

- [54] **PACKAGING DEVICE**
- [75] Inventor: **William A. Castine, Jr., Jeannette, Pa.**
- [73] Assignee: **PPG Industries, Inc., Pittsburgh, Pa.**
- [22] Filed: **Apr. 30, 1973**
- [21] Appl. No.: **356,256**
- [52] U.S. Cl. **206/448, 206/454, 206/491, 229/40**
- [51] Int. Cl. **B65d 85/48**
- [58] Field of Search **206/451, 454, 455, 491, 206/521; 229/40, 45, 52 B, 54 R, 87 R, DIG. 8**

3,524,580 8/1970 Heyworth 229/40

Primary Examiner—William I. Price
Assistant Examiner—Steven E. Lipman
Attorney, Agent, or Firm—Donald Carl Lepiane

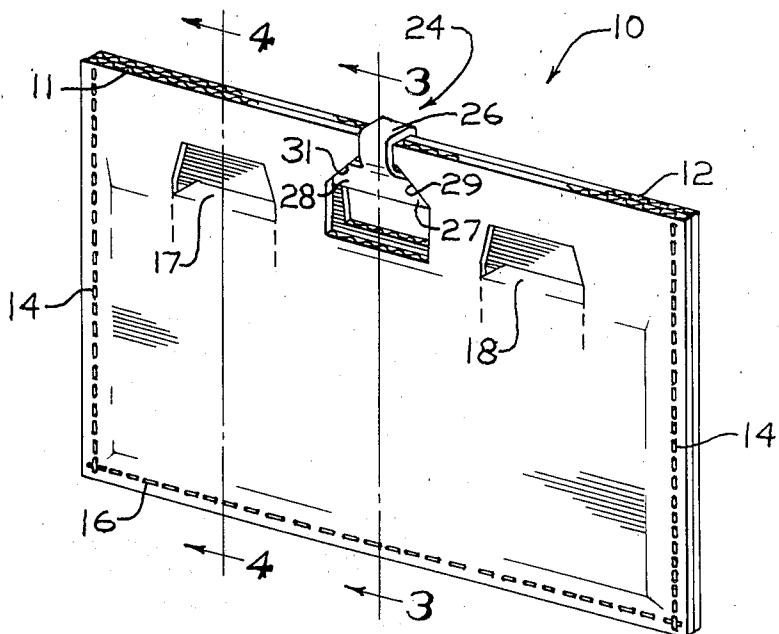
[57] **ABSTRACT**

A packaging device for a sheet-like glass article is comprised of fastened front and rear panels which define an envelope-type receptacle. The front panel is provided with a locking member in the shape of an inverted "T". In use, the locking member passes through a corresponding cut-out in the upper portion of the rear panel and through a complete turn of 360° until it overlies the front panel. The laterally projecting side portions of the locking member are then inserted between the front and rear panels through a cut-out in the front panel, the marginal edges of the cut-out being adapted to receive the locking member. The front panel is also provided with at least one hold-down flap adapted to be folded over the top edge of and behind the glass article.

[56] **References Cited**
UNITED STATES PATENTS

1,324,144	12/1919	Cone.....	229/DIG. 8
1,573,149	2/1926	Engel.....	229/DIG. 8
2,005,967	6/1935	Berdan.....	206/454
2,722,367	11/1955	Verlin.....	229/54 R
2,898,028	8/1959	Coe.....	229/45 X
3,126,145	3/1964	Struble.....	229/52 B
3,344,917	10/1967	Raffet.....	206/451

