United States Patent

Isakson

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[45] **Aug. 8, 1972**

[54] **PANEL LOCK**

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[21] Appl. No.: **703**

[52] **U.S. Cl.** **229/35**

[51] **Int. Cl.** **B65d 5/26**

[58] **Field of Search** 229/35, 31

[56] **References Cited**

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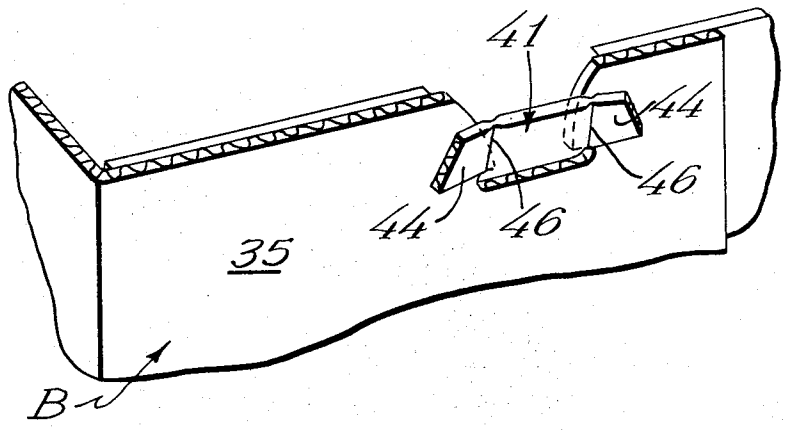
Primary Examiner—James B. Marbert

Attorney—Robert M. Dunning

[57] **ABSTRACT**

A panel lock is provided for securing two paperboard panels in face contact. A notch is provided in the edge of one of the panels, and a generally T-shaped locking tongue is hinged to the other panel along a fold line substantially coinciding with the base of the notch. The locking tongue is folded through the notch so that the cross-bar of the T-shaped tongue lies against the surface of the notched panel most remote from the panel supporting the tongue.

