

Dec. 9, 1969

R. ORTIZ
CORNER PACKING DEVICE

3,482,759

Filed March 25, 1968

2 Sheets-Sheet 1

FIG. 1.

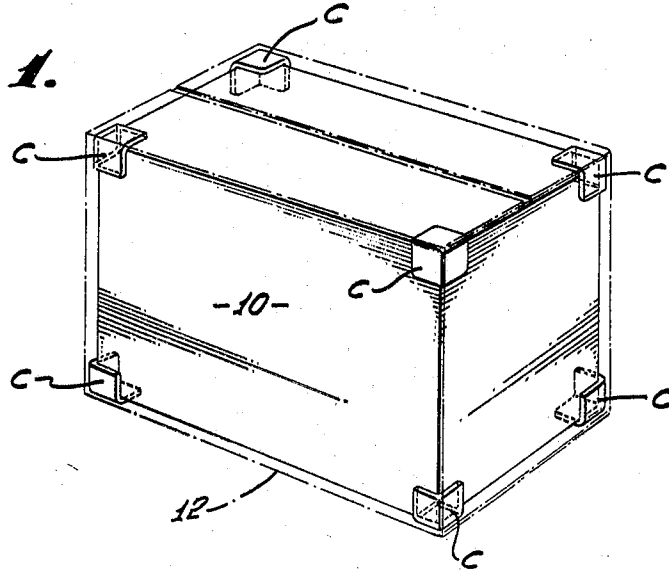


FIG. 3.

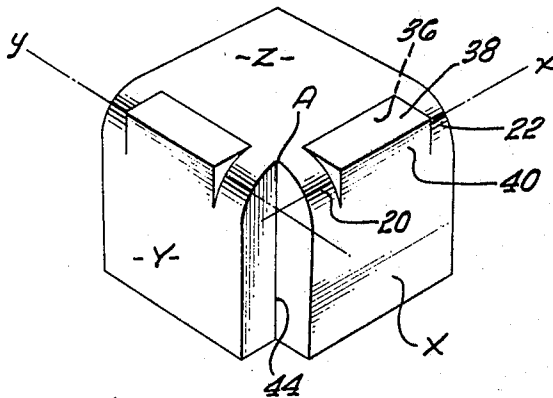


FIG. 2.

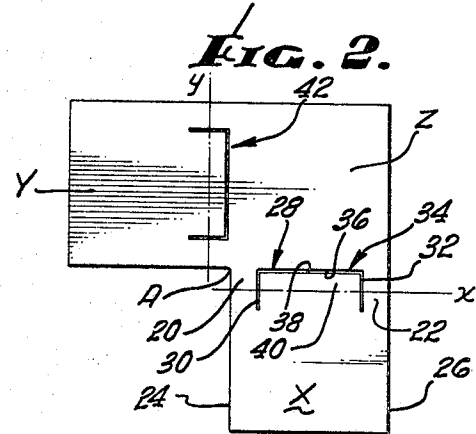


FIG. 4.

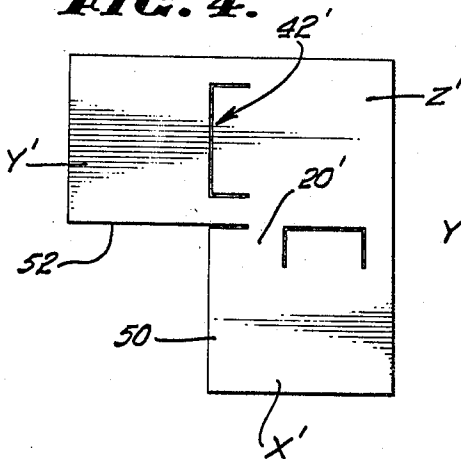
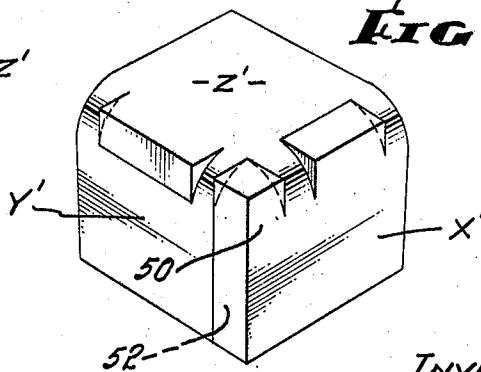


FIG. 5.



