Feb. 24, 1953 W. H. AYRES 2,629,421

METHOD OF PRODUCING CONTAINER BODIES

Original Filed July 8, 1946 2 SHEETS—SHEET 1

Fig. 1

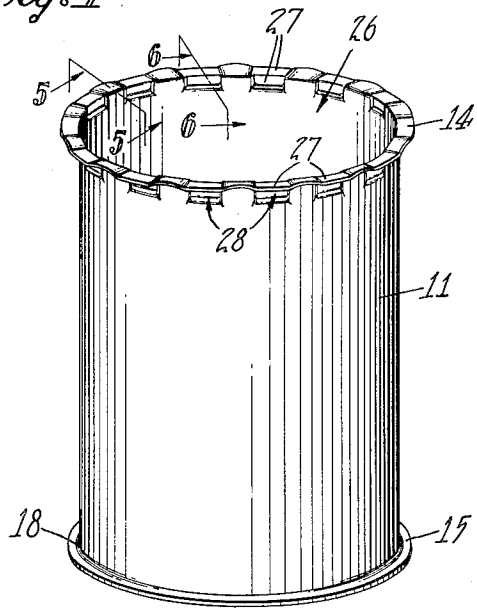


Fig. 3

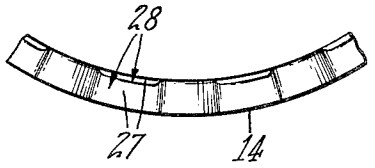


Fig. 4

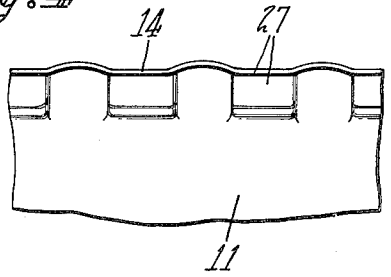


Fig. 2

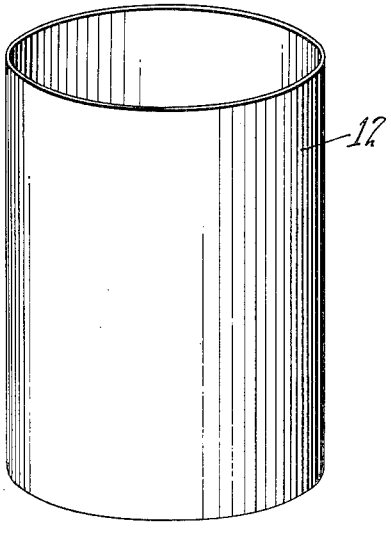


Fig. 5

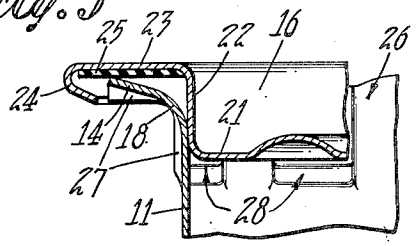
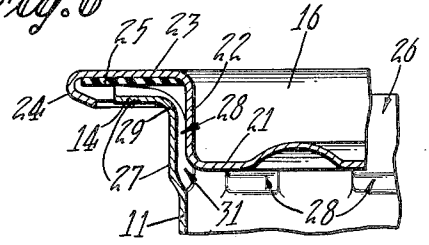


Fig. 6



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METHOD OF PRODUCING CONTAINER BODIES

