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ONE-PIECE EXTRUDED CONTAINER FOR CANNING

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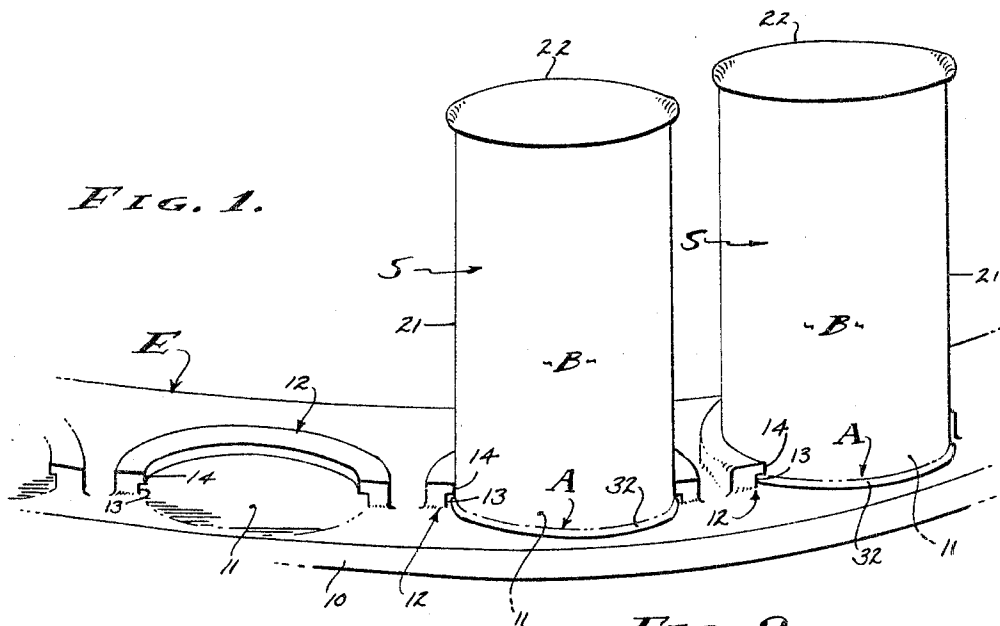


FIG. 2.

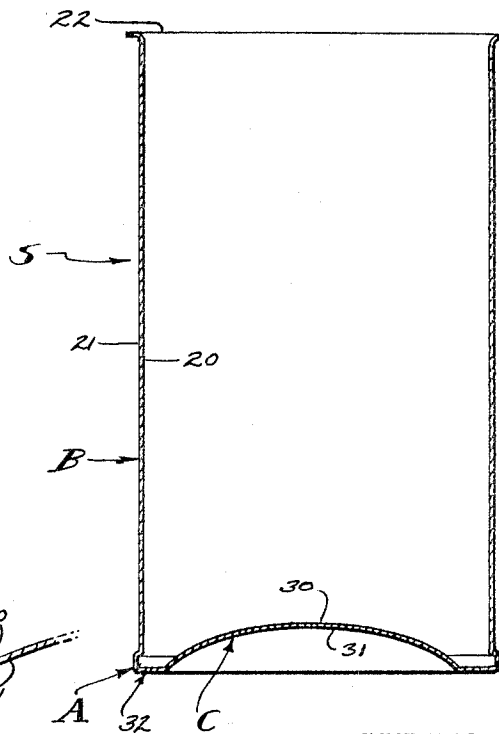


FIG. 3.

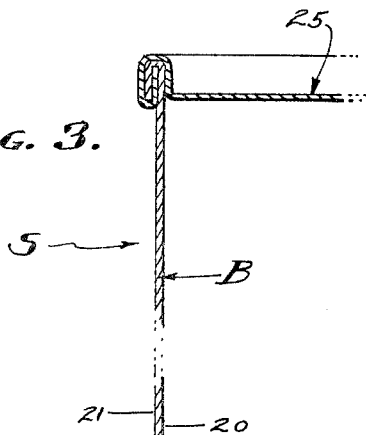
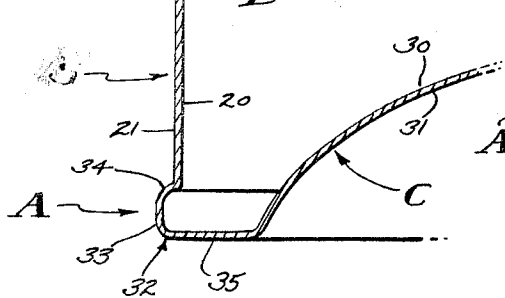


FIG. 4.



