

[54] SHIPPING CONTAINER

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[52] U.S. Cl. 229/40, 206/424, 206/521,
229/34 HW
[51] Int. Cl. B65d 5/02, B65d 85/30
[58] Field of Search 206/46 FR, 45.26; 229/33,
229/34 HW, 40, 89 B

[56] References Cited
UNITED STATES PATENTS

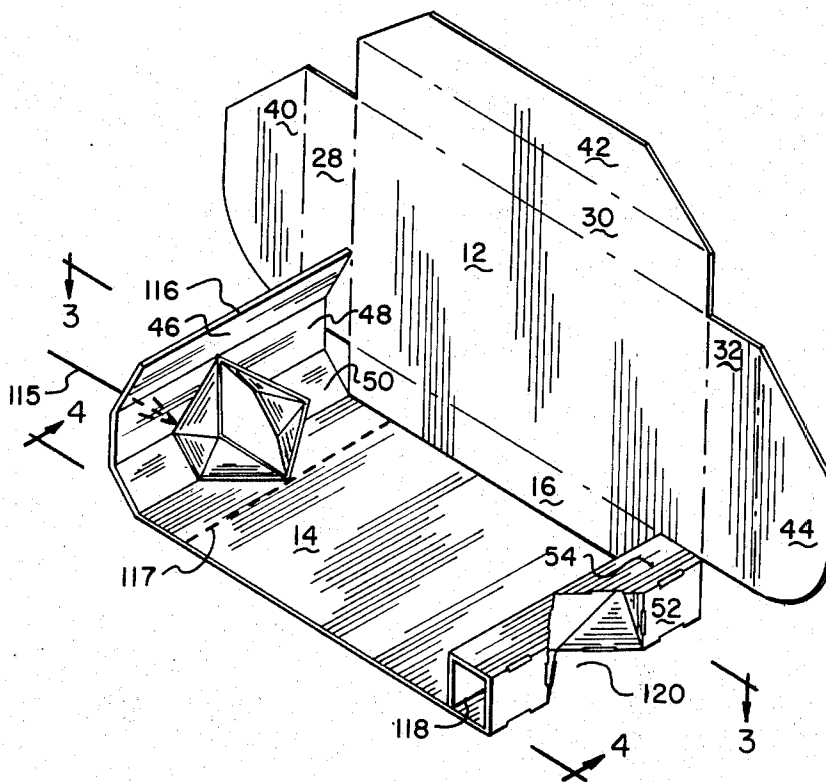
3,325,964	6/1967	Boitel.....	53/32
3,722,783	3/1973	Rous.....	229/40
3,734,397	5/1973	Cote.....	229/39 B

Primary Examiner—William I. Price
Assistant Examiner—Bruce H. Bernstein
Attorney, Agent, or Firm—Norvell E. Von Behren

[57] ABSTRACT

An improved shipping container for a book or the like having an improved end cell cushioning structure that is formed in part from the bottom panel of the container and in part from two of the three cushioning panels hingedly attached to the bottom panel. The new and improved shipping container is formed out of a single piece of paperboard having a minimal size and, due to its unique construction, it may be easily formed around the book or the like object to be packaged within the container on book folding machines of the type well known in the art.

