July 1, 1958 J. F. CURRIVAN 2,841,320

INTEGRAL CARTONS FOR THE PROTECTION OF FRAGILE ARTICLES

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Fig. 2

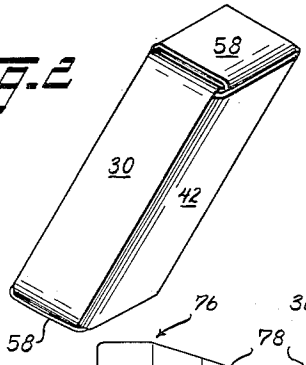


Fig. 1

Fig. 3

Fig. 4

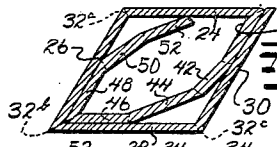


Fig. 5

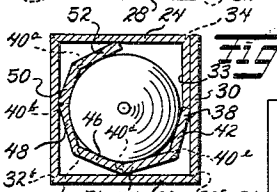


Fig. 6

Fig. 7

INVENTOR
JOHN F. CURRIVAN

BY Strauch, Nolan & Riggins
ATTORNEYS

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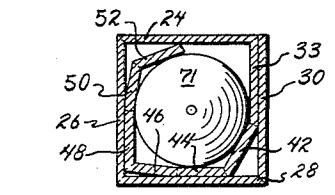


