United States Patent [19]

Sieffert

[11] **3,861,580**

[45] **Jan. 21, 1975**

[54] **BOOK FOLDER**

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[73] Assignee: **Hoerner Waldorf Corporation,** Ramsey, Minn.

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[21] Appl. No.: **409,185**

[52] **U.S. Cl.** **229/40,** 206/424, 206/521

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

[58] **Field of Search** 229/40; 206/424, 521

[56] **References Cited**

UNITED STATES PATENTS

3,386,642	6/1968	Young	229/40
3,399,821	9/1968	Ringholz	229/40
3,465,946	9/1969	Johnson	229/40
3,485,435	12/1969	Greene et al.	229/40
3,664,573	5/1972	Partain et al.	229/40
3,666,168	5/1972	Partain et al.	229/40
3,768,721	10/1973	Carpenter et al.	229/40
3,790,065	2/1974	Carpenter	229/40
3,792,811	2/1974	Carpenter et al.	229/40

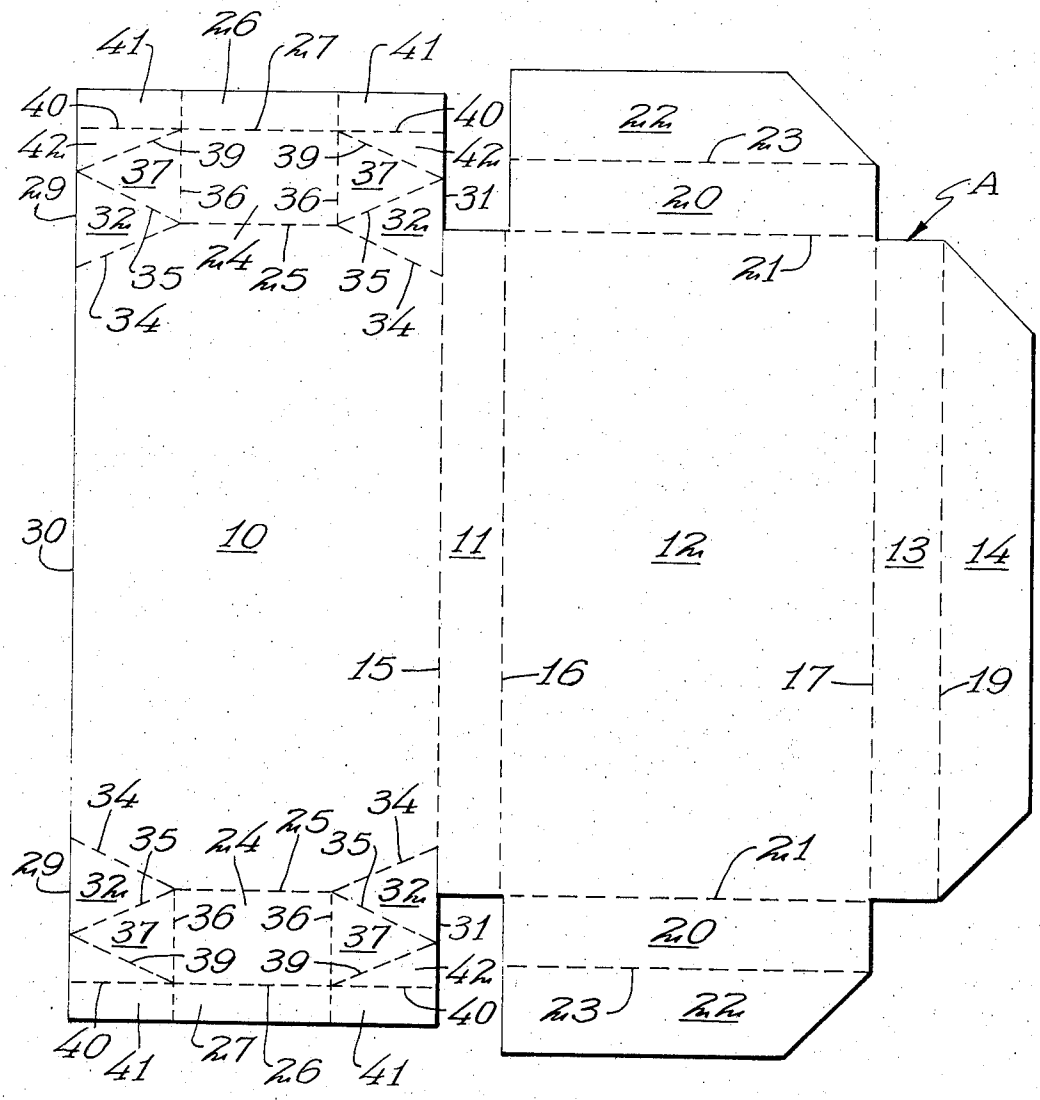
Primary Examiner—Stanley N. Gilreath

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[57] **ABSTRACT**

An improved shipping container for a book or other generally rectangular object includes a tubular body having an end closure at each end, and an end cushioning structure inwardly of each end closure. The end cushioning structure protects opposite ends of the book from damage during shipment. The folder is made of one piece of corrugated paperboard and is readily formed about the book or like object on book folding equipment of a type well known in the art.

