Jan. 30, 1968 F. L. PHILLIPS, JR 3,366,308

COLLAPSIBLE CONTAINER

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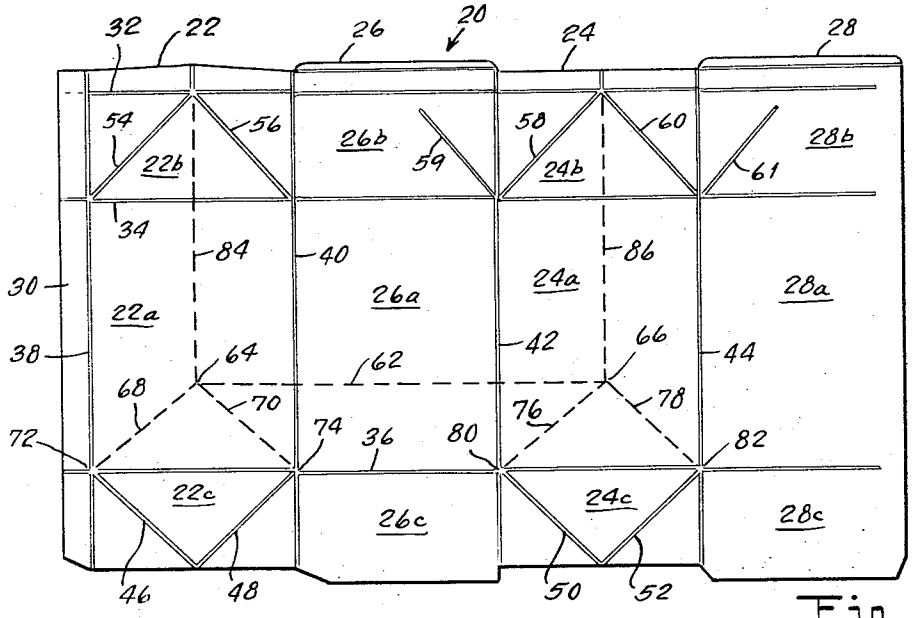


Fig. 1.

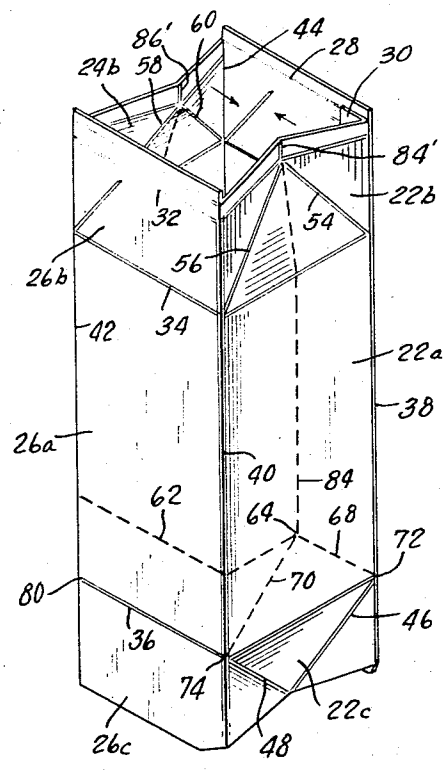


Fig. 2.

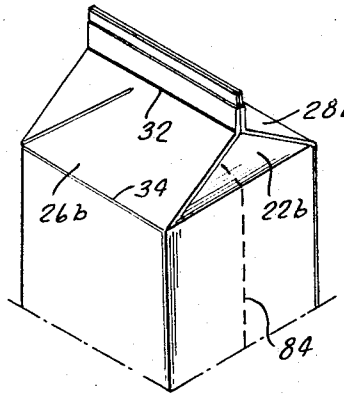


Fig. 3.

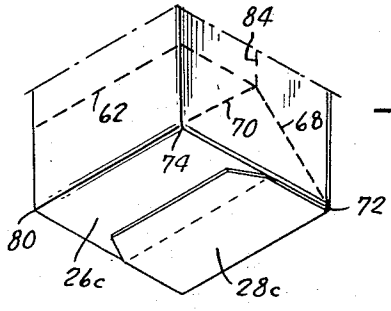


Fig. 4.

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Fig. 6.

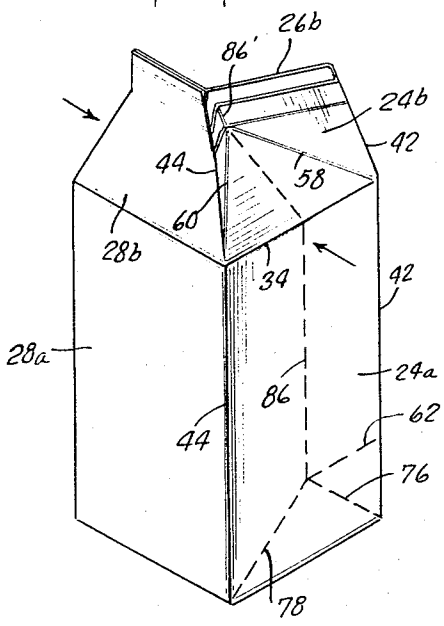


Fig. 5.

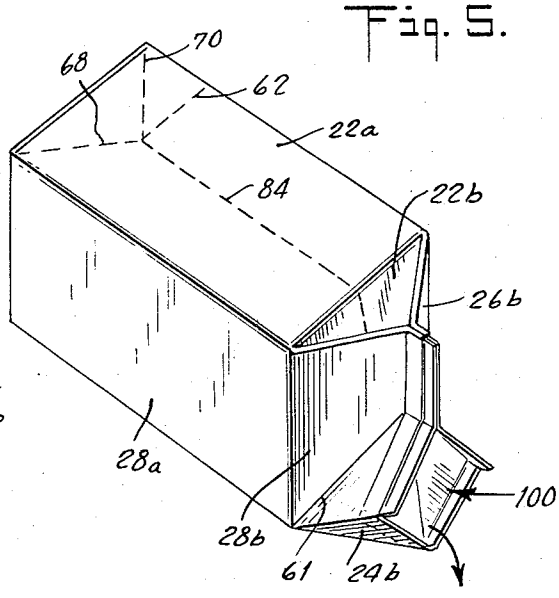


Fig. 7.

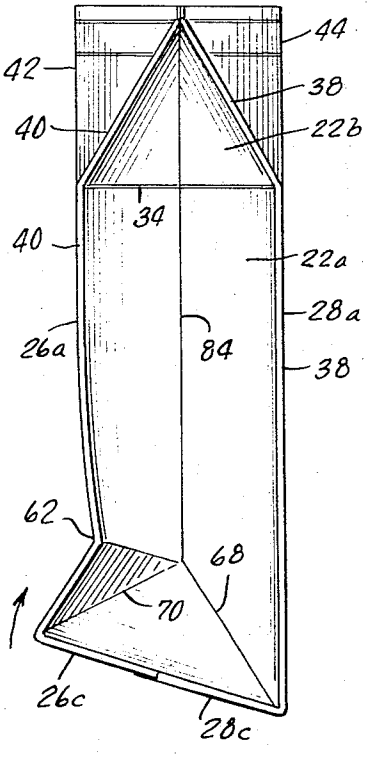


Fig. 8.

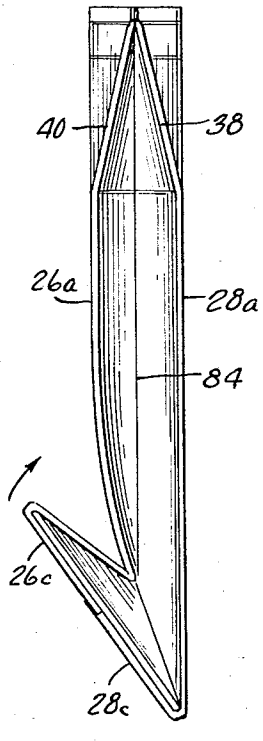
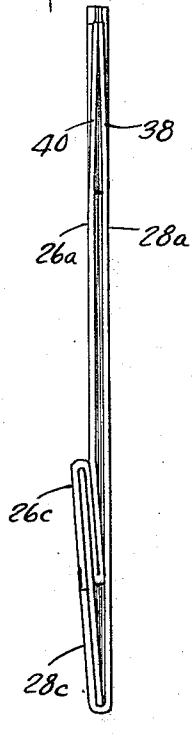


Fig. 9.



United States Patent Office 3,366,308 Patented Jan. 30, 1968

3,366,308

COLLAPSIBLE CONTAINER

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Filed Apr. 11, 1966, Ser. No. 541,823
9 Claims. (Cl. 229—41)

ABSTRACT OF THE DISCLOSURE

A collapsible container and a blank for such a container. Opposing panels of the container include diagonal score lines to the bottom corners of the panels. A horizontal score line extends from the intersections of the diagonal score lines in one panel across the panel and across an intermediate panel to the corresponding point in the opposing panel. Vertical score lines extend across the opposing panels from the intersections of the diagonal lines to the top of the container. The container top is sloping, substantially closed, and is formed from extensions of the opposing panels which slope upwardly and toward each other and from an inwardly and upwardly sloping extension of the intermediate panel. The container so scored may be collapsed by folding its bottom inwardly and upwardly against the intermediate panel while the sides are collapsed inwardly all the way to the top of the container.

This invention relates to containers, and more particularly to a container which is capable of being easily collapsed.

The invention is particularly adapted to paperboard milk containers having sloping tops, and renders such containers easily collapsible after use.

Collapsible containers have been provided in the past. Such containers are useful since they may be collapsed after use so as to take up little space. Non-collapsible containers, such as empty milk, juice and cereal containers, are quite bulky, and consequently when they are stored, e.g., in a garbage can, they occupy too much space. In the past, containers typically have had to be opened prior to the folding of the container panels for collapsing, or a substantial number of different folding operations have been necessary to complete the collapsing. Further, some types of collapsible containers have required the folding of a number of different container sections, which tends to make a bulky item even in the collapsed state.

Accordingly, it is an object of the present invention to provide an improved container.

It is a further object of the present invention to provide an improved container which may be readily collapsed.

It is a still further object of the present invention to provide a container which may be easily collapsed without requiring a substantial number of container-folding operations to complete the collapsing or a container-opening operation prior to collapsing.

Still another object of the present invention is to provide a collapsible container which in the collapsed state is generally free from bulkiness.

These and other objects of the present invention are achieved through the use of score lines in the panels of a container. Such score lines are advantageously provided in a carton blank prior to the forming of the blank to a container. A horizontal score line spaced from the bottom of the container extends from a first point in one of the container side panels, across an intermediate panel to a corresponding second point in an opposing side panel of the container. Diagonal score lines extend from the points in the opposing container side panels to the bottom corners of these panels. Further score lines extend vertically

along the opposing side panels of the container from these points to the top of the container. With such scoring of the container, the container bottom may be folded upwardly about the horizontal score line and against the intermediate panel of the container, while the two opposing side panels are at the same time pressed inwardly along the vertical score lines that extend to the top of the container and along the diagonal score lines. The two opposing side panels of the container thus collapse toward each other, and the container is compressed to a collapsed state. If the score lines are each dashed and not a single, continuous score line, then the scored container is not weakened by such score lines. The container may be easily collapsed, however, by virtue of the score lines. In the collapsed state, little bulk is provided inasmuch as only the container bottom, not also the top, is folded against the intermediate panel of the container. This arrangement has particular advantage in containers having sloping tops, typical in milk containers, inasmuch as the entire container may be collapsed without requiring the top to be opened prior to collapsing. Hence the collapsing takes place in effectively a single operation.

The invention will be more completely understood with reference to the following detailed description.

In the drawings:

FIG. 1 is a plan view of a representative scored carton blank for a container in accordance with the invention;

FIG. 2 is a perspective view of a partially completed container formed from the scored carton blank of FIG. 1;

FIG. 3 is a perspective view of the top of a completed container formed from the scored carton blank of FIG. 1;

FIG. 4 is a perspective view of the bottom of a completed container formed from the scored carton blank of FIG. 1;

FIG. 5 is a perspective view of a completed container as shown in FIGS. 3 and 4, with its top opened to provide a pouring spout;

FIG. 6 is a perspective view of the container of FIG. 5 prior to being collapsed;

FIGS. 7 and 8 are side views of the container of FIG. 6 showing the container at different stages in the collapsing of the container; and

FIG. 9 is a side view of the container of FIG. 6 fully collapsed.

Referring to FIG. 1, a representative scored carton blank **20** embodying the present invention is shown. The blank is typically made of paperboard and is suitable for being formed into a milk carton, but of course this is merely exemplary. The blank includes a first pair of opposing panels **22** and **24** and a second pair of opposing panels **26** and **28**. A panel **30** at the side of the panel **22**, which may be considered to be part of the panel **22**, is provided as a sealing flap. The portions of the panels designated **22***a*, **24***a*, **26***a* and **28***a* comprise the side panels of a container that is ultimately formed. Top extensions **22***b*, **24***b*, **26**b and **28***b* form the top of the completed container, and bottom extensions **22***c* **24***c*, **26***c* and **28***c* form the bottom of the completed container. The blank **20** includes horizontal score lines **32**, **34** and **36** extending substantially across the entire blank and vertical score lines **38**, **40**, **42** and **44** extending from the top to the bottom of the blank. Score lines **46** and **48** in the bottom extension **22***c* and score lines **50** and **52** in the bottom extension **24***c* serve to complete the bottom of the container as will be explained in more detail below. Similarly, score lines **54** and **56** in the top extension **22***b* and score lines **58** and **60** in the top extension **24***b* aid in completing the top closure of the container, as explained below. Score lines **59** and **61** in top extensions **26***b* and **28***b* aid in the forming of a pouring spout, as explained below.

A horizontal dashed score line **62** extends from a point **64** in the panel **22** to a point **66** in the panel **24**. The dashed score line thus extends across a part of the panel **22**, across all of intermediate panel **26** and across part of the panel **24**. The dashed score line **62** is generally parallel to and is spaced from the score line **36** which defines the bottom of the container. Diagonal dashed score lines **68** and **70** extend from the point **64** respectively to lower corners **72** and **74** on the side panel **22***a*. Similarly, diagonal dashed score lines **76** and **78** extend from point **66** respectively to lower corners **80** and **82** of the side panel **24***a*. Finally, vertical dashed score lines **84** and **86** respectively extend from the points **64** and **66** to the top of the container blank. It will be noted that these vertical score lines, which are substantially perpendicular to the dashed score line **62**, extend entirely across the top extensions **22***b* and **24***b*. It is the dashed score lines **62, 68, 70, 76, 78, 84** and **86** which render the container capable of being collapsed in accordance with the invention.

Referring to FIG. 2, there is shown a partially completed container formed from the score carton blank of FIG. 1. The sealing flap **30** is secured to a portion of the panel **28** against which it abuts. Typically, the adhesive used for securing the flap to the panel is any suitable thermoplastic material which sets upon the application of heat and pressure. The top of the container is formed by pressing the top extensions **22***b* and **24***b* inwardly so that the extensions respectively crease about the score lines **54, 56, 38, 40** and **58, 60, 42, 44** as well as about portions **84'** and **86'** of score lines **84** and **86** between the top of the container and the horizontal score line **32**. All the top extensions **22***b*, **24***b*, **26***b* and **28***b* crease about the horizontal score lines **32** and **34** in forming the completed container top shown in FIG. 3. As will be noted from FIG. 3, the top extensions **26***b* and **28***b* as well as portions of the extensions **22***b* and **24***b* slope upwardly. The upwardly sloping container top presents a structure eminently suitable for collapsing in accordance with the present invention, as explained in more detail below.

In similar fashion, the bottom of the container is formed by pivoting the bottom extensions **22***c*, **24***c*, **26***c* and **28***c* about the bottom score line **36**. The bottom extensions **22***c* and **24***c* respectively crease about the score lines **46, 48** and **50, 52** in completing the bottom. It will be noted that part of the bottom extension **28***c* overlies part of the bottom extension **26***c* in the completed bottom as shown in FIG. 4. The completed bottom is flat, as shown in this figure.

FIG. 5 shows the container of FIGS. 3 and 4 opened at its top portion to provide a pouring spout **100** for the product contained therein. The spout is opened by separating portions of adjacent top extensions **26***b* and **28***b* as shown in FIG. 6 and pulling the intermediate top extension **24***b* outwardly so that the latter extension creases about the score lines **34, 58, 60, 59, 61, 42, 44** and **86'** to the position shown in FIG. 5.

The container in FIG. 6 is easily collapsed after the contents of the container have been emptied therefrom by at least partially closing the container top so that it generally assumes the condition shown in FIG. 6. Next, the side panels **22***a* and **24***a* are pressed inwardly by pressure along vertical dashed score lines **84** and **86** (typically applied by the index fingers of the right and left hands) so that these side panels crease about the score lines. Pressure is also applied against the intermediate panel **26***a* in the region of the horizontal score line **34** (typically applied by the thumbs of both hands) so as to permit the top of the container to collapse inwardly, i.e., so that the top extensions **26***b* and **28***b* move toward each other while the top extensions **22***b* and **24***b* collapse by suitable creasing of these top extensions about the score lines **84, 54, 56** and **86, 58, 60**. The pressure against the intermediate panel **26***a* is then moved, if

necessary, near the region of the horizontal dashed score line **62** so that the bottom of the container starts to pivot upwardly as shown in FIG. 7. Concurrently, pressure is applied inwardly along the diagonal dashed score lines **68, 70** of side panel **22***a* and **76, 78** of side panel **24***a* (typically applied by the index and middle fingers of both hands) so that the container side panels may crease along these score lines to aid in the pivoting of the bottom of the container. The side panels **22***a* and **24***a* collapse and the side panels **26***a* and **28***a* move toward each other as shown in FIGS. 7 and 8.

FIG. 9 shows the completely collapsed container, of which the bottom is folded upwardly against the side panel **26***a*. The two side panels **22***a* and **24***a* are collapsed inwardly so that the collapsed container is of relatively flat shape. It will be noted that since the container includes the upwardly sloping top, the container is easily collapsed without requiring the top to be opened to permit collapsing. In this regard, since the top extensions **26***b* and **28***b* slope upwardly and toward each other, they readily move to the collapsed positions shown in FIG. 9 where they abut each other. It is not necessary to fold the top of the container downwardly against one of the side panels **26***a* and **28***a* as it is necessary so to fold the bottom of the container. Hence a compact structure is provided. It should be noted that in the event that upwardly sloping top extensions are not employed, dashed score lines (**84** and **86**) extending to the top of the container still may be employed; in such a case the top of the container is typically opened prior to its collapsing so as to permit the collapsing to take place.

By utilizing dashed score lines for the collapsing of the container, the container is not weakened as it might be if the score lines were each continuous. In this fashion inadvertent collapsing of the container, possible with a weakened container, is avoided.

The invention has been described in connection with a particular type of container, namely a paperboard milk container. It is applicable to many different types of containers and hence the invention should be taken to be defined by the following claims.

What is claimed is:

1. A collapsible container comprising:

(a) first and second opposing panels and an intermediate panel;

(b) a bottom;

(c) a top section comprising extensions of said first and second panels that slope upwardly and toward each other;

(d) a first score line extending substantially parallel to and spaced from said bottom from a first point in said first panel across said intermediate panel to a corresponding second point in said second panel;

(e) score lines from said points to the corners of said first and second panels abutting said bottom; and

(f) further score lines extending substantially perpendicular to said first score line from said points and across said first and second panels to the top of the container across said extensions of said first and second panels.

2. A collapsible container as defined in claim **1**, including third and fourth opposing panels forming with said first and second opposing panels a container that is rectangular in section, said intermediate panel consisting of said third panel.

3. A collapsible container as defined in claim **2**, wherein said top is a substantially closed sloping top formed from extensions of said panels, the extensions of said third and fourth opposing panels sloping upwardly toward each other and being joined along their upper edges, and wherein said further score lines extend across the extensions of said first and second panels in line with the joinder of the upper edges of said third and fourth opposing panels.

4. A collapsible container as defined in claim 3, wherein said first point is located substantially in the middle of a lower portion of said first panel and said second point is located substantially in the middle of a lower portion of said second panel.

5. A collapsible container as defined in claim 1, wherein said score lines are dashed lines.

6. A blank for a collapsible container comprising

(a) first and second opposing panels and an intermediate panel;

(b) top extensions of said first and second opposing panels for forming a sloping top section in the container;

(c) a first score line extending substantially parallel to and spaced from the bottoms of the panels from a first point in said first panel across said intermediate panel to a corresponding second point in said second panel;

(d) diagonal score lines from said points to bottom corners of said first and second panels; and

(e) further score lines extending substantially perpendicular to said first score line from said points entirely across said first and second panels and said extensions thereof.

7. A blank for a collapsible container as defined in claim 6, including third and fourth opposing panels forming with said first and second opposing panels a blank for a container that is rectangular in section, said intermediate panel consisting of said third panel.

8. A blank for a collapsible container as defined in claim 7, wherein said third and fourth panels each have a top extension thereof, said first, second, third and fourth panels each have a bottom extension thereof, said diagonal score lines extend from said points to the corners of said first and second panels that abut the bottom extensions thereof, the top extensions of said panels: (a) being separated from said panels by a second score line parallel to said first score line and (b) including a third score line parallel to said second score line at the top of the blank; the top extensions of the first and second panels including diagonal score lines extending from the lower corners of these top extensions to said further score lines at the intersections of said further score lines with said third score line.

9. A blank for a collapsible container as defined in claim 6, wherein said score lines are dashed lines.

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