Fig. 9

Fig. 8

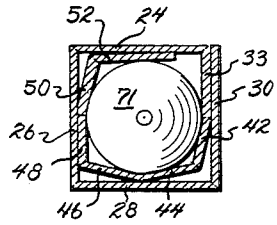


Fig. 11

Fig. 10

Fig. 12

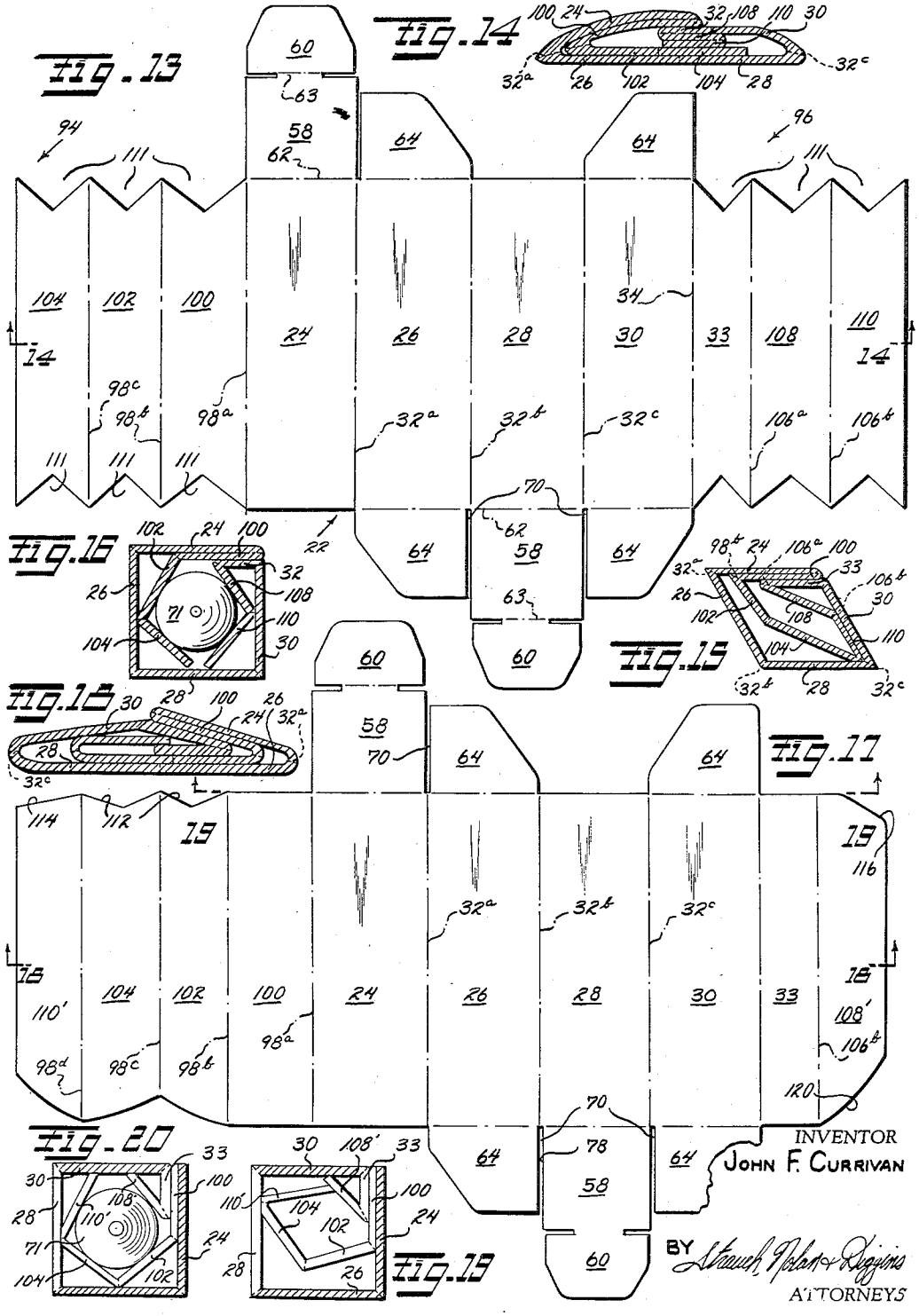
INVENTOR
JOHN F. CURRIVAN

BY Strauch, Nolan & Riggins
ATTORNEYS

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2,841,320

INTEGRAL CARTONS FOR THE PROTECTION OF FRAGILE ARTICLES

John F. Currivan, East Hampton, Conn.

Application September 9, 1953, Serial No. 379,180

5 Claims. (Cl. 229—39)

This invention relates to containers and particularly to cartons for the protective packaging of frangible articles.

The invention contemplates primarily improvements in simple collapsible protective cardboard cartons for such articles as vacuum tubes, pharmaceutical vials and the like and more specifically contemplates the improvements over the cartons claimed in my prior United States Patent No. 2,611,529.

While, through the unceasing efforts of a highly competitive industry, substantial gains have been made in the construction and production of cartons of this type, the manifold problems of creating a carton which meets the many and varied requirements of the industry has hitherto escaped complete solution.

The needs of the industry have imposed two basic inconsistent requirements on cartons of this type. First, such cartons must provide adequate protection for their contents against impact damage and breakage and second, the total cost of manufacturing and handling such cartons, which are ordinarily not re-useable, must be kept at a minimum.

Prior efforts in the field have met with some success in meeting one of these requirements but only at the sacrifice of the other. Many prior cartons provide excellent protection for fragile articles through the use of liners or other multiple-piece constructions. However, the cost of such cartons has either prevented their adoption by the industry or limited their use to specialized applications.

On the other hand cartons which are susceptible of low cost manufacture and machine handling have, with the exception of the carton claimed in my prior Patent No. 2,611,529, failed to provide adequate protection for fragile articles.

The present invention is primarily concerned with improved cartons which afford better protection of articles, such as certain television and radio tubes which are particularly sensitive to impact damage, and at the same time retain the cost advantages particularly those resulting from the adaptability to machine handling, offered by the carton of my prior patent.

All forms of the cartons of the present invention are of one piece construction, are simple to make, collapse for empty shipment, lie flat in the magazine of loading machines, erect easily and receive their contents with a minimum of mechanical and manual manipulation.

It is accordingly a basic general object of the present invention to provide improved protective containers for fragile articles.

A more specific object of the present invention is the provision of novel protective containers which are fabricated from a one piece blank of minimum size and may be easily and inexpensively manufactured, erected, filled and closed entirely by machine operations.

