May 16, 1944. E. A. THROCKMORTON 2,349,020

CARTON

Filed Aug. 15, 1941 2 Sheets-Sheet 1

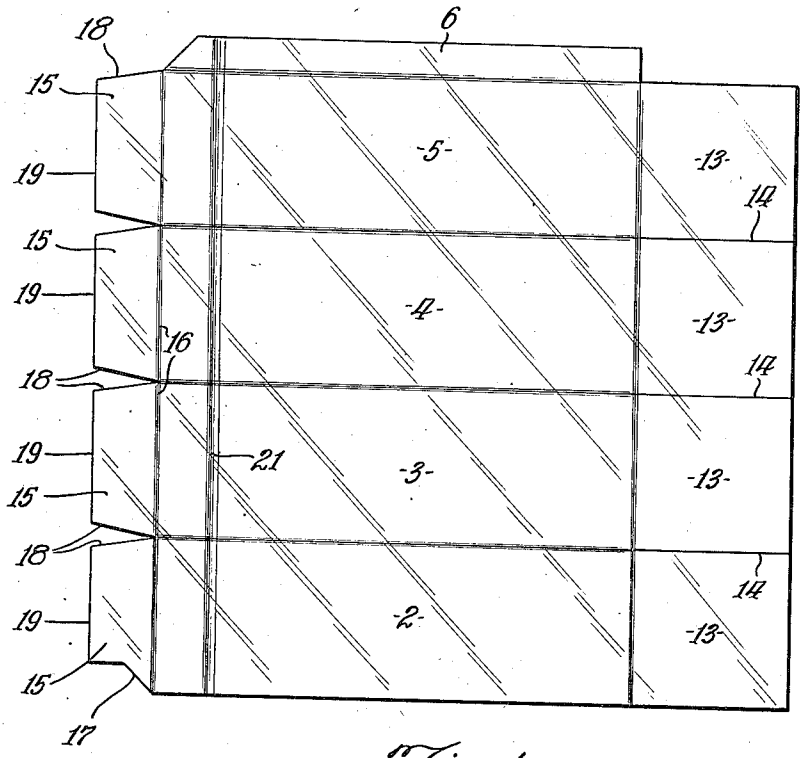

Fig. 1.

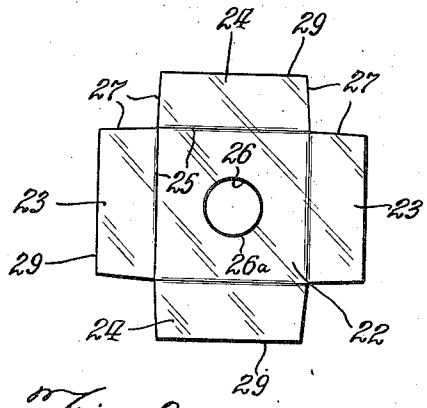

Fig. 3.

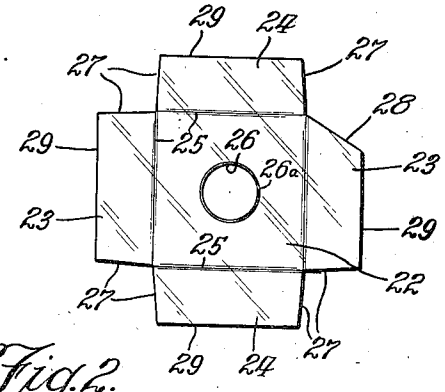

Fig. 2.