10 Claims, 6 Drawing Figures



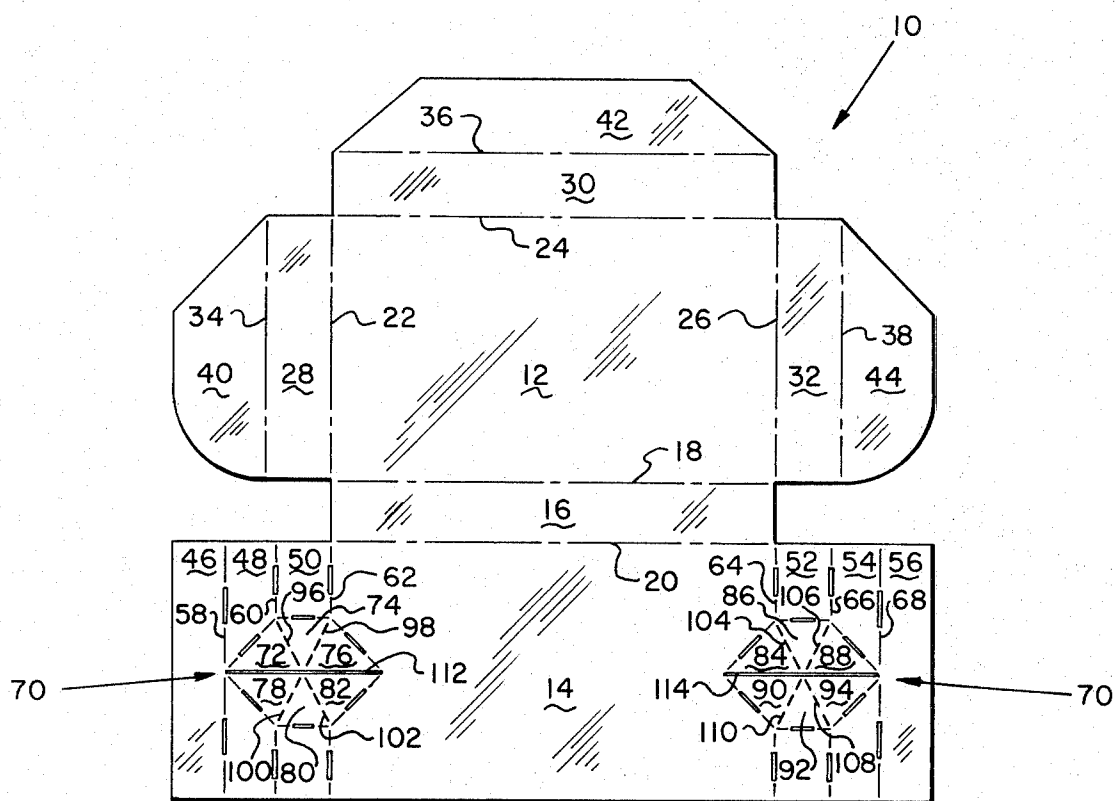


FIG. 1

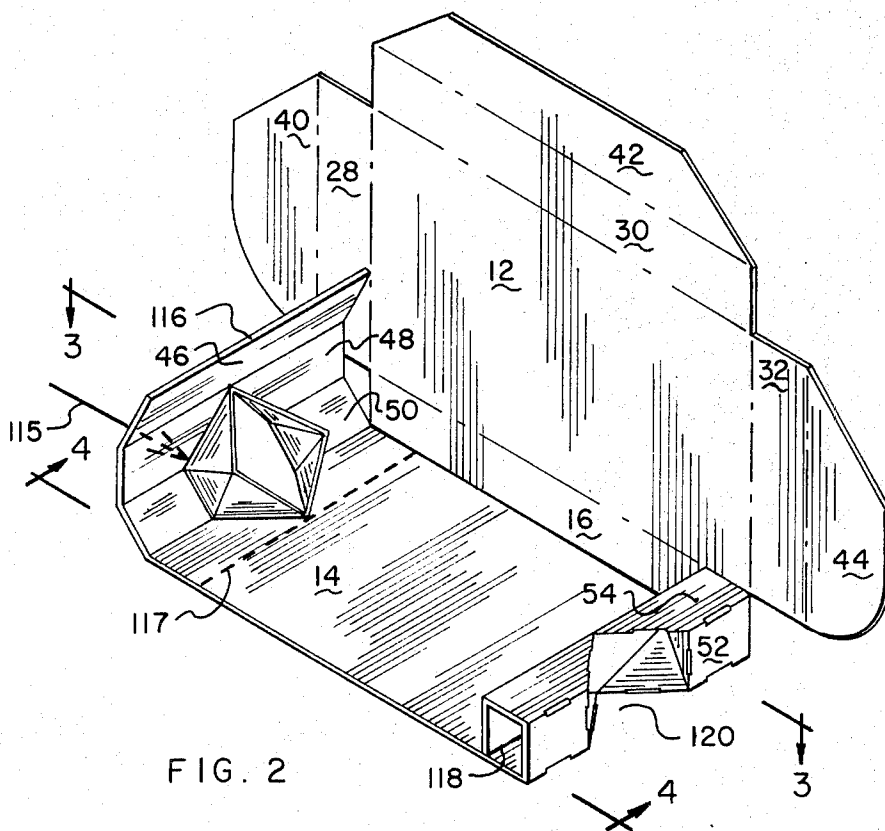


FIG. 2

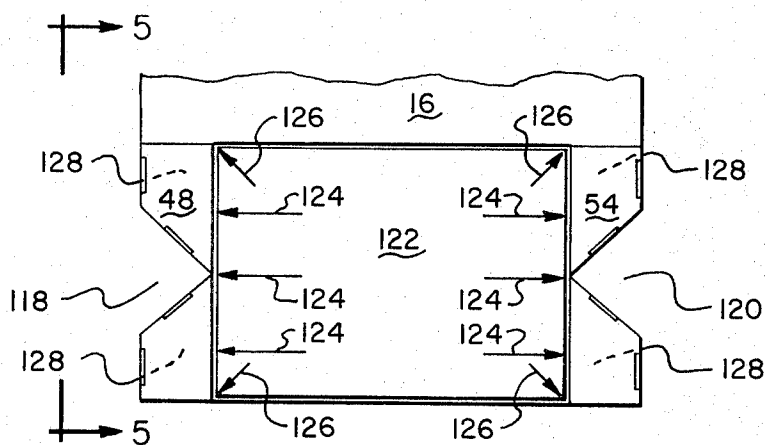


FIG. 3

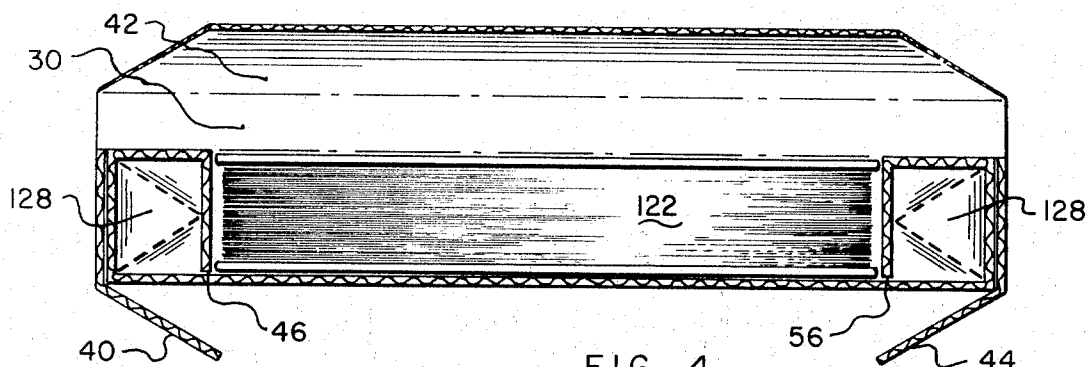


FIG. 4

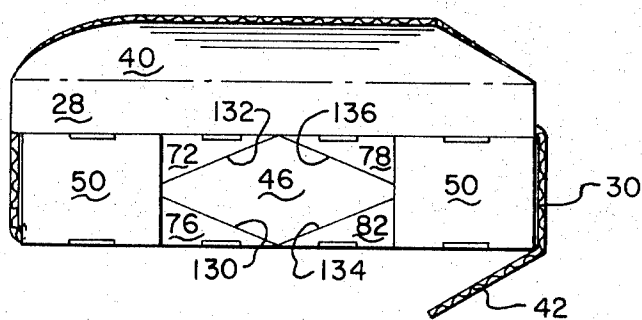


FIG. 5

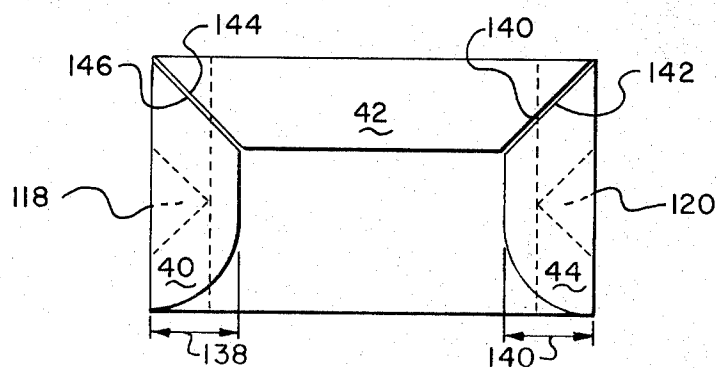


FIG. 6

SHIPPING CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to a shipping container and more particularly to a mailing container for protecting a book or the like with the container having a unique end cell construction which cushions the ends of the book or other object from damage that usually occurs during the mailing of the container.

It is known in the art of mailing container designs to provide the mailing container with cushioning end cells which are utilized to protect the ends of the book which is packaged in the container from the damaging shocks that occur from the frustrated basketball player type mail handlers that throw the mail package from one mail bag to another mail bag as is well known to virtually every person in the country that has delivered a package to our postal system for handling by them. Cushioning end cells have taken many forms, one of which is typified by the U.S. Pat. No. 2,847,152, issued to L. D. Van Antwerpen on Aug. 12, 1958 wherein the end panel construction is formed as a wrap-around hollow member formed out of five panels which are folded out of the flap shown as the numeral 9 in FIG. 2 of the drawing. A variation of this concept is shown in the U.S. Pat. No. 3,179,325, issued to R. H. Johnson on Apr. 20, 1965 wherein the cushioning end cell is formed of three intermediate strips or panels numbered 50, 52, 54 