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CONTAINER CONSTRUCTIONS

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Fig. 1

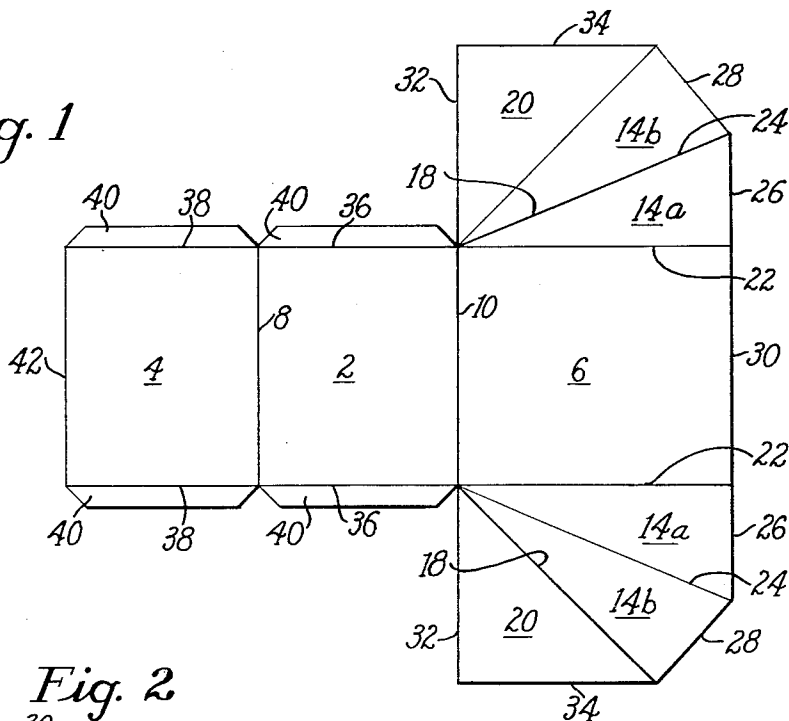


Fig. 2

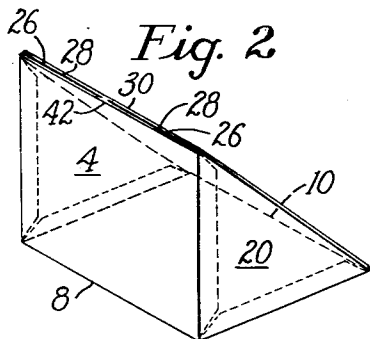


Fig. 3

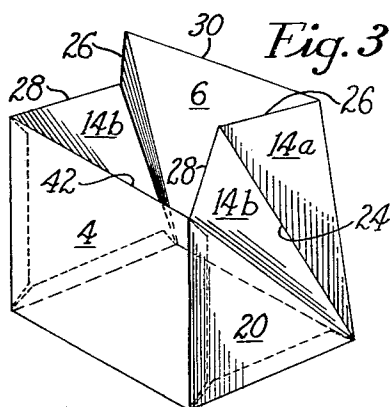
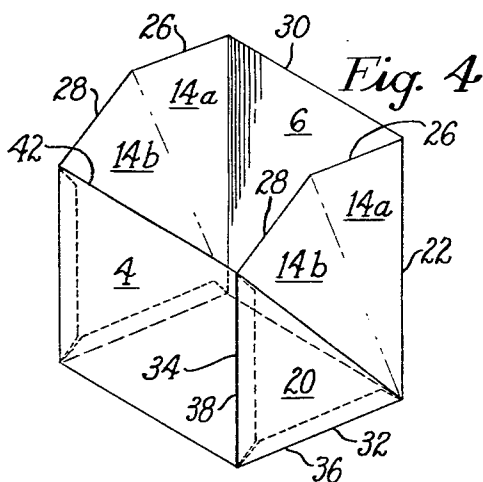


Fig. 4



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CONTAINER CONSTRUCTIONS

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7 Claims. (Cl. 229—22)

This invention relates to packaging and more particularly to containers adapted to the packaging of reconstitutable materials. Increasing use is being made of materials, such as dehydrated foods, which occupy small volumes when dry and expand substantially when liquid is added to render them useable or edible. An advantage resides in the use of a single container which, while initially used for packaging dehydrated food, may also serve as a receptacle or container out of which food may be eaten after it has been opened and liquid added. This necessitates the container either having a volume initially large enough to accommodate the reconstituted food or that the container be expandable. If it is not expandable, the dry or dehydrated food would occupy a volume substantially greater than its own bulk which would be a waste of space and destroy one of the primary advantages of dehydrated food. If, however, the container is capable of expanding its volume to a size sufficient to accommodate the reconstituted food but which initially is only large enough to hold the material in dehydrated form, the maximum volumetric efficiency is obtained, particularly, when individual containers are packed in quantity in a gross container, such as, a shipping carton.

