

Aug. 15, 1972

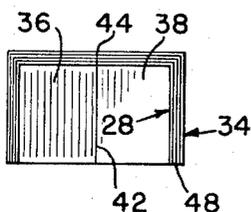
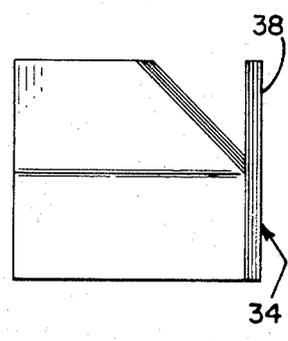
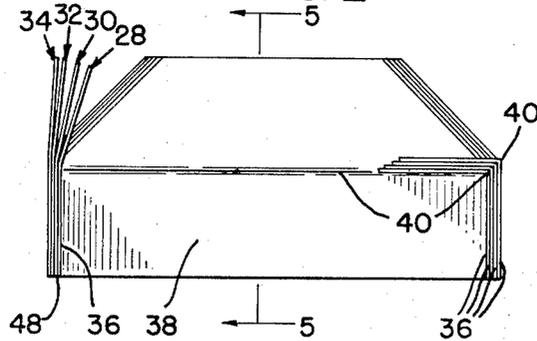
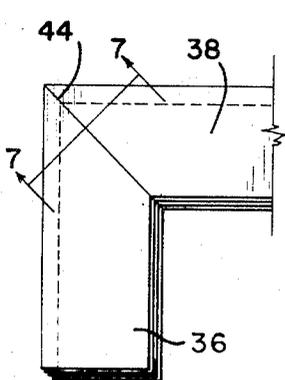
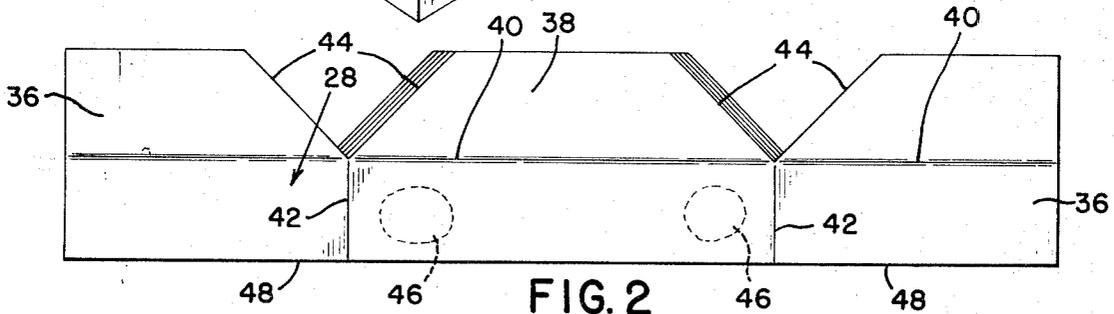
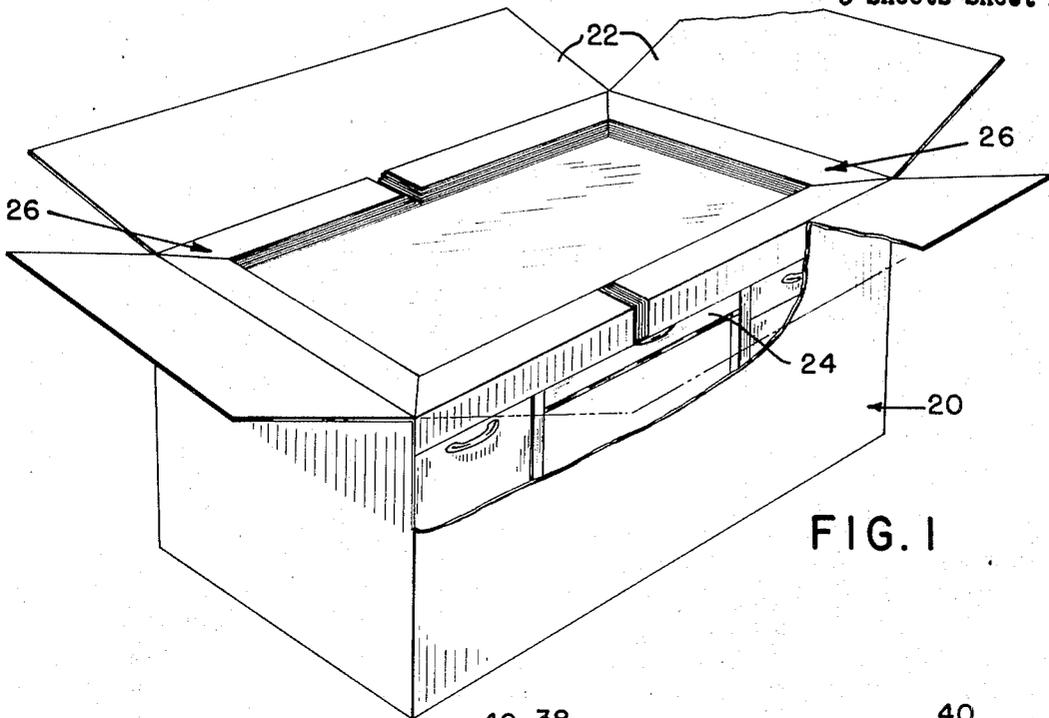
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3,684,636