Original Filed July 8, 1946 2 SHEETS—SHEET 2

Fig. 7

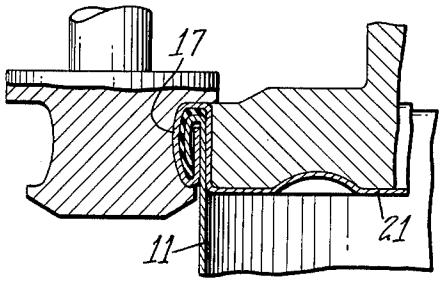


Fig. 10

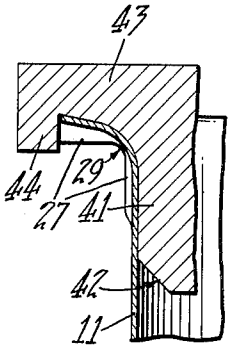


Fig. 11

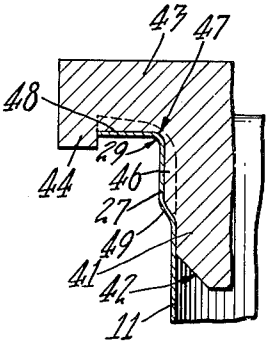


Fig. 8

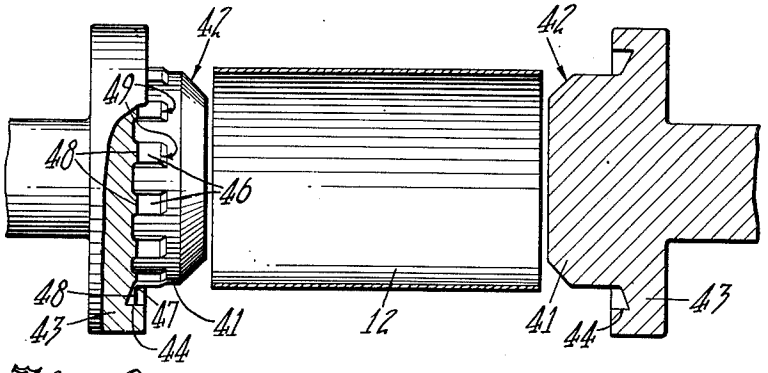
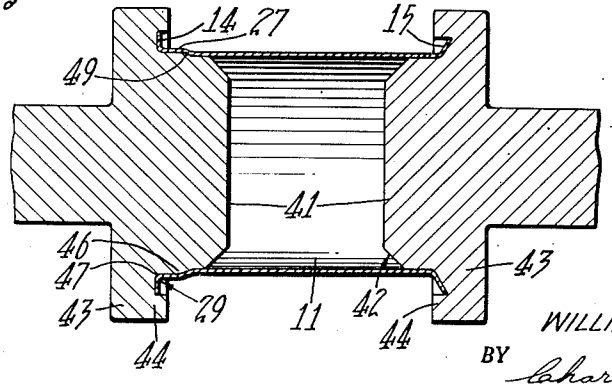


Fig. 9



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UNITED STATES PATENT OFFICE

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METHOD OF PRODUCING CONTAINER BODIES

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Continuation of application Serial No. 681,791, July 8, 1946. This application April 21, 1950, Serial No. 157,345

4 Claims. (Cl. 153—7)

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The present invention relates to a method of producing container or can bodies and has particular reference to producing flanged can bodies having reenforcing venting projections therein. This is a continuation of my United States application Serial Number 681,791 filed July 8, 1946 on Method of Producing Container Bodies, now abandoned.

In the packing of certain products in cans it is sometimes desirable to vacuumize and/or gas the cans after filling. In such cases it is customary to perform the vacuumizing or gassing operation with the can cover loosely applied to the top of the can so as to prevent displacement of the product, especially when the product is of a pulverized or powdery nature, such as coffee or the like products. In order to properly perform this vacuumizing or gassing operation the can is usually vented in some way so that gases may freely pass into and out of the can interior.

The present invention is directed to a method of forming such a vent in a can body adjacent its mouth.

An object of the invention is the provision of a method of forming a vent in a tubular can body wherein a projection setting off a venting channel is produced in the flange of the can body and in the body itself adjacent the flange so that a continuous passageway is formed between the applied cover and the can body for the free passage of gases into and from the interior of the can.

Another object is the provision of such a method of forming a vent in a tubular can body wherein the body is flanged during the formation of the vent channel so as to insure accuracy of construction and economy of time and expense.