5 Claims, 6 Drawing Figures



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SHEET 1 OF 2

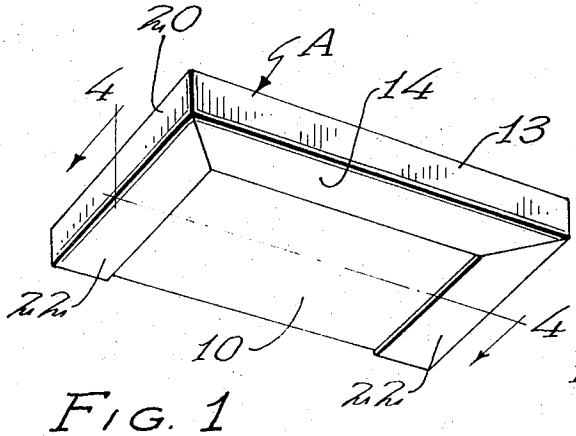


FIG. 1

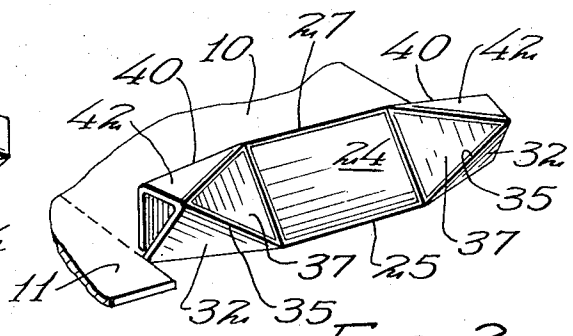


FIG. 2

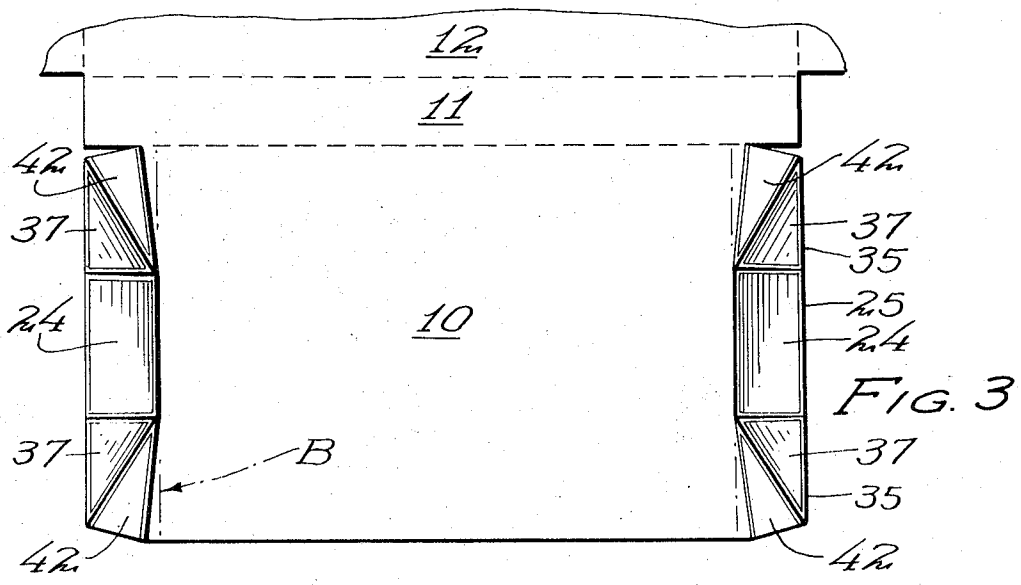


FIG. 3

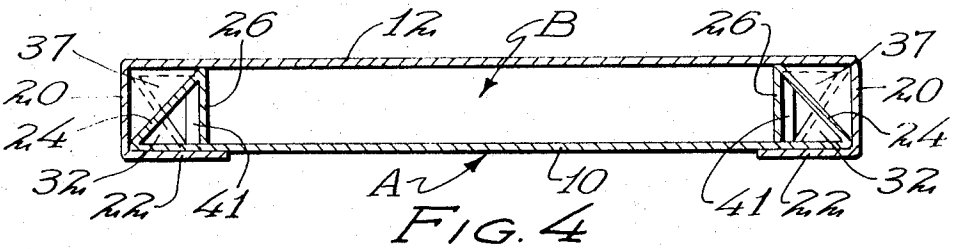


FIG. 4

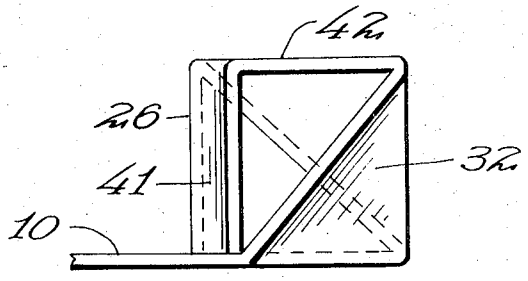


FIG. 5

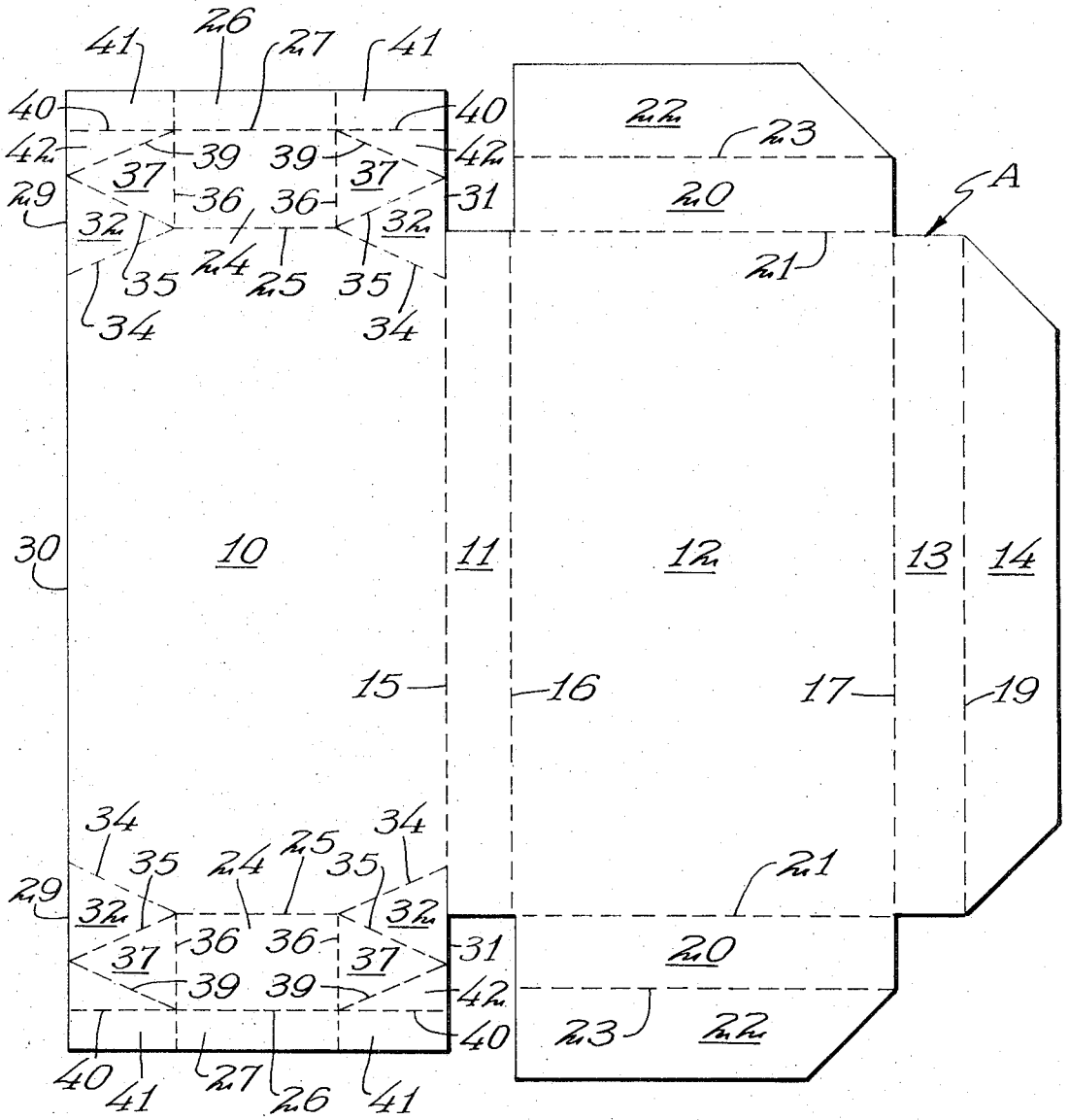

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FIG. 6

BOOK FOLDER

This invention relates to an improvement in book folder and deals particularly with a carton of rectangular form having a cushioning structure within each end thereof.

BACKGROUND OF THE INVENTION

Numerous cartons have been produced which are provided with hollow or recessed ends which are of a triangular relation and which are designed to hold the ends of the book contained in spaced relation to the ends of the carton. For example, U.S. Pat. No. 3,386,642 issued June 4, 1968 to G. H. Young shows a folder having hollow triangular cells formed by flaps **28** and **36** as shown in FIGS. **3** and **5** designed to engage opposite sides of a book to cushion these sides from the outer folder. U.S. Pat. No. 3,399,821 issued Sept. 3, 1968 to Ringholz provides a series of oppositely inclined triangular areas, providing panels such as **25** and **27** engaging the book to hold it in spaced relation to the folder ends.

U.S. Pat. No. 3,485,435 shows a construction in which the end walls of the folder are formed by connected inwardly inclined panels such as **18,** the panels being connected so as to form a connecting line which engages opposite edges of the book intermediate its surfaces thereof so as to hold the book spaced from the ends of the main panels **26** and **28.**