and 32, 34 and 36 as shown in FIG. 4 of his drawing. A more refined variation of this type end cell construction is shown in the U.S. Pat. No. 3,368,735, issued to H. L. Levi On Feb. 13, 1968 wherein four panels numbered P6', P7', P8' and P9' are utilized in combination with a tab labeled T2 as shown in FIG. 1 of his drawing.

Another variation of this type of end cell construction is shown in the U.S. Pat. No. 3,386,641, issued to B. Cassidy on June 4, 1968 wherein four panels numbered 40, 41, 42 and 43 are utilized in combination with other panels to provide a wrap-around end cell construction for cushioning the book in the package. Other designs of end cells were attempted as typified by the U.S. Pat. No. 3,386,642, issued to G. H. Young on June 4, 1968 wherein a six panel structure was attempted using the panels numbered 8, 34, 26, 42, 27 and 35 as shown in FIG. 1 of his drawing which were folded in the manner shown in FIG. 2 of the drawing to provide the end cell construction. As a variation of this type of structure reference should be made to the U.S. Pat. No. 3,399,821, issued to N. A. Ringholz on Sept. 3, 1968 wherein a four panel construction utilizing panels numbered 25, 26 and 27 were folded to form the end cell cushioning structure shown in FIG. 2 of his drawing. A more simplified version of this structure is also shown in the U.S. Pat. No. 3,485,435, issued to A. Greene et al. on Dec. 23, 1969 wherein the panels 50' and 52 along with the panels 32 and 34 were folded about the scorelines 38 and 48 to form the end cell structure shown in FIG. 4 of the drawing.