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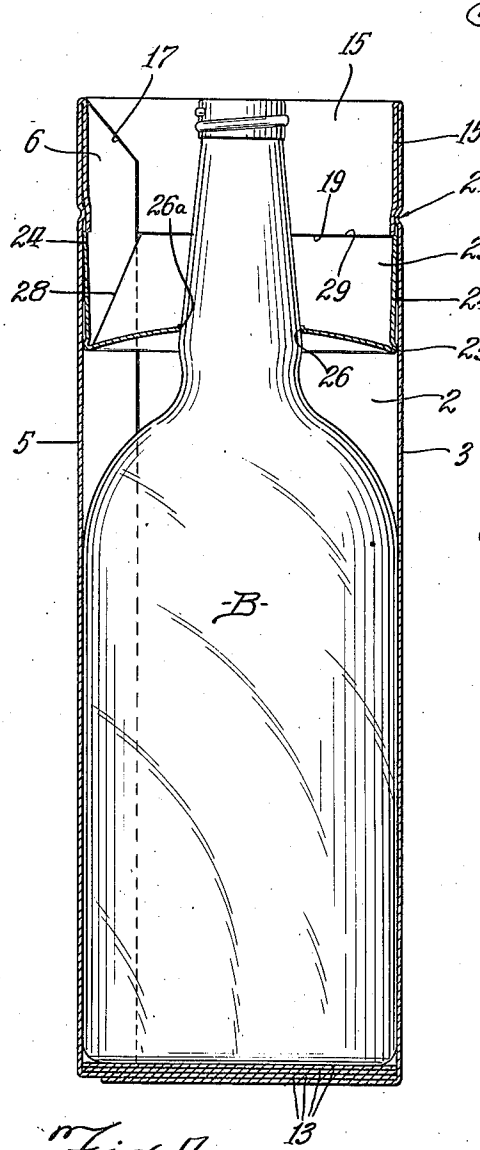


Fig. 4.

Fig. 5.

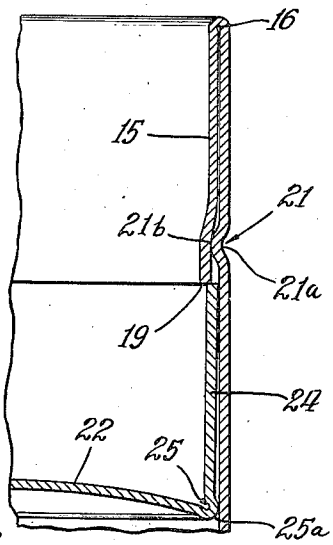
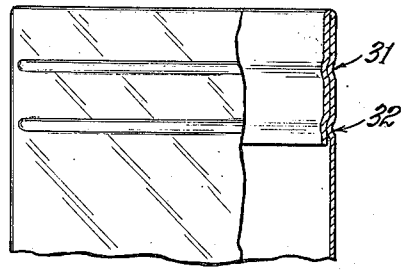


Fig. 6.



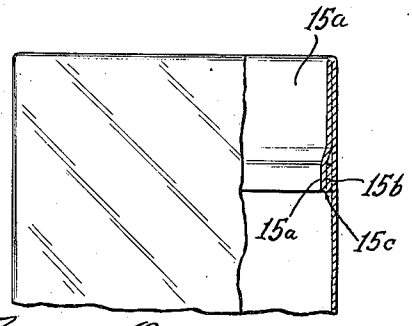


Fig. 7.

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UNITED STATES PATENT OFFICE

2,349,020

CARTON

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Application August 15, 1941, Serial No. 406,985

5 Claims. (Cl. 229—89)

This invention pertains to cartons or packages to be composed of paperboard, fiberboard, or other materials of a similar nature and, more particularly, to cartons peculiarly adapted to the packaging of bottles and bottled goods for shipment, display and other purposes, the fundamental features of the invention being adaptable, however, to other uses and purposes as will be apparent to those working in the container arts.

The packaging of bottles, especially bottles containing expensive or dangerous fluids, presents many problems. Among the problems are those encountered in insuring against accidental displacement of the bottle from the package, rupture of the package during handling or transportation, breakage of the bottle within the package, tampering with or pilferage of the bottle or contents without leaving obvious signs, and ease and economy of manufacture, storage and shipment. There is also the matter of customer satisfaction and appeal to be considered from both the standpoint of the one who packages the bottled commodity and the ultimate consumer who purchases the packaged goods.

Accordingly it is a primary object of the invention to provide a carton for the packaging of bottles and bottled goods, so constructed and arranged that while it is relatively inexpensive in construction and economical of material it will be strong and effective for its various purposes.

Another equally important objective is to provide a carton which, while permitting quick and easy loading or filling with the bottle or other item which it is to carry, will surely and safely retain the bottle against injury or loss and will substantially eliminate undetectable pilferage or tampering, whether during shipment, storage or otherwise. In this connection it should be mentioned that one of the major features of the invention lies in a simple but unique arrangement whereby the packaged bottle or other item is prevented from making material shifting movements within the carton, the bottle or the like being held relatively motionless therein from the time it is packaged therein until released or removed therefrom.

