of the parts of the seam after severance.

In the preferred embodiment of my invention a cutter-receiving space 13 is provided through the provision of an annular bead 12 projecting

radially from the bottom portion of the seam. The bead thus forms a downwardly facing shoulder radially enlarged to facilitate engagement by the cutting edge of an implement bearing upon the upper edge of the seam.

Referring now to Fig. 2, the can body is initially formed with an outwardly projecting flange 14, and the cover-section 9 is formed with a central depression providing a vertical annular portion 15 of an external diameter corresponding with the internal diameter of the can body. Projecting outwardly from the upper end of the annular portion 15 is a peripheral portion or flange 16 of a width substantially greater than the body flange 14 and terminating in a downwardly and inwardly turned curl 17. 18 designates the usual gasket of rubber composition or other suitable sealing material applied to the peripheral portion 16 of the end member.

After the parts have been assembled as shown in Fig. 2 the first step of the seaming operation is performed, substantially as in the well known manner. In this operation a forming roller 19 engages with the outer surface of the flange 16, curling the same inwardly. In this forming operation, the body flange 14 is bent downwardly in the form of a lip presenting a cylindrical outer face and the curled edge portion 17 is bent inwardly and upwardly between the flange 14 and the side wall 8.

In the next and final forming operation shown in Fig. 4, a roller 20 having a specially shaped forming groove 21 in its periphery is applied to the now rounded flange 16 of the end member so as to force the several parts tightly together, with the terminal portion 17 between the wall 8 and the flange 14, and with the flange 14 interlocked tightly between the cover flange 16 and its terminal portion 17. At the same time the bead 12 is formed, providing the annular cutter-receiving space 13. It will of course be understood that in accordance with common practice an inner backing member or chuck (not shown) engages with the annular vertical wall portion 15 so as to cooperate with the outer rolls in the formation of a tight seam.

It will be observed that in order to form the bead 12, it is only necessary to increase slightly the width of the flange 16 as compared to that necessary for the ordinary double seam, and to make the groove 21 in the roller 20 of a suitable shape to determine the position and shape of this bead. In the preferred form, the bead is made of a vertical thickness substantially less than the double seam, and is formed in the lower edge portion of the seam so as to provide a laterally enlarged downwardly facing shoulder portion 12^a adapted for penetration by a cutting element in a manner which will be understood from Figs. 5 to 7. By this arrangement, severance of the metal forming the shoulder portion 12^a leaves a cover having a downturned edge portion or lip for frictional engagement with the body flange 14, thereby forming a telescoping slip cover which may be replaced upon the can body for purposes of reclosure.

Referring first to Fig. 7, 22 designates a rotary cutter of a can-opening implement especially constructed for use in accordance with my invention. This implement may be of any suitable or preferred character and the particular details of construction form no part of the present invention. As shown it comprises a bracket 23 (Figs. 5 and 6) pivotally supporting at its lower end the roll cutter 22. At its upper end

the bracket 23 carries an arm 24 in pivotal relation thereto, and the arm in turn has mounted on one end a knurled disk 25 fast upon the shank 26 of a key 27 mounted to turn relative to the arm 24. The bracket 23 may have an intumed flange 28 for sliding engagement with the side wall 8 of the can, and the shank 26 may also have a collar 29 for guiding engagement with the annular portion 15 of the cover.

In the application of the cutter to a can to be opened, the cutter is placed in engagement with the downwardly facing shoulder 12^a at the lower side of the double seam; whereupon the arm 24 is swung from the position shown in broken lines in Fig. 6 to carry the knurled disk 25 downwardly into engagement with the upper edge of the seam 11. The swinging movement of the arm in this direction may be limited by a lug 30 on the arm engaging with the bracket 23.

The movement of the arm 24 into the full line position shown in Fig. 6 operates to draw the cutter upwardly so that its cutting edge penetrates the bottom wall of the bead 12 and enters the annular cutter-receiving space 13; and in the ensuing clockwise rotation of the key, the knurled disk 25 engages with the upper edge of the seam 11 to cause the cutter to sever the bead throughout its circumference. In this operation swinging movement of the bracket 23 relative to the container may be limited by a lug 31 formed on the bracket and adapted to engage slidably with the upper edge of the seam 11.

