United States Patent [19]

Taylor

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[54] **CONTAINER CONSTRUCTION**

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[52] **U.S. Cl.** ..... **229/39 R**
[51] **Int. Cl.** **B65d 5/10**
[58] **Field of Search** ..... 229/38, 39 R

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Assistant Examiner—Stephen Marcus
Attorney, Agent, or Firm—McDougall, Hersh & Scott

[57] **ABSTRACT**

A container embodying improved top and bottom constructions wherein the top construction is formed from a blank including opposing top panels which are joined to each other by side panels adapted to be folded under the top panels to define a space between one of the top panels and the portions of the side panels folded thereunder. The other of the top panels is provided with a projection having locking means thereon adapted to be inserted into the space for locking engagement with stepped openings in the side panels. The bottom construction includes a bottom panel having a cut-out portion, a tongue member having locking means thereon and lateral panels which define with the cut-out portion of the bottom panel a slot adapted to receive the tongue member for locking engagement therewith. The top and bottom constructions are incapable of being opened without disfiguration of the container, thereby minimizing pilferage of the contents of the container.

3 Claims, 12 Drawing Figures

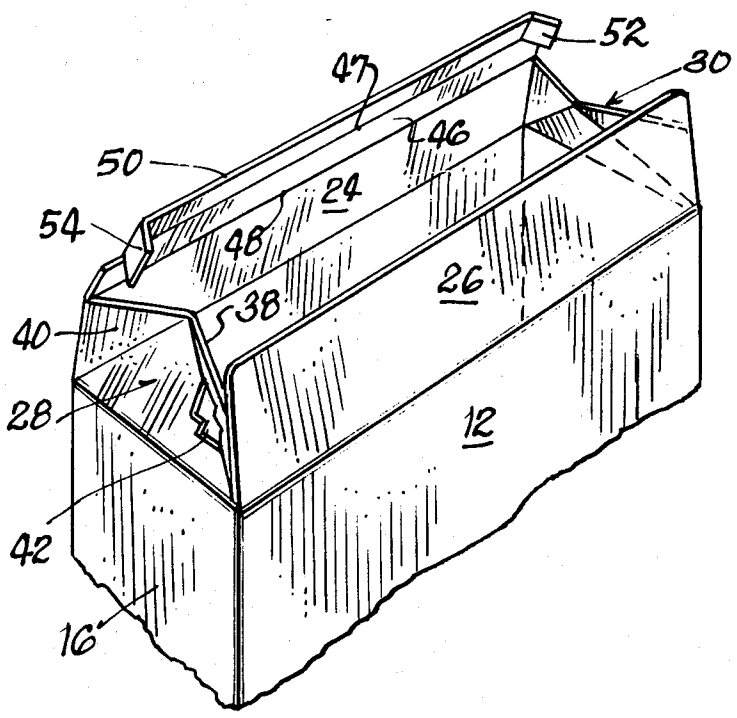


FIG. 1

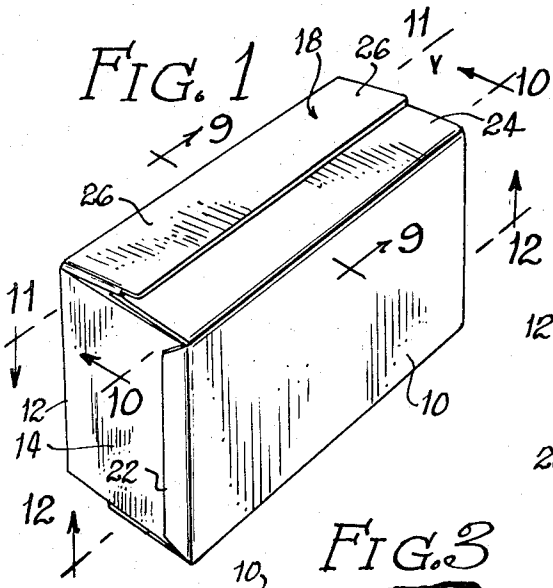


FIG. 2

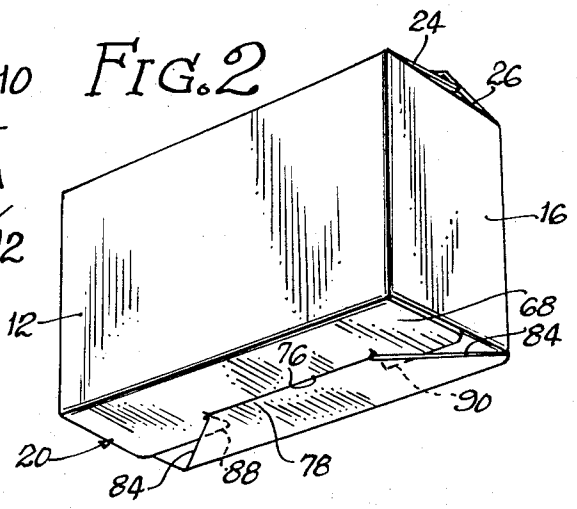


FIG. 3

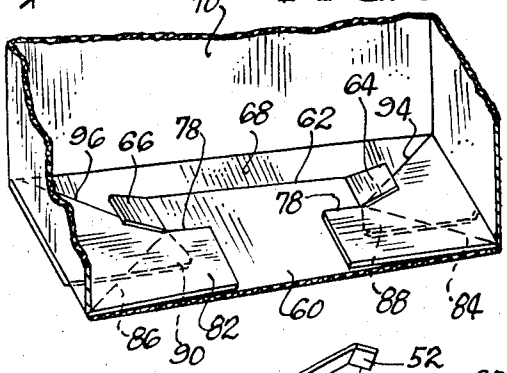


FIG. 4

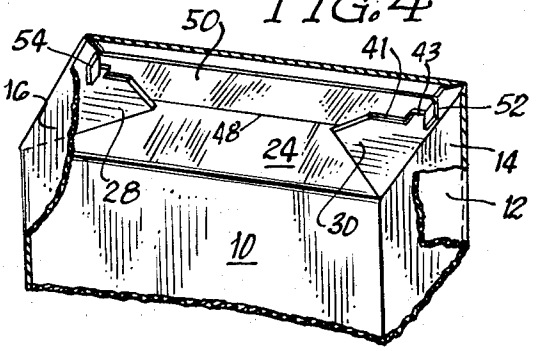


FIG. 5

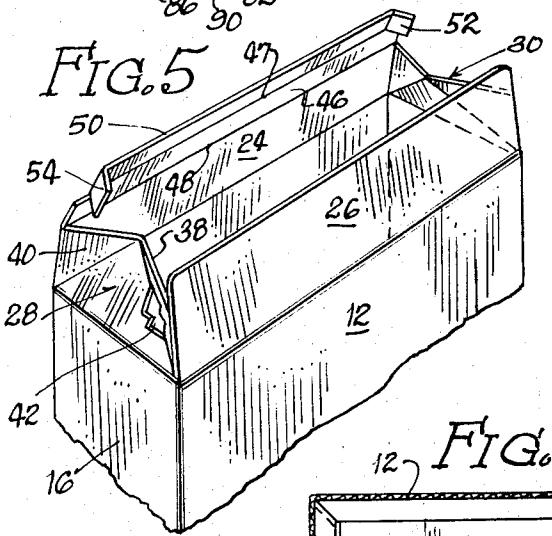


FIG. 6

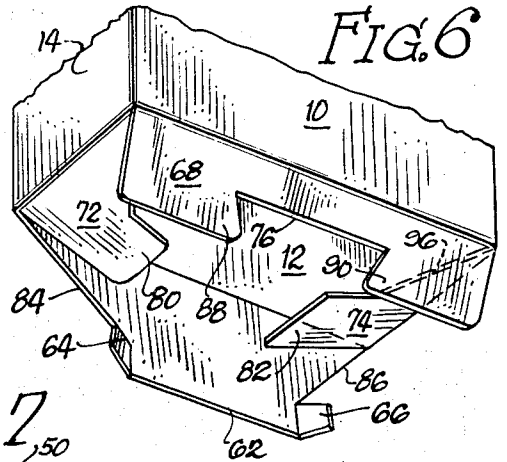


FIG. 7

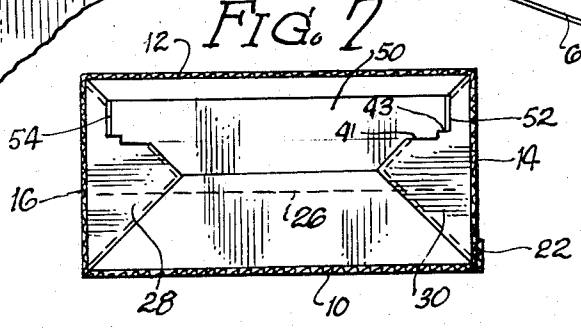


FIG. 8

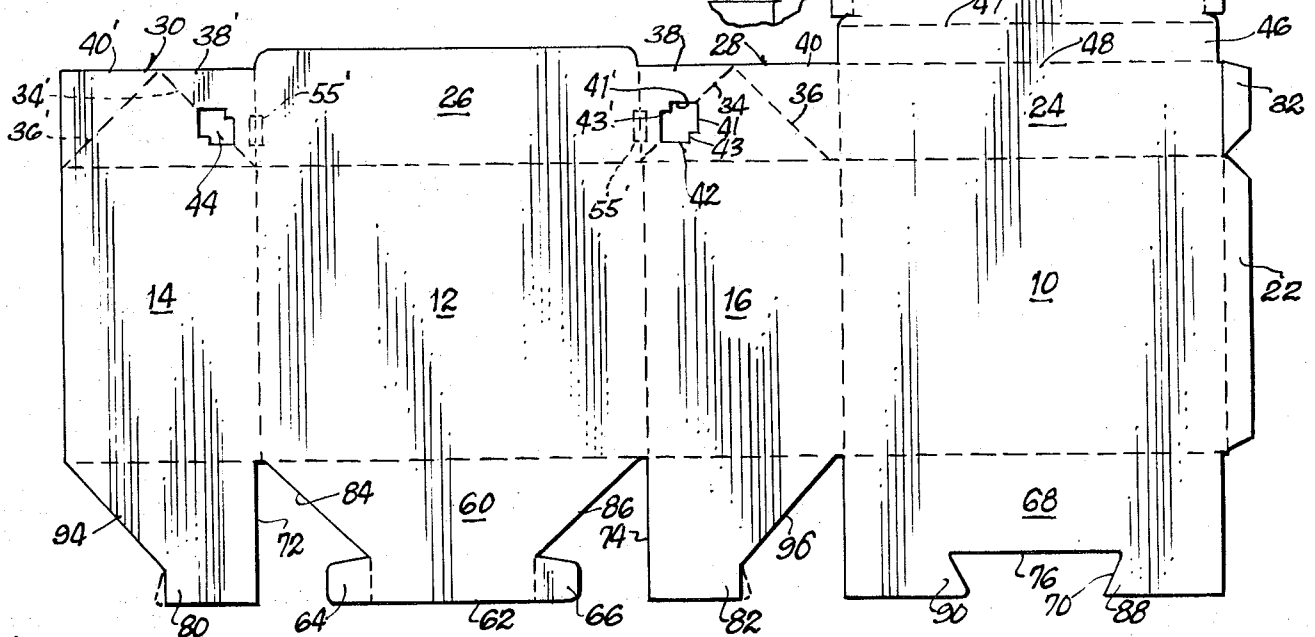


FIG. 8a

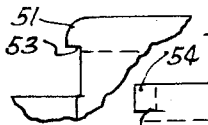


FIG. 9

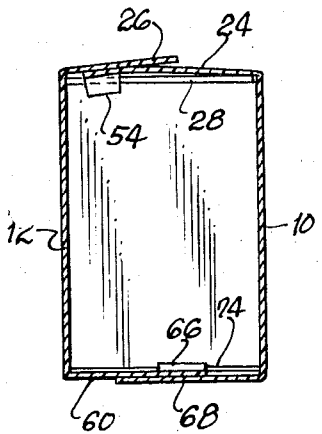
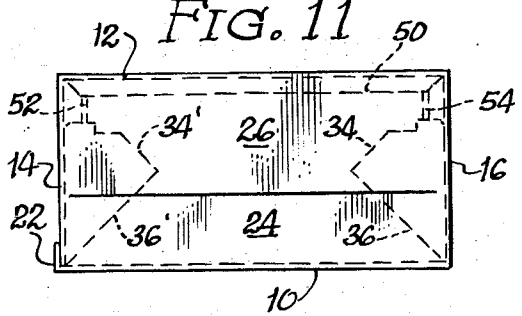