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ONE-PIECE EXTRUDED CONTAINER FOR CANNING

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Continuation of application Ser. No. 296,630, July 22, 1963. This application July 8, 1965, Ser. No. 473,896
1 Claim. (Cl. 220-66)

This is a continuation of application Serial No. 296,630, filed July 22, 1963, entitled, "One-Piece Extruded Container for Canning."

This invention relates to containers of the type used for merchandising foods and beverages, and the like, and is particularly concerned with the fabrication of containers primarily by means of extruding a single piece of relatively inexpensive lightweight metal into a monoshell form ready for the reception of contents and adapted to receive a closure.

The art relating to containers of the type under consideration is highly developed and mechanized for the production of specialized containers and also for the canning operations wherein the containers receive the contents to be merchandised. As a practical matter, and in fact, the manufacture of the containers is a business separate from the filling of the containers, the latter being referred to as the canning operation. Furthermore, the said two operations are extreme in their mechanization, with special machinery which is highly developed for the production of special containers and for the handling of the various products to be merchandised. For example, the merchandising of beverages involves certain highly developed machines that receive empty containers, fill them with the beverage, close them with a lid, and discharge and convey them for distribution and sale.

With the highly developed and efficient canning machinery as it is now available in the art, the long used and well known "tin can" is handled and which involves a tubular shell with a longitudinal seam and with transverse ends joined to the shell by a doubled seam that forms a rim or chine. Although the cross-sectional configuration of a container can vary widely, it is usual that the tubular shell is smooth and ordinarily round. Therefore, it is the doubled seam that presents the only geometric part which can be relied upon for reinforcement of and/or engagement of and/or handling of said container.

There are many considerations to be met in the manufacture of containers of the type under consideration. Not only must such a container be recognizable as such but it must also be acceptable in every respect. The presence of a bottom rim as previously formed by a double seam of joinder is necessary during the filling of the container; is necessary to engage and hold the container during application of a lid; is necessary to prevent lifting of the container when the lid applying means is retracted; is necessary to engage the container with conveying means and thereby prevent tipping and/or dislodgement; is necessary to prevent tilting when packaged, in which case the top and bottom rims of the container should be of substantially the same diameter; and is necessary to ensure uniform spacing of adjacent containers whereby defacing of the labels is avoided by preventing touching of adjacent container bodies. Another consideration is the capability of the containers to withstand internal pressures, not only constant pressures after closure but those extraordinary pressures which are invariably imposed during handling in the canning equipment.

A general object of this invention is to provide an improved and commercially practical container of the

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type under consideration, which is durable and acceptable in every respect and which can replace containers of the prior art. Furthermore, it is an object of this invention to provide such a container that is one-piece and yet capable of replacing prior art containers made in several pieces.

Another object of this invention is to provide a one-piece container that will not tilt, one relative to the other, by virtue of adjacent interengagement of one of said containers with another due to the establishment of uniform rim diameters at or close to the bottom and top of the containers. A container without a protruding bottom seam or rim and with the necessary seam that secures the lid thereon would be loose at the bottom end, so as to permit shifting and tilting. The present invention avoids this in a one-piece container.

It is still another object of this invention to provide a one-piece container that will roll straight for conveying purposes, by virtue of uniform rim diameters at both ends of the container. A container without a bottom seam or rim and with the necessary seam that secures the lid thereon would roll along a curved route and not straight. The present invention ensures rolling of the container in a straight line.

It is still another object of this invention to provide a one-piece container with means to prevent touching of the body sections thereof, whereby labels imprinted or carried thereon are not defaced or damaged by contact of adjacent containers. A container without a seam or rim at the bottom end as well as the top end will rub and chafe, one against the other, and thereby deface the labeling.

An object is to provide a leak-proof container that is formed without seams or joints and such a container that is competitively inexpensive of manufacture.