A further object to the present invention is to provide novel protective cartons having integral protective inner

flaps which are automatically opened and properly positioned during the normal machine erection of the carton.

Another object of the present invention is the provision of improved integral protective cartons having a protective inner partition section integral with the main carton walls which substantially surrounds and isolates the contents of the carton from the outer carton wall.

Still another object of the invention is the provision of novel integral protective cartons having, in certain forms of construction, integral protective inner partitions consisting of two separate inner flaps each integral with the assembled carton and requiring only one glue seam.

These and additional objects and the manner in which they are fulfilled will be apparent to those conversant with the art from a reading of the following description of certain preferred embodiment of the invention in conjunction with the subjoined claims and annexed drawings, in which,

Figure 1 is a plan view of a blank for one form of carton embodying my invention;

Figure 2 is a perspective view of an erected carton, a carton erected, for example from the blank shown in Figure 1, but representative of the general external appearance of a carton erected from any of the various forms of blanks throughout the drawings;

Figures 3, 4 and 5 are sectional views through a carton made from the blank shown in Figure 1, the location of the section line being indicated at 3—3 of said figure, the views showing the carton in fully collapsed, partially erected, and fully ereceted and loaded positions, respectively;

Figure 6 is a view similar to Figure 1 of a modified form of carton blank;

Figure 7 is a sectional view similar to Figure 5 and taken on line 7—7 of Figure 6 with the blank fully erected and loaded;

Figures 8 and 10 are views similar to Figures 1 and 6 showing further modified forms of carton blanks;

Figures 9 and 11 are sectional views similar to Figures 3 and 7 taken respectively on lines 9—9 and 11—11 of Figures 8 and 10 with the carton blanks fully erected and loaded;

Figure 12 is a view similar to Figure 11 showing the carton empty;

Figures 13 and 17 are views similar to Figures 1, 6, 8 and 10 showing still further modified forms of carton blanks;

Figures 14 and 18 are sectional views similar to Figures 3, 7, 9 and 11 taken, respectively, on lines 14—14 and 18—18 of Figures 13 and 17 with the respective carton blanks folded flat;

Figure 15 is a sectional view similar to Figure 14 with the carton partially erected;

Figure 16 is a view similar to Figure 15 with the carton fully erected and loaded;

Figures 19 and 20 are end elevational views of fully erected cartons made from the blank shown in and partly in section on line 19—19 of Figure 17.

Referring to the drawings and first particularly to Figure 1, 20 indicates, generally an unfolded carton blank ready for gluing. The blank is usually made of cardboard and is manufactured by automatic machines which print, cut out the blanks from flat stock and perform operations such as scoring, perforating, cutting, notching, etc. A gluing machine completes the carton.

Blank 20 comprises a body section 22 divided into four contiguous rectangular side wall panels 24, 26, 28 and 30 by three parallel fold lines 32*a*, 32*b* and 32*c*. These fold lines may be defined by regular scores, cut scores, or perforations depending on the type of board used and other factors indicating the necessity of one

or the other type of score in a particular carton such as the degree of resiliency desired of any particular fold. It will be understood, therefore, that in this description the term "fold line" is used generically to cover folds on all types of scores unless a particular type is specifically designated.

One end of body section **22** carries an integral extension consisting of a glue lap panel **33** joining panel **24** along a fold line **34** and a protective inner flap extension **36** joining panel **33** along a fold line **38**.

A plurality of parallel fold lines **40***a*, **40***b*, **40***c*, **40***d* and **40***e* divide section **36** into six elongate panels **42**, **44**, **46**, **48**, **50** and **52**. While six panels are shown for purposes of example, any number of panels may be used, a larger number resulting in a more nearly cylindrical protective flap.