PAPER BOARD CORNER PACKING CONSTRUCTION

Filed May 18, 1970

3 Sheets-Sheet 1



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PAPER BOARD CORNER PACKING CONSTRUCTION

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3 Sheets-Sheet 3

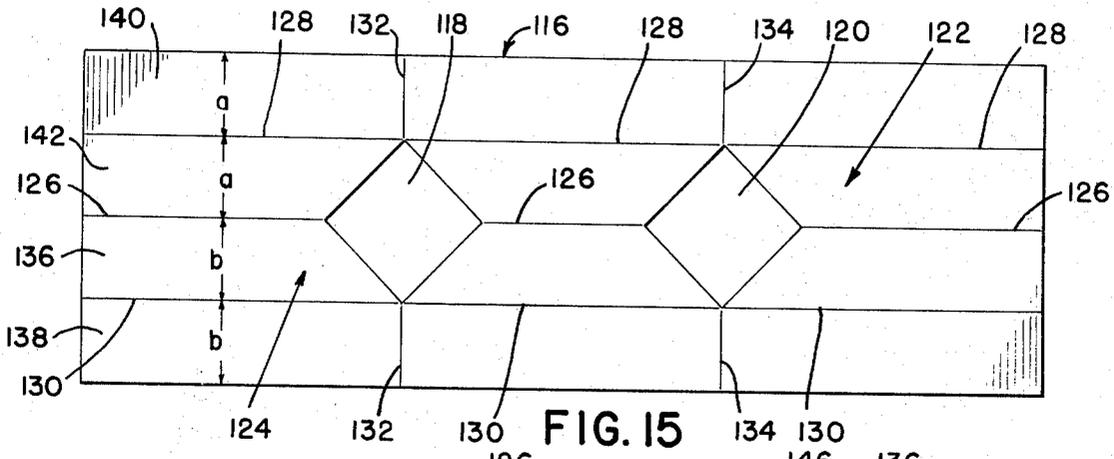


FIG. 15

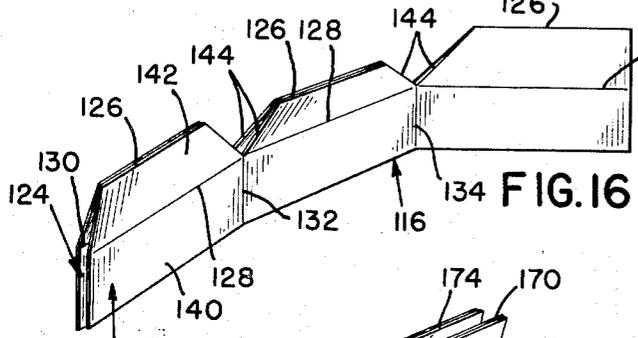


FIG. 16

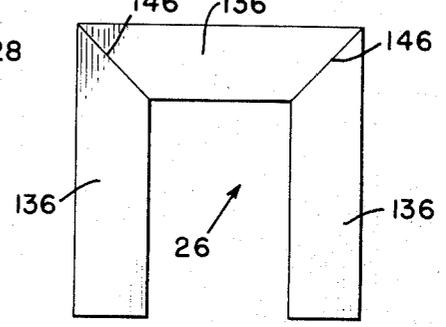


FIG. 17

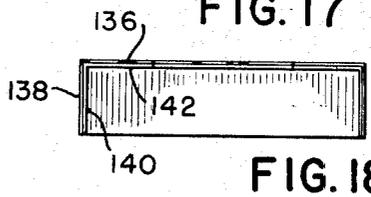


FIG. 18

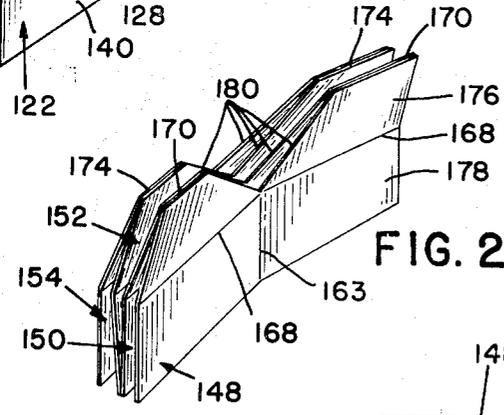


FIG. 20

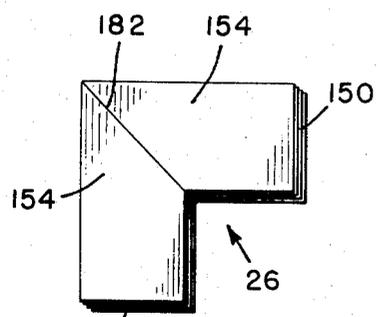


FIG. 21

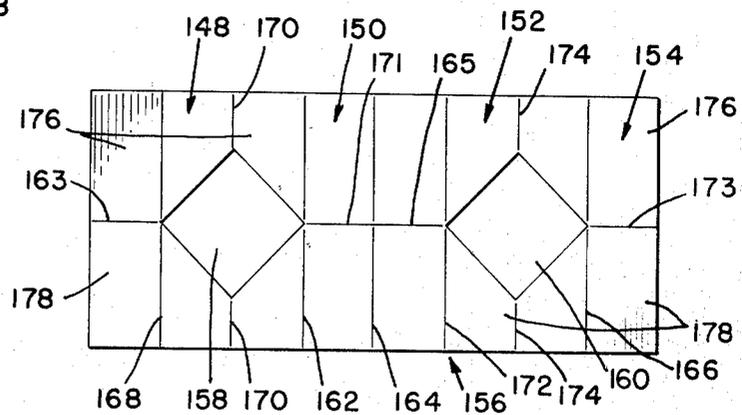


FIG. 19

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PAPER BOARD CORNER PACKING CONSTRUCTION

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ABSTRACT OF THE DISCLOSURE

A paper board packing construction comprising a plurality of panel sections secured together in a normally flattened condition and adapted to be folded along score and/or slit lines to enclose the corners and/or edges of an article to be shipped.

BACKGROUND, BRIEF SUMMARY, AND OBJECTS OF THE INVENTION

The present invention relates to new and useful improvements in packing construction, and more particularly to corner constructions adapted to be inserted within a container or carton between the walls thereof and the corners of an article packed within the container. The word "corner" is intended to include any point where converging lines, edges or sides of an article meet.

In the shipping of heavy or bulky articles which are likely to be damaged in transit, it has been the customary practice to place the articles within a container or carton and to space the corners of the article from the container walls by various means such as paper, excelsior, corrugated paper board, etc. When paper board is used, normally cardboard webs are folded a number of times along score lines to form a square corner construction from a plurality of thicknesses of cardboard where-in the edges of certain panels abut the edges of other panels. Such container packing construction is disclosed in U.S. Pat. No. 2,160,221.