While all of the beforementioned prior art end cell constructions provided some cushioning effect to the article being packaged, for one reason or another they have not found wide acceptance in the marketplace undoubtedly due to either the amount of protection that they provided, the cost of obtaining the protection by means of a larger production blank or the problems of

machining the production blank which is the term referred to in the art to mean the machine folding of the production blank around the article packaged in the container. A somewhat more up-to-date end cell structure is shown in the U.S. Pat. No. 3,664,573, issued to J. H. Partain et al. on May 23, 1972 wherein the end is formed with a four panel effect with the cell arrangement, shown as the numeral 30, forming actually two panels of the four panel end cell. As can be seen in FIG. 3 of his drawing the end cell construction of this invention utilizes an upwardly and outwardly inclined panels formed out of panels 42 in combination with a plurality of horizontal panels formed out of panels 40, both of these panels being shown generally by the numeral 30 in the drawing. In combination with this there is provided a vertical panel 56 and a horizontal panel 54 which is wedged between the book and the second rectangular panel 14 as shown in FIG. 6 of the drawing. A more complicated version of this patent is shown in the U.S. Pat. No. 3,666,168, issued to J. H. Partain et al. on May 30, 1972. While these structures may provide the desired cushioning of the book with their particular end cell structures, it is felt that whenever the particular production blank is machined, or as beforementioned, folded around the book to be contained in the package, problems will occur which will make the use of this container economically prohibitive.