FIG. 11



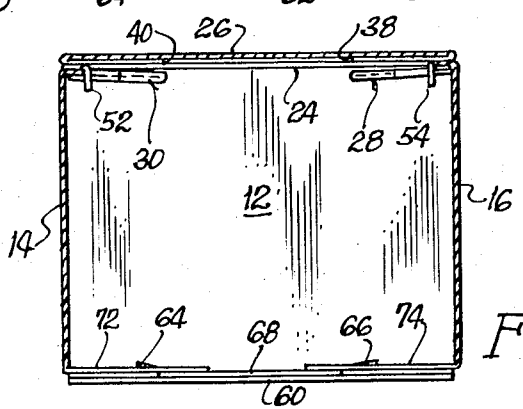
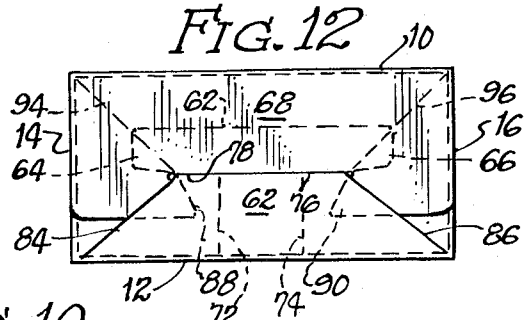


FIG. 10

FIG. 12



CONTAINER CONSTRUCTION

This invention relates to a container construction, and more particularly to a container construction embodying positive locking means on the top and/or bottom of the container.

A variety of containers formed of corrugated material are widely used in the shipment of materials. Such containers frequently are formed with tops and bottoms which are defined by four flaps, each of which share a common edge with one of the four sides of the container. When such containers are closed, two of the opposing flaps are folded perpendicularly to the side walls and then the other two opposing flaps are likewise folded and glued, taped, stapled or otherwise fixed thereto to form the top and/or bottom of the container.

One of the primary difficulties with such container constructions is that the top and/or bottom can easily be opened and reclosed. For example, the bond established between the flaps in assembling the container can be broken by the insertion of a knife or other sharp instrument between the flaps and the container opened. The container can then be resealed without noticeable disfigurement of the box by simply re-gluing the flaps as in the original sealing of the container. The result is that part or all of the contents of the container can be pilfered without leaving any indication thereof.

It is accordingly an object of the present invention to provide a container construction in which the container, once closed, cannot be reopened without disfigurement of the container.

It is a more specific object of the invention to provide a container construction in which the bottom closure of the container is capable of being positively locked in the closed position and of not being reopened from the exterior of the container.

It is a related object of the invention to provide a container construction in which the top closure of the container is capable of being positively locked in the closed position in one or more stages whereby the top can be advanced from one stage of closure to another as the contents settle.

These and other objects and advantages of the invention will appear more fully hereinafter, and, for purposes of illustration, and not of limitation, an embodiment of the invention is shown in the accompanying drawings in which:

FIG. 1 is a perspective view of the container construction of the present invention, illustrating the top thereof;

FIG. 2 is a perspective view of the container construction of the invention showing the bottom thereof;

FIG. 3 is a perspective view from the interior of the bottom of the container construction of FIG. 2;

FIG. 4 is a perspective view from the interior of the top of the container construction of FIG. 1;

FIG. 5 is a perspective view of the container construction of FIG. 1 with the top in the open position;

FIG. 6 is a perspective view of the container construction of FIG. 2 with the bottom in the open position;

FIG. 7 is a view of the top of the container construction of FIG. 1 from the interior thereof;

FIG. 8a is a fragmentary detail view illustrating a modified form of the invention;

FIG. 8 is a plan view of the blank for use in forming the container construction of the invention, embodying the top construction of FIG. 1 and the bottom construction of FIG. 2;

FIG. 9 is a cross-sectional view taken along the lines 9—9 in FIG. 1;

FIG. 10 is a cross-sectional view taken along the lines 10—10 in FIG. 1;

FIG. 11 is a cross-sectional view taken along the lines 11—11 in FIG. 1; and

FIG. 12 is a cross-sectional view taken along the lines 12—12 in FIG. 1.

The container construction of this invention generally comprises a pair of opposing side walls and a pair of opposing end walls of the type normally found in a typical corrugated box. It will be understood by those skilled in the art that while conventional corrugated material and a rectangular configuration of the side and end walls are preferred in accordance with this invention, other materials of construction and other configurations may be used in the practice of the invention to achieve the objects thereof.