One end of panel **24** and the opposite end of panel **28** carry integral closure extensions **54** and **56**, respectively, each divided into main end closure flap **58** and a tuck flap **60** by fold lines **62** and **63**. As is well known, flaps **60** tuck inside the side wall opposite, in the erected carton, that to which they are attached, flaps **58** thus forming the end walls of the erected carton. The carton illustrated and described is of the "reverse tuck" type, i. e., wherein the respective end closures tuck in opposite directions. This type is the most economical to manufacture because it permits better nesting of blank outlines and so conserves board. It will be understood, however, that the "straight tuck" type of closure, i. e., wherein both closure flaps are on opposite ends of the same wall panel may be used. Also, closure flaps may be used on all panels if a glued end carton is required.

Both ends of panels **26** and **30** are provided with secondary closure flaps **64** separated from the respective panels by fold lines **66**. These flaps fold inwardly and underlie main closure flaps **58** when the erected carton is closed. Accordingly, the location of flaps **64** is dependent on the location of the end closure flaps and therefore are placed on panels other than those carrying the main closure flaps and/or the panels opposite them in the erected carton.

In the forming of the carton blank, the flaps **58** and **64** are preferably separated by a line cut **70** which has been exaggerated in thickness throughout the drawings for sake of clarity.

Either or both of the extensions **54** and **56** preferably are provided with short line cuts **68** (also exaggerated for clarity in the drawings) running substantially along the fold line **63** between flaps **58** and **60** for locking the carton closed in a manner well known in the art.

The carton may be readied for gluing by a 3-step folding operation wherein panels **52**, **50** and **48** are folded over (to the right in Figure 1) as a unit, along the line **40***c* onto panels **46**, **44** and **42**. The resulting double thickness is folded over to the right again along line **34** whereupon panels **28** and **30** are folded over, as a unit, to the left thus lapping the right hand edge of panel **30** over onto the glue lap **32**, to which the machine has applied adhesive.

At this stage, the carton is completed in collapsed condition, ready for packaging or erection and appears substantially as shown in Figure 3.

Erection of the carton and the integral protective inner flop **36** may be accomplished by squeezing the corner edges of the carton defined by fold lines **32***b* and **34** as indicated by arrows **70**. The carton panels first assume the position shown in Figure 4 wherein the interior of said corner defined at line **32***b* contracts the inner flap **36** at the fold line **40***c*.

With continued pressure on the corners, the opposed portions of flap **36** spread and buckle slightly on the fold lines **40***a*, **40***b*, **40***d* and **40***e* forming a protective liner of generally elliptical form in the fully erected carton. In this condition, the free edge of panel **52** is in sliding abutment with side wall panel **24**, and therefore, the liner will receive articles of a substantial range of cross-sectional dimensions, Figure 5 showing the carton as it appears when containing a cylindrical article such as vacuum tube **71** of the largest diameter it will safely accommodate. As can be seen from this figure, even the largest article accommodated by the carton is almost entirely enveloped and isolated from the carton side walls by the integral liner.

It is pointed out that, due to the inherent resiliency of the board, as soon as corners **32***a* and **32***c* start to separate during the erection process, the liner panels assume a generally double convex lens shape so that panels **42**, **44**, **46**, **48**, **50** and **52** will buckle radially outwardly in mutually opposite directions instead of the bending in a double thickness toward one or the other of corner folds **32***a* and **32***c*. Further assurance that the liner panels will open properly may be obtained by using cut scores to define fold lines **40***a*, **40***b*, **40***d* and **40***e*, the cut being made on the surface of the blank which faces outwardly in the erected carton. However, it has been found that regular scores function properly in this respect.

Due to the simplicity of the blank, cutting, scoring, folding, gluing and erecting operations of the carton, may be carried out on standard machinery.

