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PREFABRICATED MILK CONTAINER

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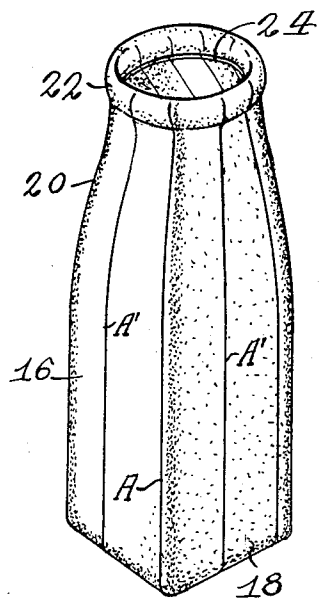


Fig. 1

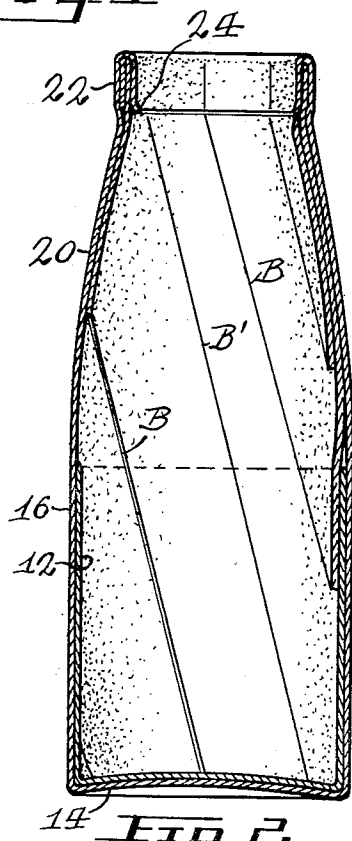


Fig. 2

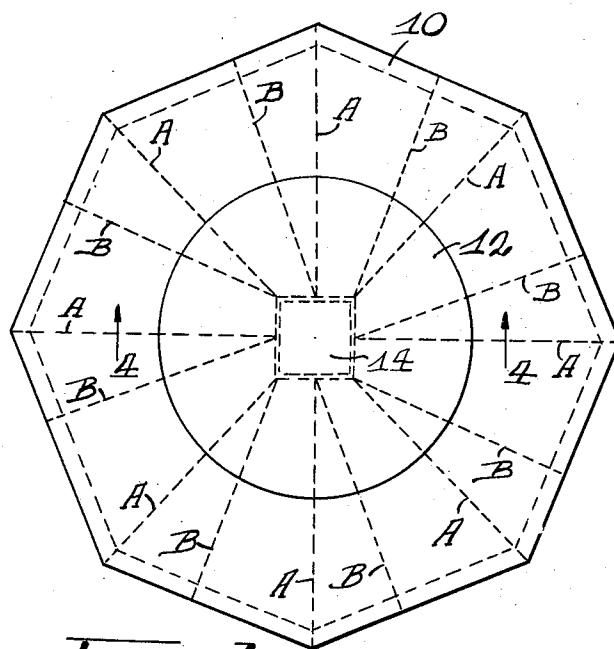


Fig. 3

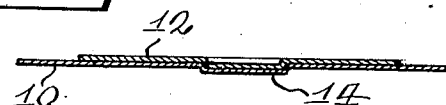


Fig. 4

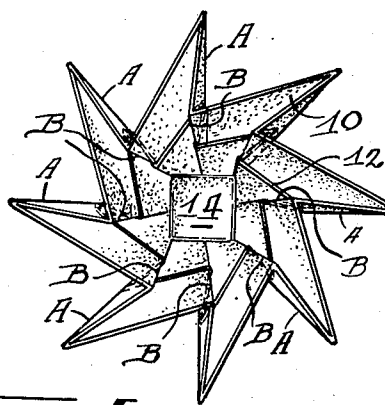


Fig. 5

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PREFABRICATED MILK CONTAINER

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9 Claims. (Cl. 229—2.5)

The present invention relates to improvements in the manufacture of non-glass milk bottles.

As is well known, a major factor in the amount of labour and cost involved in the distribution of processed milk resides in the cleaning, filling, handling and return of the glass milk bottles generally in use.

In view of this, many attempts have been made to produce a milk container made from materials other and less costly than glass which would allow the containers to be used once and destroyed after use. For example, there is presently available several types of paper or cardboard containers intended for use in bottling milk.

There are certain problems involved in making milk bottles from material such as paper, or other fibrous sheet material, for example, to achieve complete customer acceptance, it is considered essential to maintain the containers in a shape simulating that of the usual glass bottles to which the public is accustomed. Further, the container must, of course, be completely leak-proof, and be of sufficiently rigid structure to permit handling without failure both in the filling operations and in the subsequent delivery.

The present invention recognizes these problems and aims to provide a simple solution to them by furnishing an improved milk container construction which can be made from paper or other fibrous sheet material and which, while simulating the standard glass milk bottle in appearance is considerably lighter in weight and in view of the materials used is intended to be destroyed when empty.