One of the concepts of the present invention resides in a container construction in which the top is capable of self-locking in one or more stages to close the container, but which is incapable of being reopened without disfigurement of the container. The top construction includes a pair of opposing top panels which share a common edge with opposing walls of the container construction. Each of the top panels are joined by a pair of opposing side panels, each of which define a pair of fold lines extending diagonally from a point about equi-distant from each top panel to points at which each side panel is joined to each top panel. In this way, the top panels are adapted to overlay the side panel whereby each side panel defines triangular portions which fold under each top panel.

One of the side panels is provided along its longitudinal edge with a projection which is adapted to be inserted into a space formed between the opposing top panel and the triangular portions of each side panel. The projection includes a pair of tab members which extend longitudinally on each end of the projection, which are adapted to be folded under the projection.

Each of the side panels is provided with an opening, and preferably an opening having one or more steps adapted to receive the tab members on the projection to lock the top panels in the closed position when the projection is inserted into the space between the opposing top panel and the triangular portions of the side panels. In the preferred embodiment, the opening in the side panels includes a pair of steps adapted to engage the tab member. When the tab members are engaged in the first step of the opening, the top panels assume an outwardly convex configuration, thereby enabling the top panels to be closed eventhough the contents thereof extend slightly above the side walls of the container construction. When the contents of the container settle to enable the top panels to lie substantially flat, the tab members can be advanced to the second locking position by simply pressing downwardly on the top panels whereby the projection is inserted further into the space between the opposing top panel and the triangular portions of the side panels to displace the tab

members from the first step to the second in the opening.

In either stage of locking, the top of the container construction cannot be opened from the exterior thereof since the resiliency of the tab members continuously urges the top members toward locking engagement with the steps of the opening.

The top construction of the present invention has been particularly well suited for use with containers in which produce or other merchandise are stored and/or shipped. The top construction is not only self-locking to prevent subsequent opening, but also provides means to enable the container construction to be packed to its fullest capacity.

Another concept of the present invention resides in a bottom construction for use with container constructions which is characterized by improved strength and a one-way, self-locking capability. The bottom construction of the present invention includes a tongue member dimensioned to share a common edge with one of the side walls of the container construction and having a pair of flaps extending longitudinally therefrom which are adapted to be folded under the tongue member.

The bottom construction also includes a bottom panel member dimensioned to share a common edge with an opposing side wall. The bottom panel member includes a cut-out portion having a generally inverted trapezoidal configuration along the leading edge thereof. Along the other pair of opposing side walls, there is provided a pair of opposing panels which are adapted to be folded under the tongue member and which is dimensioned such that one edge of each panel and the interior edge of the cut-out portion of the bottom panel define a slit therebetween adapted to receive the leading edge of the tongue member when the flaps thereof are folded thereunder.

In the assembled position, the tongue member with its flaps folded thereunder is inserted into the slits described above, and the flaps, by reason of their resiliency, tend to return to their unfolded position to lock the bottom construction in the closed position. The bottom construction thus cannot be opened except from the interior of the box.

Referring now to the drawings for a more detailed description of the invention, there is shown in FIGS. **1** to **12** a container construction embodying both the top and bottom constructions of the invention. FIGS. **1** and **2** illustrate the container construction as being formed of a pair of spaced, opposing side walls **10** and **12** which are joined to each other by a pair of spaced, opposing end walls **14** and **16.** The container construction is closed at its top by the top construction generally referred to as **18,** and at its bottom by the bottom construction referred to generally as **20.**

The top construction is illustrated in FIGS. **1, 4, 5, 7, 9, 10** and **11,** and the blank from which the container construction is formed is shown in FIG. **8.** As shown in the latter, the container construction is formed from a blank comprising the side walls **10** and **12** and the end walls **14** and **16.** Side wall **10** can be joined to one of the end walls **14** by any conventional means such as, for example, by forming a seam with a suitable tab **22.**

The top construction of this invention is formed of a pair of opposing top panels **24** and **26** which are dimensioned to share a common edge with and are fixed to the walls **10** and **12,** respectively. In the preferred embodiment, the top panels are integral with the side walls as shown in FIG. **8.** Each of the top panels **24** and **26** is connected to each other by a pair of opposing side panels **28** and **30,** respectively, with top panel being joined to side panel **30** by way of, for example, a seam formed by flap **32** as shown in FIG. **8.**

Each of the side panels **28** and **30** is formed with fold lines **34** and **36,** preferably in the form of scored fold lines, extending diagonally from a point on their leading edge approximately equidistant from the top panels **26** and **24,** respectively, to divide the side panels into a pair of geometrically similar triangular portions **38** and **40.** Each of the side panels **28** and **30** is also formed with openings **42** and **44** as shown in FIG. **8** on the diagonal fold line **34** extending to one of the top panels **26.** Each of the openings **42** is preferably formed with two or more steps **41** and **43,** each of which are spaced from the other by a distance along the longitudinal length of the side panel **28.**

In the preferred embodiment of the invention as shown in FIGS. **4** and **8,** the openings **42** and **44** are preferably formed such that they are geometrically similar along the diagonal of the opening which is usually coincident with the fold line **34,** as shown in FIG. **8.** In this way, as triangular portions **38** and **40** are folded under top panels **26** and **24,** respectively, the remaining triangular portion of side panels **28** and **30** bounded by fold lines **34** and **36** define the steps **41** and **43** along diagonal fold line **34.**

One of the top panels **24** is provided with a projection **46** extending longitudinally along and integral with the leading edge **48** of the top panel **24.** The projection **46** preferably includes a portion **50** having a slightly reduced longitudinal dimension, and a pair of tabs **52** and **54** extending longitudinally from the opposite edges of the portion **50** which are adapted to be folded under the portion **50** as shown in FIG. **5.**

In assembling the top construction of the invention, the tabs **52** and **54** are folded under the portion **50** of the projection **46** and the side panels **28** and **30** are folded along their respective fold lines **34** and **36** inwardly as shown in FIG. **5.** As can be seen in this figure, as the side panels are folded inwardly, the inner face of top panel **26** and the triangular portion **38** of the side panels define a space therebetween.

The projection **46** of top panel **24** with the tabs **52** and **54** folded under is inserted into the space defined between the triangular portions **38** and the top panel **24** and the projection advanced therein until the tabs **52** and **54** engage the first step **41** of the openings **44** and **42,** respectively. It is frequently desirable that the projection **46** include one or more fold lines **47** to facilitate insertion of the projection into the space. By reason of the resiliency of the tabs, the tabs tend to return to their original or unfolded configuration and engage the first step of the openings **44** and **42** and extend substantially downwardly into the openings **44** and **42** from the plane of the projection **46** as shown in FIG. **4.**

The first locking position is achieved when the tabs **54** and **52** engage step **41** of the openings. As the contents of the container construction settle, the top construction can be advanced to the second locking stage by further advancing projection **46** further into the space between top panel **26** and the triangular portion **38** whereby tabs **54** and **52** slide into engagement with the second step **43** to further close the top construction.

Because the tabs **54** and **52** tend to unfold but are maintained in a position generally transverse to the plane of projection **46** by the steps **41** or **43**, the projection **46** cannot be withdrawn from the space between top panel **26** and triangular portions **38** without tearing or otherwise disfiguring the container. Thus, the top construction cannot be opened and re-sealed once it has been closed.

The bottom construction of the present invention is similarly formed from the blank of FIG. **8**, and is shown in detail in FIGS. **2, 3, 6, 9, 10** and **12** of the drawing. As illustrated in FIG. **8**, the bottom construction is formed from a blank comprising a tongue member **60** having a generally trapezoidal configuration dimensioned to share a common edge with a side wall **12**. The tongue member **60** includes a projection **62** extending longitudinally along its leading edge which is formed with a pair of opposing tab portions **64** and **66** extending beyond the length of the projection **62**.

The blank also includes a bottom panel **68** dimensioned to share a common edge with side wall **10** and having a cut-out portion **70** having the configuration of an inverted trapezoid. The blank includes a pair of opposing panels **72** and **74** which are dimensioned to share a common edge with end walls **14** and **16**, respectively. The panels **72** and **74** are adapted to be folded under both the tongue member **60** and bottom panel **68** to close the bottom of the container construction. The panels are dimensioned such that they, along with the leading edge **76** of the cut-out portion **70**, define a slit **78** therebetween when the bottom panel overlays the panels **72** and **74**, with the slit **78** being adapted to receive the tongue member **60** with the tab portions **64** and **66** folded thereunder.