15 Claims, 8 Drawing Figures



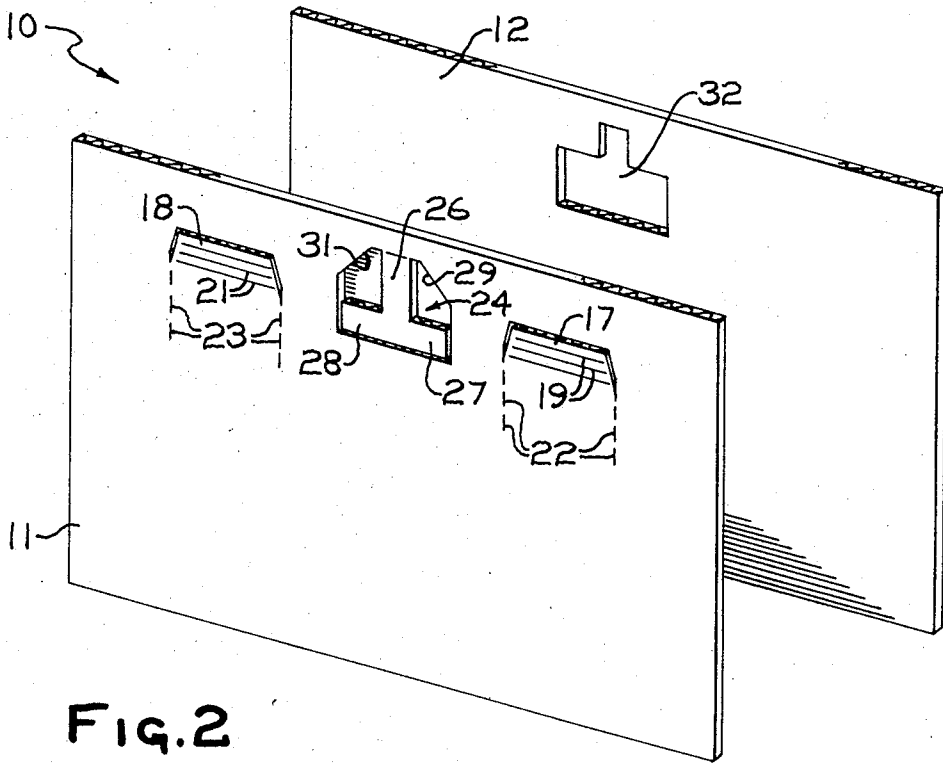


FIG. 2

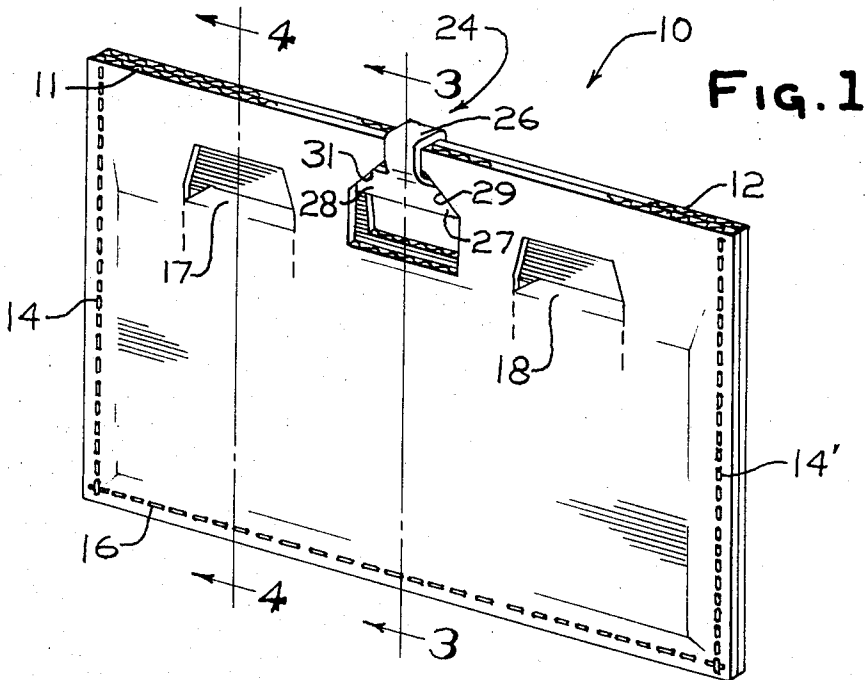


