

[54] **BOOK CARTON**

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[51] Int. Cl. .... **B65d 5/02**

[58] Field of Search ..... 229/40, 51 TC, 39 B, 37; 206/46 FR

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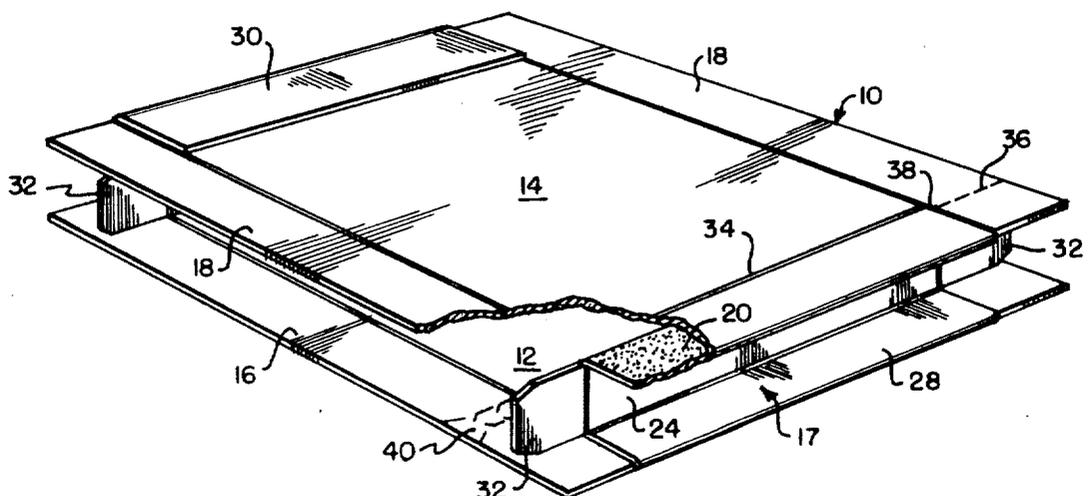
Primary Examiner—Davis T. Moorhead  
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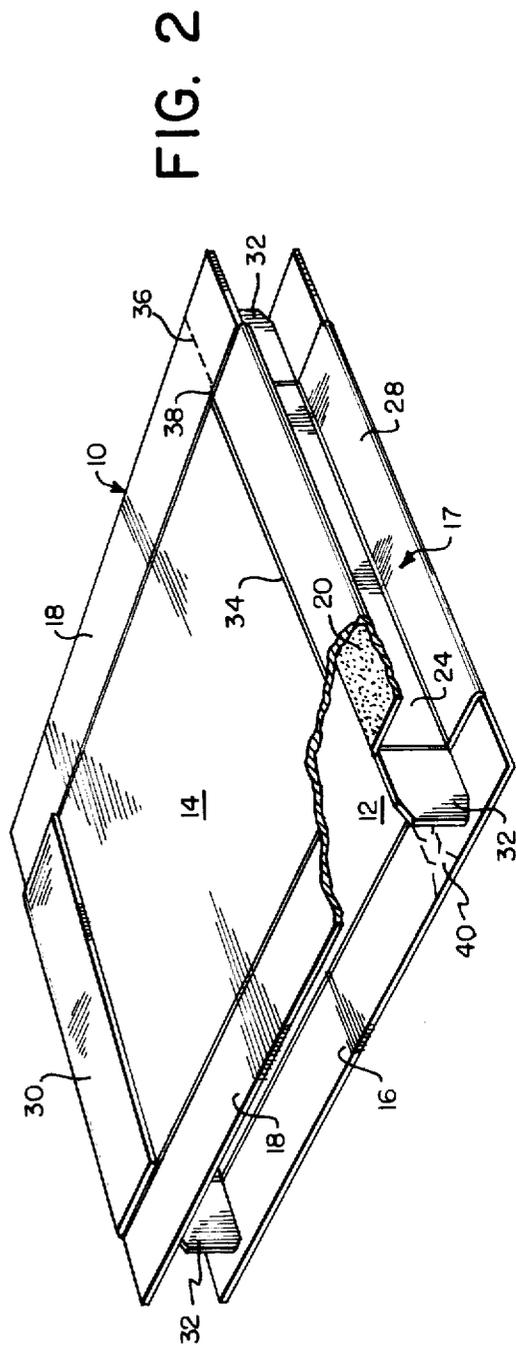
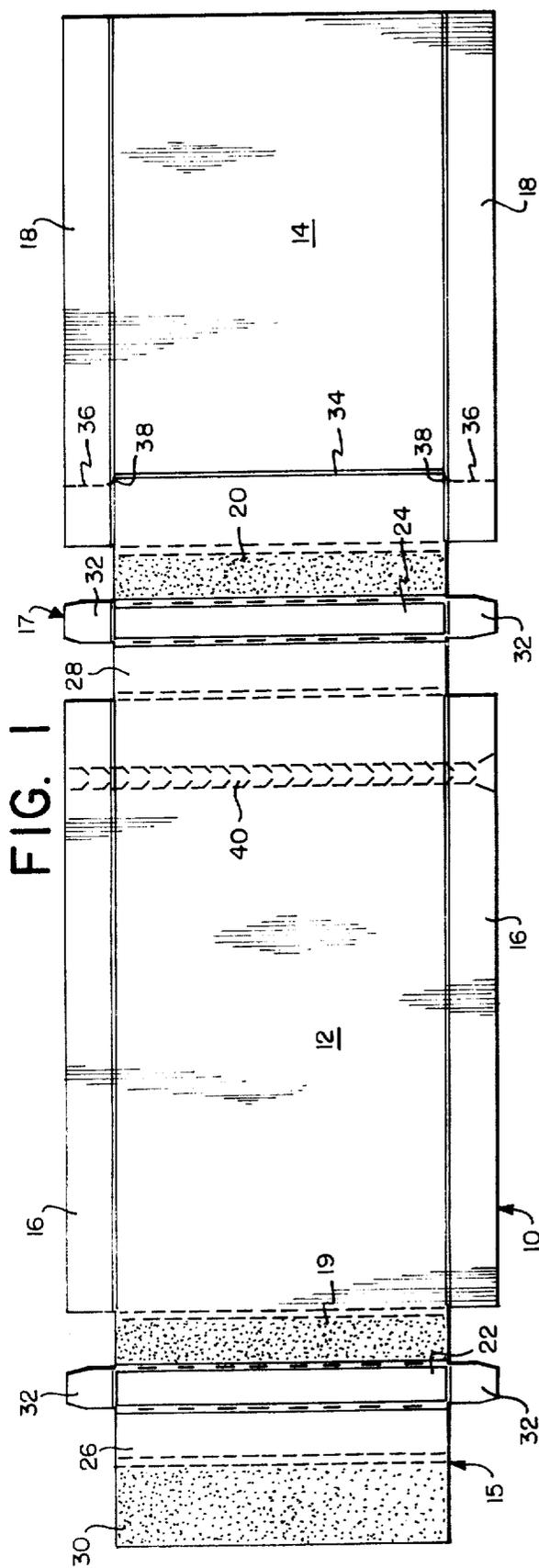
[57] **ABSTRACT**