Referring again to Figure 1, the inner flap extension **36** of the carton blank is so cut that the upper edge **76** comprises a broad V-shaped portion **78** and is located a substantial distance from one end of the erected carton. This leaves the corresponding end of the erected carton without an inner flap, adapting it particularly to the reception of such articles as radio tubes having a base portion which is larger than the fragile glass portion and does not require protection. The cut down flap extension also eliminates interference with the tuck flap **60** of the end closure extension **54** during closing while V-shape cutout **78** provides a camming surface which guides and facilitates the insertion of the contents of the carton into the protective liner during the loading operation. It is pointed out that this construction may be duplicated on the lower edge **80** of extension **36**. However, for purposes of illustration in this disclosure, the lower edge is provided with a different form of camming edge achieved by forming an arcuate cutout **82** extending from fold line **40***c* almost to the free edge of panel **52**. In the erected carton this cutout serves as a cam to guide the insertion of the contents, in the event that loading at this end of the carton is desired.

The body portion **22** of the blank described above forms the external body portion of the carton and is the same for all forms of my novel cartons with such variations between straight, reverse tuck or glued end closure flap arrangement and location as may be desired and/or necessary in view of the particular form of the integral protective inner flaps disclosed herein. For this reason, the remainder of this description will be restricted primarily to my improved inner flap constructions.

In the carton illustrated in Figures 1 through 5, the panels **42**, **44**, **46**, **48**, **50** and **52** are of substantially equal width. The precise dimensions of the inner flap panels would vary with the size of the carton because it is essential that the total width of panels **42**, **44** and **46** and of panels **48**, **50** and **52**, i. e., the dimensions of the flap **36** from fold line **40***c*, respectively, to fold line **38** and to the free edge of panel **52** be greater than the diagonal distance between fold lines **32***b* and **34** in the erected carton, in order to achieve the automatic positioning of the liner during erection of the carton. On the other hand, said respective dimensions must be less than the distance between fold lines **32***b* and **34** when the carton is collapsed (see Figure 3) so that the carton can be collapsed and will lie flat.

Figure 6 shows a modification of the carton inner protective flap **36**. In this form of construction, panel **42** extends the entire length of the glue lap **33**, the fold line **38'** therebetween being defined preferably by

perforations in order to decrease the resistance to bending resulting from the longer fold line although a regular or cut score may be used. Fold line 40*b*, Figure 1, is eliminated so that panels 48 and 50 form a single large panel 84 approximately twice as wide as the remaining panels in the liner flap. The remainder of the carton structure is identical with that shown in Figure 1, it being understood that the same variations in the location of flaps on the carton body and camming surfaces and types of camming surfaces on the liner 36 may be resorted to. The erecting action is also the same except that, in a fully erected carton containing an article of maximum permissible dimension, the inner liner assumes the position shown in Figure 7 wherein the large flap 84 is flat against the outer side wall 26. The elimination of fold line 40*b* leaves the section of the inner liner comprising panels 84 and 52 with less flexibility and therefore the liner tends to hold smaller articles more securely. Forming panel 42 coextensive with the glue lap 33 decreases the area of differential thicknesses of the carton from end to end when folded flat and therefore decreases the tendency of a stack of folded cartons, for example, in the magazine of a carton loading machine, to tilt.

A third form of the invention which is preferred for packaging miniature tubes is shown in Figures 8 and 9 wherein the inner protective flap 36 is specifically adapted for loading from the lower end as viewed in this figure. Accordingly, the camming edges 78 are provided on the lower edge 80 of the inner flap while the upper edge 76 lies in a plane parallel to but spaced from the upper edge of the carton by a distance equal to the length of the tuck flap 60 thereby eliminating the possibility of interference between the inner protective flap and the tuck flap while the carton is being closed. Inner flap extension 36, as in the species illustrated in Figures 1 through 5, is divided into six panels and, while the overall length of the flap from fold line 38' to the free edge of panel 52 is the same, as is the distance between fold 40*c* and the free edge, the relative widths of the panels are somewhat different, resulting in a different configuration of the inner flap when fully erected and containing a cylindrical article 71 of maximum permissible diameter as shown in Figure 9.