U.S. Pat. Nos. 3,664,573 and 3,666,168 show cartons having cushioning areas defined by a series of hollow triangular portions designed to space the contained book from opposed edges of the folder. Each of these previous patents, like all structures, have their advantages and disadvantages, but many of such folders engage the book along lines of engagement rather than flat areas of engagement, and others of the previous consructions employ considerably more paperboard than is absolutely necessary to form the necessary protection. Others of the patents which have been described result in folders having a pair of irregularly shaped ends or sides which do not form continuous protection for the book or other article contained. Still others of the previous structures are difficult to form on apparatus which is commercially available, making it necessary to design and produce special machinery for automatically closing such cartons when desired.

SUMMARY OF THE INVENTION

This invention relates to an improvement in book folder which comprises a rectangular container having hingedly connected main panels connected by side panels in tubular relation. The ends of the container are closed by end panels hingedly connected to the ends of one main panel and secured by glue flaps to the other main panel so that the contained book or other object B is completely then closed. A cushioning structure is hingedly secured to the remaining main panel and provides a cushioning cell between each end of the container and the book which is contained.

A feature of the present invention resides in a cushioning structure of a type described which includes a cushioning panel at each end of the folder which extends inwardly at an acute angle to the main panel from which it is hinged, and which supports a rectangular bearing flap which may be folded into right angular relation to the main panels and which forms a flat surface

intermediate the sides of the folder which is designed to engage an end of the book B to hold it cushioned from the end of the folder.