The present corner packing construction is directed to a plurality of contiguous panel sections interconnected to maintain the panel sections in assembled relation. The stacked panel sections may be secured to each other by adhesive or other suitable means along designated areas, or the panel sections may be interconnected by the plain outer webs of the corrugated paper board. The corrugated paper board comprises an inner corrugated web positioned between first and second plain outer webs. The webs are bonded together in a conventional manner by adhesive. Alternatively, the corrugated board may be of the double wall corrugated type consisting of three plain webs and two corrugated webs adhesively bonded together. The stacked panel sections are of equal or different sizes having either generally square or V-shaped portions removed therefrom and indentations in the form of score lines or slits therein for permitting prescribed edges of the panel sections to be folded in abutting relation to form a mitred joint.

One of the primary objects of the invention is the provision of a paper board corner construction for packing which serves to effectively protect an article from damages due to vertical as well as transverse forces.

Another object of the invention is the provision of a packaging corner construction having maximum strength and rigidity for completely enclosing the corners of an article to be shipped.

Still another object of the invention is a paper board corner construction formed from a plurality of panel sections for spacing the article to be shipped from the

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side walls of a container to protect it from damage during shipment.

One feature of the invention is a corner packing construction which is normally in a flattened condition and which is readily foldable to conform to the corner of an article for packing of the article within a container.

Another feature of the invention is the provision of a method of forming a corner construction, having a plurality of panel sections, from a single paper board blank.

Still another feature is the provision of simple and inexpensive corner constructions which are economical to manufacture.

Other objects of the invention will become apparent to those skilled in the art from a consideration of the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a perspective view of the shipping container, with portions broken away, having an article positioned therein and illustrating the paper board corner constructions of the present invention for spacing the article from the container walls and to serve as a cushion for forces applied to the container;

FIG. 2 is a front elevational view of a first embodiment of the corner construction, before being folded, illustrating the score lines and the staggered relationship of the central portions of the stacked panel sections;

FIG. 3 is a top plan view of the corner construction shown in FIG. 2 illustrating the manner in which the ends of the individual panel sections are permitted to move relative to each other;

FIG. 4 is a front elevational view similar to FIG. 2 after the ends have been moved towards each other and illustrating the upper portions of the panel section ends on one side of the construction folded to a horizontal plane, and the upper portions of the panel section ends on the other side of the construction before being folded to the horizontal position;

FIG. 5 is a cross-sectional view of the corner construction taken along line 5—5 of FIG. 4;

FIG. 6 is a partial top plan view of the corner construction after the panel sections have been folded, and illustrating the mitred joint;

FIG. 7 is a cross-sectional view of the corner of the paper board construction taken along line 7—7 of FIG. 6;

FIG. 8 is a front elevational view of a modified form of corner construction with the panel sections positioned in a substantially flat, stacked relationship;

FIG. 9 is a bottom plan view of the corner construction of FIG. 8;

FIG. 10 is a side elevational view of the corner construction of FIG. 8;

FIG. 11 is a perspective view of the panel construction of FIG. 8 after the panel sections have been folded into position;

FIG. 12 is a front elevational view, prior to folding of the panel sections, of another embodiment of the invention;

FIG. 13 is a perspective view illustrating the manner of folding the panel sections of FIG. 12;

FIG. 14 is a front elevational view of the panel sections of FIGS. 12 and 13, after the sections have been folded to a substantially flat, stacked relationship.

FIG. 15 is a top plan view of still another embodiment of the invention illustrating a panel section in a flattened condition;

FIG. 16 is a perspective view illustrating the manner of folding the panel section of FIG. 15;

FIG. 17 is a top plan view of the corner construction after the panel section has been folded;

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FIG. 18 is a front elevational view of the corner construction of FIG. 17;

FIG. 19 is a top plan view of a further embodiment of a panel section in a flattened condition;

FIG. 20 is a perspective view of the partially folded panel section of FIG. 19; and

FIG. 21 is a top plan view of the folded panel section of FIG. 19.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates a conventional carton or shipping container 20 with the top flaps 22 opened and having a desk 24 or other article positioned therein. In order to pack the desk or other article within the container 20 for suitable shipment, the paper board corner constructions 26 are provided to prevent damage to the desk by providing a cushion for the corners thereof and by spacing the desk inwardly from the walls of the containers. The corner construction consists of a plurality of paper board panel sections, each section preferably being formed of the single or double wall type comprising one or more corrugated filler webs interposed between facing plain webs of cardboard. All of the webs are bonded together in a conventional manner by adhesive.