An additional form of inner flap construction according to the present invention which is preferred for the packaging of longer tubes provided with bases, is shown in Figures 10, 11 and 12 which form is particularly versatile in that it may not only be used to hold articles of varying diameters, but also to space one end of a fragile article from the corresponding end of the carton, or to package two companion articles such, for example, as a medicine vial and a medicine dropper. This form of construction is generally similar to that shown in Figure 6 except that panel 42 is not coextensive with the glue lap 32. Instead a separate partition flap 86 is formed on the glue lap adjacent one end of panel 42 and foldable on the common fold line 38' therewith or on a fold line space from line 38'.

The precise lateral dimension of partition flap 86 may be varied to suit the requirements of the particular products to be packaged. Inasmuch as flap 86 is divided from panel 42 by a line cut 88, it is free to assume an angular position in the erected carton independent of panel 42. The precise angle of flap 86 in the carton is dictated by its lateral dimension. Thus, if the width of flap 86 is such that, added to the width of lap 32, it does not exceed the width of panel 30, it will lie flat against panel 30, and has the same effect of improving the stacking characteristics of folded cartons as the full length one piece panel 42 in Figure 6. As the width of panel 86 is increased, its free edge will slidably contact side panel 28 and it will occupy a position in the erected carton at increasingly greater angles to side wall 30. Additional flaps similar to flaps 86 may also be used on separate or common fold lines.

Referring to Figure 12, partition panel 86 is shown as it appears when its width plus the width of the glue lap 32 is greater than the width of side wall panel 30, under which conditions it cuts across the zone of the carton enveloped by the inner flap 36. If an article having two diameters is to be placed in the carton it would be inserted with the smaller diameter toward the end of the carton containing flap 86 and would bear against it while the larger portion of the article would occupy the opposite end of the carton, where it would be enveloped by all the panels of the protective flap. By increasing the length of flap 86 it can be made to extend substantially across the interior of the carton and utilized to space the article placed in the carton from one end thereof. Also, by proper selection of the length of panel 86 the interior of the carton can be effectively divided into zones such as 90 and 92 to receive, for example, a medicine bottle and a medicine dropper.

In this particular form of construction, the length of the inner protective flap from fold line 40*c* to the edge of panel 52 is increased over the corresponding dimension of the preceding embodiments by a small increase in the width of panel 50 and a substantially larger increase in the width of panel 52. Consequently, the inner protective flap, in the erected carton, takes the form shown in Figures 10 and 12, providing more complete envelopment of the contents thereof.

The foregoing embodiments of my invention all utilize a liner formed of a single integral inner flap extension formed on the free edge of the glue lap of the carton body portion. The following modifications, while they still require but a single glue seam in the formation of the carton and are integral in construction have a protective inner liner formed by inner flap extensions on both ends of the body portion of the carton blank.

One of these forms is shown in Figures 13–16, inclusive. Referring particularly to the carton blank shown in Figure 13, it will be seen that the body portion 22 is identical with those in all preceding embodiments; however, each end of the body portion is provided with inner protective flaps 94 and 96 formed as integral parts thereof. Flap 94 is contiguous with side wall panel 24 and separated by fold lines 98*a*, 98*b*, and 98*c* into three panels 100, 102 and 104 of substantially equal width. Panel 30 at the opposite end of the carton blank carries the glue lap 33 which, in this case, is extended to form flap 96 divided by fold lines 106*a* and 106*b* into a pair of panels 108 and 110 of substantially equal width. While the upper and lower edges of flap extensions 94 and 96 are illustrated as incorporating notches 111, it will be appreciated that these edges may be cut back and/or provided with other camming surfaces in the manner previously described. This form of carton may be folded for gluing by folding inner flap extension 94 as a unit along line 98*a* to the right; folding extension 96 as a unit along line 106*a* to the left; folding the double thickness comprising extension 96, panel 30 and glue lap 33 to the left on line 32*c*; and then folding the body panel 24 to the right on line 32*a* so that the edge of panel 100 adjacent line 98*a* overlaps glue lap 33. A suitable adhesive may be applied to either or both of the lapped surfaces before, during or after the folding operation.