FIG. 1

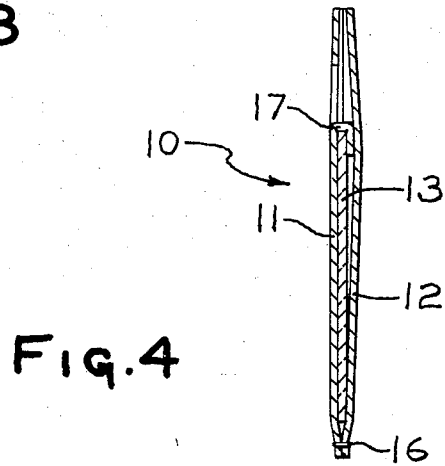
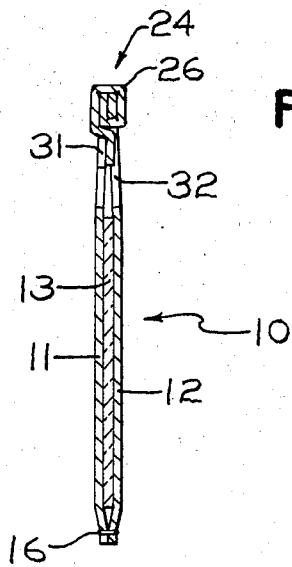
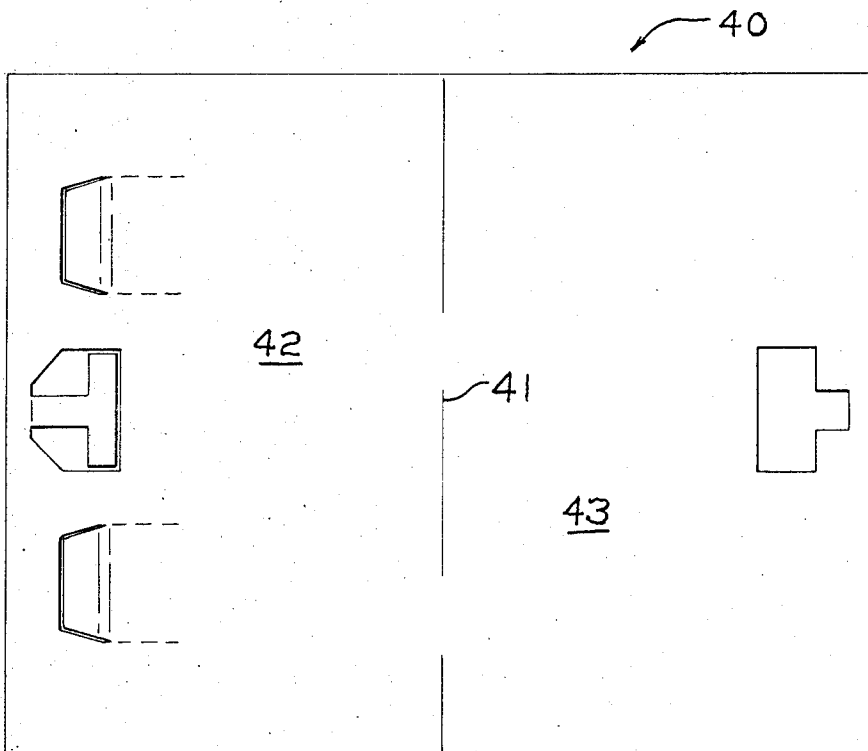