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FIG. 6.

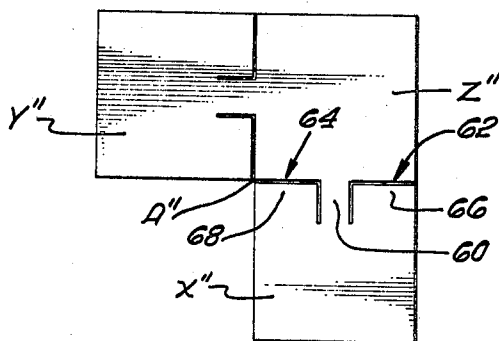


FIG. 7.

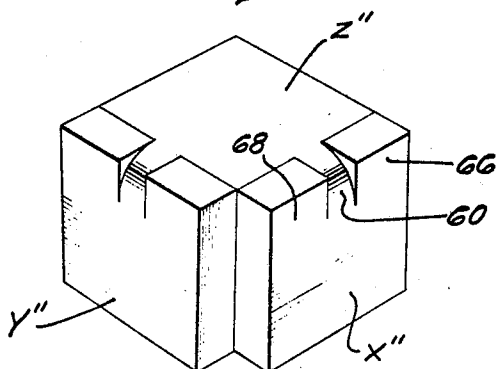


FIG. 8.

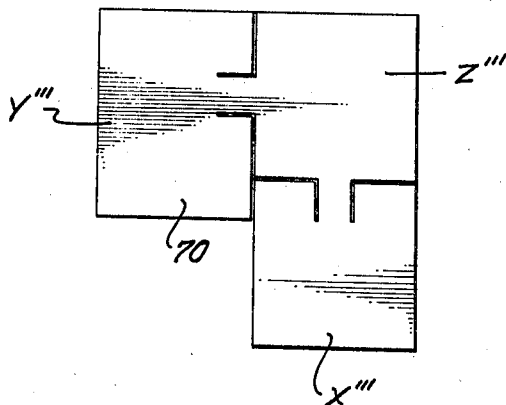
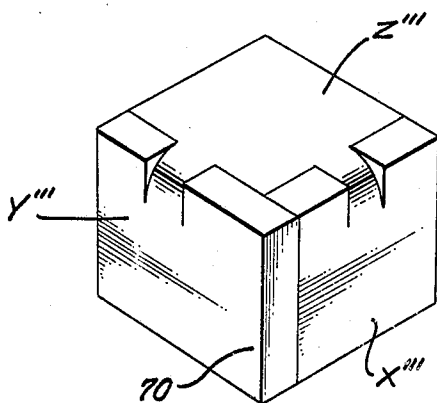


FIG. 9.



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3,482,759

CORNER PACKING DEVICE

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12 Claims

ABSTRACT OF THE DISCLOSURE

The corner structure is die cut from sheet material to form three sides. Die cuts also form hinges, as well as a flap that interlocks the adjacent corner side whereby a stable corner structure results.

BRIEF SUMMARY OF THE INVENTION

This invention relates to the problem of packing cabinets, appliances or other articles for shipment. Such articles can be created by being first rigidly secured to a suitable base about which the crate is constructed. This is quite satisfactory if no undue shock loads are imposed upon the crate; however, the crating process is fairly expensive. In general, packing such articles in cartons is less expensive. Molded expanded poly-styrene cases are often used to provide a suitable protective shell enclosure for the article. This is especially advantageous if the article is of irregular shape.