A carton constructed from an integral one-piece blank consists of a top and bottom wall, inner and outer overlapping side flaps and oppositely disposed tri-panel end walls. Each tri-panel end wall consists of a first panel which is glued to the inwardly facing surface of the top or bottom wall; a second panel which is hingedly connected to the first panel and perpendicularly positioned with respect to the top and bottom walls; and a third panel which is hingedly connected to the second panel and to the top or bottom wall and which is parallelly aligned with the top or bottom wall to which it is hingedly connected. The first or glued panels of oppositely disposed end walls are located diagonally from one another. The tri-panel end walls form U-shaped cushions which protect the corners of the packaged article during shipment. End flaps extend perpendicularly outwardly from the end wall second panels to reinforce the corners of the carton.

A tear strip is provided which extends across the carton top wall and further extends down the outer overlapping side flaps. The inner overlapping side flaps and the carton bottom wall adjacent the tear strip are precut to facilitate bending back of the end wall portion along a score line on the bottom wall in order to permit easy removal and reinsertion of the packaged article and easy resealing of the carton for reuse.

**5 Claims, 10 Drawing Figures**





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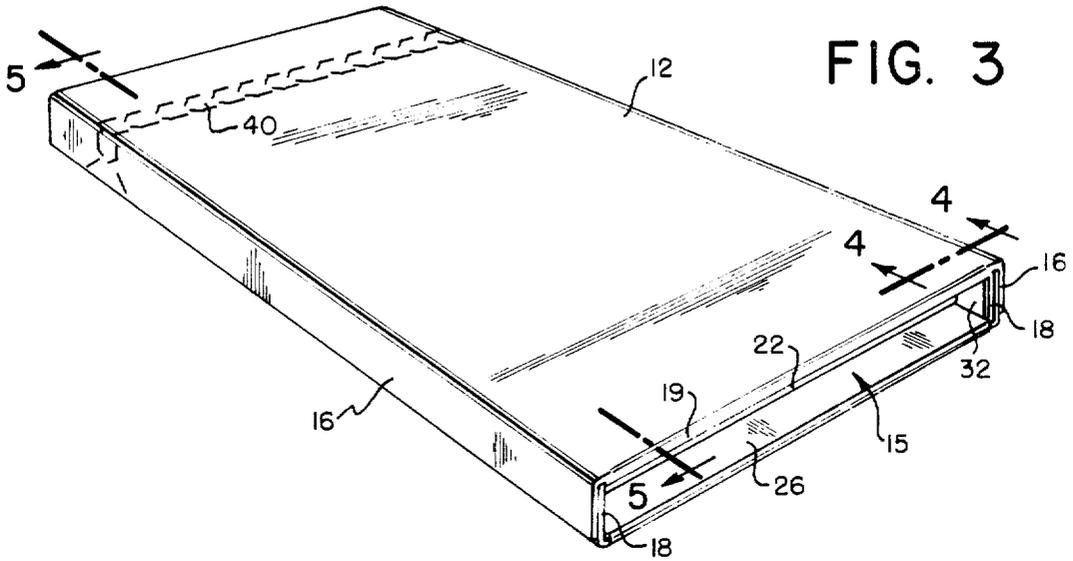