Still another object is to provide a package or carton of the character mentioned so constructed and arranged that it may be partially constructed at the place of manufacture and shipped in such condition, usually in "knocked-down" form, to the place at which the cartons are to be filled with the bottles or other items to be packaged therein, the carton preferably also being designed to permit close nesting of a plurality of filled packages for convenience and economy of shipment.

Many other objects, advantages and uses of the invention and its several features will be fully understood after reading the following description and the claims and on examination of the accompanying drawings, in which:

Figure 1 is a view of the carton blank representing what is at present a preferred form;

Figure 2 is a view of what may be termed a diaphragm blank to be used as an end closure for one end of the carton, the blank illustrated being that which is at present preferred;

Figure 3 is a view similar to that of Figure 2 of a slightly different type of diaphragm blank or end closure member;

Figure 4 is a longitudinal section through a carton formed from the blanks of Figures 1 and 2, the view illustrating a bottle disposed in the carton;

Figure 5 is an enlarged detail sectional view of a fragment of the top end of the carton and its closure of a preferred construction; and

Figures 6 and 7 show carton top fragments in illustration of other types of modifications of construction.

The carton chosen for exemplification of the invention is of parallelepiped shape, that is, is has six sides of which the opposite sides are parallel and, in this particular instance, the four sides are of equal dimensions. One end, the bottom end, is to be completely and relatively permanently closed while the top end is open except for an internal diaphragm type closure which not only serves as a closure difficult to remove without damage or detection but also as a means to secure the bottle or other packaged item against movements longitudinally of the carton, the transverse dimensions of the carton preferably being such as to preclude lateral movements of the carton contents. The diaphragm or closure member is firmly and securely held in place within the carton end by a very simple and inexpensive yet effective means, and the neck and top of the bottle carried by the carton may project upward through the diaphragm closure and may be readily inspected.

Preferably a fairly stiff paperboard or fiberboard is cut into the shape shown in Figure 1 with suitable dimensions for the bottle or other article to be carried in the final carton, the blank also being scored along predetermined fold lines and otherwise, as will be described. The blank shown comprises four side wall panels 2, 3, 4 and 5 of equal corresponding dimensions differentiat-

ed from one another and from a securing or sealing strip 6 by parallel score lines 7, 8, 9 and 11. The width, i. e., the narrow dimension, of each of the side wall panels preferably is just that of or only very slightly greater than the greatest diameter of the bottle or other object to be packaged while the length of each side wall panel is, preferably, equal to or slightly greater than the height of the bottle including its neck and cap. The securing strip 6 is relatively narrow and is intended to be lapped on the inside of the carton against and secured by adhesive to the inner face of panel 2 when the carton is formed from the blank.

At the bottom ends of the side panels and differentiated therefrom by a score line 12 are end flaps 13 each of which may be square and separated from the adjacent flap or flaps by slits or kerfs 14. Since these flaps are intended to be folded over one another in any preferred order (superimposed) and secured together in such position by adhesive, it may be desirable to have the second of slightly greater length than the first one infolded, the third of slightly greater length than the second, and the fourth or last infolded of slightly greater length than the third, in order to compensate for the increased lap, thereby to bring the outer free edges in register with the side walls. However, the flaps 13 may be all of the same length, as shown, or may be of any other suitable configuration. At the other or top end of the blank and attached one to each side panel as a continuation thereof, are what may be termed lock flaps 15 between which and the side wall panels is a score line 16 to permit easy infolding of the lock flaps which are to lie against and to be adhesively secured to the inner faces of top end or marginal portions of the side wall panels. The lock flaps 15 are wholly separated from one another along their side margins and, except for the lock flap which lies at the opposite side of the blank from the strip 6 and which is notched as at 17 at its outer end to conform to the corresponding end of strip 6 as will become clearer hereinafter, have those side margins bevelled, as shown at 18 in Figure 1, in the preferred construction.