Thus the carton is completed in the flat, folded condition shown in Figure 14. Erection may be accomplished by squeezing the corners defined by fold lines 32*a* and 32*c* toward each other whereupon, due to the resiliency of the board at the fold lines, the panels of the inner protective flaps assume the intermediate position shown in Figure 15. Under continued pressure side wall panel 24 acts on fold lines 98*b* and 106*a* tending to force the free ends of panels 104 and 110 into corner 32*c*. Then fold line 106*b* cams along side wall panels 30 to

the mid-point thereof thereby causing the free end of panel **110** to move out of the corner alongside wall panel **28** to approximately the mid-point thereof pushing the free end of panel **104** ahead of it thus fully erecting the inner flaps into the position shown in Figure 16.

It will be noted that in this form of carton, a cylindrical object placed therein has only line contact with panels **102, 104, 108** and **110** at approximately the mid-points thereof, which points are completely isolated from contact with the outer carton panels. The remainder of the contained object is spaced at all points from those portions of the protective inner liner which are in contact with the outer carton wall. The free ends of panels **104** and **110**, being in sliding abutment with panel **28** provide a high degree of resiliency and flexibility permitting a substantial range in the size of objects which may be contained in the carton.

Another form of improved carton utilizing a divided protective inner flap is shown in Figures 17–20, inclusive, wherein a single panel **108'** extends foldably from the glue lap **33** at one end of body portion **22** of the carton blank and four foldably related panels **100, 102, 104** and **110'** extend from the opposite end. A relatively shallow V-shaped notch **112** in the adjacent ends of panels **102** and **104**, inclined upper end **114** on panel **110'** and a more steeply inclined upper end **116** on panel **108'** combine in the erected carton to provide an efficient camming surface for guiding an article being loaded in the carton into the protective liner. As can be seen from Figure 20, the high points on the upper edges of the inner protective flaps form, in the erected carton, a series of peaks spaced circumferentially about the interior of the carton and connected by sloping surfaces giving the effect of a funnel for guiding the article being inserted.

An alternative form of camming surface construction is shown on the lower edge of the inner protective flaps wherein a smaller number of larger peaks is achieved by forming the ends of panels **102, 104** and **110**, with alternately directed arcuate edges **118** meeting at fold lines **98*c*** and **98*d*** and forming the corresponding end of panel **108'** an inclined edge **120**. In the erected carton, these edges are circumferentially disposed to guide the object being inserted into the protective liner. The carton blank is folded in a manner similar to that already described for the embodiment shown in Figure 13. Thus, panels **100, 102, 104** and **110'** are folded as a unit to the right along line **98*a*** and panel **110'** is folded back (to the left) on panel **104** along line **98*d***. Then panel **108'** is folded over (to the left) onto glue lap **33** along line **106*b***; panel **30**, glue lap **33** and panel **108'** are then folded as a unit to the left along the line **32*c***; and panel **24** carrying the respective inner flap extension, folded as above described is folded to the right on line **32*a*** whereupon the edge of panel **100** adjacent line **98*a*** will overlap the glue panel **33**. As in the foregoing embodiments a suitable adhesive is applied to either or both of the lapping surfaces before, during or after the folding operation.

At this stage the folded carton appears as shown in Figure 18 and may be erected by the squeezing corners defined by fold lines **32*a*** and **32*c***. When the carton is fully erected the inner respective flaps will take the position shown in Figure 19 due to the resiliency of the fold lines. As an article is inserted into the flap and acts on the camming surfaces above described the flaps are pushed into the position shown in Figure 20. The protective characteristics of the liner shown in Figures 17–20, inclusive, are the same as that in the preceding embodiment.