FIG. 3

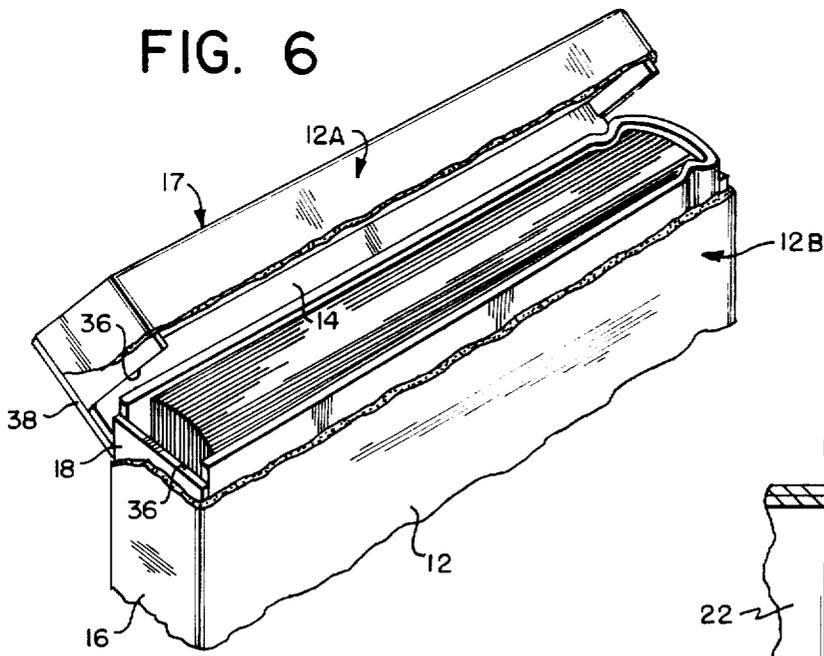


FIG. 6

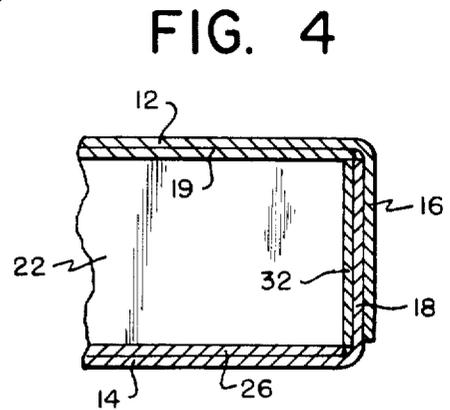


FIG. 4

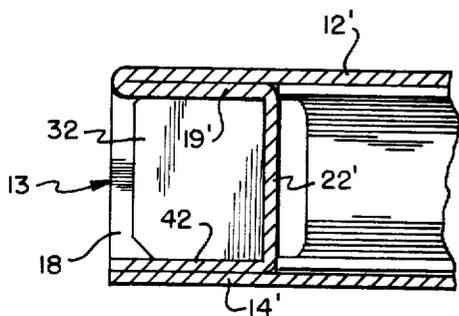


FIG. 8

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FIG. 5

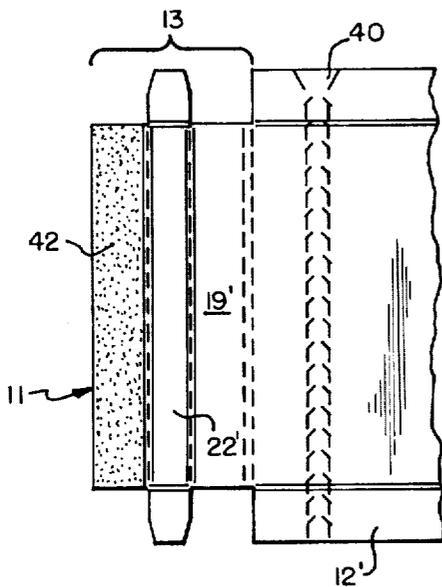
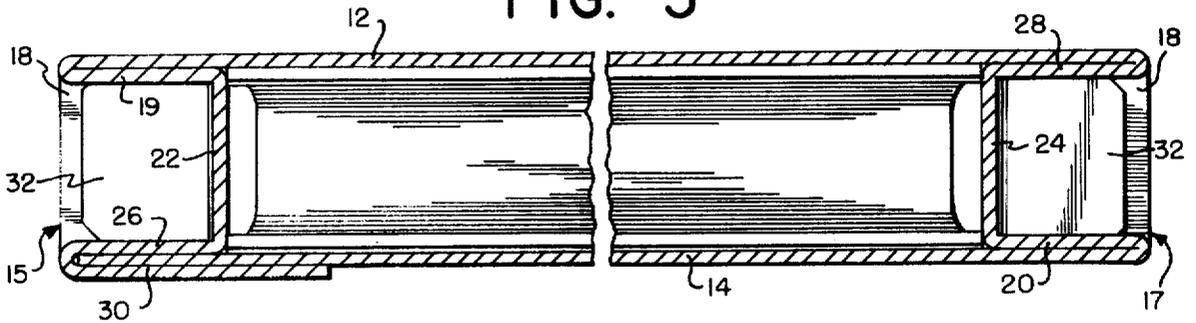