The present invention resides in a folder having an outer enclosure which is similar to that shown in other patents. In other words, it comprises a pair of opposed main panels which are connected by intermediate side panels, one of which is provided with a glue flap which may be secured to the outer surface of one of the main panels to hold the folder in tubular relation. An end panel is connected to each end of one of the main panels and includes a glue flap foldably connected thereto and secured in face contact with the other main panel to close the ends of the outer container. When the folder is made of corrugated paperboard, the various glue flaps are provided with mitered corners so as not to overlap.

A cushioning structure is provided interiorly of each end closure panel. This cushioning structure includes a rectangular cushioning panel hinged to the center portion of the end of the other main panel, and triangular end structures extending between the cushioning flap and the side walls of the outer carton. A bearing flap which is hingedly connected to the cushioning panel folds across the folder to terminate in edge abutting relation to the main panel to which the cushioning flange is secured. The triangular portions on each side of the cushioning panel include isosceles triangular portions having their bases extending along extensions of the side edges of said other main panel and having their apexes extending to corners of the rectangular cushioning panel; second isosceles triangular areas having their bases forming the sides of said rectangular cushioning panel and having their apexes at the extended edges of said other main panel, right triangular portions having their hypotenuse sides connected to the second isosceles triangular areas, and rectangular reinforcing flaps hingedly connected to a right angular side of each right triangular portion and extending to the surface of said other main panel. Thus the bearing flaps which are hinged to the cushioning panel form walls which engage the ends of the book, and the triangular portions on each side of the rectangular cushioning panel form triangular reinforcements which form a solid support for the bearing flanges which engage the ends of the book.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the book folder in closed position.