Another object is the provision of such a method wherein the formation of the can body flange and the venting projection is effected progressively to facilitate bending of these can parts into proper shape.

Another object is the provision of such a method wherein definite control may be had over the line of bend between the body and the flange so as to insure a flange of uniform width which results in a uniform length body hook when the flange is incorporated in a double seam for joining the cover to the can body.

Still another object is the provision of such a method wherein the mouth of the can body is re-enforced or stiffened with the result that the contour of the body is more readily maintained for the proper reception of the cover.

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Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings, wherein the venting projections are illustrated for clearness upon an enlarged or exaggerated scale:

Figure 1 is a perspective view of a flanged can body embodying a re-enforced and vented mouth produced in accordance with the method steps of the instant invention;

Fig. 2 is a perspective view of a can body from which the flanged body shown in Fig. 1 is produced;

Fig. 3 is an enlarged plan detail of the flange of the can, with parts broken away;

Fig. 4 is a side elevation of the flange portion of the can shown in Fig. 3 with parts broken away;

Figs. 5 and 6 are enlarged sectional views of a portion of the can as viewed substantially along the planes indicated by the respective lines 5—5, 6—6 in Fig. 1, the views showing a portion of a cover assembled on the can before sealing;

Fig. 7 is a view similar to Figs. 5 and 6 showing the cover sealed in place on the can and showing portions of apparatus for effecting this sealing operation;

Figs. 8 and 9 are sectional views of a can body and principal parts of apparatus for producing the flange and the venting projections on the body, the views showing different steps in the formation of these can parts; and

Figs. 10 and 11 are enlarged sectional details of a portion of the apparatus and can body shown in Figs. 8 and 9.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate method steps of producing a flanged and vented sheet metal tubular can body 11 (Fig. 1) made from tin plate or the like material. In accordance with these method steps an unflanged can body, such as the can body 12 shown in Fig. 2 is first provided. The unflanged can body then is formed at least at one end thereof with venting projections or channels preferably in the same continuous operation which also produces the usual top and bottom end flanges 14, 15 (Figs. 1 and 9) for the reception of countersunk end closure members or covers 16. These are secured to the body in conventional double seams 17 (Fig. 7). The flanges 14, 15 project outwardly at an angle to the body and are connected with

the body side wall in curved wall sections 18 (see Fig. 5).

The cover 16 usually is formed with a reenforced bottom panel wall section 21 (Fig. 5) adapted to fit within the can body 11 when the cover is in sealing position on the body. The bottom wall section 21 merges into an upright annular friction wall section 22 which at its top edge merges into an outwardly projecting annular flange 23. The flange terminates preferably in an edge curl 24. A gasket 25 is carried in the cover flange 23 as is usual with covers of this type.

Preferably during the formation of the top flange 14 of the body 11, this flange and a portion of the side wall of the body, adjacent its mouth indicated by the numeral 26 (Fig. 1), are corrugated or otherwise formed with a plurality of venting projections 27 (see also Figs. 3, 4 and 6). These set off shallow venting channels 28. The venting projections are arranged in spaced relation around the entire periphery of the can body.

The venting projections 27 extend radially across the full width of the flange 14 of the can body in a horizontal position substantially at an angle of 90 degrees to the axis of the can. Adjacent the curved wall section 18 of the body the horizontal portion of each projection is formed with an interrupted annular line of bend 29 (Fig. 6). Below this bend 29 each venting projection continues down vertically along the body.

When a cover 16 is in sealing position on the can body 11, the upright friction wall section 22 of the cover engages snugly against the inner surface of the body adjacent the curved wall section 18, as shown in Fig. 5. The cover flange 23 overlies the flange 14 of the body with the gasket material on the cover flange contacting and resting on the outer edge of the body flange. In this position the cover is fully seated on the body and fits tightly in place.