FIG. 7

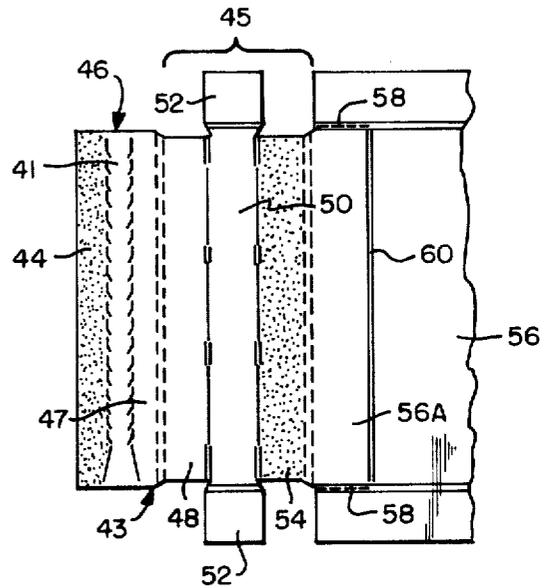


FIG. 9

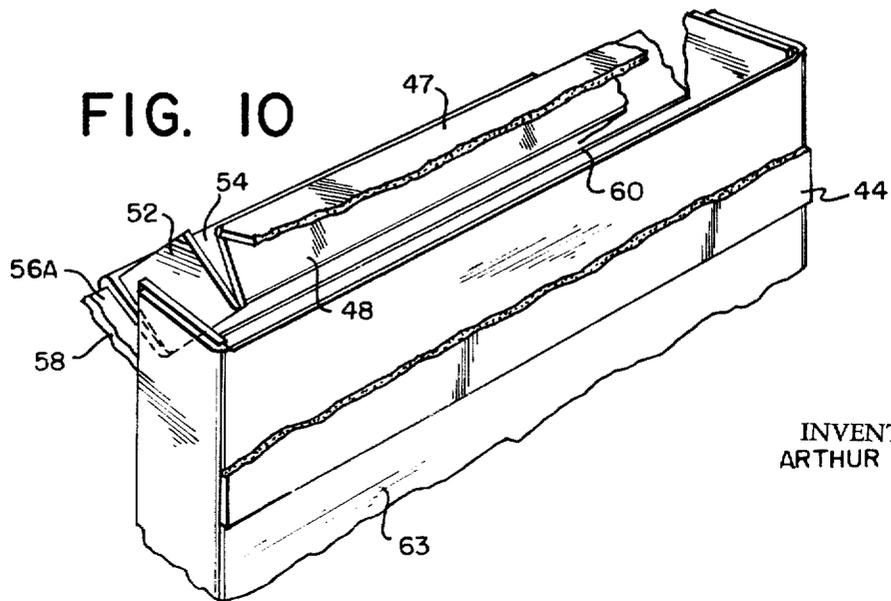


FIG. 10

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## BOOK CARTON

The invention described herein generally relates to a carton suitable for shipping books, record albums, tape cassettes and the like.

In providing a carton for shipping large quantities of these products, certain considerations are of paramount importance. The large quantities involved dictate that a minimum amount of material be used in constructing the carton in order to insure weight and materials savings. It is also important that the carton be sufficiently reinforced to protect its contents from damage during shipping. It is especially important to provide protection at the corners of the carton, since this is the area where damage most frequently occurs during shipping. It is also necessary to construct the carton in such a way that it can be easily opened and its contents removed with minimal damage to the carton so that the contents can be easily reinserted and the carton resealed for secondary use such as mailing back to the sender. It is also important that the carton be suitable for use with high speed automatic carton-erecting and article-inserting machines.

Accordingly, it is a primary object of this invention to provide a carton for books and the like which utilizes a minimum amount of material in its construction and which is reinforced at its corners.

It is a further object of this invention to provide a carton which can be easily opened and the contents of which can be easily removed with minimal damage to the carton so that the carton is suitable for reuse.