Fig. 5



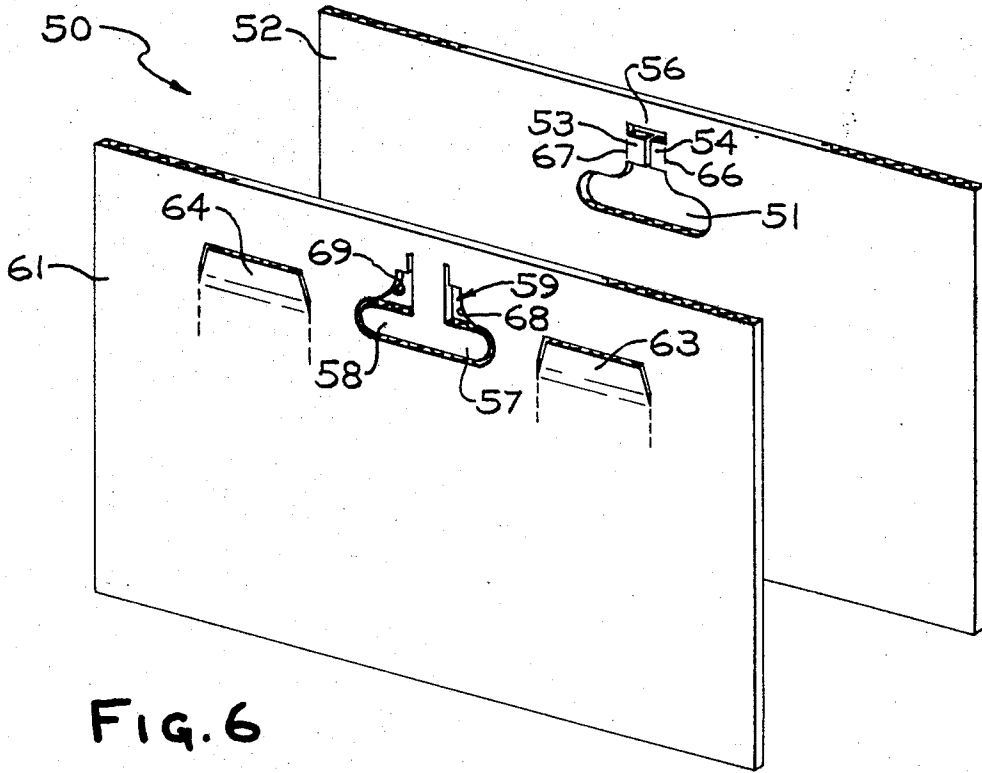


FIG. 6

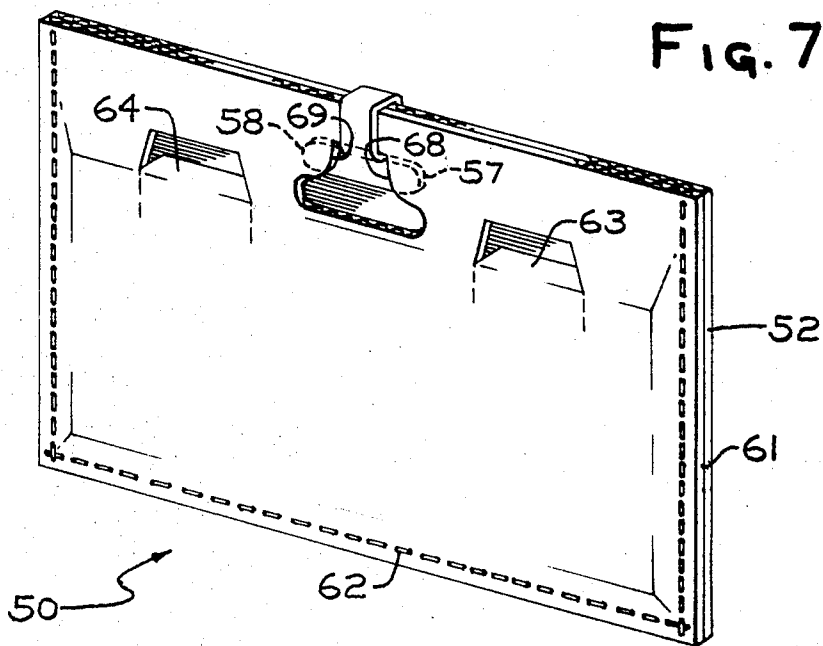


FIG. 7

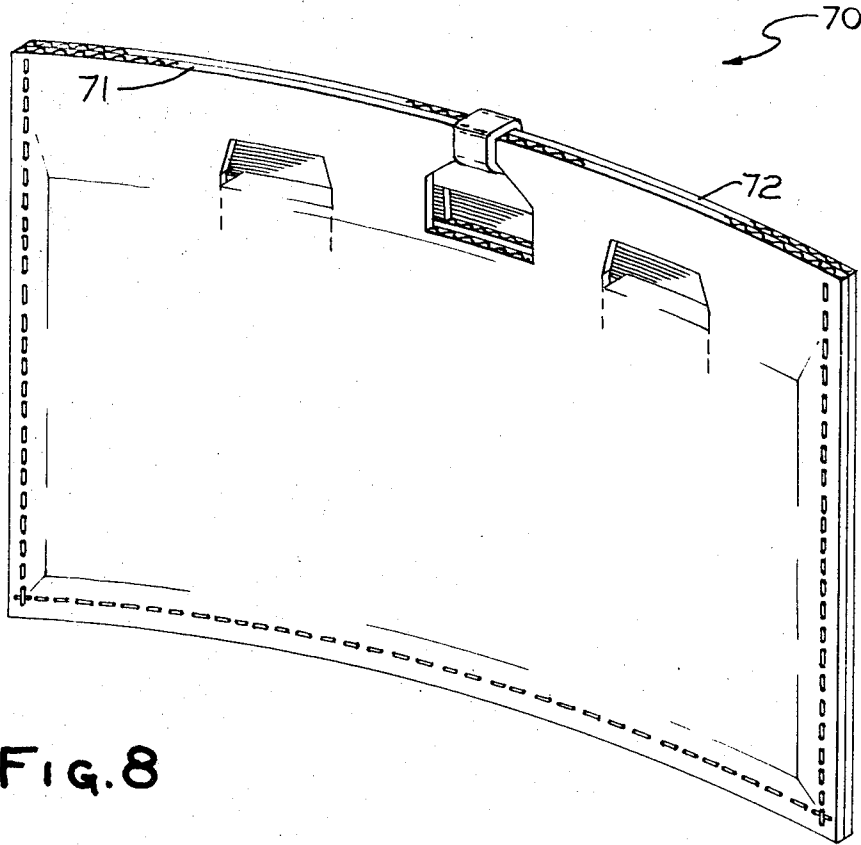


FIG. 8

PACKAGING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an envelope-type packaging device for sheet-like objects, and more particularly to a packaging device for sheets of frangible material such as vehicle windshields, lites of glass, and the like, whether the same be planar or curvilinear.

2. Discussion of the Problem

The packaging and shipping of sheet-like glass articles, particularly those having considerable surface extent, has always present certain difficulties, among which is a danger of breaking, scratching, chipping, or otherwise damaging the articles, as well as the danger and difficulty associated with handling the packaged articles. This is particularly true in connection with individual lites of glass which are supported on edge during shipping and handling.

It would therefore be advantageous to provide a packaging device that is a relatively simple and inexpensive envelope-type packaging device which will protect the sheet-like glass articles packaged therein and facilitate the handling thereof while overcoming the above-noted and other limitations that are associated with conventional packaging devices.

SUMMARY OF THE INVENTION

This invention relates to a packing device for a fragile plate-like article including a first generally rectangular panel member having a foldable lock-tab member, at least one foldable hold-down flap and a cut-out surrounding the lock-tab member. A second panel member generally corresponding in size to the first panel member having an opening corresponding in location to the lock-tab member is fastened to the first panel to define an envelope-like receptacle for the plate-like article.

The lock-tab member has a generally inverted T-shape configuration and the cut-out portion has side marginal edges and a top edge. The end of the stem portion of the lock-tab member remote from the laterally extending side portion forms an integral connection with the top edge. The distance between the marginal edges of the cut-out portion is smaller than the distance between the opposed ends of the laterally extending side portions of the lock-tab member to enable the side marginal edges to overlap the side portions when the packing device is assembled and locked.