With the cover 16 thus in place, as during a vacuumizing and/or gassing operation on a filled can made from a body 11, the venting channels 28 are disposed directly under the cover and provide continuous passageways from the interior of the can to its exterior beyond the flange 14 (as shown in Fig. 6). The inner ends of the venting channels 28 terminate interiorly of the can at a place in the body just below the bottom panel wall section 21 of the cover. Here each venting channel ends in a venting recess 31. In this manner free passage of gases into and from the interior of the body may be had even when the cover is fully seated on the can body in readiness for sealing.

Sealing of the cover 16 onto the can body 11 is effected by an interfolding of the cover flange 23 with the body flange 14 in the usual manner to produce the double seam 17. During this sealing operation the venting projections 27 and the venting channels 28 are entirely obliterated by being ironed out flat. Although the drawings show these channels of considerable depth due to the exaggerated scale at which the various figures must be drawn, in many instances, for example, when made by the method of Figs. 8 to 11, they are very shallow. For example the channel depth often is only a few thousandths of an inch in depth. Such shallow channels are easily obliterated during the sealing operation. The channels serve as a screen for preventing powdery materials such as coffee or the like, when packed in cans made from such bodies, from being drawn up into the flange parts of the body and the cover where it would interfere with proper forming of the double seam.

Figs. 8, 9, 10 and 11 illustrate one form of apparatus for producing the flanges 14, 15 and the venting projections 27 with the venting channels 28. This apparatus comprises a pair of reciprocable flanging heads 41 mounted for movement toward and away from each other. The flanging heads are slightly smaller in cross section than the unflanged body 12 and are the same shape as the body so that the heads will just fit into the ends of the unflanged body. The inner end of each head is formed with a bevelled surface 42 to facilitate entry into the body. The outer end of each head 41 is shaped as a curved flanging pad 43 having a surrounding stop collar 44. These shaped surfaces form the inclined flange 14 on the body and also the opposite flange 15.

One of the flanging heads 41 (the one shown on left in Figs. 8 and 9) is provided with elements for forming the venting projections 27 in the top flange of the body and in the body itself. This head, adjacent its periphery is formed with a plurality of spaced and parallel shallow protuberances 46 which extend out from the head a distance equal to the desired depth of venting channels 28 and have end bevels 49 as shown in Figs. 8, 9 and 11.

Adjacent the flanging pad section 43 each protuberance 46 terminates in line of bend 47 (see also Fig. 11) and merges into a continuing radial protuberance 48. The radial protuberances 48 project inwardly from the flanging pad a distance equal to the desired depth of the venting channels 28.

For the operation of flanging and protuberance forming, an unflanged can body 12 is placed endwise between the two flanging heads 41, as best shown in Fig. 8. With the body in this interposed position the heads move into the ends of the body and compress it endwise. The flanging pad 43 of the head at the right in Fig. 8 moves against the adjacent end of the body and bends or flares the marginal edge outwardly until it abuts against the stop 44, as shown in Fig. 9. It is this endwise compression that forms the body flange 15.

At the same time the opposite flanging head 41, shown at the left in Fig. 8, moves into the body 12. The edge of the body first engages against the protuberances 46 and as the metal is forced around the protuberances the venting projections 27 are formed progressively. When the flanging pad 43 strikes against the end of the body and continues its movement the curved surface of the pad bends or flares the marginal body edge outwardly. This progressively forms the flange 14 while further forming or indenting the venting projections 27 and while providing the line of bend 29, as best shown in Figs. 9 and 11.

The stop 44 on this head terminates the flanging and projection forming operations and determines the width of the flange. This stop also insures proper backing up of the body side wall against the vent forming protuberances while the body is under endwise pressure. This insures accurate forming of the flange and the venting projections.