In the packing of books into containers such as taught by the invention and the prior art cited herein, it is well known that assembly line speeds ranging between 20 and 40 books per minute are commonplace with the books being generally positioned in the package manually by women packers who build up quite a manual dexterity in placing the books in the package while the packaging line is traveling at the high rate of speed necessary to handle the 20 to 40 books per minute. In machining the mailing container taught by the first mentioned Partain patent, it becomes necessary to first fold the cell construction 30 in a manner shown in FIG. 3 of the drawing and then to fold down the wall panel 56 and to fold over the wall panel 54 while holding it in position so that the book can be rapidly placed in the container. While this folding can be accomplished automatically by the packaging machine it is felt that such a machine would be expensive to manufacture and would be exceedingly large in order to handle all of the folding steps necessary prior to the placement of the book in the container. If some of the folding steps are performed manually, as for example breaking the scoreline 58 in order to fold the wall panel 54 horizontally and to hold it in place while the book is placed in the package, then it is questioned whether or not the beforementioned packaging speeds would be obtainable using this structure.

SUMMARY OF THE INVENTION

In order to overcome the problems inherent in the beforementioned prior art patents, there has been provided by the subject invention a new and improved shipping container for a book or the like which has a new and novel end cell construction which may be formed simply out of a minimum of cushioning panels and which may be easily formed into the cushioning end cell thereby allowing the high packaging line speeds to be accomplished in the packaging process. In the preferred embodiment shown the cushioning end cell may be formed with at least three cushioning pan-

els which are hingedly attached to each other and to the bottom panel and which have formed thereon at least two inwardly opening reinforcement panels which are formed in part from two of the three cushioning panels of the structure. The reinforcement panels may be formed in the shape of a trapezoid with the base of the trapezoid being cut in part from at least two of the cushioning panels and in part from the bottom panel of the shipping container.

Accordingly it is an object of the invention to provide a new and improved shipping container that may be easily machined at the high packaging speeds required in today's technology.

Still another object of the invention is to provide a new and improved shipping container which has an improved end cell construction that provides improved cushioning of the contents of the package without requiring large amounts of paperboard for the construction blank or without requiring intricate and large numbers of folding panels in order to provide the end cell cushioning.

Still another object and advantage of the invention is to provide a improved mailing container which utilizes end cell cushioning provided by a minimum of three cushioning panels which have formed thereon cushioning reinforcement panels which are formed in part from the bottom wall of the mailing container and in part from two of the three cushioning panels.

These and other objects and advantages of the invention will become apparent from a reading of the description of the preferred embodiment and from a study of the drawings showing the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the production blank of the subject invention;

FIG. 2 is a perspective view showing the blank of FIG. 1 with the left end cell partially folded and the right end cell completely folded in place prior to the top panel being folded over to make the completed package;

FIG. 3 is a partial top view taken along line 3—3 of FIG. 2 showing the new and improved end cell construction;

FIG. 4 is an end view taken along line 4—4 of FIG. 2 showing the end cell construction prior to the top panel being completely folded over to complete the package;

FIG. 5 is an end view taken along line 5—5 of FIG. 3 showing the end cell construction of the invention after the top panel has been folded in place but before the cover panel has been folded in place completing the package; and

FIG. 6 is a bottom view of the completed package showing the three cover panels folded in place and showing the end cell construction in dashed lines on the Figure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in general and in particular to FIG. 1 of the drawings there is shown the new and novel shipping container of the invention generally by the numeral 10 which comprises a top panel 12 and a bottom panel 14 which is hingedly attached to the top panel 12 by means of an end panel 16 at the scorelines

18 and 20. The top panel 12 also has hingedly attached thereto, by means of scorelines 22, 24 and 26, the end panels 28, 30 and 32. Hingedly attached to the end panels 28, 30 and 32, by means of the scorelines 34, 36 and 38 are a plurality of cover panels 40, 42 and 44.