2 Claims, 8 Drawing Figures



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SHEET 1 OF 2

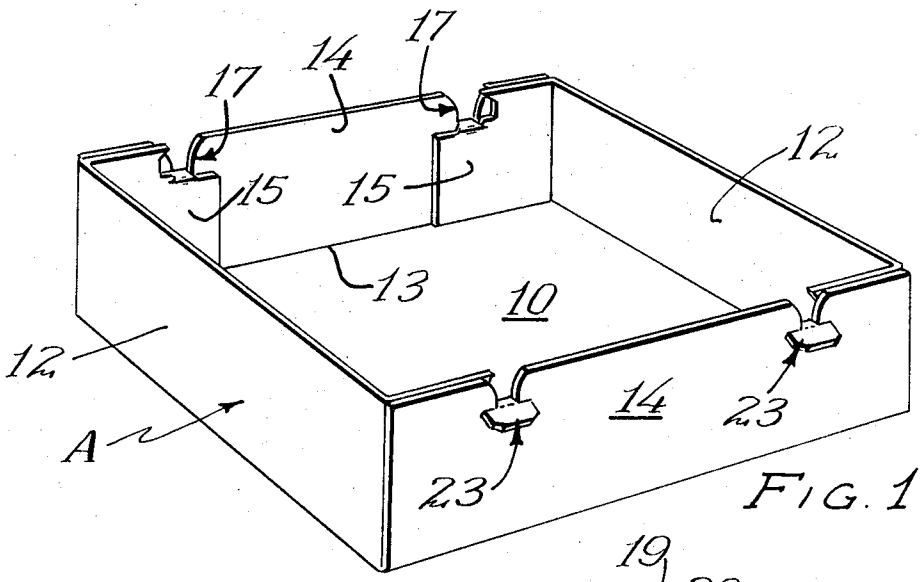


FIG. 1

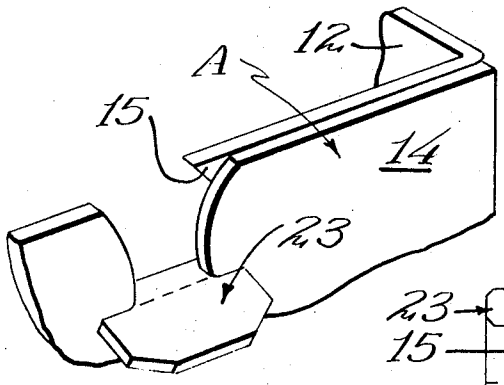


FIG. 2

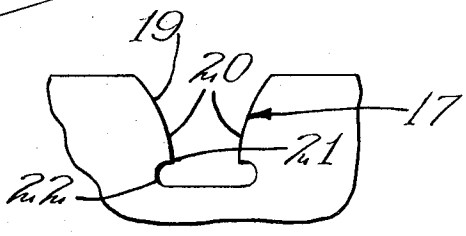


FIG. 5

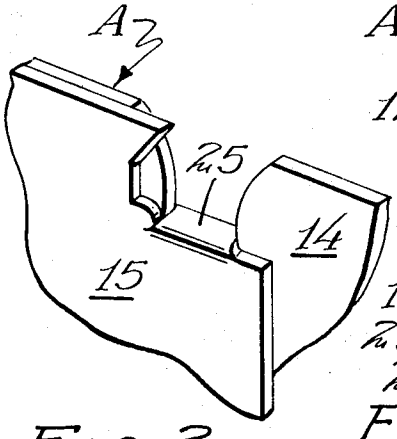


FIG. 3

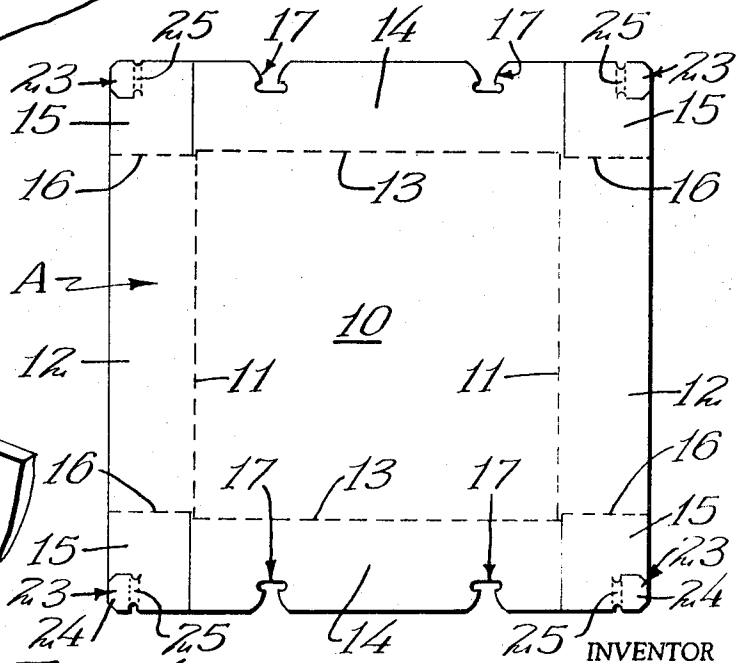


FIG. 4

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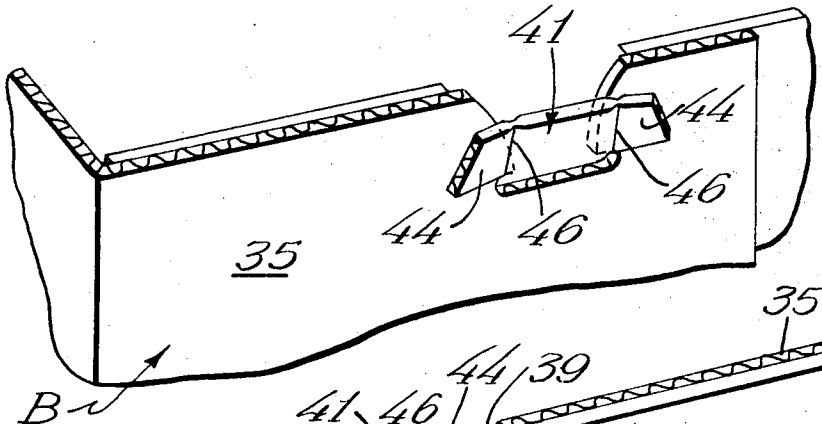