The hold-down flap is defined by a generally horizontally disposed slit and a pair of slits depending generally downward therefrom such that when a plate-like article is placed in the receptacle, the hold-down flap is folded over the top edge of the article and down between the article and the second panel member. The opening of the second panel is large enough to pass the lock-tab member therethrough.

The packing device is assembled by pushing the lock-tab member of the first panel through the opening of the second panel and folding it through a complete turn of 360° to insert the side portions of the lock-tab member under the side marginal edges of the cut-out between the first and second panel members so as to lock the article within the packing device.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the assembled packaging device in accordance with the present invention;

5 FIG. 2 is an exploded perspective view illustrating the two-piece construction of the packaging device in FIG. 1;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1, illustrating the means for locking the packaging device;

10 FIG. 4 is a sectional view taken along line 4—4 of FIG. 1, illustrating the means for securing the packaged article against movement during shipping and handling;

15 FIG. 5 is a plan view of a modification of the packaging device of FIG. 1, wherein the modified packaging device is made of one piece;

FIG. 6 is an exploded perspective view of a modification of the packaging device of FIG. 1;

20 FIG. 7 is a perspective view of the packaging device of FIG. 6 in its assembled condition; and

FIG. 8 is a perspective view of an assembled packaging device for a curvilinear sheet-like glass article.

25 DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, and particularly to FIGS. 1—4, there is shown one embodiment of a packaging device 10 which comprises two discrete blanks or panels 11 and 12 enveloping a single sheet-like glass article 13. The panels 11 and 12, which are substantially the same size and shape, and which comprise corrugated paper or its equivalent, are secured together at their side and bottom marginal portions, preferably by vertical stitching 14, 14' and horizontal stitching 16. It is to be understood, of course, that staples or other conventional fastening means may be employed for this purpose. In this manner, the top marginal portion of the packaging device 10 is open to receive the sheet-like glass article 13, while the marginal stitching ensures that the edges of the glass article are spaced from the edges of the packaging device and thereby protected against abrasion or chipping.