FIG. **2** is a perspective veiw of the cushioning structure at one end of the carton.

FIG. **3** is a plan view of a main panel carton wall with the cushioning structure attached thereto in erected condition.

FIG. **4** is a sectional view through the carton, the position of the section being indicated by the line **4—4** of FIG. **1.**

FIG. **5** is an enlarged side elevation of the cushioning structure.

FIG. **6** is a diagrammatic view of the blank from which the book folder is formed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The book folder is indicated in general by the letter A. The blank shown in FIG. **6** includes a first main panel **10**, a first side wall panel **11**, a second main panel **12**, a second side panel **13**, and a glue flap **14** which are hingedly connected together along parallel fold line **15**, **16**, **17**, and **19**. End panels **20** are foldably connected to the ends of the second main panel **12** along parallel fold lines **21** which intersect the previously described fold lines at right angles. Glue flaps **22** are foldably connected to the end flaps **20** along fold lines **23** which are parallel to the fold lines **20**. The panels thus formed may produce a tubular structure in the completed form of the folder with the end panels **20** closing the ends of the tubular structure.

The cushioning structures are foldably connected to the first main wall panel **10**. As the cushioning structures are both identical, the portions thereof will be described by similar numerals. Rectangular cushioning panels **24** are connected to the panel **10** along first cushioning panel fold lines **25** which are substantially alined with the fold lines **21** previously described. Bearing flaps **26** are connected to the cushioning flaps **24** along second cushioning flap fold lines **27**. The cushioning flaps **24** extend only a portion of the width of the main panels **10** to provide a triangular structure on each side of the cushioning panel **24** at each end of the carton. The portion of the first main panel **10** extending beyond the cushioning panel fold line **25** is defined by an edge extension **29** forming a continuation of the main panel edge **30** and an edge extension **31** which forms a continuation of the fold line **25**.

First trapezoidal triangular areas **32** are provided having their bases extending along the main panel edge **30** and the main panel edge extension **31**. These triangular areas are defined by bases extending along the edges **29** and **31**, and by equal length triangle sides **34** and **35** which converge together to the ends of the fold line **25**. Parallel fold lines **36** form the sides of the cushioning panel **24**, and form the bases of second isosceles triangular portions **37** which are defined by the fold lines **36**, and equal length sides **35** and **39** which have their apexes at the edges **29** and **31** which extend from the panel toward **30** and fold line **15**. Fold line extensions **40** of the fold line **37** define reinforcing flaps **41** between the fold line extensions **40** and the ends of the blank. Right triangular reinforcing flap areas **42** are provided between the second isosceles triangular portions **37** and the fold line extensions **40**, the base portion of these triangular areas **42** extending along the edge extensions **29** and **31**, the hypotenuse sides being formed by the fold lines **39**, and the right angular sides being formed by the fold lines **40**. This completes the folding of the end sections of the main panel **30**, forming the cushioning structure at the ends of the folder.

In folding the cushioning structure, the bearing flaps **26** and adjoining reinforcing flaps **41** are folded along the fold line **27** and its extension **40**. The carton is then folded along the fold line **25** until the cushioning panels **24** are at an acute angle to the main panel **10**. This folding action continues until the free edges of the bearing flap **26** and the reinforcing flaps **41** abut against the inner surface of the panel **10**. During this folding operation, the isosceles triangular portions **32** incline to an obtuse angular relation to the bottom panel **10**, the right triangular portions **42** form into right angular relation to the reinforcing flaps **41** and into parallel relation to the panel **10**, and the isosceles triangular portions **37** incline into angular relation to the cushioning panels **24** to which they are hinged. As a result, the triangular areas **32**, **42** and the right angular flaps **41** form triangular struts which form a firm support for the bearing flap **26** at each end of the folder. When folded in the manner described, the apexes of the isosceles triangular portions **37** and the base portion of the isosceles triangular portions **32** extend into engagement with the inner surfaces of the end panels **20**, and the fold lines **35** connecting the isosceles triangular portions **32** and **37** lie in the same vertical plane as the fold lines **25** as indicated in FIG. **2** of the drawings.