Adjacent and parallel to the top edges (score line 16) of the side wall panels but spaced downward therefrom a distance slightly less than the distance from the score 16 to the outer edges 19 of the lock flaps 15 is a line score 21 which is so formed as to provide a perimetrically extending channel 21*a* in the outside surface of the final carton and, correspondingly, a rib, ridge or projection 21*b* on the interior surface of the carton. This ridge projection is shown in a prominent and somewhat exaggerated manner in Figure 5, the actual projection of the top of the ridge above the plane of the interior of each side wall panel surface being, preferably, about half the thickness of the material of the wall although it may be somewhat greater or less and still perform its function. When the lock flaps 15 are folded inward and secured by adhesive or otherwise against the inner top marginal parts of the side walls, the adhesive is so applied, preferably, as to secure the flaps to the side walls over substantially the entire area of each flap down to and including the crest of the ridge or projection 21*b* but is omitted from that portion of each flap which extends below the ridge 21*b*. In other words the lower edge portions of the flaps 15 are unsecured to the adjacent surfaces of the side walls below the rib 21*b* and therefore are spaced inwardly (of the carton) from such adjacent side wall panel surfaces by a distance substantially equal to the rise of the rib or projeciton 21*b*, thereby to provide an abutment or shoulder.

It will, ordinarily, be found desirable first to fold down and secure the flaps 15 to their respective side wall panels, thereafter folding the side panels into carton shape and securing the strip 6 to the inside surface of panel 2 with the bevelled edge of the top end of strip 6 substantially abutting and conforming to bevelled edge 17. For conservation of space in shipment of unfilled cartons, the cartons may be "knocked down" by flattening them to bring adjacent side panels, such as 2 and 3, and 4 and 5, in face to face relationship, the cartons to be "set up" and bottom flaps 13 folded in and secured in overlapping relation to one another at the place of use. When the cartons have been "set up" they are ready to be filled with the items (bottles, for instance) for which the cartons were designed, and after being filled they are ready to be closed by the means and in a manner now to be related.

Cut from fiberboard, paperboard or the like but preferably from the same or similar material to that of which the carton body is composed, are the diaphragm-like closure elements or members shown in Figures 2 and 3, the former illustrating the form preferred for use with the carton body above described. The two illustrated closure elements are identical in construction wtih one exception which will be pointed out. Each comprises a center panel 22 of a shape (in this instance, square) and dimensions, in the plane of the panel, designed fairly snugly to fit the maximum inside transverse dimensions of the carton body below the edges 19 of the inturned flaps 15, and, preferably, two pairs of oppositely disposed flanges or extensions 23, 24, line scorings 25 defining the sides of the center panel and permitting each flange to be swung at an angle to the center panel. The scoring preferably is so done as to produce ribs or ridges projecting above the plane or surface of the material on one side of the closure member, the resultant product, after folding or swinging the flanges at an angle to the center panel, appearing as illustrated in Figure 5. The center panel is also provided with a central aperture 26 (circular in this instance) of dimensions sufficient to permit the projection of a portion of a bottle neck there through and, while all of the flanges are trimmed with a slight bevel along edges 27, that one of the flanges (the right hand flange 23 of Figure 2) which is to overly the inside surface of panel 2 and strip 6 attached thereto, is trimmed at its edge 28 to a greater bevel so as to permit such end of its outer edge 29 to clear the strip 6 as best illustrated in Figure 4.

The width of each of flanges 23, 24 preferably is somewhat greater than the perpendicular distance between a plane containing the end edge or abutment surfaces 19 of the flaps 15 and a plane parallel thereto and passing through the neck somewhat above the juncture of the neck with the body of the bottle to be disposed in the carton when the bottle is firmly seated at its bottom upon the carton bottom closure flaps 13. It has also been found desirable so to form the margin of the panel 22 about the aperture 26 as to provide a circumferentially extending and upwardly directed lip 26*a* thereby snugly to engage the bottle neck over a little greater area than would be possible with the mere edge

thickness of the panel material. The aperture 26 and lip 26a will be modified, of course, to adapt the closure to bottle necks of various configurations and characters as will be understood. This arrangement and dimensioning of the center panel 22 and flanges 23, 24, is designed for the purpose of placing the center panel under tension thereby to tend to urge the bottle toward and to hold it against the bottom of the carton at all times as will be clearer as this description proceeds.

