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Ross

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[54] **RIGID PANEL CONTAINER**

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[52] **U.S. Cl.** ..... **229/14 C,** 206/46 FC, 229/23 R, 229/48 R

[51] **Int. Cl.** **B65d 5/32,** B65d 5/60

[58] **Field of Search** ..... 217/12, 13, 43, 45, 217/53; 220/4 F, 75; 229/6, 14 C, 48 R, 23 R, 41 R; 206/46 FC

[56] **References Cited**

UNITED STATES PATENTS

2,025,420	12/1935	Osgood	217/12 R
2,178,984	11/1939	Zimmerman	229/48 R
3,204,803	9/1965	Sandkuhle	217/12 R
3,273,779	9/1966	Mykleby	206/46 FC
1,952,817	3/1934	Neary	217/12 R
1,498,377	6/1924	Honigbaum	217/43

FOREIGN PATENTS OR APPLICATIONS

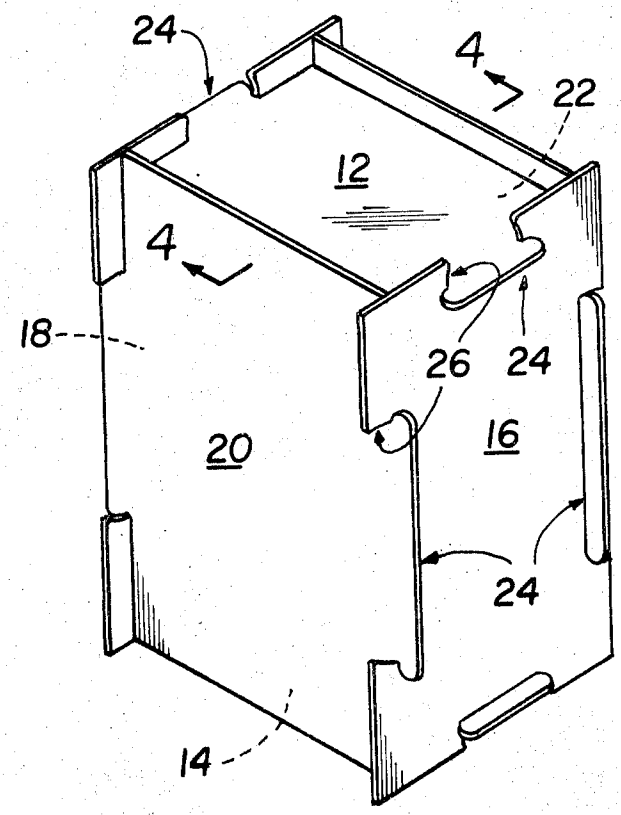
666,117	2/1952	Great Britain	217/12 R
729,062	5/1955	Great Britain	217/12 R
265,489	2/1927	Great Britain	217/12 R
380,636	9/1964	Switzerland	217/12 R

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Assistant Examiner—Stephen Marcus
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[57] **ABSTRACT**

A readily assembled and disassembled container fabricated of rigid panels to provide maximum protection to the transported product, in which cooperating tabs and notches are relied on solely to assemble the panels, i.e., no nails, bolts, screws or the like, nor is assembly facilitated by any appreciable bending of the rigid panels. Instead, an angular orientation of the tabs and notches, which orientation will not often occur inadvertently, is made a requirement for panel assembly and disassembly.