From the foregoing description of certain preferred cartons embodying my inventive concept, it will be appreciated that all cartons are characterized by simplicity and economy of all stages of manufacture and loading in that all are formed of single, unitary blanks, require but a single glue seam, fold flat for stacking, are easily folded, glued, loaded, and closed by operations capable of being performed by standard carton making and loading machinery.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A collapsible carton of substantially rectangular cross-section for the protective containment of fragile articles consisting of a single blank having first, second, third and fourth side wall panels separated by fold lines and angularly related in the erected carton, at least two end closure flaps having foldable extensions, said end closure flaps extending integrally from the ends of certain of said first, second and fourth side wall panels only, additional end closure flaps extending integrally from the opposite ends of two of the side wall panels which are opposed in the erected carton and, in the erected carton, are immediately adjacent the panels to which said first mentioned end closure flaps are attached, said end closure flaps being adapted to provide end walls of the erected closed carton, a glue lap panel extending from said fourth side wall panel and adapted to be overlapped by said first side wall panel and be rigidly secured thereto, said glue lap panel being of substantially less width than said first side wall panel, and an internal flap terminating in a free edge and extending inwardly from said glue lap intermediate the edges of said first side wall panel, said internal flap consisting of a plurality of elongate panels foldably related on fold lines parallel to the axis of the erected carton and adapted to substantially envelop an article placed in the carton, the total width of said panels on each side of one of said fold lines being greater than the diagonal of the erected carton and less than the width of two adjacent side wall panels whereby said inner flap will fold flat on said one fold line when said carton is folded on the fold lines between said first and fourth and said second and third side wall panels, and the width of portion of said internal flap between said free edge and said one fold line being such that said portion of said flap slidably contacts the inner surface of said third side wall section and said free edge slidably contacts said fourth side wall panel on a line substantially spaced from a fold line between said fourth side wall panel and said glue lap when said carton is erected and loaded.

2. The carton defined in claim 1 wherein at least one lateral edge of said inner flap has a shallow angular cut-out portion having its apex on said one fold line whereby an article being inserted into the carton exerts a camming action against said cut-out edge portion to facilitate loading of the carton.

3. The carton defined in claim 1 wherein at least one lateral edge of said inner flap has a shallow arcuate cut-out portion extending from said one fold line substantially to the free end of said inner flap whereby an article being inserted into the carton exerts a camming action against said cut-out edge portion to facilitate loading of the carton.

4. The carton defined in claim 1 wherein at least the panel of the inner flap adjacent the glue lap is substantially shorter than the glue lap, an additional inner partition flap foldably extending from the portion of the glue lap extending beyond said inner flap panel, the total width of said glue lap and additional partition flap exceeding the width of said first side wall panel whereby in the erected carton, said additional partition flap extends at an angle to said first side wall panel and has its free end in sliding abutment with said second side wall panel.

5. A collapsible carton of substantially rectangular cross section for the protective containment of fragile articles consisting of a single blank having first, second, third and fourth side wall panels separated by fold lines and angularly related in the erected carton; a glue lap panel extending from said fourth side wall panel and adapted to be overlapped by the first side wall panel and to be rigidly secured thereto, said glue lap panel being of substantially less width than said first side wall panel; and an internal flap extending integrally from said glue lap, terminating in a free edge slidably contacting said fourth side wall panel along a line substantially spaced from the fold line between said fourth side wall panel and said glue lap panel and consisting of a plurality of elongate contiguous panels foldably related along fold lines parallel to the longitudinal axis of the erected carton, the total width of said inner flap panel and the spacing of said fold lines being such that said inner flap slidably contacts each of said second and third side wall panels on one of the inner panel fold lines and will substantially envelope an article contained in the carton, one of said inner flap fold lines being substantially at the midpoint of the flap permitting the flap to fold in half along said one fold line, the width of said inner flap so folded being

greater than a diagonal of the erected carton passing through the corner of the body portion between said first and fourth side wall panels and less than said diagonal when said carton is folded flat, whereby movement of the corners of the body portion defining said diagonal toward each other during erection of the carton automatically unfolds, erects, and positions said inner protective flap.

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