The front panel 11 is slit or cut so as to provide two hold-down flaps 17 and 18. As shown, the hold-down flaps 17 and 18 are in line and are located near upper portions of the packaging device 10. However, it will be appreciated that the number of hold-down flaps is a matter of choice, and that the provision of only one flap, or three or more flaps, may sometimes be desirable depending upon the size of the packaging device and upon the size of the glass article to be packaged. As illustrated most clearly in FIG. 4, hold-down flaps 17 and 18 are designed to be folded over and behind the glass article 13, thereby holding the article securely in place and preventing any movement thereof during shipping or handling. To facilitate their being folded, the flaps 17 and 18 are provided with a series of spaced, parallel score lines or fold creases 19 and 21. In addition, a plurality of perforations 22 and 23 run downwardly from each respective hold-down flap 17 and 18 to facilitate the enlargement of the flaps as dictated by the relative size of the glass article being packaged.

The front panel 11 is also provided with a locking flap 24 which is disposed between the hold-down flaps and generally on the center line of the panel. As shown, the locking flap 24 somewhat resembles an inverted T having a stem or main portion 26 and two laterally ex-

tending ears or side portions 27 and 28. The portion of the panel 11 surrounding the locking flap 24 is cut-out so as to enable free movement of the flap 24 relative to the plane of the panel. Generally speaking, the configuration of the cut-out portion is merely a matter of choice (e.g. compare FIGS. 2 and 6). However, as will be appreciated more fully from a consideration of FIGS. 1 and 7, it is essential that the width of the cut-out be chosen such that the side portions 27 and 28 of the flap 24 will extend beyond the side marginal edges 29 and 31 of the cut-out when the packaging device 10 is assembled.

The back panel 12 is provided with a cut-out 32 which corresponds generally in shape and disposition with the locking flap 24 of the front panel 11. However, in a preferred embodiment, the cut-out 32 is slightly larger than the locking flap 24 to facilitate assembling the packaging device.

In assembling the above-described packaging device, the front and back panels 11 and 12 are first machine sewn or otherwise secured together along their marginal side and bottom edges. Then, a sheet-like glass article 13 is inserted into the open top of the packaging device and pushed downward between the panels 11 and 12 toward the stitching 16 at the bottom of the packaging device. Next, the hold-down flaps 17 and 18 are creased along the appropriate score lines 19, 20, or perforations 22, 23, and folded over the top edge and downwardly behind the article 13 (see FIG. 4). As shown most clearly in FIG. 3, the locking flap 24 is then pushed through the cut-out 32 in the back panel 12, and pulled completely around the top of both the front and back panels. The laterally extending side portions 27 and 28 of the locking flap 24 are then inserted behind the marginal edges 29 and 31 and between the front and back panels, thus locking the packaging device 10.

A slightly modified version of the packaging device 10 is illustrated in FIG. 5, wherein a packaging device 40 is comprised of a single sheet of corrugated paper having a central fold crease 41. The central fold crease 41 defines front and back panels 42 and 43, respectively, of the packaging device 40, and thus eliminates the need for sewing or otherwise securing the packaging device along its bottom marginal portion. However, in all other respects, the packaging device 40 is the same as the packaging device 10.

Another modification of the packaging device 10 is shown in FIGS. 6 and 7. In this modification, the cut-out 51 of the rear panel 52 is formed so as to include flaps 53 and 54 which resemble swinging doors. As illustrated, the flaps are integrally connected to the side marginal edges of the cut-out 51 and extend laterally therefrom. The flaps 53 and 54 are located just below the top edge 56 of the cut-out 51, and just above the portion of the cut-out 51 through which the laterally extending portions 57 and 58 of the locking tab 59 pass when the device 50 is assembled.

As suggested above, the cut-out portion of the front panel 61 which surrounds the locking flap 59 differs slightly in configuration relative to the corresponding cut-out in the device 10. However, it will be appreciated that the function of the respective cut-outs is the same.