1 Claim, 5 Drawing Figures



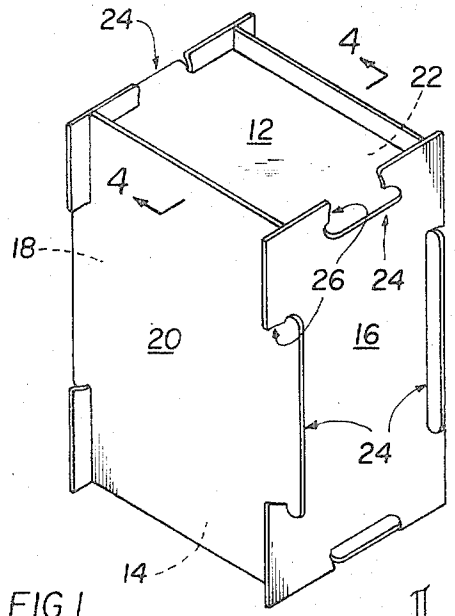


FIG. 1

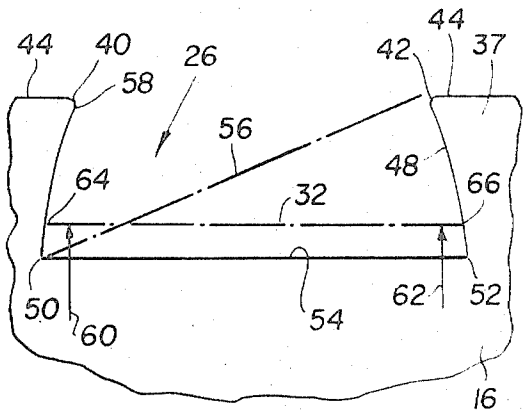


FIG. 5

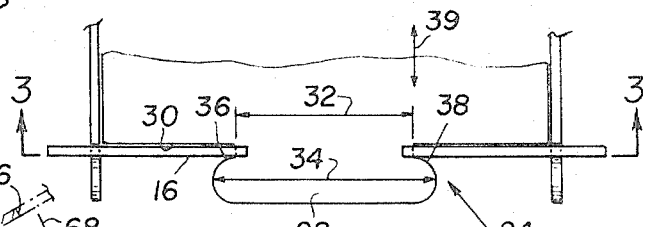


FIG. 2

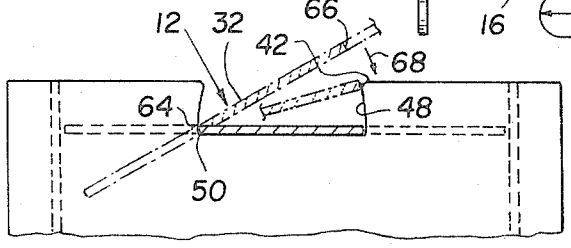


FIG. 3

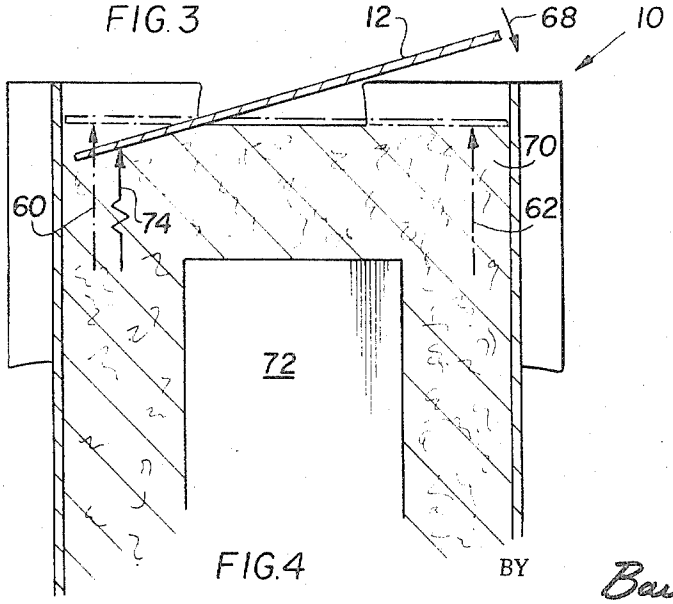


FIG. 4

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RIGID PANEL CONTAINER

The present invention relates generally to improvements for shipping containers, the improvements relating to the ease of assembling and disassembling the container, and more specifically to such containers constructed of rigid, rather than deformable, panels.

Maximum product protection is, of course, afforded by rigid panel containers because of the greater strength in the construction materials used for the panels. Yet, the flexing of deformable or bendable panels is often the prerequisite for assembling such panels and thereby obviating the need for nails, bolts, straps, or other such connecting or fastening means. The container hereof provides, in a noteworthy manner, both the features of rigid panel construction and of ease of assembly and disassembly thereof.

Broadly, it is an object of the present invention to provide a container having rigid panels and which is nevertheless easily assembled and disassembled, and thus overcomes the shortcomings of minimum product protection of deformable panel containers. Specifically, it is an object to achieve construction panel assembly solely with cooperating tabs and notches, the same being readily put together but nevertheless not readily disengaged when subjected to normal and typical jostling and the like as may occur during transit of the container.