It will be observed that the opening implement is associated with the can in guided reactive relationship with the double seam, being maintained in proper position by the engagement of the knurled disk 25 and collar 29 with the upper and inner sides of the seam, and the cutter engaging with the bottom of the seam. As shown in Fig. 7, the cutter 22 is adapted to be positioned with its cutting edge disposed substantially centrally of the plane of the cutter, and at opposite sides of the cutting edge, the cutter curves downwardly and outwardly so as form in effect rounded cam surfaces 32. These curved surfaces act in the cutting operation to turn the severed edge portions of the bead upwardly into the space 13 so as to fold or double them back with a smoothing action, thus eliminating sharp or rough protruding edges. It will be observed that the line of severance is disposed outwardly of the body flange 14 and that the severed edge portion remaining attached to the can body is folded into position adjacent the terminal edge of the flange 14. After the bead has been cut and the edge portions folded back, a closure member is formed which may be removed readily and replaced when desired after partial removal of the contents of the can.

It will be seen from the foregoing that my invention consists in modifying the standard interlocking double seam so as to provide for the opening of the can by cutting the seam circumferentially of the cylindrical body wall as distinguished from cutting the top wall in the usual manner, thereby precluding the possibility of dirt and metal particles falling into the can and at the same time producing a removable friction slip cover or reclosure member which has heretofore been possible only in the case of the so-called tearing strip or key cans of high manufacturing cost. While the formation of an annular space in the seam reduces to a slight degree the area of the sealing surfaces, it has nevertheless been found that it is possible to ef-

fect and maintain a tight seal. In this connection, it appears that the formation of a narrow protruding bead on the seam tends to stiffen the metal with a resulting strengthening of the seam.

In the operation of opening the can, advantage is taken of the upstanding seam to guide the cutting implement. Also the cutter penetrable space performs an important part in this guiding function. Thus the space 13 is so dimensioned that after the cutting edge of the cutter is initially forced through the shoulder portion 12 its side edges coact with the severed edges of the metal as shown in Fig. 7 to maintain the implement in proper position to perform the circumferential severance of the end wall or closure member. When replaced upon the can body, the closure member is frictionally held in position by the engagement of the flange 15 thereof with- 20 in the upper end of the can body and also by the engagement of the depending outer portion of the end wall flange with the body flange 14.

It will be understood that in the drawing the parts are shown on a substantially enlarged scale for the sake of clearness. In actual practice, the double seam, except for the bead 12 is of the usual size, and as to the bead, this increases only very slightly the diameter of the seam. The size of the space 13 formed by the bead need not be 30 large. Thus a space about twenty-thousandths of an inch wide and ten-thousandths of an inch deep has been found to be satisfactory.

I claim as my invention:

1. A sheet metal can comprising a cylindrical body wall and a top wall united to the upper end of the cylindrical body wall by means of a double interlocking seam having a down-turned external flange on the body wall and a flange on the top wall including an inner portion telescoping into the upper end of the body wall, and a peripheral edge portion folded around and into interlocking engagement with the flange on the body wall so that the seam projects upwardly from the top wall and has an outer face offset outwardly a short distance from the outer face of the cylindrical body wall, the peripheral edge portion of the top wall flange being shaped to form an annular bead protruding radially outward at the bottom of the seam beyond the outer face of the upper portion of the seam, said bead providing an annular space in the seam with the lower side of the space defined by a downwardly facing shoulder portion of a radial width greater than the thickness of the seam above the bead so as to facilitate the circumferential severance of the seam by a cutting element inserted through said shoulder portion only and penetrating said space.

2. A sheet metal can comprising a cylindrical body wall and a top wall united to the upper end of the cylindrical body wall by means of a double interlocking seam having a down-turned vertical external flange on the body wall and a flange on the top wall including an inner vertical portion telescoping into the upper end of the body wall, and a peripheral edge portion folded around and into interlocking engagement with the vertical flange on the body wall so that the seam projects upwardly from the top wall and has an outer face offset outwardly a short distance from the outer face of the cylindrical body wall, the peripheral edge portion of the top wall flange being shaped to form a vertically narrow annular bead protruding radially outward beyond the outer face of the seam at one side 75

of the bead and fashioned to provide an annular space in the seam adapted to promote the circumferential severance of the seam by a cutting element penetrating only the portion of the end wall flange forming one side of the bead.