Assembling the device 50 is accomplished generally in the same manner as described above. Thus, the front and back panels 61 and 52 are first machine sewn or

otherwise secured together along their marginal side and bottom edges. Then, a sheet-like glass article is inserted into the open top of the device 50 and pushed downward between the panels toward the stitching 62 at the bottom of the packaging device. Next, the hold-down flaps 63 and 64 are creased along the appropriate score lines or perforations and folded over the top edge and downwardly behind the article being packaged. The locking flap 59 is then pushed through the door-like flaps 53 and 54, which fold along crease lines 66 and 67, respectively. The movement of the locking flap is continued through a complete turn until the flap 59 overlies the cut-out portion of the front panel 61. The ears or projections 57 and 58 are then tucked behind the opposed marginal edges 68 and 69 of the front panel cut-out and between the front and rear panels 61 and 52, thus locking the packaging device. The door-like flaps 53 and 54 are then folded back to their original position so as to reinforce the locking tab 59 and to prevent it from becoming dislodged from its locked position.

Still another modification of the packaging device 10 is shown in FIG. 8, wherein the front and back panels 71 and 72, respectively, of the packaging device 70 are curved to accommodate a curvilinear glass article, such as a curved automobile windshield. In all other respects, the packaging device 70 may be the same as packaging device 10.

It will thus be seen that there is provided a complete packaging device for a sheet-like glass article which can be shipped without further packaging. The glass article itself furnishes adequate strength for the unit and the packaging device provides a protective cover which prevents damage to the glass article. The glass article is positively spaced from the load bearing edges of the package by means of the stitching along the marginal edges of the device, so that the glass articles, which are usually shipped on edge, will be cushioned against direct contact.

While the packaging device hereindescribed is for the purpose of illustration only, it is to be understood that the present invention includes all modifications and equivalents which fall within the scope of the invention as defined by the appended claims.

What is claimed is:

1. A packaging device for a fragile plate-like article which comprises:

a first generally rectangular panel member having a foldable lock-tab member, at least one foldable hold-down flap and a cut-out surrounding said lock-tab member;

a second generally rectangular panel member corresponding substantially in size to said first panel member and having an opening corresponding in location to said lock-tab member;

means fastening said first and second panel members along their side and bottom marginal edges such that the space between the respective panel members defines an envelope-like receptacle for the plate-like article;

said lock-tab member having a generally vertically extending stem portion and two laterally extending side portions so as to define a generally inverted T-shaped configuration;

said cut-out portion having side marginal edges and a top edge, said top edge forming an integral connection with the end of said stem portion of said

lock-tab member that is remote from said side portions thereof, the distance between said side marginal edges of said cut-out being smaller than the distance between the opposed ends of said laterally extending side portions of said lock-tab member so as to enable said side marginal edges to overlap said side portions when the packaging device is assembled and locked;

said hold-down flap being defined by a generally horizontally disposed slit and a pair of slits depending generally downwardly therefrom, such that when a plate-like article is placed in said envelope-like receptacle said hold-down flap can be folded over the top edge of the article and down between the article and said second panel member; and said opening being sufficiently large such that when an article is placed in said envelope-like receptacle, said lock-tab member can be pushed through said opening and folded through a complete turn of 360°, whereafter said side portions of said lock-tab member can be inserted under said side marginal edges of said cut-out, and thus between said first and second panel members so as to lock the article within the packaging device.

2. The packaging device of claim 1, wherein said first panel member comprises two hold-down flaps substantially equispaced with respect to the marginal side edges of said first panel, and wherein said lock-tab member is substantially equispaced between said hold-down flaps.

3. The packaging device of claim 2, wherein said first and second panels are stitched along their side and bottom marginal edges.

4. The packaging device of claim 3, wherein said first and second panel members are flat and wherein said packaging device is adapted for packaging planar articles.

5. The packaging device of claim 4 including a planar sheet-like glass article packaged therein.

6. The packaging device of claim 3 wherein said first and second panels are curvilinear and wherein said packaging device is adapted for packaging curvilinear articles.