When packing articles of substantially rectangular or parallelepiped configuration in cartons, there is no particular need for a molded shell enclosure; eight corner devices can be installed. In the past, molded expanded polystyrene corners have been used. This material does provide shock cushioning; however, the material does not recover or return to its original configuration, and repeated shock loads pose the possibility of damage to the packaged article since the polystyrene compresses and creates slack. Moreover, this material produces certain changes on the furniture finish of the cabinet if it remains in contact for considerable periods of time. Polyurethane foam has better properties of resilient recovery and does not mar the cabinet finish. This material, however, cannot be economically molded. Polyurethane can be fabricated from sheet material into a corner configuration, as by cementing certain components in right angle relationship to other components. This fabrication process is likewise expensive.

The primary object of this invention is to provide a new, simple method of fabricating a corner structure from sheet material having suitable protective characteristics. In order to accomplish this object, I die cut sheet material in such manner as to form three integrally joined parts that may be folded to a stable corner cup configuration. Two types of operative elements are formed at the juncture between the corner parts, one of the elements being a hinge and the other of the elements being an interlock for holding the parts in a three-dimensional configuration. By ensuring a stable three-dimensional configuration, there is no opportunity for the corner to unfold and creep around the corner of the article with consequent loss of protection.

Another object of this invention is to provide a new corner structure of this character in which the hinge elements are so formed as to provide substantial bending radii whereby under stress on the hinge elements that would otherwise tend to tear the material, is avoided.

Another object of the invention is to provide a corner structure made by die cutting sheet material and folding parts into position. A companion object of this invention is to provide a corner structure of this character that re-

quires no staples, adhesive or other supplementary means for assembly. Another companion object is to provide a corner structure of this character having a pattern enabling a plurality of such structures to be cut from a common rectangular sheet without waste.

This invention possesses many other advantages and has other objects which may be made more clearly apparent from consideration of several embodiments of the invention. For this purpose, there are shown a few forms in the drawings accompanying and forming part of the present specification, and which drawings are true scale. These forms will now be described in detail, illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a pictorial view of a cabinet packaged in a carton by the aid of eight corner structures, each incorporating my invention, the carton being shown in dot and dash lines.

FIGS. 2 and 3 illustrate one form of the invention, FIG. 2 being a plan view of the die cut sheet material, and FIG. 3 being a pictorial view of the completed part.

FIGS. 4-5, 6-7 and 8-9 are sets of views corresponding respectively to FIGS. 2 and 3 and showing other modified forms of the present invention.

DETAILED DESCRIPTION

In FIG. 1 there is illustrated a substantially rectangular or parallelepiped cabinet, furniture or other article 10 to be shipped in a cardboard or similar carton 12. Eight corner structures C protect the article 10. These corner structures fit between the inside corners of the carton and the outside corners of the article packed. The corner structures each have three parts extending mutually in right-angle relationship with respect to each other to define a cup for receiving the furniture corner. The corner structures preferably are slightly compressed in the carton 12 and, furthermore, desirably have a resilient characteristic in order to provide suitable recovery upon impact whereby the article is protected. Various materials exhibiting suitable properties of tensile strength, shear strength and resilience may be suitable. One such material is polyurethane foam having any suitable density. Cardboard or foam material may be installed between the sides of the carton and the sides of the cabinet if desired for supplemental protection.

One corner structure is shown in FIGS. 2 and 3. FIG. 2 illustrates the corner structure as cut from the sheet material. At this stage, the structure is in the form of a block L or angle. The ends of the block L form two substantially square parts X and Y, and the center forms a third substantially square part Z. The part X is turned downwardly about the fold axis *x* to a 90° position relative to the part Z. The part Y is similarly turned downwardly about the fold axis *y*. The axes *x* and *y* extend across the structure at the region of the juncture of the parts, the folding axes *x* and *y* being perpendicular. Hence, the parts extend at right angles to the other from a common apex or corner A.