One of the objects of this invention is to provide a blank for a relatively small container or carton for reconstitutable material which, when opened, becomes a useable liquid-tight receptacle having a substantially greater volume than when closed.

Another object of this invention is to provide a blank for an expandable container or carton for reconstitutable materials having a shape when closed which is particularly adapted for packaging in gross.

It is a necessity that any container intended for the packaging of reconstitutable foods be able to be hermetically sealed since the premature introduction of moisture would result in spoilage. It follows, therefore, that a container having the least number of openings or edges which must be sealed not only results in savings in manufacture but presents the least likelihood of hermetic failure.

Accordingly, it is another object of this invention to provide a blank for an expandable container or carton for reconstitutable materials having but a single edge which need be sealed to transform the container from an open watertight receptacle to a hermetically sealed package.

In accordance with these objects and as a feature of this invention there is provided a blank for a container or carton having the configuration of a hermetically sealed right triangular prism when closed comprising a rectangular bottom and rectangular front and rear walls which are sealed along their intersecting exterior exposed edge. The container is opened by breaking the seal whereupon a pair of collapsible wall members are exposed, which, when the front and rear walls are moved away from each other, form co-planar extensions of the side walls, thus permitting the container to be transformed into an open watertight receptacle of substantially larger volume than the closed container. The collapsible wall members comprise a pair of triangular panels which, when the container is closed, are folded completely within the container, each of the panels having an edge occupying a position coincident with the

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exterior exposed intersection of the front and rear walls and, which, along with said walls, are sealed by a single closure. One form of container made in accordance with this invention provides, when open, a watertight receptacle which when resting on its bottom has a liquid retaining volume twice the volume of the closed container. Another container made in accordance with this invention is provided with a square bottom and a volume when closed of exactly one-half of a cube constructed with sides equal to the size of the container bottom and which, when assembled, with a similar container with their inclined walls in engagement, produces a cube of these dimensions.

The above and other features of the invention including various novel details of construction and combinations of parts will now be more particularly described with reference to the accompanying drawings and pointed out in the claims.

In the drawings,

FIG. 1 is a plan view of a cut and scored blank for making a container in accordance with this invention;

FIG. 2 is a completely closed container made from the blank of FIG. 1;

FIG. 3 is the container of FIG. 2 shown partially open; and

FIG. 4 is the container shown fully open.

The container blank (FIG. 1), which may be made from plastic or fibrous material appropriately waterproofed, is cut and scored to provide a rectangular bottom 2, a rectangular first or front wall 4 and a rectangular second or rear wall 6. The front wall is joined to one edge of the bottom along a crease line 8 and the rear wall is joined to the parallel edge of the bottom along a crease line 10. Triangular panels 14a and 14b form on each side of the rear wall a collapsible member which extends between the hypotenuse 18 of a right isosceles triangular side wall 20 and the edge 22 of the rear wall 6 which is normal to the line 10. The panels 14a and 14b of the collapsible wall members are separated by a crease line 24 which bi-sects the included angle between the edge 22 of the rear wall and the hypotenuse 18 of the side wall. Each of the collapsible wall members has two exterior edges 26 and 28 which are of equal length and half the length of the exterior edge 30, the edge 26 being an extension of the edge 30 of the rear wall.

The blank is formed into the open receptacle, shown in FIG. 4, by folding the front wall 4 and the rear wall 6 upwardly along the lines 8 and 10, respectively. The side walls 20 are then folded inwardly by bending the blank along the edge 22. The edges 32, 34 of the side walls are joined hermetically to the edges 36, 38 of the bottom and front walls, respectively. The hermetic joining may be accomplished by any convenient means, such as, by overlapping tabs 40 appropriately supplied with adhesive. When assembled, the container is a watertight receptacle which, when resting on its bottom, has a liquid retaining volume extending up to the edge 42 of the front wall. It will be noted that in the fully opened container the triangular panels 14a and 14b form coplanar extensions of the side walls 20 which are normal to both the bottom 2 and the front wall 4.

