Aug. 7, 1945. M. O. KUHN 2,381,386

METHOD OF MAKING CONTAINERS

Original Filed Oct. 4, 1940 2 Sheets-Sheet 1

Fig. 1.

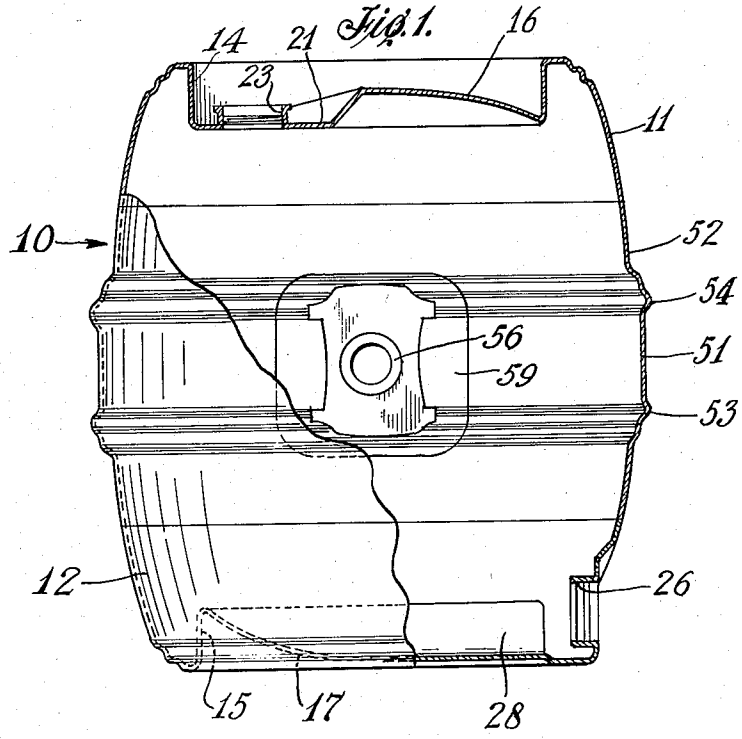
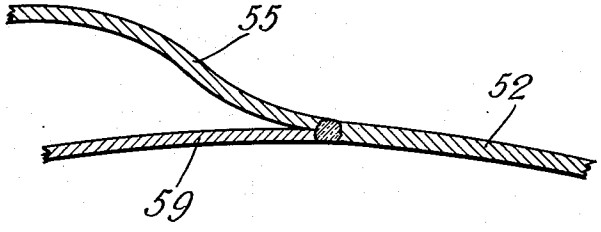


Fig. 2.



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Fig. 3.

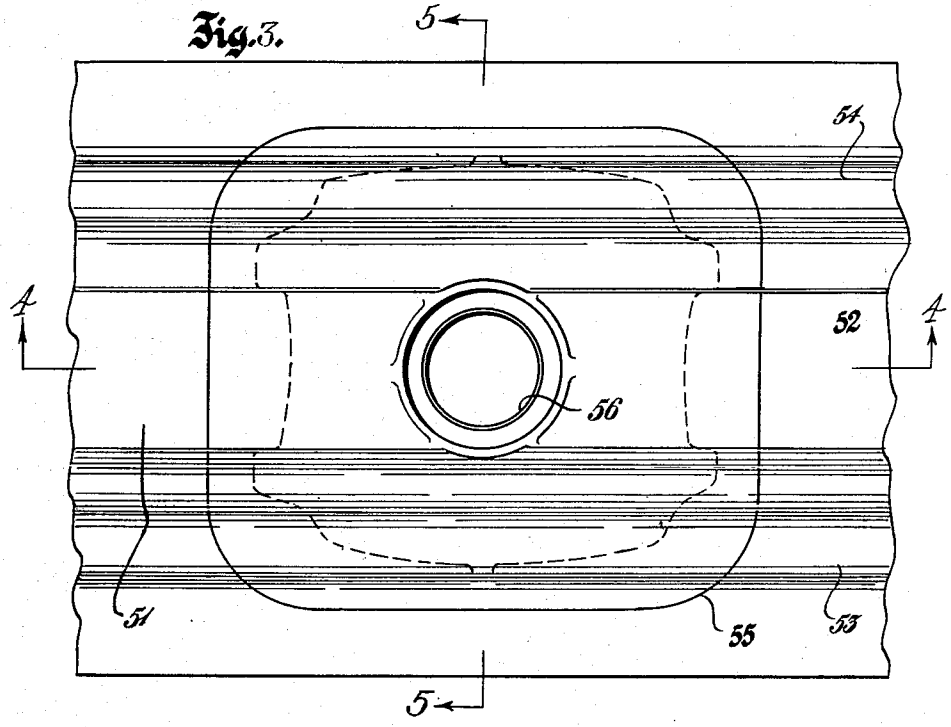


Fig. 4.