Container construction panels demonstrating objects and advantages of the present invention include "male" or tab panels, and "female" or notch panels. Specifically, said panel notch is so sized relative to said panel tab that the assembly and disassembly of the same requires a specific angular orientation in the tabs for its proper entry into and exit from a cooperating notch. This achieves the result desired since it has been found in practice that said required angular orientation does not often inadvertently occur.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a rigid panel container according to the present invention;

FIG. 2 is a partial plan view, on an enlarged scale, illustrating details of the cooperating tab and notch connecting structure of the container panels;

FIG. 3 is a side elevational view, in section taken on line 3—3 of FIG. 2, illustrating further structural features of said tab and notch and in which, additionally, the positions of movement of a panel to achieve interconnection between said tab and notch are illustrated in full line and phantom line perspective;

FIG. 4 is a side elevational view similar to FIG. 3 and illustrating how an assembled condition is maintained by internal resilient packing within the container; and

FIG. 5 is an enlarged partial side elevational view of a tab-accommodating notch together with reference lines which illustrate the size relationship thereof to a cooperating tab.

Reference is now made to the drawings wherein there is shown a container, generally designated **10**, which is comprised of plural rectangular panels which bound a correspondingly rectangular volume and which, according to the present invention, is readily assembled and disassembled because of the noteworthy interconnecting structure of said panels, all as will be explained in detail subsequently. That is, container **10** is readily assembled using the illustrated panels, without any use of nails, bolts, or other such connecting structure into the rectangular shape illustrated having a top **12**, a bottom **14**, and four side panels including two opposite ends **16** and **18** and sides **20** and **22**. Of the foregoing, the top **12**, bottom **14**, and two sides **20** and **22** are identical except for size, and constitute what might be characterized as the male panels in that they contain tab structures, generally designated **24**. Cooperating therewith are the remaining identical end panels **16** and **18** which each includes, in each of their four sides, tab-accommodating notches, generally designated **26**. It will be understood that each of the noted panels of which container **10** is comprised is rigid, or in other words cannot be significantly bent out of plane, and therefore the bending of these panels is not available for achieving said interconnected relation between the tabs **24** and notches **26**. Nevertheless, this interconnecting relation must be readily achieved so that the assembly of the containers **10** is not too complicated. At the same time, container **10** must be readily disassembled in order to obtain access to the merchandise being transported therein, without at the same time inadvertently coming apart or becoming disassembled during transit of the container **10**. It will now be described how these objectives are achieved using rigid panels which, in an obvious manner, afford optimum protection against breakage and other such damage to which products are subjected when transported within the container **10**.

It will be understood that, except for size, each of the tab structures **24** and each of the notch constructions **26** are identical so that for brevity's sake only one of each of these will be described in connection with FIGS. **2–5**. As is perhaps best illustrated in FIG. **2**, each tab structure **24**, as exemplified by the illustrated tab structure on the top panel **12**, includes a tab **28** in the plane of the body of the rigid panel **12** which extends in projected relation beyond an end edge **30**. More particularly, tab **28** is connected to edge **30** by a connecting section **32**. The transverse dimension of section **32** is of a specific selected size (herein also connotated by the reference numeral **32**) which is less than the transverse dimension **34** of tab **28**. The difference between the transverse dimensions **34** and **32** thus provides holding surfaces **36**, **38** on the tab **28** which are adapted to engage end panel **16** at areas coextensive with the surfaces **36** and **38** and thus prevent disengagement of the two panels **12** and **16** as the result of any relative movement **39** in either of the interconnected panels **12** and **16**. That is, these holding surfaces **36** and **38** prevent disengaging movement **39** of panel **12** relative to panel **16** and also hold panel **16** in its vertical orientation relative to the panel **12**.

Referring now more particularly to FIGS. **3–4**, each notch construction **26**, as clearly illustrated in these figures, is provided in a peripheral panel section, such as section **37** of panel **16**. Specifically, each notch **26** starts at first juncture locations **40** and **42** of the upper peripheral edge **44** of panel **16** with each of two notch side edges **46** and **48**. The sides **46** and **48** extend inwardly from the border section edge **44** and have an outwardly diverging relation to each other, the signifi-

cance of which will soon be described, until terminating in second juncture locations **50** and **52** with a bottom notch edge **54**. The size of each notch **26** is highly significant in implementing the connecting relation with the tab structures **24**. Said size is such that the diagonal distance **56** of the notch, as measured between one of the juncture points **50, 52** and one of the juncture points **40, 42**, is equal to the previously noted transverse dimension of a tab connecting section **32**. However, since the side edges **46** and **48** converge in the direction of the upper edge **44**, the opening **58** of the notch **26**, as measured between the juncture locations **40** and **42**, is smaller than said tab connecting section transverse dimension **32**.