It is also an object of this invention to provide a container of the character referred to which is lightweight and yet strong and so as to withstand internal pressures without resort to encumbering the same.

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred form and application thereof, throughout which description reference is made to the accompanying drawings, in which:

FIGS. 1 through 4 illustrate the article of manufacture, FIG. 1 being a perspective view showing a fragmentary portion of typical canning machinery that may be involved and with the one-piece containers of the present invention in place thereon and engaged therewith, FIG. 2 being an enlarged elevation showing the container of the present invention in section, FIG. 3 being an enlarged detailed sectional view showing the conventional double seam which occurs at and in order to fasten the closure to the container, and FIG. 4 being an enlarged detail sectional view taken at the lower end portion of the container shown in FIG. 2.

The one-piece container of the present invention is worked from a single piece of material as distinguished from the prior art containers that are fabricated of multi-pieces. Tubular shell-like articles can be made in various ways and in order to form a one-piece seamless article the process of extrusion is employed in carrying out this invention. However, impact extrusion of a satisfactory container having all of the necessary features is not readily accomplished and heretofore the forming of such a container in which the bottom and sides are of one integral piece of metal and devoid of the protecting rim or chine has been considered inferior to the multi-piece conventional can, because such an extruded container does not meet all of the necessary requirements as hereinabove set forth. Many attempts

have been made with the purpose of fabricating a suitable lightweight container meeting the said requirements of the present invention, however all previous efforts have resulted either, in an extruded aluminum cup devoid of the protecting chine, or in an extruded aluminum tube secured at a separate bottom piece by means of a double seam and thereby returning to a multi-piece container of conventional structure.

In the drawings I have shown a container of ordinary proportion, being an elongate can of cylindrical cross section and having disc-shaped top and bottom ends. Although the usual can is encumbered with a longitudinal joint or seam, the instant container is not so encumbered, being fabricated of one piece or a single integral body of material which also forms one of the heads, preferably the bottommost head. However, the said container hereinafter disclosed nevertheless has all of the necessary features to be found in the rather heavy seamed cans with separate bottom ends joined to the body of the can by a double seam. As it is illustrated, the instant one-piece container involves, generally a single mono-shell S with a body B and an end C joined to said body at a bead or chine A.

It is significant that the single mono-shell S is an article fabricated of one piece of material, preferably of aluminum that can be readily impact extruded, and that the elements thereof including the body B, end C and chine A are integrally formed and established of one body of material. For instance, the process of either forward or backward extrusion can be practiced to this end, preferably the latter, in which case a blank of metal such as aluminum or the like having the proper selected volume for the intended container is inserted into a set of or sets of dies, whereupon said dies are moved relative to each other in order to extrude a portion of the said blank and thereafter press the same into the desired configuration.

In FIG. 1 of the drawings I have shown, for one example, a fragment of a piece of canning machinery E, namely a part of the carrier or conveyor 10 that supports and transports the containers that are received thereby, filled, closed and then discharged and conveyed elsewhere. The conveyor 10 is in itself a moving element commonly in the form of a turntable and with a continuous series of container receiving stations 11. The said stations 11 are located at the periphery of the conveyor 10 and face radially outward in order to receive containers delivered to the conveyor tangentially. Further, each of said stations 11 is characterized by means 12 to engage the bead or chine of the container, at the bottom end thereof, whereby said containers are captured in place on the conveyor 10. Typically, said means 12 is a semicircular pocket that comprises an arcuate laterally disposed channel having a bottom 13 faced toward the periphery of the conveyor and with a flange 14 overlying the surface 15 of the conveyor a distance to receive the head or chine A of the container. With the conveyor 10 and its stations 11 as described generally above and as clearly illustrated in FIG. 1 of the drawings it should be apparent and clear wherein the bead or chine A is a necessity, for example to hold the container and to permit the upward withdrawal forces that are necessarily imposed in said canning machinery.

In FIG. 2 of the drawings I have shown a cross section of the completed one-piece container fabricated as a mono-shell S, in FIG. 3 I have shown the chine A which characterizes the one-piece container of the present invention. A comparison of these three figures shows that the chine A presents a cross-sectional configuration substantially the same as or equivalent to the cross-sectional configuration of the double seam or bead at the top rim of the container.