The bottom panel 14 has hingedly attached thereto, on each of two opposite sides thereof, a plurality of cushioning panels 46, 48, 50, 52, 54 and 56 by means of the slit scorelines 58, 60, 62, 64, 66 and 68. Formed on each of the two opposing sides of the bottom panel 14 are at least two inwardly opening reinforcement panels, shown generally by the numeral 70 and comprising a plurality of triangular-shaped panels 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92 and 94 which are formed in part by means of the slit scorelines 96, 98, 100, 102, 104, 106, 108 and 110 and in part by the cut lines 112 and 114. The reinforcement panels 70 are formed in part from the bottom panel 14 and in part from at least two of the cushioning panels formed on each side of the bottom panel 14. When formed in this manner, the reinforcement panels 70 are formed in the shape of a trapezoid with the base of the trapezoid being cut in part from at least two of the cushioning panels and in part from the bottom panel 14. In the embodiment shown in FIG. 1 of the drawing, at least two trapezoidal-shaped reinforcement panels are formed on each of the two opposite sides of the bottom panel 14 with the bases of the trapezoids being in juxtaposition with each other along the cut lines 112 and 114. However it is within the spirit and scope of the invention that the bases of the trapezoids could be in a facing relationship but spaced apart simply by repositioning the bases of the trapezoids away from each other and separating them by several cut lines with the material between the bases blanked out or removed from the production blank. The trapezoids may be formed as isosceles trapezoids or as non-isosceles trapezoids depending upon the thickness of the book to be contained within the shipping container and the location of one trapezoid in relation to the other trapezoid on that side of the book container.

Referring now to FIG. 2 of the drawing there is shown a perspective view showing the production blank of FIG. 1 with the left end cell being partially folded and the right end cell being completely folded and with the reinforcement panels 70 structurally reinforcing the cushioning panels in order to provide cushioning support to the book or other object placed within the container. When the cushioning end panels are initially formed as shown on the left side of FIG. 2 of the drawing, a breaking force 115 is applied from beneath the reinforcement panels 70 when they are in the unfolded position shown in FIG. 1 of the drawing in order that the cushioning panels may be wrapped around the inwardly opening reinforcement panels as the cushioning panel is formed. When completely formed, the cushioning panel 46 is in juxtaposition with the bottom panel 14 along the line 116 as shown by the dotted line 117 representing its final position and the cushioning panel 56 is in juxtaposition with the bottom panel 14 along the line 118, both being substantially vertical in relation to the bottom panel 14. When formed in this manner the cushioning panels 48 and 54 are then substantially horizontal in relation to the bottom panel 14 and the cushioning panels 50 and 52 are substantially vertical in relation to the bottom panel 14 and lie on the outside of the package. When the rein-

forcement panels are formed in the manner hereinbefore described, they provide a V-shaped opening 118 and 120 on each side of the package with the triangular-shaped panels 72, 74, 76, 78, 80 and 82 and the triangular-shaped panels 84, 86, 88, 90, 92 and 94 giving structural support to the cushioning panels 46 and 56.

Referring now to FIG. 3 of the drawing there is shown a partial top view taken along lines 3—3 of FIG. 2 showing the improved end cell construction folded in place as beforementioned prior to the top panel 12 being folded over the end cells to make the complete package. Whenever a book 122 or other similar object is placed within the package and the package is completely made up, the longitudinal forces, shown by the arrow direction 124, will be cushioned by the end cell with the shock being absorbed by the cushioning panels 46 and 56 as well as being absorbed by the cushioning panels 50 and 52 by virtue of the resultant force being transferred to these latter panels by means of the reinforcement panels 70 being folded in the particular manner taught by the subject invention. Referring to FIG. 4 of the drawing there is shown an end view taken along line 4—4 of FIG. 2 showing the end cell construction prior to the top panel being completely folded over to complete the package and showing the book 122 in place in the package. In addition to the forces 124 occurring to cause potential damage to the book 122 there may also be a plurality of diagonal forces applied to the edges of the book as shown by the arrow direction 126. Due to the unique construction of the end cell, a hollow space 128 is provided which is sufficient to allow the cushioning panel 46 or 56 to deflect inward or to somewhat collapse in order to absorb the shock incurred by means of the force applied to the diagonal corners of the book as shown by the arrow direction 126.