It is another object of this invention to provide a carton suitable for use with high speed automatic carton-erecting and article-inserting machines.

The carton of the invention described herein is constructed from an integral, single piece blank of ordinary or corrugated paperboard. The carton blank consists of top and bottom walls which are rectangular in shape and which are adapted to be parallelly aligned one above the other; a pair of inner and outer overlapping side flaps which are hingedly connected to the side of the top and bottom walls and which are coextensive in length with the top and bottom walls; and a pair of oppositely disposed, foldable, tri-panel end walls. The tri-panel end walls each consist of a first or pre-glued panel which is glued to the inwardly facing surface (the surface which ultimately faces the packaged article) of the top or bottom wall of the carton during the manufacture of the carton; a second or intermediate panel which is hingedly connected to the first panel and which is adapted to ultimately (that is, when the article is packaged in the carton) be perpendicularly disposed with respect to the top and bottom walls of the carton; and a third or hinged panel, one side of which is hingedly connected to the intermediate panel and the other side of which is hingedly connected to the top or bottom wall. The end wall third panel is adapted to be parallelly disposed with respect to the top or bottom wall and to lie directly adjacent the inwardly facing surface of the top or bottom wall to which it is hingedly connected. It is a requirement of this invention that the first or glued panels of the oppositely disposed tri-panel end walls be diagonally aligned. Thus, if one end wall first panel is glued to the inwardly facing surface of the top wall, the other end wall first panel must be glued to the inwardly facing surface of the bottom wall and vice versa. It is also a requirement of this invention that the end wall first panels be completely glued to the in-

wardly facing top and bottom wall surfaces rather than only partially glued or partially secured by some other means. This is necessary in order to insure that U-shaped cushions are sufficiently strong to protect the contents of the carton and also to allow the carton to be used with high speed automatic carton-erecting and packaging machines.

In the preferred embodiment of this invention, a closure flap is also provided. The closure flap is hingedly connected to one of the end wall hinged (third) panels. The inwardly facing surface of the closure flap is adapted to be glued to a portion of the outwardly facing surface of the bottom wall over which the closure flap extends to form a carton sleeve.

In the manufacture of the carton of this invention, the paperboard is first cut and scored and then one of the end wall first panels is glued to the inwardly facing surface of the carton top wall and the other end wall first panel is glued to the inwardly facing surface of the carton bottom wall. In the preferred embodiment, after the above operation has taken place, the closure flap is then glued to the outwardly facing surface of the carton top or bottom wall to form a carton sleeve with the side flaps being open. In a second embodiment of this invention which does not have a closure flap, the carton sleeve is formed by the end wall first panel at the edge of the carton blank being glued to the inwardly facing surface of the top or bottom wall.

In the carton sleeve thus formed, the top and bottom walls and the end wall first panels are parallelly aligned; the end wall intermediate panels are substantially parallel to one another and may be perpendicularly, parallelly or obliquely disposed with respect to the plane of the top and bottom walls depending upon the closeness of the top and bottom walls; and the end wall third or hinged panels are substantially parallel to each other and perpendicularly, parallelly or obliquely disposed with respect to the plane of the top and bottom wall depending upon the closeness of the top and bottom walls.

When the top and bottom walls are in contact, the carton sleeve is substantially flat. This is the ideal position for shipping the unerected cartons to the carton packager because the flat cartons occupy a minimal amount of space. When the top and bottom walls of the carton are moved apart as far as possible, the end wall intermediate and hinged panels are coincidentally aligned perpendicular to the plane of the top and bottom walls. As the top and bottom walls are moved toward each other, the end wall intermediate panels move toward each other and the end wall hinged panels move to a position parallel to the top and bottom walls and the end wall first panels and perpendicular to the end wall intermediate panels.

When the carton sleeves described above are received by the packager, the sleeves are partially erected by moving the top and bottom walls away from each other. The expandability of the carton sleeve described above provides a certain amount of latitude in the preciseness of machine insertion of the article to be packaged. Further, since the end wall intermediate panels move toward one another as the top and bottom walls move toward one another, it is not necessary to precisely position the article to be packaged in the carton sleeve. The action of the intermediate panels moving toward one another as they move to their final position aids in positioning the article.

Another feature of this invention is that the gluing of the end wall first panels to the inwardly facing surfaces of the top and bottom wall prevents the end wall intermediate panel from kicking outwardly during the inserting of the article to be packaged. This problem of the end wall intermediate panel kicking outwardly has been encountered during the packaging operation in cartons in which the end wall first panel is not glued to the inwardly facing surface of the carton top or bottom wall.

After the packaging operation is completed, the top and bottom carton walls are parallelly aligned one above the other so that their inwardly facing surfaces are directly adjacent the packaged article and the end wall intermediate panels are in contact with the ends of the article to prevent it from shifting in the carton.

