

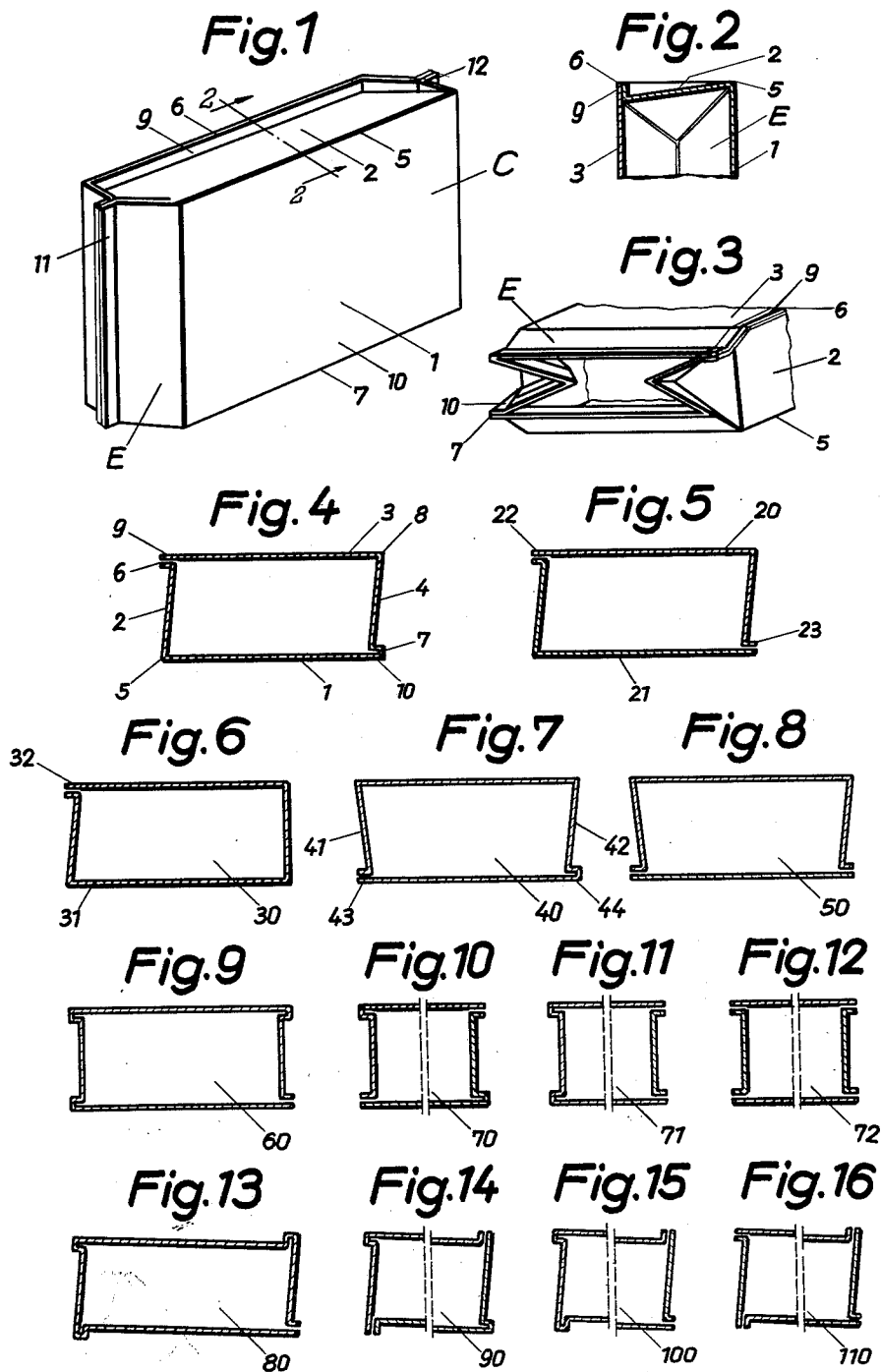
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LIQUID-TIGHT CONTAINERS

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LIQUID-TIGHT CONTAINERS

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The present invention relates to a leak-proof or liquid-tight, prismatic or multi-sided container of paper, cardboard and like carton-forming materials and methods for making the same.

More particularly, the invention is directed to a leak-proof, or liquid-tight, prismatic container in which the tubular body portion is provided at its ends with bellows-type or inwardly folded closures of substantially W-shape with such container being particularly adapted for holding liquids such as milk.

In connection with throw-away containers, or containers which are used but a single time such as milk containers or cartons, troublesome requirements are imposed upon such containers with respect to economy and reasonable production, as well as the liquid-tight or leak-proof, stiffness and simple manipulation characteristics. Of particular importance, especially in the case of containers which are of the mass consumption type, such as milk, is an acceptable cost for the carton as compared to the value of the contents. Prismatic containers formed from a single blank and preferably of rectangular, parallel walled cross-section are especially suitable for cartons or containers which are used but once. Paper, cardboard, and the like provided on one side with a synthetic resin or discardable papers are preferably employed for the production of such containers. The containers are formed from an initially flat blank, which by folding and sealing adhesively longitudinally provide the tubular container body. The thus formed body is then expanded open or opened to its full cross-section, filled and closed, and while avoiding special closure components, the two openings of the body are completed by folding and sealing to form the bellows-type or W-shaped closures.