FIGS. 2-7 illustrate one embodiment of the corner construction 26 comprising a plurality of substantially rectangular panel sections 28, 30, 32 and 34, each consisting of end segments 36 and a central segment 38. Each panel section 28-34 is provided with a horizontal score line 40 extending through segments 36 and 38, for dividing each segment into upper and lower portions, and vertically extending score lines 42 positioned at the juncture of the end segments with the central segment. Each of the panel sections 28-34 is mitred at 44 to remove substantially V-shaped portions from the junctures of the central and end segments 36, 38 and thereafter stacked in the manner shown by FIG. 2. As can be seen most clearly from FIGS. 2-5, the end segments 36 and central segments 38 of adjacent panel sections are of different sizes. Furthermore, while each panel section 28-34 is provided with the horizontal score line 40 and two vertical score lines 42, the position of the score lines on adjacent panel sections varies slightly as shown by FIG. 4. The height of the score lines 40 above the base 48 of the panel sections increases slightly from the innermost panel section 28 to the outermost panel section 34 from the position shown at the left side of FIG. 4 to the folded position shown at the right side of FIG. 4. Also, the spacing between the parallel score lines 42, 42 on the panel sections increases slightly from the innermost section 28 to the outer section 34 to facilitate folding of the end segments 36, 36 to positions normal to the central segment 38. While the angled edges of the upper portion of the central segment 38 are parallel, the upper central segment 38 of adjacent panel sections increases in width uniformly from the panel section 28 to the panel section 34, as shown by FIG. 2. The panel segments 28-34 are secured together by adhesive 46 or other suitable means, only on the lower portions of the central segments 38, thus permitting pivotable or sliding movement of the end segments of each panel relative to each other, as shown by FIGS. 3 and 4. The corner constructions are normally stored in a substantially flat condition, as shown by FIG. 2, until such time that they are to be positioned on the corners of an article to be shipped within a carton.

The corner construction end segments 36 are folded along score lines 42 until they extend substantially normal to the central segment 38, as shown for example at the left end of FIG. 4. The upper portions of each of the central and end segments are then folded approximately ninety degrees about the score line 40 to define mitred joints 44, one of which is shown by FIG. 6, to form the corner construction. Thus it can be seen that the upper edges of the central segments 38 and the end segments 36

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of each panel are in abutting relationship to form the joint 44 as shown in FIGS. 6 and 7. While the corner constructions 26 described above are of a length sufficient to extend generally around the entire upper corners or perimeter of the article 24 to be shipped, as shown by FIG. 1, it is obvious that small, individual mitred constructions 26, as shown by FIG. 11, may be provided for specified corners of the article 24. In addition, a number of straight cardboard sections may be provided intermediate the small constructions 26 for protecting the article 24 around the entire perimeter thereof.