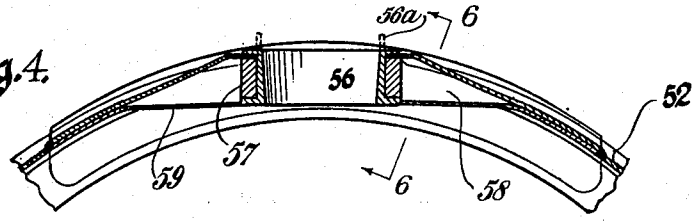


Fig. 5.

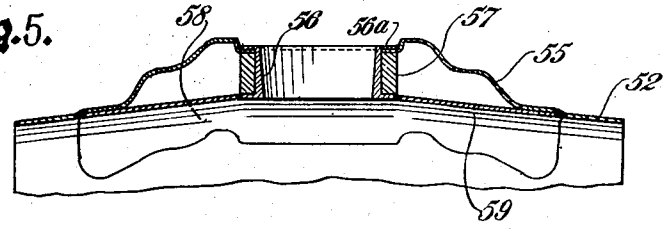
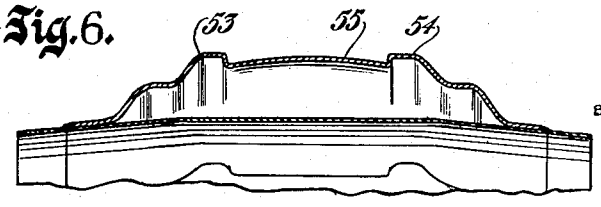


Fig. 6.



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METHOD OF MAKING CONTAINERS

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Original application October 4, 1940, Serial No. 359,673, now Patent No. 2,354,425, dated July 25, 1944. Divided and this application May 9, 1942, Serial No. 442,376

4 Claims. (Cl. 113—120)

This invention relates to methods of making containers, and more especially it relates to improved procedure for the manufacture of single walled metallic containers.

The present application is a division of applicant's prior application, Serial No. 359,673, filed October 4, 1940, for Container, now matured to Patent No. 2,354,425, issued July 25, 1944.

Many types of containers have heretofore been made with a majority of the containers being of the double wall type. One principal reason for making containers double walled is that it is difficult to produce single walled containers that retain their shape when subjected to the rough use which containers normally receive. Another reason is that most single walled containers enlarge when containing a fluid under pressure. These disadvantages of single wall containers are difficult to overcome and have forced most manufacturers to produce double walled containers, whereas obviously double walled containers weigh and cost more than single walled containers.

The general object of the present invention is to provide a method of manufacturing an improved type of container.

A further object of the invention is to provide in an improved manner for the manufacture of a sturdy, constant volume, light weight container.

Another object of the invention is to provide a single wall container having desirable physical properties.

More specifically, the invention aims to provide a single wall container of improved construction at the bung opening thereof.

Other objects of the invention will be manifest from the following specification, particular reference being directed to the accompanying drawings, of which:

Fig. 1 is an elevation, partly in section, of a container produced in accordance with the method of the invention;

Fig. 2 is a fragmentary sectional view, on a larger scale, showing how a bung unit, comprising cut-out section and a reinforcing plate therefor, are mounted in an opening in the wall of the container, which opening is the result of the prior removal of the cut-out section;

Fig. 3 is a plan view of the construction of the bung opening of the container, as viewed from the exterior thereof;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3; and

Fig. 6 is a section on the line 6—6 of Fig. 4.

Referring to the drawings, there is shown a single walled metallic container 10 which is made up of two cup-shaped container sections 11 and 12 that are united to the opposite edges or margins of a medially positioned container ring 52. The container sections 11 and 12 have double walled chimes 14 and 15 respectively formed at the respective ends thereof, the inner walls of said chimes being integral with indented spheroidally contoured heads 16 and 17, respectively, of the container sections 11 and 12. The upper head 16 is formed with a flattened region 21 that has a flanged opening 23 therein to receive any usual or desired tapping fixture (not shown). In like manner the lower container section 12 has a flat portion formed in the outer wall of its chime 15, which portion is formed with a flanged opening 26 to receive a tapping fixture (not shown). The lower head 17 of the container is formed with a radially extending tapping trough 28 that is aligned with the opening 26. The trough 28 facilitates draining of the container through the tapping means in opening 26, and also serves to reinforce the end of the barrel. The container sections 11 and 12 are made by conventional drawing operations, and the ring 52 is formed by expanding a circular metal band to the desired contour. The container sections and ring are composed of a suitable metal such as stainless steel, and are united to each other by being butt welded together by the atomic hydrogen method.