However, the longitudinal seam of such a tubular container body presents a special problem, since if the seam or seams are formed as an overlapping seam, there is the danger that the container contents can penetrate from the internal cut edge into the body of the container, thus softening the same, with the result that the leak-proof characteristics are lost, especially in the area or region of the longitudinal seam or seams.

This danger of loss of the leak-proof or liquid-tight characteristic can be overcome by forming an outwardly disposed longitudinal seam in such a fashion that upon folding of the blank the longitudinal edges will cover one another, and are sealed together internally. Such an outwardly disposed longitudinal seam is objectionable, since such seam projects outside or outwardly of the perimeter of the container, and thereby influences disadvantageously the stacking ability of such containers. The ability to stack containers of this type in a minimum of space is of particular importance regarding the transportation and storage of containers. To fold down the outwardly disposed longitudinal seam necessitates an additional working step, so that the thus folded seam must be joined by an adhesive to the wall of the container. In addition,

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the thus folded down seam projects externally of the body, and as a consequence provides an external projection.

Yet a further disadvantageous characteristic of the known containers of this type resides in the fact, particularly in the case of thin-walled containers, that the side walls are curved or bulged outwardly by virtue of the liquid pressure, so that both the ability for stacking and the stiffness of the container are affected adversely.

To overcome the above and other objectionable features of known containers of this type is an important object of the present invention.

Viewing the invention broadly, the container or carton is so formed that one or more of the container walls or sides extend back relative or lie within a plane extending through the adjacent container outer edges, and are secured to adjoining container walls by the formation of a fin-like seam, and more particularly, that one or more of the walls are inclined in the direction of the container to the plane defined by the adjacent outer edges of the container, starting from one edge of the container. In other words, at least one wall portion joining in each situation two opposed walls is, starting from the outer edge of one wall, joined to the other wall below the outer edge of such other wall.

A preferred embodiment of the invention comprises a container having a right angle cross-section in which the upper and lower sides are defined by inclined walls, while the ends of the container include known fold closure components, with the arrangement being such that the inclined walls are arranged in parallelism, and the fin-seams being located at diagonally opposite edges of the container.

A further advantageous characteristic which simplifies the production of the container resides in the fact that one fin seam is formed by securing together two coincident edges of the blank, while the other fin seam is provided by securing the folded edge produced during folding of the initially flat blank.

The container embodying the present invention provides an absolutely leak-proof or liquid-tight, longitudinal seam which, even though the same is arranged outwardly does not project relatively to the perimeter or outer cross-sectional configuration of the container, and the setting back of the inclined portion of the wall serves to stiffen the container, since the same is supported solely by the edges of the container, with such fin seams stiffening the container longitudinally and transversely, thereby enabling thin cross-section, carton-forming materials to be used for the container.

To produce the present container, a flat blank is scored, and after the desired folding operation, the longitudinal edges are brought into registry and secured internally, together with the overlapping portions which are formed, and such overlapping portions are also secured together internally, after which the thus formed tubular body is opened to its full cross-section as known in the art, and thereafter closed by the bellows-type or W-shaped closures.

This method of producing the longitudinal seam or fin seam of the container is particularly simple and efficacious, since by merely folding the initially single layer blank in the zone of the longitudinal seam, one layer lies on the other, so that pressure and heat are required to penetrate in each case only one layer of carton-forming material.

Another important advantage of the present invention resides in the fact that the longitudinal seam, during formation of the W-shaped closure, an additional "bunching up" of the material, which disadvantageously influences the pressing and sealing is avoided, which is a marked improvement over the usual overlapping seam.

Further and more specific objects and advantages of the present invention will become more apparent from the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a view in perspective, illustrating the present container in the closed condition;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a fragmental view in perspective, showing the W-shaped or bellows-type closure in the half-closed condition; and,

FIGS. 4 to 16 are diagrammatic representations of various cross-sectional forms of the body falling within the scope of the present invention.

With reference to FIG. 1, the container C is of prismatic or multi-sided form having an essentially right-angle body cross-section. To produce such a leak-proof or liquid-tight container, there is employed a paper or cardboard blank coated on one side or face or on both sides or faces, with a synthetic resin or discardable material. The coating not only possesses an impregnating property, but also that of becoming adhesive when subjected to the action of heat and pressure.