In order to facilitate the folding, strap type hinges integrally join parts X and Y to the part Z. Thus, the part X is joined to the part Z by hinges 20 and 22 adjacent the side edges 24 and 26 of the part X. The hinges 20 and 22 are formed by a substantially U-shaped or three-sided die cut 28. The cut has one section 30 extending parallel to the edge 24 and at right angles to the bending axis *x*. The die cut has a similar section 32 parallel to the edge 26 and likewise extending at right angles to the axis *x*. Sections 30 and 32 are joined at corresponding ends by

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a section 34 that is aligned with the side edge of the companion part Y. This section 34 defines opposed surfaces 36 and 38 at the juncture of the parts Z and X respectively. The U-shaped die cut 28 defines a flap 40 that serves to interlock the parts Z and X. Thus, when the part X is rotated about the axis *x* and as shown in FIG. 3, the end surface 38 rotates upwardly into a coplanar relationship with the part Z. At the same time, the undersurface of the part X snaps into opposed relationship to the side surface 36 of the part Z whereby the part X is restrained from returning to coplanar relationship with the part Z. The hinge sections 20 and 22 are just long enough to achieve a tight interlock. In practice, the hinges have lengths about equal to the thickness of the material.

A similar die cut 42 is provided between the parts Y and Z. As shown in FIG. 3, the edges of the parts X and Y meet along the line 44. The hinges 20 and 22 extend perpendicular to the bending axis *x* for a considerable distance. Thus, fairly large bending radii are defined whereby undue compression or expansion of the hinge is avoided.

The form of the invention shown in FIGS. 4 and 5 is similar to that shown in FIGS. 2 and 3. Three parts X', Y' and Z' are provided as before. One difference is that the part X' has an added flap 50 beyond the hinge 20'. The undersurface of the flap 50 butts up against the side surface 52 of the part Y'. The orientation of the U-shaped die cut 42' is reversed without change in operation.

The form of the invention shown in FIGS. 6 and 7 is similar to the previous forms, except that each of the parts X'' and Y'' is connected to the central part Z'' by a single hinge. Thus, the part X'' is connected to the central part Z'' by a hinge 60. Two L-shaped die cuts 62 and 64 are provided to define the opposed side surfaces of the parts X'' and Z'' as well as the hinge 60. The cut 62 extends inwardly from the corner A'' in alignment with the side edge of part Y''. The cut 64 extends inwardly from the opposite edge. Both cuts 62 and 64 terminate at spaced ends extending parallel to each other to form the hinge 60. In this instance, two flaps 66 and 68 are provided, the undersurfaces of which interlock with the side surfaces of the part Z'' as shown in FIG. 7. The part Y'' is similarly formed.

In the form shown in FIGS. 8 and 9 a similar arrangement is provided, except that the part Y''' has an added side extension as at 70 in order to provide a butt joint between the parts X''' and Y'''.

In all forms of the invention the hinge is formed by die cuts extending substantially perpendicular to the bending axes. Accordingly, no undue strain is imposed upon the hinges. In all forms, a suitable interlock is provided to hold the corner structures in a three-dimensional configuration so that it remains in place at the corners of the carton without creeping.

I claim:

1. A corner packing structure having three integrally joined parts cut from resilient sheet material having sufficient thickness to provide cushioning, the first and second parts adjoining the third part respectively along side edges of the third part that extend substantially at right angles with respect to each other; hinge means integrally connecting the first part to the third part and formed by cuts extending substantially at right angles to the corresponding edge of said third part; and hinge means integrally connecting the second part to the third part and formed by cuts extending substantially at right angles to the corresponding edge of said third part; said cuts forming flaps locking the first and third parts in substantially right angle relationship to said third part.

2. The corner carton packing structure as set forth in claim 1 in which said first part has a side extension overlapping the side of said second part when said parts are folded to a right angle relationship with respect to said third part.

