United States Patent

Carroll

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[54] CORNER PROTECTOR

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[52] **U.S. Cl.** .....**229/14 C,** 206/46 FC

[51] **Int. Cl.** **B65d 5/56**

[58] **Field of Search** .....229/14 C, DIG. 1; 206/46 FC

[56] **References Cited**

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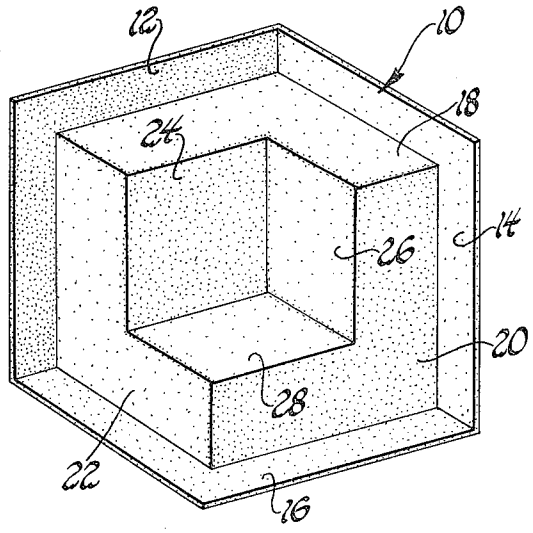
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[57] **ABSTRACT**

A corner protector for packing assemblies comprising an injection molded, monolithic plastic sheet formed into an article receiving pocket, three spaced walls and three carton-engaging border walls. The protector is a shell of single sheet thickness but is rigidified when loaded.