A flat blank, thus treated, is provided with score or fold lines, so that upon folding, there is provided longitudinally extending outer edges 5, 6, 7 and 8 which form walls 1, 2, 3, and 4, respectively. As shown in FIG. 4, the walls 1, 3 and 2, 4, respectively, are parallel. It will further be noted that the wall 2 from its point of juncture with its outer edge 5 is inclined in a direction toward the interior of the container C, while the wall 4 from its juncture with the edge 8 is also inclined inwardly with respect to the container. Inasmuch as a single blank is used to form the container C, the free longitudinal edge of the wall 3 is sealed or secured to the edge 6, which projects outwardly from the wall 2, thereby providing an outwardly directed fin seam 9. The edge 7 is formed by the fold of the blank, and this double layer is likewise secured so as to define an outwardly directed fin seam 10, which is located diagonally opposite the fin seam 9. By virtue of the aforementioned structure, it will be appreciated that the outwardly directed fin seams 9 and 10, respectively, fall within a plane drawn through outer edges 5, 6 and 7, 8, respectively, so that the fin seams 9 and 10 do not project beyond the outer perimeter of the container body, per se.

End walls E of the container C are so formed as to provide, after suitable infolding and being subjected to heat and pressure define closure seams 11 and 12. It will be appreciated from FIGURE 3 that by virtue of the outwardly disposed fin seams 9 and 10, additional "piling up" of the material is avoided, so that upon sealing the shaped fold closures, a uniform pressure may be exerted over the entire width of the closure seams 11, 12, which is a marked improvement over the use of an overlapping longitudinal seam or seams.

With reference to FIGURE 5, there is illustrated a modification of the container shown in FIGURE 4, in which the tubular body of the container is formed not by the longitudinal folding of a single blank, but by the use of two blanks 20 and 21, in which the free edges of the respective blanks overlap, and are subjected to heat and pressure to provide longitudinal seams 22 and 23, respectively. Of course, this particular container also is provided with the bellows-type or W-shaped end closures, as shown in FIGURE 3.

In FIGURE 6 there is shown a container 30 which is also formed from a single blank in which but a single wall 31 is inclined in the direction towards the inside

of the container, and is provided with a single outwardly disposed longitudinal seam 32.

FIGURE 7 discloses a container 40 in which inclined walls 41 and 42 are not arranged in parallelism, with this container being formed from a single blank. It will further be noted that outwardly disposed longitudinal seams 43 and 44 are not arranged diagonally, as shown in FIGURES 4 and 5.

The container 50 illustrated in FIGURE 8 is similar to that of FIGURE 7, except that the container is formed from two blanks.

FIGURE 9 discloses still a further modification of the invention in which one or more of the walls of tubular body 60 are set back relatively to the planes defined by the adjacent outer edges of the body, and the seams are disposed parallel to one another with the tubular body being formed from a single blank.

Containers 70, 71 and 72 shown in FIGURES 10, 11 and 12, respectively, are variations of the container body of FIGURE 9, in that the container body is formed from two or more blanks suitably folded to provide the completed container.

In FIGURE 13, container 80 is formed from a single blank shaped and folded to provide a body in which all walls starting from one edge are inclined in a direction toward the inside of the container relative to the plane defined by the adjoining outer edges of the container.

FIGURES 14, 15 and 16, respectively, show containers 90, 100 and 110 which are variations of the container 80, with the body being formed from at least two blanks.

Various constructional modifications of the apparatus hereinabove described and illustrated are possible, without departing from the spirit and scope of the present invention.

What is claimed is:

1. A liquid tight container comprising a polygonal hollow body having upper, lower and side walls and closed ends, at least said upper wall having an outturned free edge, one of said side walls having an outwardly projecting free edge coinciding with said outturned free edge, means securing said free edges together for providing a fin seam extending longitudinally of said body, and said upper wall having the outturned free edge being inclined throughout its length toward the interior of the body relative to the plane defined by the outer edge of the fin seam and the other edge of said upper wall.

2. The liquid tight container as claimed in claim 1 in which said body is rectangular in cross section and said upper and lower walls and side walls are arranged in parallelism.

3. The liquid tight container as claimed in claim 1 in which one edge of said lower wall and other side wall include means providing a second fin seam extending longitudinally of the body and located diagonally opposite said first named fin seam and said lower wall being inclined throughout its length toward the interior of the body relative to the plane defined by the outer edge of said second fin seam and the other edge of said lower wall.

4. The liquid tight container as claimed in claim 3 in which said body is rectangular in cross section and said upper and lower walls and side walls are arranged in parallelism.

5. The liquid tight container as claimed in claim 1 in which said walls are formed from a single blank of container-forming material.

6. The liquid tight container as claimed in claim 1 in which the upper wall having the outturned free edge and the side wall having the outwardly projecting free edge are formed from separate blanks of container-forming material.

7. The liquid tight container as claimed in claim 1 in which one edge of said lower wall and side wall include means providing a second fin seam extending longitudi-

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nally of the body and located diametrically opposite said first named fin seam and said lower wall being inclined throughout its length toward the interior of the body relative to the plane defined by the outer edge of said second fin seam and the other edge of said lower wall.

8. The liquid tight container as claimed in claim 7 in which said walls are formed from a single blank of container-forming material.

9. The liquid tight container as claimed in claim 7, in which the upper and lower walls and said side wall having the outwardly projecting free edge, respectively, are

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formed from separate blanks of container-forming material.

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