As a result of the foregoing, the tab connecting section in its selected size **32** can only be projected into the notch **26** when having an angular orientation which is parallel to the reference line **56** (See, in particular, FIG. **5**). Moreover, assuming that the connecting section **32** is in spanning relation between the juncture locations **50** and **52**, a condition which exists when supported on the bottom edge **54**, any applied force which tends to simultaneously lift the tab connecting section **32** while maintaining its horizontal orientation, as for example forces **60** and **62** (again see FIG. **5**), will result in jamming of the opposite end edges **64** and **66** of each connecting section **32** against the notch side edges **46** and **48**. Thus, angular orientation parallel to reference line **56** is necessary both to disengage and to engage a tab structure **24** and a cooperating notch construction **26**.

FIGS. **3** and **4**, to which reference is now specifically made, illustrate a typical assembling procedure for the container **10**. Specifically, top **12** is initially angled at approximately a 45° angle within the top opening of the container as bounded by the end and side panels **16, 18, 20** and **22**. Thus, the end edge **64** of the tab connecting section **32** thereof seats at juncture location **50**, and panel **12** is then rotated through pivotal movement **68**. During such movement, the opposite end edge **66** clears the juncture location **42** and moves along the notch side edge **48** until assuming a supported position at juncture location **52** upon the notch bottom edge **54**, which completes assembly of the top panel **12** within the top opening of the container **10**. As already noted, movement disengaging or disassembling panel **12** from its position in the top opening of the container **10** also requires a diagonal orientation of the tab structure **24** relative to the notch **26**.

FIG. **4** illustrates that the pivotal movement **68** which serves, as just noted, to engage panel **12** with the end panels **16, 18**, is preferrably made against the urgency of appropriate resilient packing material **70** which may be internally disposed within the container **10** in a protective encircling position about the transported object **72**. That is, at the initial portion of its pivotal movement **68**, an end portion of the panel **12** which is inserted within the container **10** will cause compression **74** in the material **70**. However, once panel **12** assumes its interconnected position, as illustrated in phantom perspective in FIG. **4**, the resilient material **70** is effective to exert the previously noted lifting forces **60** and **62** causing binding, as at points **64** and **66** in FIG. **5**, between each cooperating connecting tab **24** and notch **26**. As a consequence, in addition to the requirement that there exist the noted diagonal orientation of the tabs and tab-accommodating notches before disengagement can occur, an orientation which it has been found in practice will not ordinarily occur during typical transportation of the container **10**, the force-applying resilient packing material **70** contributes, in an obvious manner, to further maintain the interconnected assembled relation of the rigid panels of the container **10**.

From the foregoing, it should be readily appreciated that there has been described herein noteworthy cooperating construction panels capable of being used to readily construct a container without the need for further fastening means such as nails, bolts, screws and the like. Yet, even though dispensing with such fastening means, the assembled containers **10** do not inadvertently become disassembled by virtue of the requirement of a specific angular orientation of one panel relative to the other in order to achieve this result.

A latitude of modification, change and substitution is intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A rectangular container defined by an interconnected arrangement of a rigid top, a rigid bottom, and four rigid sides, said top, bottom and two of said sides each comprising a rigid body having peripheral edges, at least one tab-connecting section on each of two opposite edges each projecting from one said peripheral edge and having a transverse dimension of a first selected prescribed extent, and a connecting tab on each said tab-connecting section of a greater transverse extent than that of said tab-connecting section to provide holding surfaces extending in opposite directions laterally thereof, and said remaining two sides each comprising a rigid body having peripheral border sections presenting peripheral edges thereabout, at least one tab-accommodating notch in each of two opposite peripheral border sections each bounded by opposing notch side edges originating in said peripheral edge of said border section at spaced-apart first juncture locations and extending inwardly therefrom in an outwardly diverging relation to each other to second juncture locations with a notch bottom edge, each said tab-accommodating notch being selectively sized so that the transverse dimension thereof as measured between said first juncture locations bounding the opening into each said notch is smaller than said first selected transverse dimension of said tab-connecting section and is substantially equal to the size thereof in a diagonal dimension as measured between one said first juncture location and one said second juncture location so that the assembly and disassembly of said container contemplates a diagonal orientation of said tab and tab-accommodating notch, and internally disposed resilient packing material effective to urge each panel and the tab-connecting sections thereon outwardly into contacting relation against cooperating notch side edges to thereby contribute to maintaining said assembled condition of said container during the transportation thereof.

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