7. The packaging device of claim 6 including a curvilinear sheet-like glass article packaged therein.

8. The packaging device of claim 3, wherein said second panel member further comprises a door-like, foldable flap means adapted to reinforce said lock-tab member and to prevent said side portions of said lock-tab member from being withdrawn inadvertently from under said side marginal edges of said cut-out when the packaging device is locked, said door-like flap means comprising a pair of flap members integrally connected to and extending toward each other from the side marginal edges of said opening in said second panel member, said flap members being foldable in the direction away from said first panel member so as to permit said lock-tab member to pass through said opening, said flap members being disposed in the plane of said second panel member when the packaging device is locked.

9. The packaging device of claim 1, wherein said hold-down flap includes fold lines to facilitate folding said flap over and behind an article placed in said receptacle.

10. The packaging device of claim 1, wherein a plurality of perforations are provided in said first panel

member, said perforations extending generally downwardly from said downwardly extending slits of said hold-down flap so as to facilitate the enlargement of said flap as dictated by the relative size of the article being packaged.

11. A packaging device for a fragile plate-like article, which comprises:

a generally rectangular body having a first longitudinal fold line dividing said body into first and second panels, said first panel having substantially the same dimensions as said second panel, said body being folded along said first fold line such that said first panel and said second panel are disposed in face-to-face relationship;

means fastening said first and second panels along their side marginal edges such that the space between the respective panels defines an envelope-like receptacle;

said first panel having a foldable lock-tab member, at least one foldable hold-down flap and a cut-out surrounding said lock-tab member;

said second panel having an opening corresponding in location to said lock-tab member;

said lock-tab member having a generally vertically extending stem portion and two laterally extending side portions so as to define a generally inverted T-shaped configuration;

said cut-out portion having side marginal edges and a top edge, said top edge forming an integral connection with the end of said stem portion of said lock-tab member that is remote from said side portions thereof, the distance between said side marginal edges of said cut-out being smaller than the distance between the opposed ends of said laterally extending side portions of said lock-tab member so as to enable said side marginal edges to overlap said side portions when the packaging device is assembled and locked;

said hold-down flap being defined by a generally horizontally disposed slit and a pair of slits depending generally downwardly therefrom, such that when a plate-like article is placed in said envelope-like receptacle, said hold-down flap can be folded over the top edge of the article and down between the article and said second panel; and

said opening being sufficiently large such that when an article is placed in said envelope-like receptacle, said lock-tab member can be pushed through said opening and folded through a complete turn of 360°, whereafter said side portions of said lock-tab member can be inserted under said side marginal edges of said cut-out, and thus between said first and second panels so as to lock the article within the packaging device.

12. A packaging device for sheets of frangible material such as sheets of glass, vehicle windshields and the like, which comprises:

a frangible sheet having forward and rearward surfaces and a top edge;

a first generally rectangular panel member overlying said forward surface of said sheet and having dimensions greater than said sheet, said first panel member having at a location above said top edge of said sheet at least one foldable hold-down flap, a foldable lock-tab member and a cut-out surrounding said lock-tab member;

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a second generally rectangular panel member overlying said rearward surface of said sheet and having marginal edges which coincide substantially with the corresponding marginal edges of said first panel member,

means fastening said first and second panel members along their side and bottom marginal edges;

said lock-tab member having a generally vertically extending stem portion and two laterally extending side portions so as to define a generally inverted T-shaped configuration;

said cut-out portion having side marginal edges and a top edge, said top edge forming an integral connection with the end of said stem portion of said lock-tab member that is remote from said side portions thereof, the distance between said side marginal edges of said cut-out being smaller than the distance between the opposed ends of said laterally extending side portions of said lock-tab member;

said hold-down flap being defined by a generally horizontally disposed slit and a pair of slits depending generally downwardly therefrom, said flap being folded rearwardly over the top edge of said sheet

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and downwardly between said sheet and said second panel member;

said second panel member having an opening through which said lock-tab member is passed, said stem portion of said lock-tab member being folded through a complete turn of 360° and said side portions thereof being inserted under said side marginal edges of said cut-out, and thus between said first and second panel members so as to lock said sheet within the packaging device.

13. The packaging device of claim 12, wherein said first panel member comprises two hold-down flaps substantially equispaced with respect to the marginal side edges of said first panel, and wherein said lock-tab member is substantially equispaced between said hold-down flaps.

14. The packaging device of claim 13, wherein said first and second panel members are stitched along their side and bottom marginal edges.

15. The packaging device of claim 12, wherein said hold-down flap includes fold lines to facilitate folding said flap over and behind said sheet.

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