End flaps are hingedly connected to each end of each end wall intermediate or second panels. The end flaps are adapted to extend perpendicularly outwardly (that is, in a direction away from the packaged article) from the end wall intermediate panels. After these end flaps have been directed outwardly, the overlapping inner and outer side flaps of the carton are folded into place and glued.

The resulting packaged carton utilizes a minimal amount of material to provide generally U-shaped cushions at each end of the carton which both protect the ends of the packaged article from damage during transit and also serve to prevent the article from shifting in the carton. The end flaps which extend outwardly from the intermediate panels serve to reinforce the carton corners and prevent crushing of the ends of the article. The reinforcement is accomplished by the end flaps adding an additional thickness of material to the overlapping side flaps. When corrugated paperboard is used in constructing the carton, an additional element of strength is added to the carton corners because the corrugations on the end flaps run perpendicular to the corrugations on the side flaps.

A tear strip is provided for the carton of this invention in order to facilitate opening and closing the carton. In one embodiment, the tear strip extends across the entire top panel of the carton adjacent one of the end walls and further extends down along the outer overlapping side flap. The inner side flap is precut along its width in order to facilitate bending back of the end wall after the tear strip has been removed. The bottom carton wall is scored adjacent the carton end wall nearest the tear strip, also to facilitate bending back of the end wall. The cut extending along the inner side flap may also be extended into the carton bottom wall. This cut extends from the termination point of the inner side flap cut to the scoreline, once again to facilitate bending back of the end wall.

Bending back of one of the carton end walls facilitates removal of the packaged article from the carton with a minimum amount of destruction to the carton. If the article is to be returned to the sender, it is relatively simple to reinsert it into the carton and apply tape or the like to the carton along the tear strip juncture so that the carton is suitable for mailing or shipping.

In a third embodiment of the invention, the tear strip extends across the closure flap which is attached to one of the end wall hinged or third panels. Partially cut scorelines are formed on the carton wall opposite the wall on which the tear strip is located. The partially cut

scorelines are formed adjacent the edges of the end wall glued panel. In this embodiment, the closure flap is only partially glued to the top wall of the carton. The portion of the closure flap nearest the end wall is not glued whereas the portion of the closure flap farthest from the end wall is glued. In opening the carton, the tear strip is removed first, thus leaving the unglued portion of the closure flap free. The free portion of the closure flap is then pulled rearwardly, partially exposing the contents of the carton. In order to completely open the carton, it is necessary to grasp the end wall glued panel and the bottom wall portion to which it is glued and pull it downwardly so that the bottom wall of the carton is torn away along the partially cut scorelines. It is also possible with this embodiment to easily reinsert the packaged article, reclose the end wall and reseal the unglued portion of the closure flap so that the carton is suitable for reuse.

These and other objects and features of this invention will be more readily understood and appreciated by reference to the following descriptions and drawings in which:

FIG. 1 is a plan view of the preferred embodiment of a carton blank constructed according to this invention; FIG. 2 is a perspective view of the carton blank of FIG. 1 partially erected with parts cut away to show gluing;

FIG. 3 is a perspective view of the carton blank of FIG. 1 fully erected;

FIG. 4 is a portion of a sectional view of the carton of FIG. 3 taken along the line 4-4;

FIG. 5 is a cross-sectional view of the carton of FIG. 3 taken along the line 5-5 with a portion broken away;

FIG. 6 is a perspective view of the carton of FIG. 3 with the tear strip removed and the end wall partially pulled back to expose the contents of the carton;

FIG. 7 is a plan view of a second embodiment of a carton blank portion constructed according to this invention;

FIG. 8 is a portion of a cross-sectional view, similar to FIG. 5, of the carton erected from the blank illustrated in FIG. 7;

FIG. 9 is a plan view of a third embodiment of a carton blank portion constructed according to this invention; and

FIG. 10 is a perspective view, similar to FIG. 6, of a portion of a carton erected from the carton blank illustrated in FIG. 9 with the closure flap broken away and the bottom wall of the carton pulled back rearwardly.

Referring now to FIGS. 1-6, in which the preferred form of the invention is illustrated, the carton blank 10 consists of top wall 12 and bottom wall 14; outer side flaps 16 hingedly connected to top wall 12 and inner side flaps 18 hingedly connected to bottom wall 14; and a pair of oppositely disposed tri-panel end walls 15 and 17. End wall 15 consists of a first panel 19 which is adapted to be glued to the inside surface of top wall 12; a second panel 22 which is hingedly connected to the first panel 19 and which is adapted to be disposed perpendicularly with respect to bottom wall 14 and top wall 12; and a third panel 26 which is hingedly connected to the second panel 22 and which is adapted to be hingedly connected to the bottom wall 14. The third panel 26 is adapted to lie parallel and directly adjacent to the bottom wall 14.