FIGS. 8-11 illustrate a second embodiment of the paper board corner construction 26 comprising a series of panel sections 50-56. A score line 62 divides each panel section into a lower segment 58 and an upper segment 60. The upper segment 60 of each panel section has a V-shaped portion removed therefrom, as shown by FIG. 8, thus dividing the upper segment into two generally triangular portions 64, 66. The lower segment 58 is divided into two portions 68, 70 by a score line 72. As will be observed from FIG. 8, the left edge 74, the base 76 and the edge 78 of each panel section 50-56 are aligned while the edge portions 80 and 82 of each section are parallel with adjacent sections increasing uniformly in size from the inner panel section 50 to the outer panel section 56. The sections are maintained in assembled relation by adhesive 84, or other suitable means positioned between portions 68 of the panel sections, thus leaving the portions 64, 66, 70 of the sections free to move relative to each other. As can be observed from FIG. 9, the position of the score line 72 on the lower segment 58 of the sections progressively moves toward the section edge 82 from the inner panel section 50 to the outer panel section 56. Also, the height of the score lines 62 above the section base 76 increases slightly from the inner panel section 50 to the outer panel section 56, as shown by FIG. 10. By progressively staggering the score lines on adjacent panel sections, the portions 68, 70 of each lower segment 58 can be folded toward each other about score lines 72 into a substantially right angular configuration, and the portions 64, 66 of each upper segment 60 are folded approximately ninety degrees about the score lines 62 to form a mitred joint 86 resulting in a corner construction substantially as shown by FIG. 11. It is to be noted that all edges 74, 76, 78, 80 and 82 of the panel segments are aligned when in the folded condition of FIG. 11.

FIGS. 12-14 illustrate another embodiment of the invention wherein the corner construction panel sections 88, 90, 92 and 94 are formed from a single blank 96, of paper board, by cutting the blank to the general configuration of FIG. 12. As can be readily observed from FIGS. 12 and 14, adjacent panel sections vary both in height and in width. The panel sections are formed from the blank by slitting one of the plain cardboard outer webs and the inner corrugated web of the paper board blank. In order to fold the panel sections in the accordian fashion of FIG. 13, it is necessary for the slits 98 and 102 to be on one side of the blank cutting through one of the plain outer webs, and for the slit 100 to be on the other side of the blank cutting through the other plain cardboard web. Each of the panel sections 88-94, of generally the same configuration as the panel sections of FIG. 8, are divided into upper and lower segments 104, 106, respectively, by score lines 108. The position of the score lines above the base 110 of the panel sections progressively increases from the inner panel section 88 to the outer panel section 94 similarly to the score lines 62 of the embodiment illustrated by FIGS. 8-11. Score lines 112 are positioned on each of the panel sections 88-94 such that when the sections are in the folded condition of FIGS. 13 and 14, the score lines 112 are aligned. A small amount of adhesive 114 is positioned between adjacent panel sections, as shown in FIG. 13, to maintain the panel sections in a flattened condition until such time they are required for

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packing. The panel sections then are folded along score lines 108 and 112, breaking the adhesive seal, to form a corner construction similar to that illustrated by FIG. 11.

Still another embodiment of the invention is illustrated in FIGS. 15-18 wherein the corner construction 26 is formed from a single paper board blank 116 cut to a generally rectangular configuration with openings 118, 120 formed therein as shown by FIG. 15. The panel sections 122 and 124 are formed from blank 116 by slitting the cardboard plain outer web or webs on one side of the blank 116 and the inner corrugated webs along line 126 such that the panel sections can be folded to the configuration of FIG. 16. The blank 116 is scored along lines 128, 130 and along lines 132 and 134 to facilitate folding to the positions of FIGS. 17, 18. The width *b* of each segment 136 and 138 of panel section 124 is slightly greater than the width *a* of each segment 140 and 142 of panel section 122 such that the edges of the sections 122, 124 will be approximately flush when folded. As shown by FIG. 15, the segments 136 and 142 of panel sections 124 and 122, respectively, having openings 118, 120 formed therein, define mitred surfaces 144 which form mitred joints 146, when folded as shown by FIG. 17.

FIGS. 19-21 illustrate an embodiment of the corner packing construction including panel sections 148, 150, 152 and 154 formed from a paper board blank 156 having portions removed therefrom to define openings 158, 160. In order to fold sections 148-152 in an accordian fashion, as shown by FIG. 20, it is necessary to slit the blank 156 at 162, 164, 166, 163, and 165 on one side and to provide slits 168, 170, 171, 172, 173 and 174 on the opposite side of the blank. The slits 170, 164 and 174 separate panel sections 148 and 150, 150 and 152, and 152 and 154, respectively, as illustrated by FIG. 19. The panel sections 148-154 generally are of the same size and each is divided into upper and lower segments 176 and 178 by slits 163, 171, 165, 173 and openings 156, 158. When folded as shown in FIG. 20, the panel sections 148-154 cooperates with openings 156, 158 to define mitred surfaces 180 which can be folded to form a mitred joint 182.