In forming the assembled cartons A, the book B is placed upon the panel **10**, and the cushioning structures are formed by flexing the bearing flap **26** and reinforcing flaps **41** into right angular relation to the remainder of the blank, the blank being folded along the fold lines **27** and alined fold lines **40**. The cushioning structure is then folded along the fold lines **25**, the bearing flanges **26** engaging the ends of the book and the triangular structures folding into the form illustrated in FIG. **3** of the drawings.

The folder is then completed by wrapping the remaining panels about the book, the side panel **11** extending upwardly from the edge of the panel **10**, the panel **12** folding over the top of the book, the side panel **13** overlying the opposite side of the book, and the glue flap **14** underlying the edge of the panel **10**. The reinforcing structure is then enclosed by folding the end walls **20** downwardly, and folding the glue flaps **22** under the panel **10** to complete the folding operation.

In accordance with the Patent Statutes, I have described the principles of construction and operation of my improvement in BOOK FOLDER; and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A blank for forming a book folder including a first main panel, a first side panel, a second main panel, a second side panel, and a side glue flap connected in series along parallel fold lines, an end panel secured to each end of said second main panel along end fold lines which are at right angles to said parallel fold lines, end glue flaps secured to said end panels along fold lines extending at right angles to said parallel fold lines, said first and second main panels and said first and second side panels being adapted to form a tubular body with said side glue flap adapted to be secured to said first main panel to hold said tubular body in tubular relation, said end panels being adapted to close the ends of said tubular body, and said end glue flaps being adapted to be secured to said first main panel and a cushioning structure connected to each end of said first main panel and defined by extensions of the side edges of said first main panel, each cushioning structure including:

a rectangular cushioning panel defined by parallel first and second cushioning panel fold lines spaced apart a distance greater than the width of said side panels, and connecting fold lines parallel to said

parallel fold lines and equally spaced from said first main panel edge extensions,

first isosceles triangular areas having their base sides extending along said first main panel extensions and their equal length sides converging from said base to apexes at an end of said first cushioning panel fold line,

second isosceles area having their bases extending along said connecting fold lines and having their equal lengths sides converging from the ends of said connecting fold lines to apexes at said extensions of said edges of said first main panel,

said second cushioning panel fold line having extensions extending to the extending edges of said first main panel and defining right triangular areas having their bases extending along said edge extensions of said first main panel and their hypotenuse sides hingedly connected to an equal length side of said second isosceles triangular area,

rectangular bearing flaps hinged to said cushioning panel along said second cushioning panel fold lines and adapted to fold into edge abutting relation to said first main panel and

rectangular reinforcing flaps hinged to the sides of said bearing flap and to the right triangular edges of said right triangular areas and adapted to fold into edge abutting relation to said first main panel.

2. The structure of claim **1** and in which said reinforcing flaps are adapted to fold into right angular relation to said second main panel.

3. A cushioned end book folder containing a book and the like the folder including:

a pair of parallel main panels and a pair of parallel side panels secured in tubular relation,

one of said main panels being rectangular and having end panels connected to the ends thereof, and glue flaps connected to said end panels and secured to the other main panel to close the folder,

a cushioning structure inwardly of each of said end panels, each cushioning structure including:

a rectangular cushioning panel hinged to an end of the central portion of the other main panel and folded inwardly at an acute angle to the other main panel,

a rectangular bearing flap connected to said cushioning panel and having its edge engaging the inner surface of said other main panel to form a hollow right triangular cushioning area between said other main panel, said cushioning panel, and said bearing flap, hollow triangular structures between the sides of said cushioning panels and said side panels, each hollow triangular structure including:

a first isosceles triangular area having its base extending along an extension of an edge of said other main panel and its apex at a corner of said rectangular cushioning panel, said first isosceles triangular area being at an obtuse angle to said other main panel,

a second isosceles triangular area connected to the first isosceles triangular area and having its base hingedly forming an edge of said rectangular cushioning panel, said second isosceles triangular area being at an acute angle to said other main panel,

a right triangular area having its hypotenuse side connected to an equal length side of said second isosceles triangular area said right triangular area being in face contact with the inner surface of said one main panel, and

a rectangular reinforcing flap hinged to said bearing flap and to the right triangular edge of said triangular area and extending in right angular relation to said other main panel having an edge thereof engaging said other main panel.

4. The structure of claim **3** and in which the bases of said first isosceles triangular areas are disconnected from said side panels.

5. The structure of claim **3** and in which said bearing flap connected to each cushioning panel is engageable with the book contained in said folder.

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