Referring now to FIG. 5 of the drawing there is shown an end view taken long lines 5—5 of FIG. 3 showing the end cell construction of the invention after the top panel has been folded in place but before the cover panel has been folded in place to complete the package. As beforementioned the reinforcement panels 70 are formed by means of the triangular-shaped panels which are constructed in the general form of a trapezoid having its base formed by means of the cut lines 112 and 114. In the view shown in FIG. 5 of the drawing whenever the cushioning end cell is formed, the base of one trapezoid forms itself into a generally V-shaped segment having two legs 130 and 132 while the base of the other trapezoid forms itself into a similar V-shaped segment having two legs 134 and 136 which rest against the cushioning panel 46 and transmits the shock, shown by the arrows 124 through the reinforcing members into the cushioning panels.

Referring to FIG. 6 of the drawing there is shown a bottom view of the completed package showing the three cover panels folded in place and showing the end cell construction with a plurality of dashed lines on the figure. As beforementioned whenever the cushioning panels are folded around the reinforcing panels, a generally V-shaped opening 118 and 120 is formed in each side of the cushioning end cell. For esthetic purposes, in order to cover this opening, the cover panels 40 and 44 should be of sufficient width 138 and 140 to cover the opening as shown in FIG. 6 of the drawing.

In addition the cover panel 42 as well as the cover panels 40 and 44 are generally formed with tapered sides at 140 and 144 as well as 142 and 146 in order that the three cover panels can be tightly folded in place and glued to form the completed package by means well known in the art. When the completed package is thusly formed, the outward appearance is similar to other book packages however it should become apparent the inward end cell construction is uniquely different.

From the above it should become apparent that there has been provided by the subject invention, a new and improved shipping container for a book or the like having an improved cushioning end cell structure which may be simply formed out of a minimum of panels and which provides the required structural support to the book contained within the package whenever various shocking forces are applied to the edges of the books resulting from the beforementioned improper handling of the package. When the subject improved package is to be machined, a simple breaking force is required to the reinforcement panels to break them upwardly and the end cells can then be quickly formed by wrapping the cushioning panels around the reinforcement panels with the book being placed in the package without recourse being made to other means to hold the end cell in a proper position prior to insertion of the book. As a result the beforementioned high packaging speeds are obtainable with the unique end cell construction of the invention thereby overcoming the problems inherent in the beforementioned prior art book packages.

From the above it should become apparent that many variations may be utilized within the spirit and scope of the invention in order to take advantage of the unique end cell construction. For example, in the preferred embodiment shown the reinforcement structure comprises two trapezoids having their bases in juxtaposition on each side of the package. It is also conceivable that the structure could be formed with only one trapezoid on each side of the package with the trapezoid being formed in part from the bottom panel and in part from two of the three cushioning panels making up the end cell. In addition, as beforementioned, the trapezoid-shaped reinforcement panels can also be formed in the position shown in FIG. 1 of the drawing but having their bases spaced apart within the spirit and scope of the invention. It is also conceivable that each end cell could be constructed with more than one trapezoidal-shaped reinforcement panel, having bases either touching, spaced apart or in the same direction, if more structural rigidity was desired for the end cell with the reinforcement panels being formed in part from the bottom panel and in part from two of the three cushioning panels forming a part of the end cell.

From the foregoing it can be seen that there has been provided a new and improved shipping package which accomplishes all of the objects and advantages of the invention as outlined before. Nevertheless many changes may be made in the basic structure of the invention and in the arrangement of the panels without departing from the spirit and scope of the invention and the invention is not to be limited to the preferred embodiment shown which has been given by way of illustration only.