After the contents have been placed in the container, it is closed and sealed in the following manner. The triangular panels 14a and 14b are folded inwardly toward each other along the bi-secting crease line 24. At this time the rear wall 6 is drawn toward the front wall 4 by being bent additionally along the crease line 10. When the edge 30 of the rear wall engages the edge 42 of the front wall, the edges 26, 28 of the triangular panels become coincident with the edges 30 and 42 thereby forming a single exterior raw or exposed edge which may be

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secured together to hermetically seal the then closed container. Any appropriate sealing means, such as an adhesive pull tab, may be employed to hermetically seal this single exposed edge. It will be noted that the closed container is in the form of a right triangular prism with the collapsible wall members completely within the container whereby the container has smooth outer sides permitting it to be stacked in a carton with like prismatic containers without having gaps or spaces between them.

If it is desired that the container should be constructed such that when opened, as seen in FIG. 4, all of its walls form 90° angles with the bottom, the blank shown in FIG. 1 would be cut and scored in accordance with the following example. The edge 36 of the bottom 2 would be 2 units in length while the edge 8 would be 2.342 units long. The included angle of the collapsible wall member, i.e. the angle between the hypotenuse 18 of the side wall and the edge 22 of the rear wall, would be 45° . With these dimensions known, the remaining dimensions of the container may be easily calculated from the above information. By this construction, the container when open, and resting on its bottom, as seen in FIG. 4, will be capable of retaining a volume of liquid extending up to the edge 42 which volume will comprise 9.368 cubic units. This container when closed, as seen in FIG. 2, will contain 4.684 cubic units which is one-half of its opened capacity.

If it is desired to produce a container which, when closed, is a prism having a square bottom and the volume of exactly one-half of a cube constructed with sides equal to the size of the container bottom and which, when assembled with a similar container with their inclined walls in engagement will produce a cube, the blank shown in FIG. 1 would be modified slightly in accordance with the following. The bottom is a square 2 units long on its side. The included angle of the collapsible wall member is $38^\circ 41' 42''$. When a container made from this blank is opened, the front and side walls will be perpendicular to the bottom but the rear wall will be inclined slightly toward the front wall forming an angle of $83^\circ 41' 42''$. It follows that the volume of fluid this semi-cubical container will be able to retain when open will be slightly less than twice its closed volume but it will have, as stated above, the advantage of being able to be assembled into a cube when mated with another container of like size and shape.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom.

2. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, and a crease line in each of said collapsible wall members bi-sectioning the included angle between said hypotenuse and the said edge of the second wall member normal to the said opposite edge of the bottom.

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3. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, and having two exterior edges of equal length one of which is an extension of the edge of the second rectangular wall extending parallel to the said opposite edge of the bottom.

4. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, the included angle between said hypotenuse and the said edge of the second rectangular wall normal to the said opposite edge of the bottom being substantially 45° .

5. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, the included angle between said hypotenuse and the said edge of the second rectangular wall normal to the said opposite edge of the bottom being substantially $38^\circ 41' 42''$.

6. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, and having two exterior edges of equal length one of which is an extension of the edge of the second rectangular wall extending parallel to the said opposite edge of the bottom, the included angle between said hypotenuse of the said edge of the second rectangular wall normal to the said opposite edge of the bottom being substantially 45° .

7. A blank cut and scored to form a liquid retaining carton when folded comprising a rectangular bottom, a first rectangular wall joined along one edge of the bottom, a second rectangular wall joined along the opposite edge of the bottom, a pair of isosceles right triangular side walls, and a pair of collapsible wall members each being located between the hypotenuse of one side wall and an edge of the second rectangular wall normal to the said opposite edge of the bottom, and having two exterior edges of equal length one of which is an extension of the edge of the second rectangular wall extending parallel to the said opposite edge of the bottom, the included angle between said hypotenuse and the said edge of the second rectangular wall normal to the said opposite edge of the bottom being substantially $38^\circ 41' 42''$.

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