Assuming that the carton body has been formed and set up into shape, as in Figure 4, from the blank of Figure 1, the next step is to load or insert the bottle B which it was designed to receive. If the carton body has been well made the side panels 2, 3, 4 and 5 will be snugly tangent to the bottle sides (if the bottle is cylindrical as shown), or will otherwise snugly fit the bottle sides, when the bottom of the bottle rests upon the bottom of the carton. The next step is to insert a top closure or diaphragm element. This is done, preferably, by folding or swinging the flanges 23 and 24 to substantially right angular positions with respect to the center panel, with the folding in such direction as to place the score ribs or ridges 25a on the outside of each fold corner as illustrated in Figures 4 and 5 and to bring the bevelled edge 28 into a position where it may register with the corresponding edge of strip 6. Of course all of the flanges are folded to extend in the same general direction but it is desirable that they not be folded so far as materially to impair the natural resilience of the material and the tendency of the flanges to return (if left alone) to positions in the plane of the center panel 22. In the folded or cupped position of the flanges 23, 24, the top closure member is pushed into the open top of the carton much after the manner of a close fitting piston into a cylinder with the bottle neck disposed through the aperture 26. During the first part of this movement and until the center panel 22 and the ribs or ridges between the edges of panel 22 and the flanges 22, 23 have passed inward and downward from the carton body top beyond the flap ends 19, there may be some substantial resistance to such movement but thereafter the resistance will decrease as will be understood. The inward and downward movement of the top closure member is continued until the outer free edges 29 pass the edges 19 of the infolded flaps 15 at which time owing to the natural or inherent resilience of the flanges 23, 24 they will snap or move outwardly toward the side wall panels 2, 3, 4 and 5 in which positions they will tend to remain, except, however, for such upward movement as may be imparted to them by the tendency of the center panel 22 to return to a flat form from a convexly (looking down from the top) bowed condition due to engagement of marginal portions 26a thereof about the opening 26 with the neck portion of the bottle just before the edges 29 have been pushed to positions to pass the edges 19. In normal operation the flanges tend to spring back toward the top of the carton but being restrained by the abutment of edges 29 against the edges 19, the result is that the panel 22 remains somewhat bowed and maintains a tension on the flanges 23, 24 urging them tightly and firmly in abutment against the side panels 2, 3, 4 and 5 and the edges 19 of flaps 15, at the same time reacting against the bottle through its neck to urge and hold the bottle firmly but resiliently against the carton bottom. In some instances the edges 29 of flanges 23, 24 may even ride in behind the edges 19 and between the lower marginal portions of flaps 15 and the adjacent side panels which are spaced therefrom, the adhesion between the flaps 15 and the ribs 21b of the scores 21 as well as the ribs themselves serving to limit the upward movement of the top closure by engagement of the edges 29, the while pressing the bottle against the carton bottom.

The arrangement described effectively secures the bottle B against lateral and longitudinal movements within the carton body and at the same time is quite simple and inexpensive to manufacture. It becomes very difficult to remove the bottle without detectable injury to or marking on the carton or bottle and where the bottle top is sealed in such manner as to conceal the seal below the top closure or diaphragm, the contents of the bottle may not be removed or tampered with without leaving tell-tale indications. Safety against breakage of the bottle due to motion of the bottle within the carton is achieved and a neat and attractive package is provided, the character of the contents also being visible at the partially open top.

The modified top construction shown in Figure 6 differs from that of the preferred form of Figures 1, 2, 4 and 5 only in the provision of an extra line score 31 parallel to a score 32 which corresponds to the score 21. The score 21 tends to strengthen the side wall panels at their top ends and is also designed to reduce the chances of accidental outward displacement of the diaphragm top closure. In the modified form of Figure 7 a wide abutment to engage the top end edges of a closure to prevent its displacement and to hold the center panel of the closure under tension as above described, is provided by making each of the infolding flaps 15a of sufficiently greater length than a flap 15 as to permit a marginal strip 15b to be folded upwardly and secured between each flap 15a and a side wall panel, the strips 15b preferably being partially severed from flaps 15a, for instance, by a cut score, so that the adjacent severed faces will provide a relatively broad square or upwardly and outwardly inclined shoulder 15c against which the upper edge of a flange of a closure element may abut.

The invention has been disclosed in a preferred embodiment and in a square section parallelepiped type of carton body but, as will be apparent, the essential features of the invention may be applied to cylindrical or other shapes and types of carton body with which top closure elements of corresponding shape and types would be used. Various other adaptations as well as many modifications may be devised and arranged following the teachings hereof and it is therefore desired that the scope of this patent be circumscribed only by the spirit of the invention and the purview of the appended claims.