In assembling the bottom construction of the invention, reference is made to FIG. **6**. Panels **72** and **74** are folded to form a portion of the bottom and the bottom panel **68** is folded to overlay panels **72** and **74** and thereby form the slits **78**. The tab portions **64** and **66** of tongue member **60** are folded thereunder and the tongue member inserted into the slits **78** defined between the leading edge **76** of the cut-out portion **70** and the panels **72** and **74**. After the projection **62** emerges through the slits **78** on the interior of the container construction, the tab portions **64** and **66** tend to return to their original, flat position.

Thus, in the closed position as shown in the drawing, the inclined edges **84** and **86** of the tongue member **60** overlay the shoulders **88** and **90**, respectively, of the bottom panel **68**, while tab portions **66** and **64** overlay the inclined edges **96** and **94**, respectively, of panels **74** and **72**, respectively. Simultaneously, the bottom panel **68** overlays the projection **62** to retain the tongue member **60** locked in position to prevent opening of the bottom construction.

As will be appreciated by those skilled in the art, the top and bottom constructions of the present invention are susceptible to numerous variations without departing from the spirit of the invention. For example, where it is desired to produce a reusable container construction, that is, a container construction in which the top construction can be re-opened without disfigurement of the container construction, the tabs **52** and **54** on projection **46** can be omitted and, similarly, the openings **42** and **44** in side panels **28** and **30**, respectively, can likewise be omitted. In this embodiment of the invention, the projection **46** is inserted into the space defined between top panel **26** and the triangular portions **38** of the side panels as previously described, and are held in such a closed position by friction. When it is desired to open the container, the projection **46** can simply be withdrawn from the space to re-open the top construction.

In another variation of the invention, the tabs **52** and **54** can be replaced by a barb **51** as shown in FIG. **8** of the drawing, as extending from portion **50** of projection **46**. The barb **51** forms a surface **53** opposite the leading edge of portion **50**. In this embodiment, there are formed in the side panels **28** and **30** openings **55** and **55'** adapted to engage the barbs **51**. As the projection **46** is inserted into the space defined between top panel **26** and the triangular portions **38** and **38'**, the barbs **51** are knurled or accordioned down toward the portion **50** of projection **46**. As the leading edge of portion **50** is progressively advanced into this space, the barbs **51** engage the openings **55** and **55'** and at least partially return to their original configuration to thereby lock in the openings **55** and **55'**.

This embodiment of the invention is particularly advantageous for use in container constructions which must be opened to permit inspection of the contents or the like. In this embodiment, the opening of the top construction serves to further distort and knurl barbs **51** as the barbs are withdrawn from openings **55**. This distortion, however, does not prevent the container from being re-closed although it does detrimentally affect the locking feature.

It will be understood that various changes and modifications can be made in the details of construction, assembly and use without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. In a container construction comprising two pairs of spaced opposing side walls, a top and a bottom, the improvement comprising a top formed from a blank section comprising a pair of top panels dimensioned to share a common edge with one pair of the spaced opposing side walls said top panels defining leading edges, one of the top panels having a projection extending longitudinally along the leading edge thereof, the projection having opposing tabs extending longitudinally away from the projection adapted to be folded under the projection, a pair of side panels dimensioned to share a common edge with the other of the pair of spaced opposing side walls, with the side panels being joined to adjacent top panels, each of the side panels having fold lines extending from a point on its leading edge diagonally to divide the side panels into triangular portions, one of which is adjacent to the top panel having the projection and one of which is spaced from the top panel having the projection, with each triangular portion spaced from the top panel having an opening therein defining at least one step adapted to engage the tabs on the projection, each of said openings in the triangular portions being geometrically similar and being located on the diagonal fold lines forming those triangular portions whereby the side panels define a triangular section bounded by said openings, each of said triangular portions of the side panels being adapted to be folded under the top panels to define respective spaces between at least the other of the top panels and the triangular portions spaced from the top panel having the projection whereby the projection, with the tabs

thereon folded thereunder, is adapted to be inserted into the spaces defined between the other top panel and the triangular portions of the side panels spaced from the top panel having the projection to lock the tabs on the steps.

2. A container construction as defined in claim 1 wherein the openings on the triangular portions define a plurality of steps, one of which is elevated below and spaced from the others longitudinally away from the top panel having the projection thereon.

3. A container construction as defined in claim 1 wherein the projection includes at least a portion having a reduced longitudinal dimension to enable the projection to be inserted into said space.

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