Similarly, end wall 17 is composed of a first panel 20 which is glued to the inside surface of the bottom wall

12; a second panel 24 which is hingedly connected to the first wall 20 and which is adapted to be disposed perpendicularly with respect to the top and bottom walls; and a third panel 28 which is hingedly connected to the second panel 24 and which is also hingedly connected to the top wall 12. The third panel 24 is adapted to lie parallel and directly adjacent to the top wall 12.

End flaps 32 extend outwardly from the end wall second panels 22 and 24. A scoreline 34 is formed on the bottom wall 14 adjacent one end of the carton blank. The inner side flaps 18 are precut along lines 36 as the bottom wall 14 is precut along line 38. A closure flap 30 is hingedly connected to the end wall first panel 19. The closure flap is adapted to be glued to the outwardly facing surface of the bottom wall 14. A tear strip 40 is formed across the carton top wall 12 and the outer side flaps 16. The tear strip 40 is positioned adjacent the carton blank end wall 17.

Referring now to FIG. 2, the carton blank illustrated in FIG. 1 is shown partially erected with the top side down. The bottom wall 14 is parallelly aligned above the top wall 12. The first panel 20 of end wall 17 is folded and glued to the inside surface of the bottom wall 14. The end wall second panel 24 and third panel 28 are folded to form a generally U-shaped cushion. Similarly, the first panel 19 of end wall 15 is glued to the inwardly facing surface of the top wall 12 and the end wall second panel 22 and third panel 26 are folded to form a generally U-shaped cushion. After this construction is completed, the closure flap 30 is glued to the outwardly facing surface of the bottom wall 14. The completed carton sleeve ready to receive the article to be packaged is thus formed. This sleeve can be folded flat for shipping to the packager.

Referring now to FIG. 3, the article to be packaged has been inserted in the open sleeve carton illustrated in FIG. 2 and the outer overlapping side flaps 18 which are hingedly connected to the bottom wall 14 have been folded over the inner side flaps 18.

Referring now to FIG. 4, the feature whereby the cushioned corners of the carton are reinforced is illustrated. In the carton illustrated in FIG. 3, the end flaps 32 which extend from the end wall intermediate panels 22 and 24 have been pushed outwardly so that they are perpendicular to the end wall intermediate panels and parallel to the overlapping side flaps 16 and 18. The end flaps 32 along with the overlapping side flaps 16 and 18 provide a triple thickness which strengthens the corners of the carton which are particularly vulnerable to damage during shipping. Furthermore, in the corrugated version, the corrugations in the end flaps 32 run perpendicular to the corrugations in the side flaps 16 and 18. This adds an additional degree of strength to the corners of the cartons.

Referring now to FIG. 5, the U-shaped cushions which protect the corners of the contents of the carton are formed by the tri-panel end walls 15 and 17. The end wall intermediate panels 22 and 24 serve to prevent the article from shifting within the carton whereas the end wall first panels 19 and 20 and end wall third panels 26 and 28 serve to provide an additional thickness of material to strengthen the corners of the carton. Furthermore, the end wall first panels 19 and 20 add an additional element of reinforcement to the cushion because glued panels are stronger than non-glued panels.

Referring now to FIG. 6, the tear strip illustrated in FIG. 3 has been torn away from the carton and the end

wall 17 has been pulled rearwardly a sufficient degree to permit removal of the contents from the carton. After the tear strip is removed, the end wall 17 is easily pulled backwardly along the precut lines 36 in the carton inner side flaps 18 and further pulled back to the scoreline 34 along the precut lines 38 in the carton bottom wall 14. In order to reuse the carton, it is simply necessary to reinsert the article into the carton, close the end wall 15 so that the carton top wall sections 12A and 12B are substantially coincidentally aligned, and reseal the carton with tape or the like.

In the following descriptions, the primed numerals refer to elements substantially the same as the elements referred to in the description of the preferred embodiment, and these elements respond to the same description as the corresponding unprimed numerals.

Referring now to FIGS. 7 and 8, a second embodiment of this invention is illustrated. The carton blank 11 includes an end wall section 13 which consists of a first panel 42 which is adapted to be glued to the inwardly facing surface of the bottom wall 14'; an intermediate wall 22' which is hingedly connected to the end wall first panel 42; and a third wall 19' which is hingedly connected to the intermediate wall 22' and which is also hingedly connected to the top wall 12'. The gluing of the end wall first panel 42 to the bottom wall 14' completes the carton sleeve. In all other respects, this second embodiment is the same as the preferred embodiment described above.

Referring now to FIG. 9, a third embodiment of this invention is illustrated. The carton blank 43 includes a tripanel end wall portion 45 which consists of a first panel 54 which is adapted to be glued to a portion 56A of the inwardly facing surface of the carton blank bottom wall 56; an intermediate wall 50 which is hingedly connected to the end wall first panel; and a third panel 48 which is hingedly connected to the intermediate panel 50 and which is hingedly connected to the closure flap 46. The closure flap 46 has a glued portion 44 and an unglued portion 47 with a tear strip 41 separating the two portions. The closure flap is adapted to lie over the outwardly facing surface of the top wall (not illustrated in FIG. 9). Partially cut scorelines 58 extend from the end of the carton blank top wall 56 to the scoreline 60 formed in the bottom wall.