I claim:

1. A carton composed of foldable sheet material of the character described for bottles and the like comprising, a parallelepiped tubular body adapted to receive a bottle with the top of the bottle at one end and the bottom of the bottle at the other end of the carton body, the bottle top end of the carton having strips of material extending along and overlying marginal edge portions of the inside faces of one pair of opposite side walls, said strips being secured to said marginal edge portions with their lower edges providing abutments facing toward the bottle bottom end of the body, said

marginal edge portions of said pair of opposite side walls having score lines therein directed transversely of the side walls and providing projections internal of the carton end beneath said strips, a closure panel adapted to be disposed transversely of said body between said abutments and the bottle bottom end of the body, and flanges carried by said panel at an angle thereto with the free edges of the flanges directed toward said bottle top end of the body and held by said abutments.

2. A tubular carton composed of material such as fiberboard and the like and adapted to receive a bottle with the bottom of the bottle directed toward one end of the tube and the bottle top directed toward the other end of the tube, integral portions of the carton at the top end thereof being inturned and secured against marginal parts of the inner face of the tube at such end with the terminal edges of said integral portions forming abutments facing toward the bottom end of the carton, at least one of said abutments lying substantially opposite to another of the abutments, a score line formed in the tube wall beneath each of said opposite abutment forming inturned portions and projecting inward from the inner face of the tube, said score line extending adjacent to said terminal edges of said opposite inturned portions, a closure member having a panel forming a diaphragm extending across the tube between said abutments and the bottom end of the tube and closely fitting against the interior surface of the tube substantially perimetrically of the latter, and flanges integrally connected with the outer edges of said panel and extending at an angle thereto toward said top end and adapted to be engaged along their top end directed edges in abutting relationship with said abutments.

3. A tubular carton composed of material such as fiberboard and the like and adapted to receive a bottle with the bottom of the bottle directed toward one end of the tube and the bottle top directed toward the other end of the tube, a score line extending about said tube adjacent to the top end thereof and creating a ridge projecting above the normal plane of the material face on the inside of the tube, integral portions of the carton at the top end thereof being inturned and secured against marginal parts of the inner face of the tube at such end and overlying said score line ridge with the terminal edges of said integral portions forming abutments facing toward the bottom end of the carton, at least one of said abutments lying substantially opposite to another of the abutments, a closure member having a panel forming a diaphragm extending across the tube between said abutments and the bottom end of the tube and closely fitting against the interior surface of ths tube substantially perimetrically of the latter, and flanges integrally connected with the outer edges of said panel and extending at an angle thereto toward said top end and adapted to be engaged along their top end directed edges in abutting relationship with said abutments.

4. An improved package comprising a carton formed of foldable sheet material and a bottle or the like disposed therein having a neck portion, said carton comprising four side wall panels, bottom closure means supporting said bottle, locking flaps integrally joined to the upper edges of said panels, said locking flaps being folded down and secured against the inner surfaces of the upper portion of said side wall panels, whereby the free edges thereof form a downwardly facing abutment, and a separate top closure member including a panel having substantially the same dimensions as the cross-section of said carton fitting closely around said neck portion, said top closure panel having at least two flaps on opposite sides thereof folded upwardly to form an upwardly facing abutment in contact with said downwardly facing abutment, all of said flaps being of such width that said top closure panel exerts a downward force on said bottle and said bottom closure means.

5. An improved package comprising a tubular carton formed of foldable sheet material such as fiberboard or the like, a bottle therein having a neck portion, and a separate top closure member, said carton having a bottom closure supporting said bottle by its bottom, substantially opposite integral parts of said carton at the top end thereof being inturned and secured against the adjacent inner surface thereof with the terminal edge portions of said integral parts directed toward the bottom end of said carton, said separate closure member having a panel forming a diaphragm extending transversely of said carton within the vertical limits of said neck portion, said panel having an aperture through which said neck portion extends, said aperture being of lesser dimensions than the maximum transverse dimensions of said neck portion whereby said neck portion engages said panel, and said panel having means connected therewith at a place laterally spaced from said aperture and held by said terminal edge portions against upward displacement in said carton for exerting a downwardly directed resilient stress upon said panel.

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