3. A corner carton packing structure having three inte-

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grally joined parts made of resilient sheet material having sufficient thickness to provide cushioning, said three parts extending along the outside of an L-shaped boundary with one side of the boundary forming the edge of the first part and the other side of the boundary forming the edge of the second part, the third part being located between the first and second parts; means forming opposed edges between the first and third parts and between the second and third parts, said opposed edges terminating in right angle ends forming integral strap hinges between the corresponding parts with the areas located laterally of said right angle ends forming flaps interlocking the companion parts upon movement of the parts to mutual right angle relationship to prevent return movement of said parts to coplanar relationship.

4. The corner carton structure as set forth in claim 3 in which the corner of the L-shaped boundary forms the apex of the cup formed as the first and second parts are folded to a right angle relationship.

5. The corner carton structure as set forth in claim 3 in which one side of the L-shaped boundary is extended to cross the other side to terminate at a point that is the apex of the cup formed as the first and second parts are folded, the flap formed by the extended part of the L-shaped boundary abutting the edge of the companion part.

6. The corner carton structure as set forth in claim 3 in which the said opposed edges of the first and third parts are formed by a U-shaped cut with the sides of the cut forming the sides of the strap hinges at the sides of the parts, with the intermediate part forming the interlocking flap.

7. The corner carton structure as set forth in claim 6 in which the said opposed edges of the second and third parts are formed by a U-shaped cut with the sides of the cut forming the sides of the strap hinges at the sides of the parts, with the intermediate part forming the interlocking flap.

8. The corner carton structure as set forth in claim 3 in which the said opposed edges of the first and third parts are formed by a pair of spaced L-shaped cuts having legs paralleling each other at the center of said parts to form the strap hinge with the portions located laterally of the hinge forming the interlocking flaps.

9. The corner carton structure as set forth in claim 8 in which the said opposed edges of the second and third parts are formed by a pair of spaced L-shaped cuts having legs paralleling each other at the center of the parts to form the strap hinge with the portions located laterally of the hinge forming the interlocking flaps.

10. A corner carton packing structure having three integrally joined parts cut from resilient sheet material having sufficient thickness to provide cushioning; said parts together having a block L configuration with an L-shaped edge on the inside of the block, and a substantially L-shaped edge on the outside of the block; the first and second parts being located at the ends and the third part being located at the corner between the first and second parts; one side of the inside edge being continued to form a side flap on the first part; a first substantially U-shaped cut having a central portion forming opposed edges between the first and third parts, and located in substantial alignment with one side of said inside edge, the ends of said U-shaped cut extending away from said third part and forming spaced strap hinges along the sides of said first part integrally joined to said third part; a second substantially U-shaped cut having a central portion forming opposed edges between the second and third parts, and located in substantial alignment with the other side of said inside edge, the ends of said U-shaped cut extending inwardly of said third part and forming spaced strap hinges along the sides of said third part integrally joined to said second part; the portions of said parts between the ends of said U-shaped cuts forming flaps interlocking the companion parts upon folding of said parts

to a mutual right angle relationship, and the flap along the side of said one part abutting the companion edge of said second part.

11. A corner carton packing structure having three integrally joined parts cut from resilient sheet material having sufficient thickness to provide cushioning; said parts together having a block L configuration with an L-shaped edge on the inside of the block, and a substantially L-shaped edge on the outside of the block; the first and second parts being located at the ends and the third part being located at the corner between the first and second parts; the first and second parts each being partially severed from the third part by a pair of cuts; the cuts between the first part and the third part extending inwardly from the sides of the parts in substantial alignment and terminating substantially centrally of the parts in spaced angled substantially parallel ends defining a strap hinge between the parts; the cuts between the second part and the third part extending inwardly from the sides of the parts in substantial alignment and terminating substantially centrally of the parts in spaced angle substantially parallel ends defining a strap hinge between the parts; portions of said parts laterally adjoining said strap hinges forming flaps interlocking the com-

panion parts upon folding of said parts to a mutual right angle relationship.

12. The corner carton packing structure as set forth in claim 11 in which one of the cuts along the second and third parts extends inwardly from the corner of said inside L-shaped edge whereby a flap is formed on the first part that abuts the companion edge of said second part.

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