Having described my invention, I claim:

1. In a shipping container for a book or the like and of the type comprising a top panel, a plurality of end

panels hingedly attached to the top panel, a plurality of cover panels hingedly attached to at least three of the end panels and a bottom panel hingedly attached to at least one of the end panels, the improvement comprising:

- a. the bottom panel having formed on each of two opposite sides thereof at least three cushioning panels, the cushioning panels being hingedly attached to each other and to the bottom panel; and
- b. the bottom panel also having formed on each of the two opposite sides thereof at least two inwardly opening reinforcement panels, each reinforcement panel being formed in part from at least two of the cushioning panels and from the bottom panel.

2. The improvement as defined in claim 1 further comprising the reinforcement panels being formed in the shape of a trapezoid with the base of the trapezoid being cut in part from at least two of the cushioning panels and in part from the bottom panel.

3. The improvement as defined in claim 2 wherein the trapezoid is formed from at least three triangular shaped panels cut scored in part from the cushioning panels and in part from the bottom panel.

4. The improvement as defined in claim 2 wherein at least two trapezoidal shaped reinforcement panels are formed on each of the two opposite sides of the bottom panel with the bases of the trapezoids being in juxtaposition.

5. The improvement as defined in claim 2 wherein at least two trapezoidal shaped reinforcement panels are formed on each of the two opposite ends of the bottom panel with the bases of the trapezoids being in a facing relationship but being spaced apart.

6. The improvement as defined in claim 2 further comprising the trapezoid to be formed as an isosceles trapezoid.

7. In a shipping container having a pair of protective end cells for a book or the like and of the type comprising a top panel, a plurality of end panels hingedly attached to the top panel, a plurality of cover panels hingedly attached to at least three of the end panels and a bottom panel hingedly attached to at least one of the end panels, the improvement comprising:

- a. the bottom panel having formed on each of two opposite sides thereof and hingedly attached thereto

a first cushioning panel; a second cushioning panel hingedly attached to the first cushioning panel and a third cushioning panel hingedly attached to the second cushioning panel; and

- b. the bottom panel also having formed on each of the two opposite sides thereof a pair of reinforcement panels formed in a hexagonal shape and die cut and formed in a manner sufficient to allow the hexagonal shaped reinforcement panels to open inwardly whenever the cushioning panels are wrapped around the reinforcement panels thereby forming the protective end cells for the shipping container.

8. In a shipping container for a book or the like and of the type comprising a top panel, a plurality of end panels hingedly attached to the top panel, a plurality of cover panels hingedly attached to at least some of the end panels and a bottom panel hingedly attached to at least one of the end panels, the improvement comprising:

- a. The bottom panel having formed on each of two opposite sides thereof and hingedly attached thereto a first cushioning panel, a second cushioning panel hingedly attached to the first cushioning panel and a third cushioning panel hingedly attached to the second cushioning panel; and
- b. the bottom panel also having formed in part on each of the two opposite sides thereof and in part on the first and second cushioning panels at least two reinforcement panels, each reinforcement panel being formed so that the innermost portion of the reinforcement panel extends into the bottom panel and the outermost portion of the reinforcement panel extends to the hinge line forming the beginning of the third cushioning panel.

9. The improvement as defined in claim 8 wherein the reinforcement panels open inwardly whenever the first, the second, and the third cushioning panels are wrapped around the reinforcement panels thereby forming a protective end cell for the shipping container.

10. The improvement as defined in claim 9 wherein the reinforcement panels are formed in the shape of a trapezoid.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,820,708 Dated June 28, 1974

Inventor(s) William G. Sieffert

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 6, after "end" insert --cell--.

Column 4, line 2, after "of" insert --the--.

Column 5, line 39, change "lines 5-5" to --line 5-5 --.

Column 6, line 23, change "cells" to --cell--.

Column 6, line 43, change "trapezoid" to --trapezoidal--.

Column 7, line 26, change "sides" to --ends--.

Signed and sealed this 5th day of November 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents