

May 19, 1964

E. A. FREMION
PROTECTIVE PACKAGE WITH CUSHION DEVICES FOR
PACKAGING FRAGILE SHEET-LIKE ARTICLES

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2 Sheets-Sheet 1

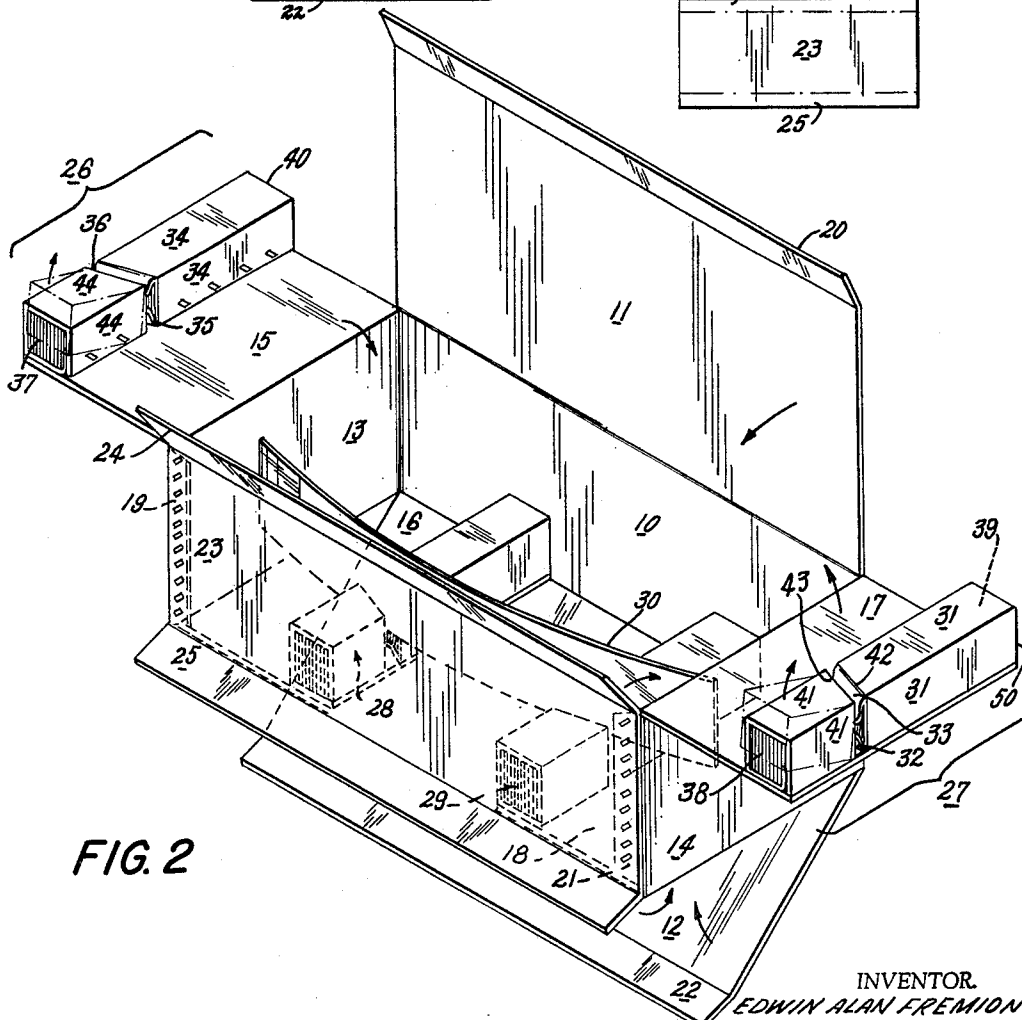
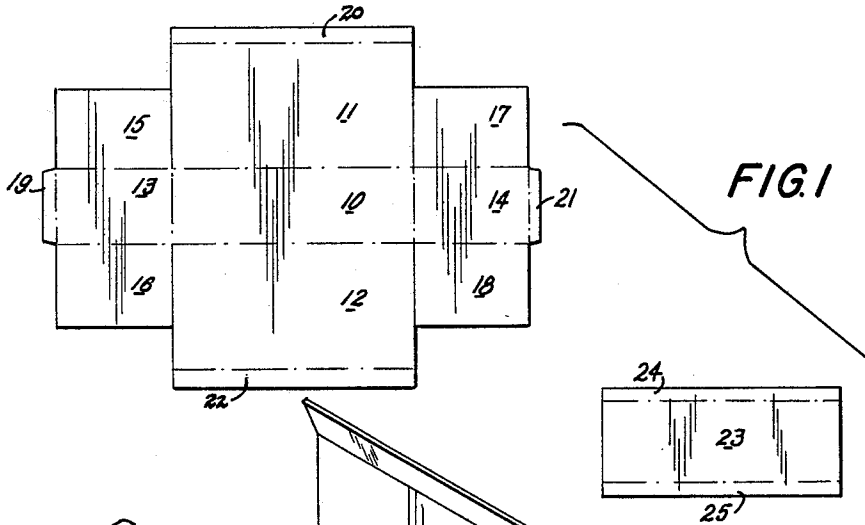


FIG. 2

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FIG. 3

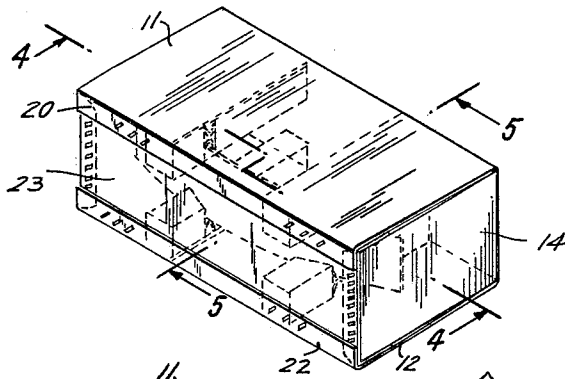


FIG. 4

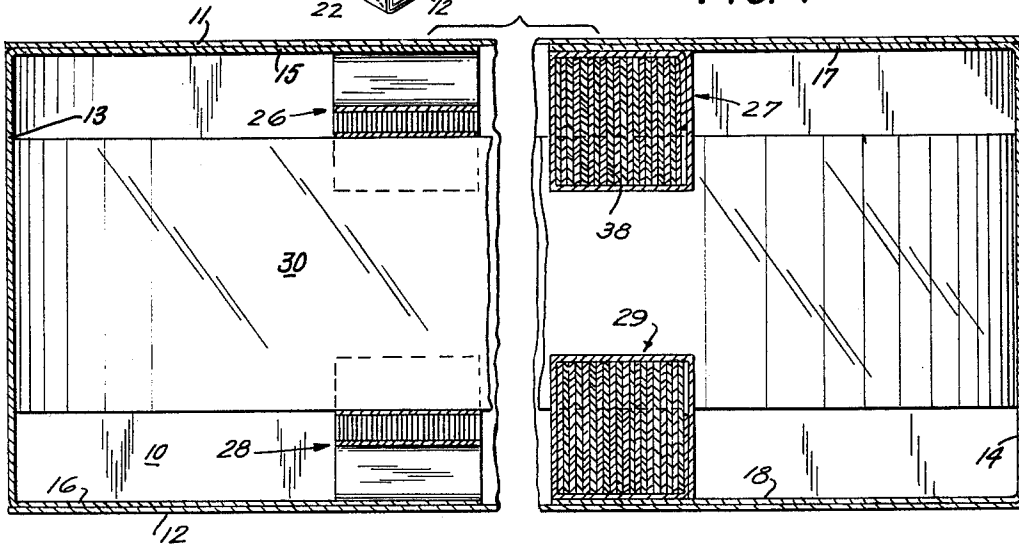
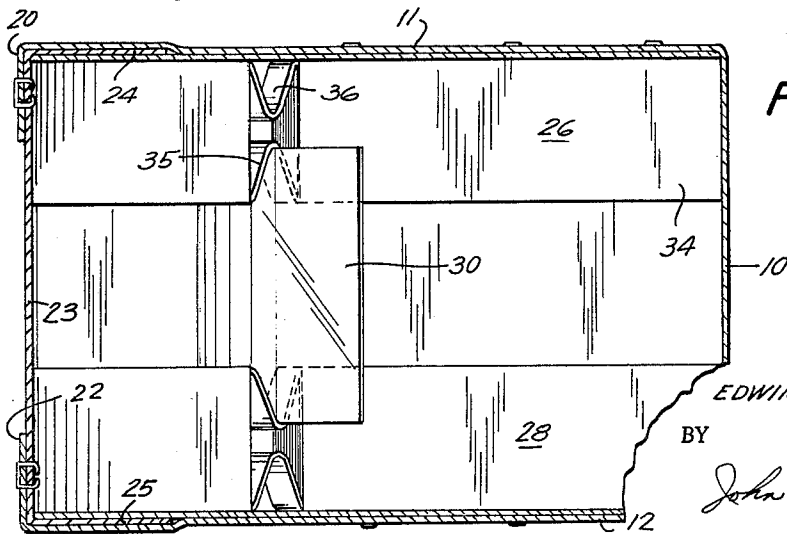


FIG. 5



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PROTECTIVE PACKAGE WITH CUSHION DEVICES FOR PACKAGING FRAGILE SHEET-LIKE ARTICLES

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This invention relates to an improved protective package with cushion devices for packaging fragile sheet-like articles such as relatively thin sheets of glass used for automobile windshields and backlights. The present invention represents an improvement in the design of protective cushioning devices which are to be used with a suitable container. The invention provides a package having cushion devices which are adaptable to conform with the surface of the packaged article serving to isolate the packaged article from any strain or twisting in the container walls.

Prior art protective packages with cushion blocks proved an adequate safeguard to cushion the packaged object from the shock of heavy blows, however, the very protective action of the container, with a series of cushion blocks attached to the container caused heavy blows to develop a new and insidious hazard to the packaged glass sheets; the packaged article essentially becomes a part of the container and thus very susceptible to the twisting action induced when the container is handled. The cushion device becomes a means of transmission of shock to the packaged article. The ideal protective package would serve to protect the packaged object from damage due to the heavy shock and not transmit the twisting motions and strains caused by container movement.

The invention provides an improved cushion device which has a two-fold action, the device firmly anchors the packaged goods in relation to the container walls and provides mobility of the cushion device which allows it to move freely over a large geographical area. These two actions insure a positive positioning of the packaged article within the container yet avoids the danger of transmitting twists or strains to the packaged object through the medium of the cushion device. The ability to move over a relatively wide geographical area, in two planes of motion, is referred to as "free floating action." The cushion device securely grips the packaged article due to its ability to conform to the surface of the packaged article. The design of the cushion device incorporates a flexible structure to firmly grip the packaged article, while providing the characteristic of "free floating action" which serves to completely isolate the packaged article from the effect of any strain or stress to the container. One form of the invention is shown in the accompanying drawings which may be described as follows:

FIGURE 1 illustrates a blank from which a suitable container may be assembled; FIGURE 2 is a perspective view of a partially assembled container with improved cushion blocks attached to top flaps and bottom flaps; FIGURE 3 is a perspective view of an assembled container with a packaged article positioned within the cushion device; FIGURE 4 illustrates a section along line 4-4 and is a cross section of a pair of cushion blocks; FIGURE 5 is a cross section of an assembled carton taken along line 5-5 and illustrates a packaged object positioned within the load bearing section of a top and bottom cushion block.

A suitable container may be assembled from the blank of FIGURE 1 having wall panels, a top panel, a bottom panel and a pair of end panels interconnected to form a container with a top and bottom opening. Bottom panel 12 is foldably attached to backside panel 10. Bot-

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tom panel 12 has tab 22 for use as a fastening surface. The bottom flaps 16 and 18 are connected to end panels 13 and 14 respectively, and panels 13 and 14 have tabs 19 and 21 respectively. Front panel 23 has front panel flap 24 and front panel bottom flap 25. The blank when suitably scored and folded as described above forms a container.

Cushion devices 26 and 27 are attached to flaps 15 and 17, for securing packaged object 30. The cushion devices 28 and 29 are attached to the container flaps 16 and 18 for securing another edge of the packaged object. The cushion devices may be attached to a separate supporting structure such as a panel of heavy fibre board, or built up corrugated plies of paperboard or other suitable material sufficiently rigid to support the cushion devices in spaced relationship in the same general place. The pad may be dropped into the container forming either or both a bottom and top supporting structure for the cushion devices.

A flexible cushion device 27, will be described in detail as illustrative of a typical cushion device of my invention. The cushion device has an anchored section 31, flexible article contacting sections 32 and 33, and a free floating section 41. The anchored section 31 and the free floating section 41 are connected by flexible connection strips 32 and 33. Strip 33 connects the upper surface of section 31 to section 41. Strip 32 connects the lower surfaces. The connecting strips 32 and 33 may be extensions of the cover material of the sections 31 and 41, or dissimilar material integral with the cover sections. Rigid section 31 is attached to top flap 17 by glue, staples, or any other suitable means. Flexible strip 33 is connected along line of connection 42 to anchored section 31 and along line 43 to free floating section 41. The lines of connection are canted from the perpendicular with an edge of blocks 31 and 41. The load bearing surfaces of flexible strips 32 and 33 are thus placed in substantial alignment with the curved edges of packaged object 30.

The free floating section 41 of the cushion device may range over a wide geographical position in relation to the anchored section 31. This feature allows approximate positioning of the anchored section relative to the packaged object 30, thus eliminating the necessity for placing the cushion block within a very narrowly defined area on the top flap 17 so that it meets with an edge of the packaged object 30, when the packaged object is put into the container. The flexible connecting strip, composing the article contacting section, conforms to the edges of the packaged object and grips that object and thus firmly holds it, positioned in relation to the container walls. The free floating section is entirely movable in two planes at the same time. The packaged object is firmly positioned within the container and yet completely isolated from the stress and strain induced into the container by the twisting motion of ordinary handling and shipping.

The cushion blocks 39 may be constructed of any suitable material such as inexpensive built up plies of corrugated paperboard 38 with an overlapping of paperboard or fibre board 50, portions of which may form the flexible load bearing sections 32 and 33 connecting the anchored section 31 and free floating section 41.

Cushion device 26 is attached to top flap 15; cushion devices 28 and 29 are attached to the bottom flaps 16 and 18 respectively.

FIGURE 3 illustrates an assembled container with a packaged object positioned within. The protective container is completed by folding inwardly and downwardly top flaps 15 and 17, and folding inwardly and upwardly bottom flaps 16 and 18. This action serves to position the packaged object 30 within the flexible load bearing strips, and positions the object in relation to top panel 11

and bottom panel 12 which are the top and bottom of the container. Flaps 24 and 25 are folded inwardly and between top and bottom flaps 15, 16, 17, and 18 and top and bottom panel 11 and 12 respectively. Tabs 20 and 22 are then fixed to wall panel 23 by gluing, stapling, or any other suitable means.

Cushion devices 26, 27, 28, and 29 hold the packaged object, and suspend that object in spaced relation from the side walls of the container, thus affording protection from heavy blows and the free floating section serves to isolate the packaged object from any stress induced into the packaged walls by twisting and banding during shipment. The only connection between the packaged object and the container walls is thus through the flexible load bearing strips.

The canted lines of connection 42 and 43 between the anchored section 31 and the free floating section 41 of the cushioned device provides for a very easy engagement between the load bearing strips and the edge of the packaged object when the packaged object is curved in one or more planes.

The degree of canting from the perpendicular to an edge of the cushion device can be changed to correlate with the curvature of the packaged object. A cushion device may have more than one flexible load bearing strip section in holding more than one packaged article.

The container is reusable for many successive shipments. The isolation of the packaged object from the stresses induced in the package walls as well as from the shock of blows results in a package of superior protective qualities, yet inexpensive to make, very easy to load and close.

The above description and examples are intended to be illustrative only. Any modification of or variation therefrom which conforms to the spirit of the invention is intended to be included within the scope of the claims.

The invention claimed is:

1. A protective package for packaging sheet-like articles such as sheets of curved glass used for automobile back-lights, comprising:

- (A) a blank of sheet material scored and cut to form a box;
- (B) two pairs of flexible cushion devices deposed within the box in opposing relationship;
- (C) each of said flexible cushion devices comprising a pair of rectangular rigid sections and a pair of flexible strips connecting said rigid sections, one of said flexible strips being in position to contact a portion of an edge of the sheet-like article and conform therewith, one of said rigid sections being anchored to the box, and the other said rigid section being free to move away from said box and from side to side to provide a free floating action for the sheet-like article.

2. A protective package for packaging sheet-like articles such as sheets of curved glass used for automobile back-lights, comprising:

- (A) a blank of sheet material scored and cut to form a box blank comprising:
 - (i) a back side panel,
 - (ii) a top panel foldably connected along the top edge of the back side panel,
 - (iii) a bottom panel foldably attached to the back

side panel along the bottom edge of the back side panel,

- (iv) a pair of end panels foldably connected to the back side panel along opposite side edges of the back side panel,
- (v) a pair of top flaps foldably connected to the end panels along the top edges thereof,
- (vi) a pair of bottom flaps foldably connected to the end panels along the bottom edges thereof; and

(B) flexible cushion devices mounted on the top and bottom flaps of the box;

(C) each of said flexible cushion devices comprising a pair of rectangular rigid sections, and an opposed pair of flexible strips connecting said rigid sections, one of said flexible strips being in position to contact a portion of an edge of the sheet-like article and conform therewith, one of said rigid sections being anchored to one of said flaps and the other said rigid section being free to move away from said flaps and from side to side to provide a free floating action for the sheet-like article.

3. A protective package for packaging sheet-like articles such as sheets of curved glass used for automobile back-lights, comprising:

(A) a blank of sheet material scored and cut to form a box blank comprising;

- (i) a back side panel,
- (ii) a top panel foldably connected along the top edge of the back side panel,
- (iii) a bottom panel foldably attached to the back side panel along the bottom edge of the back side panel,

(iv) a pair of end panels foldably connected to the back side panel along opposite side edges of the back side panel,

(v) a pair of top flaps foldably connected to the end panels along the top edges thereof,

(vi) a pair of bottom flaps foldably connected to the end panels along the bottom edges thereof; and

(B) flexible cushion devices mounted on the top and bottom flaps of the box;

(C) each of said flexible cushion devices comprising a pair of rectangular rigid sections and an opposed pair of flexible strips connecting said rigid section along a canted line of connection, one of said flexible strips being in position to contact a portion of an edge of the sheet-like article and to conform therewith, one of said rigid sections being anchored to one of said flaps and the other said rigid section being free to move away from said flaps and from side to side to provide a free floating action for the sheet-like article.

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