Accordingly, the invention comprises a milk bottle made from a one-piece blank of fibrous sheet material which is creased, plated and compressed under pressure to provide a finished milk container simulating a standard milk bottle and having a flat or slightly concave bottom, a main body portion of substantially square cross section with parallel substantially flat sides, a tapering cylindrical neck portion extending from the main body portion and terminating in an outstanding annular top having an internal cap holding lip or flange.

More specifically, in a preferred construction of a milk bottle in accordance with the invention, a re-enforcing insert, also comprising a one-piece blank, is combined with the one-piece blank making up the main body of the bottle and these combined blanks are simultaneously creased and pleated to form the bottle structure described above. The internal re-enforcing insert thus formed extends from the bottom of the bottle structure to a position beneath the beginning of the tapering neck portion.

In accordance with the invention, the blanks for the bottle and re-enforcing insert are preferably cut and partially folded together, and are then subjected to a forming process which simultaneously pleats the combined insert blank and the bottle blank from the bottom or centre so as to draw the pleated sheet about the body of a forming mandrel, the bottom of which is centered relatively to the combined blanks. Other means are provided to complete and set the pleats to form the blanks to the dimen-

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sions of the form and by the application of suitable pressure, sets and crushes the fibrous material into the desired conformation including the internal cap supporting lip or flange.

5 The sheets of fibrous material, for example, paper, will be pre-coated or impregnated with a suitable water-proofing material, for example, paraffin wax or the like, which will act to adhere the pleats and give a finished bottle its desired liquid-proof characteristics.

10 In the preferred bottle construction in accordance with the invention, the edges of the pleats disposed on the outer surface of the bottle body extend substantially parallel to the longitudinal axis of the bottle and in alignment with the corners of at least the main body portion of the bottle from adjacent the bottom portion to the beginning of the tapering neck portion. The edges of the pleats disposed on the inner surface of the bottle extend diagonally around the interior relative to the outer pleats.

Having thus generally described the nature of the invention, particular reference will be made to the accompanying drawings, wherein there is shown by way of illustration a preferred embodiment thereof, and in which:

Figure 1 is a side view in perspective elevation of a bottle constructed of fibrous sheet material in accordance with the invention.

Figure 2 is a vertical cross section of the bottle construction shown in Figure 1.

Figure 3 is a plan view of the one-piece blanks making up the main bottle body and re-enforcing insert as they would appear when combined prior to forming with the fold or pleat lines indicated in dotted lines and the bottom slightly indented prior to the main forming operation.

Figure 4 is a sectional view of the combined blank shown in Figure 3.

Figure 5 is a diagrammatic view in plan of the combined blank shown in Figure 3 showing the pleats partially formed prior to their final placement in the form shown in Figures 1 and 2.

With particular reference to Figures 1 and 2 of the drawings, a milk bottle constructed in accordance with the invention comprises combined one-piece blanks 10 and 12, of fibrous sheet material, for example, paper, which are cut and creased as shown in Figure 3, pre-formed as shown in Figures 4 and 5, and finally consolidated and compressed into the finished form shown in Figure 1.

This bottle construction includes an inwardly concave bottom portion 14, a main body portion 16, having substantially flat sides 18, and a tapering neck portion 20 terminating in an annular re-enforced top portion 22 having an inner cap supporting flange or bead 24.

The bottom portion 14 and the main body portion 16 are substantially square, in outline, and cross section, respectively, and the tapering neck portion 20 gradually evolves from a square to a circular cross section terminating in the annular top portion 22. As will be appreciated by reference to Figure 1, the finished bottle closely resembles the conventional square sided glass milk bottle.

The pleats "A" and "B" in the blanks 10 and 12, by means of which the surplus material is consolidated through the formation of the bottle, are arranged and disposed relative to the blank outlines so that when the blanks are folded as shown in Figure 5, the pleats "A" are aligned in equally spaced apart relationship about the outer surface of the bottle in substantial parallel alignment with the longitudinal axis of the bottle. The pleats "B" are disposed about the interior of the bottle at an angle relative to the exterior pleats "A." This formation gives the walls of the bottle structure considerable strength and rigidity.

Further, the pleats "A" adjacent the corners of the

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sides 18 of the body portion of the bottle are disposed relative to the bottom portion 14 so that they do not occur directly at the corners but approximately $\frac{1}{8}$ " around each corner and overlap the next adjacent side. This arrangement not only provides a more rigid structure but also makes it possible, during the manufacturing process to apply considerable pressure to the straight sides 18 without the danger of pressing on a pleated edge, as would be the case if the folds or pleats "A" were disposed directly at the corners of the bottle structure.

The pleats 'A' intervening the corner pleats "A" are accordingly aligned substantially $\frac{1}{8}$ " off the longitudinal centre line of the bottle body portion at each side 18 so that the pleats are equally spaced apart about the circumference of the bottle.

Since the re-enforcing or insert 12 is simultaneously folded or pleated with the main body of the bottle, the pleats are correspondingly arranged and are interleaved between the folds or pleats "A" and "B" of the main body blank. As is shown in cross section in Figure 2, the re-enforcing 12 terminates within the main body portion of the bottle before the beginning of the tapering to form the neck portion 20.