FIG. 6

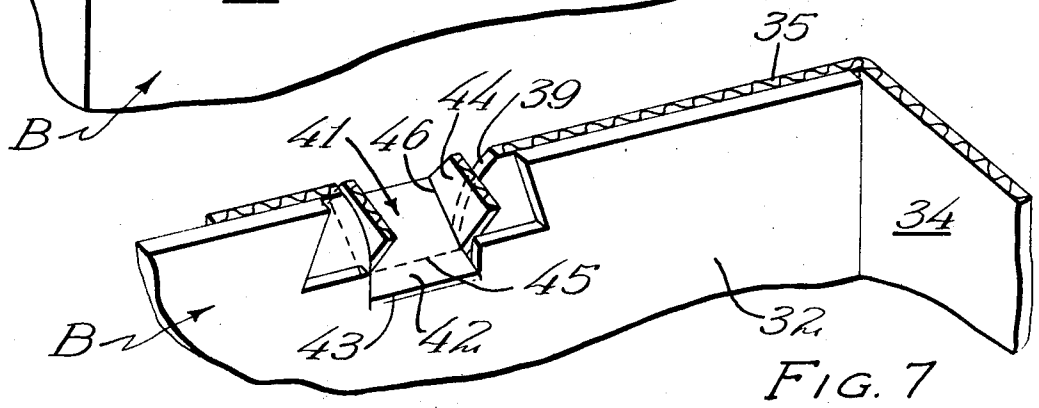


FIG. 7

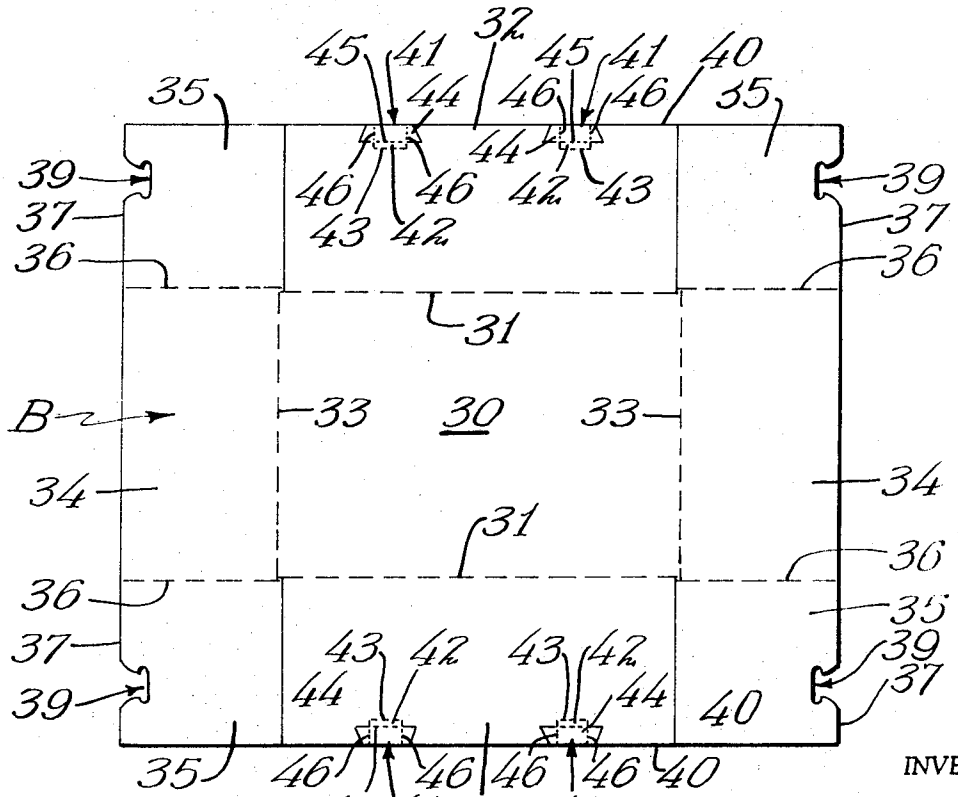


FIG. 8

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PANEL LOCK

This invention relates to an improvement in corner lock and deals particularly with a means of securing a pair of paperboard panel portions in face contact.