The medial member 52 of the container has a complete centrally disposed circumferential band 51 formed therein, which band has rolling rings 53 and 54 adjacent the edges thereof. After the band 51 is formed, preferably by cold rolling it into the member 52, a section 55, that is substantially rectangular in projection, is cut therefrom by a suitable punch and die, a bung opening disposed centrally of the section preferably being punched therein during the cutting thereof. Next a relatively thin reinforcing plate 59 having a bung liner 56 secured thereto is secured to the concave or inner surface of the section 55 by spot welding. A reinforcing sput 57 is positioned around the bung liner 56 and the latter is inserted in the bung opening formed in the section 55 before assembling the reinforcing plate with the latter, the outer end 56a of the bung liner extending through the bung aperture. Next, the margin of the plate 59 is trimmed to exact conformity with the margin of the section 55 the assembly then constituting a bung unit 58. Note that the center portion of the plate 59 is flat while the ends and sides thereof are out of the plane of the center portion and are contoured so as to fit snugly against the section 55. The bung unit 58

is placed in the hole formed in the band 51 by cutting section 55 therefrom and the inner edge of the plate 58 is positioned flush with the inner edge of the band which obviously makes the outer edge of the section 55 protrude slightly beyond the surface of the container member 52. The abutted edges then are fused together by the atomic hydrogen process, by which all joints in the container are made. The fused joint positioning the bung unit 58 now is tested to determine if it is watertight and, if tight, the protruding end 56a of the bung liner is pressed down against the sput 57, while the liner is pressed out against the sput, and atomically welded in place. The dotted line in Figure 3 indicates the line of contact of the plate 59 with the section 55. In securing the bung unit to the container, the plate 59 is fused to the section 55 at the edge thereof and both the plate and section are fused to the container. After the bung unit is mounted as described, then a container section 11 or sections 11, 12 can be secured to the member 52 to form a container therefrom.

If the section 55 does not readily fit back into the opening produced by cutting it from the band 51, the edges of the section may be trimmed slightly to facilitate repositioning the section. Or, the band 51 may be heated, for example, by placing it on a hot welding jig whereby the hole in the band 51 is enlarged slightly and adapted to receive the section 55.

The container of the invention is provided with a bung bushing which connects to a flattened zone of the container in order that the inner and outer ends of the bushing can be anchored in place without forming a protuberance on the container. Also, this bung construction permits complete drainage of the container. No crevices or cracks are formed on the inner surface of the container, since it is primarily used as a beverage container and it is essential that the container can be kept clean easily. Preferably all of the component parts of the container of the invention are made from stainless steel, except for the reinforcing sputs which may be made from any suitable material, such as carbon steel. A further feature of the container is that it does not expand appreciably when it is filled under internal pressure. Hence, no liquid is expelled when the filling pressure is removed after the container is filled, and the volumetric capacity of the container does not vary substantially under different degrees of internal pressure.

It will be seen that a sturdy easily constructed container has been provided by the invention and that the objects thereof have been realized.

Modification may be resorted to without departing from the spirit of the invention or the scope thereof as defined in the appended claims, which are not limited to the exact procedure described.

What is claimed is:

1. That method of manufacturing a single walled metallic container comprising forming end sections and a medial section for the container, rolling an annular band into the medial container section, forming a bung aperture in said medial section, cutting a segment from the annular band, forming a reinforcing plate of the same size and contour as said segment and adapted to fit against the inner surface thereof, forming a bung aperture in said plate, aligning the edges of said reinforcing plate and segment and forming a bung at said bung apertures to make a bung unit, positioning the bung unit in the hole formed in said annular band with the inner surfaces of the bung unit and annular band being flush, and welding the bung unit to the medial container section and thereafter welding the end sections of the container thereto to complete the container.

2. That method of manufacturing a single walled metallic container comprising rolling an annular band into a container section, cutting a section from the annular band, forming a reinforcing plate of the same size and contour as the section and adapted to fit against the inner surface thereof, making a bung unit out of said reinforcing plate and rectangular section by forming and joining bung apertures therein, positioning the bung unit in the hole in said annular band originally occupied by said rectangular section, and welding the bung unit to the container section.

3. In a method of manufacturing a single wall metallic container, the steps of forming a bung aperture in a cylindrical container section and cutting a plate from the container section with the bung aperture located therein, forming a reinforcing plate having the same general contour as the plate cut from the container section and having a bung liner extending radially outwardly therefrom, assembling said plates in confronting relation including inserting the bung liner in the bung aperture from the concave side thereof, locally banding the cutout plate to the reinforcing plate, trimming the edges of the reinforcing plate to make them flush with the edges of the cutout plate, positioning the assembled unit in the aperture in the container section with the inner surface of the edges of the reinforcing plate flush with the inner surface of the container section, progressively fusing the edges of the cutout plate and the reinforcing plate to each other and to the edges of the container section, securing the outer end of the bung liner to the adjacent surface of the cutout plate, and incorporating the section in a container.

4. In the manufacture of a single wall metallic container comprising an arcuate container section, the steps of cutting a plate having a bung aperture therein from the container section, forming a reinforcing plate having the same general marginal contour as the cutout plate but having a substantially flat medial portion, there being a bung liner secured to the medial portion of the reinforcing plate and a sput positioned about the bung liner, placing the cutout plate and reinforcing plate in juxtaposition so that the marginal portions thereof are in abutting relation and the medial portions thereof are in spaced apart relation, the bung liner extending through the bung aperture in the cutout plate, locally bonding the reinforcing plate to the cutout plate to provide a bung unit, mounting the unit in the aperture in the container section from which the cutout plate previously had been removed, progressively fusing the edges of the cutout plate and reinforcing plate of the unit to each other and to the container section, and then securing the projecting end portion of the bung liner to the cutout plate.

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