It will be readily apparent that the corner constructions 26, of each of the embodiments, may be shipped and stored in its flat state. When it is desired to utilize the corner construction, it is merely folded along the score lines and/or slit lines until it assumes a generally right angular configuration as shown by FIGS. 6, 11, 17 or 21. It will be noted that when the construction 26 is folded to the right angular configuration, each panel section forms a mitred joint wherein opposed edges of the panel sections abut to completely enclose the corners to afford maximum strength and rigidity to the corner construction. Therefore, the corner constructions have vertical as well as transverse crushing resistance.

The number of panel sections utilized in each corner construction may vary depending upon the particular articles to be packed. Furthermore, the particular number of plain and corrugated webs forming the paper board blanks or sections may vary.

We claim:

1. A corner packing construction comprising: a plurality of panel sections maintained in a substantially flattened condition, means for retaining said panel sections in a joined relationship, each panel section having a planar surface including at least one pair of mitred edges forming an included angle of less than 180° forming cut out sections in said planar surface and each of said plurality of panel sections having indentation means formed therein for permitting said plurality of panel sections to be folded to an angular configuration wherein said one pair of mitred edges coincide with each other

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and abut forming another planar surface at an angle with said first planar surface along an extended line to define a mitred joint for enclosing a corner of an article to be packed.

2. A corner packing construction as defined in claim 1, wherein said plurality of panel sections are maintained in a stacked relationship, said panel sections being of varying sizes to define at least one series of panel section edges in parallel, stepped relation for permitting the panel sections to be folded to the right angular configuration.

3. A corner packing construction as defined in claim 1, further including adhesive means for retaining said panel sections in joined relationship.

4. A packing corner construction as defined in claim 1, said indentation means including a first score line provided on each of said panel sections, the score lines on adjacent panel sections being spaced from each other to facilitate folding of the panel sections.

5. A packing corner construction as defined in claim 2, wherein said stacked panel sections are of uniformly varying size and define a second series of edges in parallel, stepped relation, and at least one series of edges in flush alignment.

6. A packing corner construction as defined in claim 1, said panel sections being of equal size having at least one series of panel section edges in aligned relationship.

7. A packing corner construction comprising: a plurality of nested panel sections of uniformly varying size, each of said panel sections having a first segment folded substantially to a configuration forming an included angle of less than 180°, and a second segment folded substantially at right angles with respect to said first segment to define a mitred joint, said mitred joint being formed by abutting edges of each panel section of said plurality of panel sections.

8. The method of forming a corner packing construction comprising the steps of: forming a plurality of paper board panel sections, mitering at least one portion of each of the panel sections to form at least one pair of mitred edges having an included angle of less than 180°, positioning the panel sections in a stacked relationship and folding the stacked panel sections to bring each pair of mitred edges together in abutting relationship to form at least one mitred joint while retaining the panel sections in joined relationship.

9. The method of forming a corner packing construction as defined in claim 8, wherein the flat paper board panel sections are of uniformly varying sizes.

10. The method of forming a corner packing construction as defined in claim 8, wherein the paper board panel sections are formed by sectionalizing a single paper board element.

11. The method of forming a corner packing construction as defined in claim 8, wherein the paper board panel sections are sectionalized by scoring the element along preselected lines, and partially slitting the element in designated areas.

References Cited

UNITED STATES PATENTS

2,950,038	8/1960	Rupp	229-14 C
2,867,367	1/1959	Butz	229-14 C
2,509,468	5/1950	Anderson, Jr.	229-14 C
3,220,683	11/1965	Doll	229-14 C X
3,511,464	5/1970	Doll	229-14 C X
3,337,111	8/1967	Petrieckis et al.	229-14 C

PHILIP DIER, Primary Examiner

U.S. Cl. X.R.

156-204, 257; 161-44, 108; 229-14