BACKGROUND OF THE INVENTION

Various means have been provided for securing panels in face contact. For example, paperboard trays often include a bottom panel, side and end walls hingedly connected to the bottom panel, and corner flaps on certain of the walls which are folded into face contact with adjoining walls. The corner flaps may be glued together, or may be stitched or stapled together, but such an arrangement usually requires special equipment and is time consuming, and the resulting trays cannot be disconnected and flattened out if it is so desired.

In order to detachably connect the walls in erected condition, liner panels have often been hinged to the upper edges of two opposed walls, these liner panels being folded over the corner flaps on the other panels and locked in position by a suitable means. Such a means is very effective but is of necessity more expensive as the area of the paperboard used is increased.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an extremely simple means of locking panels in face contact. The edge of one of the overlapping panels is provided with a notch, and the edge of the other panel is provided with a generally T-shaped locking tongue. When the two panels are in face contact, the locking tongue may be swung down into the notch to lock the two panels from separation.

A feature of the present invention resides in the simplicity of the operation of setting up a tray or the like. But providing corner flaps on two opposed panels which are foldable into face contact with the remaining two opposed panels, the walls may be locked in proper relation by merely swinging four locking tongues into corresponding notches. The corner flaps may be folded either inwardly or outwardly of the adjoining walls. The locking tongues may be provided on the corner flaps in which case the locking tongues are folded outwardly to project beyond the adjoining wall. Alternatively, the locking tongues may be on the tray wall, and the notches may be in the corner flaps so that the tray may be locked by swinging the locking tongues inwardly or outwardly, depending upon whether the corner flaps are outwardly or inwardly of the adjoining tray wall.

A feature of the present invention resides in the provision of a means of holding two panels in face contact which may, if desired, be disconnected at least a reasonable number of times. The locking tongues are distorted to some extent in the locking operation and will not function effectively if locked and unlocked continuously, but may be unlocked several times if desired.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a tray in set up form.

FIG. 2 is an enlarged perspective view of one of the locks in locked position.

FIG. 3 is a perspective view of the inside of a portion of the tray showing one of the locks.

FIG. 4 is a diagrammatic view of the blank from which the tray is formed.

FIG. 5 is an enlarged detail of the locking notches.

FIG. 6 is a perspective view of a corner of a modified form of a tray.

FIG. 7 is a perspective view of the tray corner shown in FIG. 5 in partially locked position.

FIG. 8 is a diagrammatic view of the blank from which the modified form of tray is formed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is shown as applied to a rectangular tray. Obviously, the tray may form one portion of a telescope container including two tray sections telescoped together. Furthermore, the trays could be hexagonal, octagonal, or even triangular if desired, it only being necessary that the tray structure include corner flaps which are folded in face contact with adjoining panels.

The tray A shown in FIGS. 1 to 4 of the drawings is constructed of the blank indicated in FIG. 4. The tray is shown as including a rectangular bottom panel 10 which is foldably connected along parallel fold lines 11 to side walls 12. The bottom panel 10 is also connected along parallel fold lines 13 to end walls 14. The side walls 12 are provided as their end edges with corner flaps 15 which are connected thereto along parallel fold lines 16, these fold lines 16 being substantially extensions of the fold lines 13, but which may be slightly offset therefrom in order to allow for the thickness of the paperboard.

The upper edges of the end walls 14 are each provided with a pair of notches 17 in the areas thereof which normally overlap the corner flaps 15. As is indicated in FIG. 5 of the drawings, each notch 17 has a relatively wide inlet portion 19 connected by inwardly converging rounded cut lines 20 to a relatively narrower throat portion 21. Below the throat, the notch is relatively wider providing a wide base portion 22. Each corner flap 15 is provided with a generally T-shaped locking tongue. Each locking tongue 23 includes a relatively wide end portion 24 forming the cross bar of the T, and a relatively narrow stem portion 25, the stem portion 25 preferably being slightly wider than the throat 21 of the notch 17, and of substantially the same width as the base portion 22 of the notch 17. The cross bar of the T, or the end portion 24 is preferably wider than the base portion 22 of the notch. The length of the stem 25 is substantially the same as the thickness of the paperboard used. Normally the tray is made of corrugated paperboard.