The body B in the case illustrated is cylindrical and in practice it is extruded to have a substantially uniform wall

thickness of approximately .010 of an inch, for example. The said body B has, therefore, inner and outer diameters 20 and 21 that project upward from the end C to terminate in a plane and open end 11 normal to the longitudinal axis of the container. In practice, the plane end 22 is flared outwardly, as shown, for the reception of the lid 25 which is to be applied in the usual manner.

The lid 25, which forms no part of this invention, but which is to be compared with the chine A, comprises the usual double seam wherein the body B and lid 25 each overlap the other. The said seam is constructed vertically in the direction of the body walls, the said body being turned back 180° while the marginal portion of the lid 25 wraps around 360° and beneath the turned-back edge of the body. This seam as briefly described is conventional and presents a radial enlargement commonly referred to as a bead or rim and which normally projects radially three times the thickness of the wall of the body and extends vertically about 1/8 of an inch. It is significant that the usual pairs of like or identical beads are relied upon for straight rolling of the container for conveying purposes, and they are relied upon to space the containers in the packaging and to prevent defacing of labels on the bodies B.

The end C is the bottom end of the one-piece container, the configuration of which can vary so as to withstand fluid pressure applied from within the container. In practice, the end C is concavo-convex, being concaved into the body B so as to withstand increased internal pressures. Further, the marginal portion of the end C is widened coincidentally with the end plane of the container at 32 where it presents a substantial area for supporting engagement of the container.

In accordance with this invention, I have provided a one-piece article with said juncture at 32 of enlarged proportion in comparison with the body B thereof, however, this is accomplished without encumbering the container. That is, the wall of the container can remain unaltered as it continues out of the bottom C and into the body B, and thus there is no significant change in body structure. In order to establish the chine A the juncture of the body B and bottom C is enlarged radially at 32 so as to protrude beyond the body wall 21. It is to be understood that the portion 32 can be enlarged to any desired dimension as circumstances require. The flat marginal bottom 35, as it is shown, provides support for the container.

With the mono-shell S fabricated as hereinabove described the chine A is formed from the one-piece container intermediate the end C and body B in order to enlarge the container at this point of joinder, to thereby afford a protruding and protecting portion for supporting engagement upon a surface, and to present a radial protrusion for cooperative engagement in and with canning machinery and to provide spacing for conveying and packaging. The one-piece container as it is disclosed hereinabove is durable and not subject to breakage or leakage at the sharp angular juncture or point of joinder, and above all the container is conventional in every other required respect and is suitable for handling in the usual manner and is therefore adaptable to be handled by the conventional and accepted highly developed machines referred to above. Further, all seams and joints are eliminated in the body B and end C, and therebetween, by means of the method of manufacture. However, the added formation of the chine A results in an extremely practical and utilitarian article of manufacture, without which the article would be practically useless for the purpose intended.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations

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that may appear to those skilled in the art and fall within the scope of the following claim:

Having described my invention, I claim:

An article of manufacture comprising a seamless, cylindrical container of circular cross section having integral side and bottom walls of uniform thickness; and being formed by the bottom wall and a top end, the bottom wall being formed with a central concave shape as viewed externally from the bottom end thereof to provide added strength for withstanding internal pressures, the central concave shape being surrounded by a flat annular bottom surface perpendicular to the longitudinal centerline of the container and extending outward at least to approximately the plane of the side wall; a top secured to the side wall and closing off the top end of the container, the top and the side wall forming a bead adjacent the top end of the container and extending completely around the top end, the bead projecting radially outwardly from the side wall for a predetermined distance relative thereto and terminating in an annular flat surface parallel to the longitudinal axis of the con-

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tainer; a chine formed at the juncture of the side and bottom walls, extending around the bottom end, and projecting radially outwardly from the side wall the predetermined distance whereby the bead and chine have equal outer diameters, the chine also terminating in an annular flat surface parallel to the longitudinal axis of the container so that the container may be rolled in a straight line across a flat surface and may be held by the chine in automatic handling apparatus during manufacturing and filling thereof.

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J. B. MARBERT, *Assistant Examiner*.