3. A sheet metal can comprising a cylindrical body wall and a top wall united to the upper end of the cylindrical body wall by means of a double interlocking seam having a down-turned vertical external flange on the body wall and a flange on the top wall including an inner vertical portion telescoping into the upper end of the body wall, and a peripheral edge portion folded around and into interlocking engagement with the vertical flange on the body wall so that the seam projects upwardly from the top wall and has an outer face offset outwardly a short distance from the outer face of the cylindrical body wall, the peripheral edge portion of the top wall flange being shaped to form an annular hollow bead protruding radially outward from the outer face of the seam and made of a vertical thickness less than the seam, said bead being severable circumferentially by a cutting element penetrating the portion of the end wall flange forming the bead whereby to form a removable friction slip cover for the can.

4. A sheet metal can comprising a cylindrical body wall and a top wall united to the upper end of the cylindrical body wall by means of a double interlocking seam, said seam having a down-turned vertical external flange on the body wall and a flange on the top wall including an inner vertical portion telescoping into the upper end of the body wall and a peripheral edge portion folded around and into interlocking engagement with the vertical flange on the body wall so that the seam projects upwardly from the top wall and has an outer face offset outwardly a short distance from the outer face of the body wall, said peripheral portion of the top wall flange being shaped to provide an annular space in the seam fashioned to promote the circumferential severance of the seam by a cutting element penetrating into said space whereby to permit removal of the end wall.

5. A sheet metal can of the type in which a flat top wall is united to the upper end of a cylindrical body wall by means of a standard upstanding double interlocking seam; characterized in that the standard seam is modified to form an annular bead protruding radially outward at the bottom of the seam beyond the normal outer face of the upper portion of the seam, said bead being fashioned to provide an annular space externally of the body wall with the lower side of the space defined by a downwardly facing shoulder portion of a radial width greater than the thickness of the seam above the bead whereby to promote the circumferential severance of the seam by the cutting element of an opening device associated with the can in guided reactive relationship with the upstanding double seam, with the cutting element inserted through said shoulder portion in an upward direction substantially parallel with the body wall of the can.

6. A sheet metal can of the type in which a flat top wall is united to the upper end of a cylindrical body wall by means of standard upstanding double interlocking seam; characterized in that the standard seam is modified to form an annular bead protruding radially outward from the normal outer face of the seam below the upper edge thereof and providing an 75

annular space externally of the can fashioned to promote the circumferential severance of the seam by the cutting element of an opening device penetrating into said space and associated with the can in guided reactive relationship with the upstanding double seam.

7. A sheet metal can of the type in which a flat top wall is united to the upper end of a cylindrical body wall by means of a standard upstanding double interlocking seam; characterized in that the standard seam is modified to provide an annular space externally of the cylindrical body wall fashioned to promote the circumferential severance of the seam by a cutting implement which penetrates into said space and which is movable circumferentially of the can in guided reactive relationship with the upstanding double seam, said space being dimensioned to receive and guide a cutting edge on said implement.

8. A can having a body side wall and an end wall having a depressed portion adapted to fit within the body, the marginal edges of the side

wall and cap being joined by a double interlocking seam, the portion of the metal of the end wall that extends downwardly outside of the re-bent flange of the side wall and upwardly within the seam being substantially in excess of that required for the seam whereby to provide an intervening hollow bead, the lower wall of which is flat and extends a distance laterally away from the side wall and outside the area of the seam sufficient to provide for engagement on its underside by a cutter blade and so arranged that the cutter blade may make its cut at a point in line with the vertical junction line between the downturned flange of the body and the downturned flange of the end wall, the space and disposition of the metal of the hollow bead permitting the severed edge of the metal in the outer portion of the bead to turn upwardly and inwardly away from said junction line and thus permit the end wall to be removed without interference between the said cut edge and the downturned flange of the side wall.

CHARLOTTE A. ARNESEN.

CERTIFICATE OF CORRECTION.

Patent No. 2,196,181.

April 9, 1940.

CHARLOTTE A. ARNESEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 22, after "flange 14." insert the following paragraph -

--No claim is herein made to the can opening device either by itself or in combination with the can, nor to the method of opening the can, this subject matter being covered in whole or in part in my copending applications Ser. No. 205,109 filed April 30, 1938 and Ser. No. 255,303 filed February 8, 1939.--;

line 26, for "bed" read --bead--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of June, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)