In the arrangement illustrated in FIGS. 1 through 5, the tray is set up by folding the side walls 12 upwardly into parallel relation, and folding the corner flaps 15 to extend in opposed relation along the fold lines 13, as indicated in FIG. 1. The end walls 14 are then folded upwardly outwardly of the corner flaps 15, and the locking tongues 23 are folded downwardly and outwardly through the notches 17. Actually this may be done by folding the locking tongues downwardly, distorting portions of the tongues to pass through the notches, or the locking tongue may be folded outwardly while the side walls are slightly less than right

angles to the bottom panel, swinging the corner flaps downwardly into position against the bottom wall **10** as the locking tongues are inserted.

The finished tray has the locks projecting outwardly therefrom as indicated in FIG. **1**. If the tray is a portion of a telescope container, the ends of the tongues are bent down as the cover of the container is inserted. It is possible to arrange the structure so that the locking tongues of the bottom section project outwardly, and the locking tongues of the upper section project inwardly, concealing the ends of the tongues when the two sections are engaged.

A modified form of tray B is indicated in FIGS. **6**, **7**, and **8** of the drawings. As indicated in FIG. **8**, the tray blank includes a rectangular bottom **30** which is foldably connected along parallel fold lines **31** to side walls **32**. The bottom panel **30** is also connected along parallel fold lines **33** to end walls **34**. The end walls **34** are provided with corner flaps **35** which are connected to the end walls along parallel fold lines **36**, these fold lines being substantially parallel to the fold lines **31**, but offset slightly therefrom to allow for the thickness of the paperboard.

The edges **37** of the flaps **35** which are upper most in the set up form of the tray provided with notches **39** which may be identical to the notches **17** illustrated in FIG. **5** of the drawings, and which accordingly will not be described in detail. The edges **40** of the side walls **32** are provided with generally T-shaped locking tongues **41** which are positioned to register with the notches **37** in the corner flaps **35**. Each locking tongue **41** includes a short stem portion **42** connected to the side wall **32** along a fold line **43**, and connected to the cross bar member **44** along a fold line **45**. A pair of generally parallel fold lines **46** extend across the cross bar **44** in substantial alignment with the side edges of the stem portion **42** of the locking tongue. The fold lines **46** form wings which fold out of the plane of the center portion of the cross bar **44** when the locking tongues are folded into the notches **39**. This operation is illustrated in FIG. **7** of the drawings. It will be noted that in FIG. **7**, the corner flaps **35** are folded outwardly of the side walls **32**, and the locking tongues **31** fold outwardly, this arrangement is preferable in view of the fact that the corner flaps then wrap around the corners of the side walls and hold the side walls from bulging outwardly. However, if preferred, the corner flaps **35** could be arranged to fold inwardly of the side walls in which case the locking tongues **41** would be folded inwardly rather than outwardly.

I claim:

1. A corrugated paperboard tray including a bottom panel, side panels hinged to the edges of said bottom panel and extending upwardly therefrom and corner flaps hinged to an end of certain of said side panels and folded into face contact with the adjoining side panel, a lock including:

a notch in an edge of one of the overlapping panels at each corner of said bottom panel,

a generally T-shaped locking tongue hinged to the other of said overlapping panels along a fold line substantially coinciding with the base of the notch,

said locking tongue including a stem portion having parallel sides extending through said notch, said stem being of a length greater than the thickness of the corrugated paperboard, and a cross-bar portion engaging the surface of said one overlapping panel opposite that engaged by said other panel, and parallel fold lines extending across said cross-bar portion from the stem portion to the end of said locking tongue portions, said parallel fold lines being substantially aligned with the parallel sides of said stem.

2. A corrugated paperboard tray including a bottom panel, side panels hinged to the edges of said bottom panel and extending upwardly therefrom and corner flaps hinged to an end of certain of said side panels and folded into face contact with the adjoining side panel, a lock including:

a notch in an edge of one of the overlapping panels at each corner of said bottom panel,

a generally T-shaped locking tongue hinged to the other of said overlapping panels along a fold line substantially coinciding with the base of the notch,

said locking tongue including a stem portion having parallel sides extending through said notch, said stem being of a length greater than the thickness of the corrugated paperboard, and a cross-bar portion engaging the surface of said one overlapping panel opposite that engaged by said other panel, said notch having a base portion substantially equal in width to said stem portion of said locking tongue and a throat portion above said base portion which is slightly narrower than the width of said stem portion.

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