This provides extra re-enforcing and strength to the lower portion of the bottle which is normally subjected to the greatest strain or abuse and also provides a double seal to the portion where leaks are most likely to occur.

The lip or flange 24 formed in the inside of the upper annular cap portion 22 is constituted by a folding in of the upper extremities of the main body blank 10. The final formation of the lip and of the annular top is formed by compression of the excess pleated paper and in the present construction is preferably formed by the exertion of internal pressure forcing the upper end of the bottle against rigid molding surfaces.

As shown most clearly in Figure 3, the blank 10 for the main body of the bottle is of octangular outline while the blank 12 for the re-enforcing insert is of circular outline and is of approximately half the size of the blank 10. The blank 12 is located centrally and concentrically of the blank 10 so that when the bottle is formed, the insert forms a cylindrical lining within the lower portion of the main body of the bottle.

In the manufacture of bottles in accordance with the invention, special apparatus has been designed for the simultaneous cutting and pre-forming of the combined blanks and the final pleating and pressing of the combined blanks into finished form. Since no claim is made to this apparatus in the present application, a detailed description and/or illustration is not thought necessary.

In the formation of a bottle in accordance with the present invention, the sheets of fibrous material, for example, paper, light cardboard or the like forming the basic blanks are preferably pre-impregnated with a suitable wax and combined prior to a cutting and pre-creasing operation which results in the formation of combined blanks as shown in Figure 3 with the bottom portion 14 being formed as shown in Figure 4.

The fold lines defining the pleats "A" and "B" then permit the combined blanks to be folded upwards and swirled about a suitable form having the configuration of the finished bottle, shown diagrammatically in Figure 5 and then internal and external pressure is applied to set the pleats, fold in the annular top 22 and form the internal lip 24.

The finished bottle is, during or on completion of its formation, coated with additional wax or other suitable material and preferably the final pleating and compression is performed at elevated temperatures to allow the coating material to thoroughly impregnate and retain the pleats.

I claim:

1. A milk container formed from a symmetrical one-piece unslotted blank of flexible fibrous material coated with moisture resistant material and comprising a bottom

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portion, a seamless main body portion extending upwardly from said bottom portion and having substantially equal flat sides, a tapering neck portion extending inwardly from said body portion, and terminating in an annular top portion having an internal cap retaining flange, the said one-piece blank of fibrous material being pleated from the juncture of said bottom portion with said body portion and through said body, neck, and top portions, and being folded inwardly upon itself at said top portion to provide said cap retaining flange, certain of said pleats being so disposed on the exterior surface of said container that their folded edges extend in parallel relationship from said bottom portion to said neck portion in substantial alignment with the outer edges defining said straight sided body portion.

2. A container as claimed in claim 1, including an inner re-enforcement comprising a further symmetrical one-piece unslotted blank of fibrous material coated with moisture resistant material and creased and pleated to correspond with the pleating of said body portion, the upper marginal edges of said re-enforcement terminating beneath said tapering neck portion.

3. A container as claimed in claim 2, wherein said container body blank and said re-enforcement blank are secured together prior to said pleating.

4. A container as claimed in claim 1, wherein said one-piece blank making up said main container body is of continuous octangular outline with said bottom portion centrally disposed within said outline.

5. A container as claimed in claim 2, wherein the blank for said re-enforcement is of circular outline and of considerably lesser diameter than the blank for said main container body.

6. A container as claimed in claim 1, wherein said bottom portion is of inwardly concave formation.

7. A container for liquids formed from combined first and second one-piece blanks of flexible fibrous material coated with moisture resistant material, said first blank being formed as the main body of said container having an inwardly concave bottom portion, a main body portion extending upwardly from said bottom portion and being substantially square in cross section with parallel flat sides, a tapering neck portion extending from said body portion and while gradually evolving from a square cross section to a circular cross section terminating in an outstanding annular top portion having an internal cap retaining flange, said first blank being pleated from the juncture of said bottom portion with said body portion and through said body, neck, and top portions, and being folded inwardly upon itself at said top portion to provide said inner cap retaining flange, certain of said pleats being disposed about the outer surface of said container so that their folded edges extend upwardly in spaced apart parallel relationship the length of said container and on said body portion in parallel alignment with the outer edges defining said straight body portion, the said second blank constituting an inner reinforcement pleated and formed to correspond with the pleating and formation of said main body blank and being disposed within said main body portion with the upper marginal edges of said re-enforcement terminating beneath said tapering neck portion.

8. A container as claimed in claim 7 wherein said first blank making up said main container body is of octangular outline and said second blank is of circular outline, said second blank being of lesser dimensions than said first blank and being located centrally and concentrically of said first blank prior to forming.

9. A container as claimed in claim 7, wherein the folded edges of said first and second blanks disposed on the inner surface of said container extend upwardly the length of said container in equally spaced apart relationship and at an angle relative to said outer surface pleats edges.

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