The endwise pressure of the body against the flanging stop 44 also insures proper formation of the line of bend 29 of the body against its bending element 47 in the head. This line of bend determines the line of bend of the flange 14 when it is incorporated in the double seam 17 and thus

provides a control which insures uniform length of the body hook in the seam. This line of bend and the venting projections 27 also stiffen the body adjacent its mouth and thereby facilitate maintaining the contour of the body mouth during subsequent handling of the can body.

It is to be understood that the vent projections shown in exaggerated form as 27 in Fig. 1, when made by the method of Figs. 8 to 11 will have an exact form which obviously will be dependent upon the action of the shallow protuberances 46 on the metal walls.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A method of producing a flanged can body having a continuous venting projection in both the flange and a contiguous section of the can body, which comprises providing an unflanged tubular can body, inserting into an end portion of said can body a flanging head having a shallow peripheral projection, without supporting the exterior of said end portion, thereby forming a shallow continuous venting projection in a marginal edge portion of said unflanged can body, which marginal edge portion is of greater width than the width of the ultimate flange, and flanging by means of said head a partial width of said marginal edge portion, to produce a continuous venting projection extending across said flange and along said unflanged body section.

2. A method of producing a flanged can body having a continuous venting projection in both the flange and a contiguous section of the can body to provide a continuous venting passageway between the interior of the can body and a cover loosely applied thereto, which comprises providing an unflanged tubular can body, inserting into an end portion of said can body a flanging head having a shallow peripheral projection, without supporting the exterior of said end portion, thereby progressively forming a shallow continuous venting projection in a marginal edge portion of said unflanged can body, and progressively flanging said marginal edge portion while continuing to progressively extend the venting projections in said marginal edge portion to a width greater than the width of the ultimate flange and greater than the depth of the cover to be applied to the can body to produce a continuous venting projection extending across said flange and along said unflanged body section beyond the depth of the cover to be applied to the can body to provide uninterrupted venting of the can body interior when the cover is loosely applied to the body.

3. A method of producing a flanged can body having a plurality of venting projections each projection continuing in both the flange and a contiguous section of the can body, which comprises exerting a longitudinal endwise pressure against a straight walled unflanged tubular can body to force a marginal edge portion of the body against and over spaced shallow lateral protuberances on a flanging head to radially expand peripherally spaced sections of the marginal edge portion to form a plurality of peripherally spaced longitudinally extending shallow continuous vent projections in the marginal edge portion of the can body, and continuing said longitudinal endwise pressure against the can body to extend the vent projections in said marginal edge portion of the body and to force said marginal edge portion against a curved wall on the flanging head, said wall having thereon extensions of the vent forming protuberances to bend a partial width of the marginal edge portion of the body into an outwardly extending annular flange containing formed portions of said vent projections, while maintaining the continuous formation of said vent projections, the portions of said projections extended in said marginal edge portion of the body by said continuing endwise pressure being continuous with said flange-contained portions to provide uninterrupted venting of the can body interior.

4. A method of producing a flanged can body having a plurality of venting projections each projection continuing in both the flange and a contiguous section of the can body, which comprises exerting a longitudinal endwise pressure against a straight walled unflanged tubular can body to force a marginal edge portion of the body against and over spaced shallow lateral protuberances on a flanging head to radially expand peripherally spaced sections of the marginal edge portion to form a plurality of peripherally spaced longitudinally extending shallow continuous vent projections in the marginal edge portion of the can body, continuing said longitudinal endwise pressure against the can body to extend the vent projections in said marginal edge portion of the body and to force said marginal edge portion against a curved wall on the flanging head, said wall having thereon extensions of the vent forming protuberances to bend a partial width of the marginal edge portion of the body into an outwardly extending annular flange containing formed portions of said vent projections, while maintaining the continuous formation of said vent projections, and continuing said endwise pressure against the can body to force the outer periphery of the flange against a stop on the flanging head to insure uniform width of said flange, the portions of said projections extended in said marginal edge portion of the body by said continuing endwise pressure being continuous with said flange-contained portions to provide uninterrupted venting of the can body interior.

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