Referring now to FIG. 10, the tear strip 41 has been torn away from the closure flap 46 leaving the closure flap portion 44 intact on the carton blank top wall 63. The closure flap unglued portion 47 has been pulled rearwardly so that the end wall third or hinged panel 48 is pulled away from the contents of the carton. Similarly, the end wall glued panel 54 and the bottom wall portion to which it is glued have been pulled backwardly so as to rip the bottom wall portion 56A along the precut scores 58 so as to bend back bottom wall portion 56A along the scoreline 60. The contents of the carton can then be removed.

In order to reuse the carton, the article to be packaged is reinserted into the carton, the closure flap unglued portion 47 is positioned adjacent the closure flap glued portion 44, and the entire end wall portion of the carton is sealed by tape or the like.

While the principles of this invention have been made clear in the illustrative embodiments, it will be immediately obvious to those skilled in the art that modifications in the structure, arrangement, proportions of the elements and of the materials and parts

used in the practice of the invention, can be made without departing from those principles. The appended claims are, therefore, intended to cover and embrace any such modifications, within the limits only of the true spirit and scope of the invention.

What is claimed is:

1. A carton comprising an integral one-piece blank including a top wall and bottom wall, said top and bottom walls being parallelly aligned one above the other, first side flaps being hingedly connected to the sides of said top wall, second side flaps being hingedly connected to the sides of said bottom wall, first and second end walls which adjoin the ends of said top and bottom walls, said first end wall including a first panel being completely glued to the inwardly facing surface of said top wall and being parallelly aligned with said top wall, a second panel being hingedly connected to said first panel and being perpendicularly disposed with respect to said top wall and a third panel being hingedly connected to said second panel and being hingedly connected to said bottom wall; said second end wall including a fourth panel being completely glued to the inwardly facing surface of said bottom wall and parallelly aligned with said bottom wall, a fifth panel being hingedly connected to said fourth panel and being perpendicularly disposed with respect to said bottom wall, and a sixth panel being hingedly connected to said fifth panel and being hingedly connected to said top wall and a pair of end flaps being hingedly connected to the ends of said second and fifth panels, said end flaps being adapted to be perpendicularly disposed with respect to said second and fifth panels, a first precut being formed in said second side flaps adjacent one of said end walls, said first precut extending the width of said second side flaps, a second precut being formed along the boundaries between each of said second side flaps and said bottom wall, said second precut extending from said first precut in a direction away from said adjacent end wall and means for separating said top wall into two sections, said separating means extending across the width of said top wall and said first side flaps, said separating means being positioned generally parallel to and adjacent said adjacent end wall.

2. The carton defined in claim 1 wherein the carton is composed of corrugated paperboard and wherein the corrugations in said end flaps are perpendicularly aligned with respect to the corrugations in said first and

second side flaps.

3. The carton defined in claim 1 wherein the boundaries between said bottom wall and said second side flaps are precut a distance substantially equivalent to the width of said fourth panel.

4. A carton comprising a top wall and bottom wall, said top and bottom walls being parallelly aligned, first side flaps being hingedly connected to the sides of said top wall, second side flaps being hingedly connected to the sides of said bottom wall, first and second end walls which adjoin the ends of said top and bottom walls, said first end wall including a first panel being completely glued to the inwardly facing surface of said top wall and being parallelly aligned with said top wall, a second panel being hingedly connected to said first panel and perpendicularly disposed with respect to said top wall and a third panel being hingedly connected to said second panel and being hingedly connected to said bottom wall; said second panel wall including a fourth panel being completely glued to the inwardly facing surface of said bottom wall and parallelly aligned with said bottom wall, a fifth panel being hingedly connected to said fourth panel and being perpendicularly disposed with respect to said bottom wall, and a sixth panel being hingedly connected to said fifth panel and being perpendicularly disposed with respect to said bottom wall, and a closure flap including a first portion and a second portion, said closure flap first portion being hingedly connected to said end wall fifth panel, said closure flap second portion being glued to the outwardly facing surface of said top wall, a first precut being formed in said second side flaps adjacent one of said end walls, said first precut extending the width of said second side flaps, a second precut being formed along the boundaries between each of said second side flaps and said bottom wall, said second precut extending from said first precut in a direction away from said adjacent end wall and means for separating said top wall into two sections, said separating means extending across the width of said top wall and said first side flaps, said separating means being positioned generally parallel to and adjacent said adjacent end wall.

5. The carton defined in claim 4 wherein the boundaries between said second side flaps and said bottom wall are precut a distance substantially equivalent to the width of said fourth panel.

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