6 Claims, 5 Drawing Figures



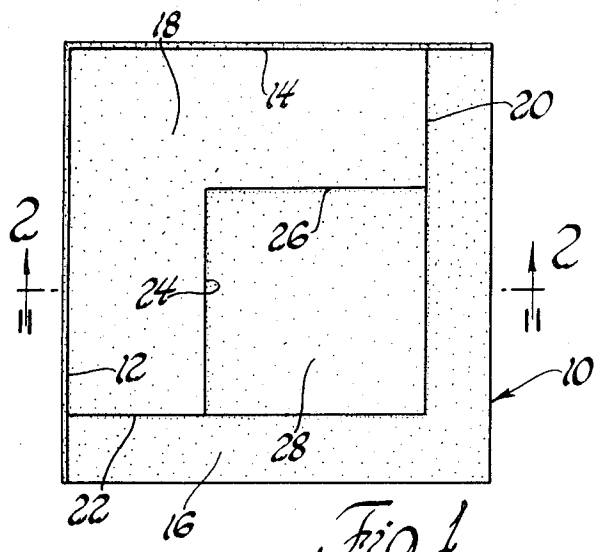


Fig. 1

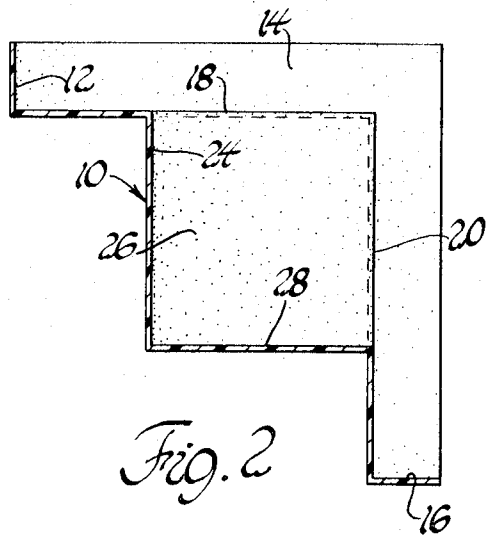


Fig. 2

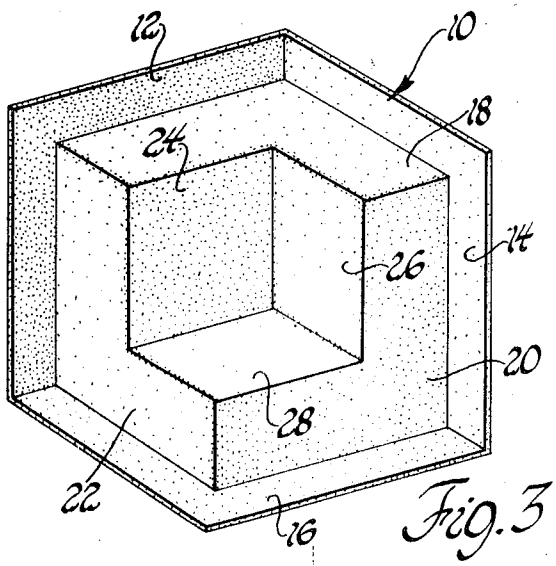


Fig. 3

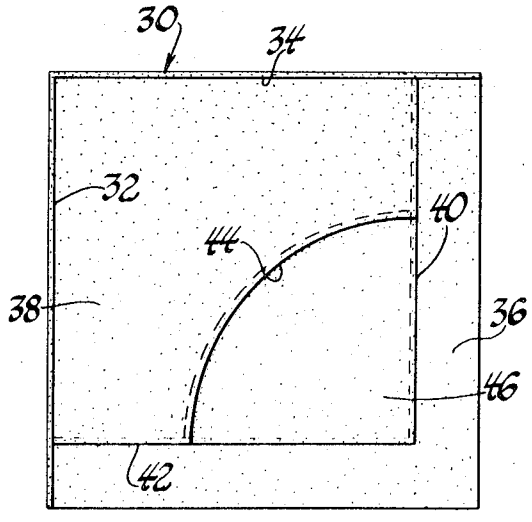


Fig. 4

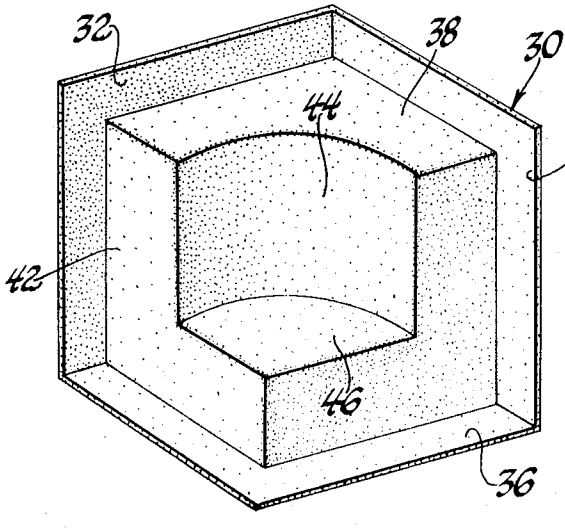


Fig. 5

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CORNER PROTECTOR

This invention relates to packing apparatus and particularly to corner protectors.

A corner protector is a packing device which is placed between an article and the interior corner of a shipping container such as a cardboard carton to protect the edge or corner of the article against damage. Corner protectors of various types are known to be fabricated from trihedral arrangements of several thicknesses of corrugated cardboard, foamed plastic trihedrons, molded rubber blocks with trihedral pockets, cylindrical posts with and without article receiving slots and many other arrangements of materials.

The general problem with such prior art devices is that when in the useable condition, the devices are somewhat bulky and although light are not in themselves easily handled or shipped prior to actual use. One answer to this problem is to fabricate the corner protector from cardboard or some other relatively flat, foldable material in such a fashion as to permit the material to be folded in a predetermined way immediately prior to use. This facilitates shipping and handling but obviously requires an assembly step just prior to the use of the corner protector for its intended purpose.

The present invention provides a corner protector which is light, yet strong, nestable for high-density preuse or post-use handling in the ready to use condition and, thus, requires no assembly step between handling and use. Moreover, the subject invention provides a corner protector which is a shell of single sheet thickness, yet having high structural rigidity when in use and which provides supported article protection by spacing the article away from all three of the mutually intersecting carton walls which make up the various corners thereof.

In general, this is accomplished by forming a corner protector from a monolithic sheet of polymeric material to define three, flat, and linearly contiguous perimeter walls which lie against the three trihedral walls of a carton corner, three flat and linearly contiguous spacer walls each of which lies perpendicular to a pair of perimeter walls, and a shaped recess or pocket for receiving the article to be protected. This pocket, which may be trihedral, semicylindrical, or otherwise shaped to the article, is spaced away from all three of the trihedral walls and, thus, is spaced away from the carton corner thereby to suspend and cushion an article within a carton from all of the walls of the carton. Since the subject corner protector is monolithic in structure and of a single sheet thickness, it may be interfittingly nested with similar structures. Moreover, in use the arrangement of walls is such that the load imposed by the article actually rigidifies the structure.

The subject device is readily vacuum drawn or injection molded or otherwise fabricated from a monolithic sheet of relatively flexible polymeric or "plastic" material, such as polyethylene. Such material is light, inexpensive, durable, waterproof, and has a substantially less abrasive surface characteristic than paper or foamed polystyrene and, thus, is less likely to mar the articles in contact therewith.

The various features and advantages of the subject invention will be best understood from a reading of the following specification which sets forth in detail to specific embodiments of the invention. These embodiments are illustrated in the accompanying drawings of which:

FIG. 1 is a plan view of a first embodiment,

FIG. 2 is a cross-sectional view of the first embodiment looking along the line 2—2 of FIG. 1,

FIG. 3 is a perspective view of the first embodiment,

FIG. 4 is a plan view of a second embodiment of the invention,

FIG. 5 is a perspective view of a second embodiment.

Referring to FIGS. 1 through 3, a corner protector **10** is shown to be formed of a single sheet thickness of injection molded polyethylene to form a monolithic structure wherein all surfaces and walls as hereinafter specified are interjoined and integrated, rather than folded or bonded. Corner protector **10** includes flat, L-shaped perimeter walls **12**, **14**, and **16** which lie in three mutually perpendicular planes. The L-shaped perimeter walls **12**, **14**, and **16** are linearly contiguous, i.e., joined end to end, and do not form a mutually intersecting trihedral assembly, commonly known as a corner. However, the walls **12**, **14**, and **16** are parallel to and, thus, susceptible of lying against the three trihedral walls which form the interior corner of a shipping carton or the like. The cross-sectional view of FIG. 2 best illustrates the shell-like or single-sheet thickness character of the corner protector **10**.

Corner protector **10** further includes linearly contiguous spacer walls **18**, **20**, and **22** which are L-shaped and lie in mutually perpendicular planes. Spacer wall **18** lies in a plane which is mutually perpendicular to the plane of perimeter walls **12** and **14**; spacer wall **20** lies in a plane which is mutually perpendicular to the planes of perimeter walls **14** and **16**; spacer wall **22** lies in a plane which is mutually perpendicular to perimeter walls **16** and **12**.

The spacer walls **18**, **20**, and **22** define the boundaries of an interior trihedral pocket made up of the trihedral arrangement of walls **24**, **26**, and **28**. Wall **24** is parallel to perimeter wall **12**, wall **26** is parallel to perimeter wall **14**, and wall **28** is parallel to perimeter wall **16**.

In the specific embodiment, the sheet thickness of the monolithic corner protector **10** may be on the order of one thirty-second of an inch and the perimeter walls **12**, **14**, and **16** may be 3 inches on a side. The pocket walls **12**, **26**, and **28** are approximately one-and-one-half inches squares, thus, to provide a 1-inch spacing between the deepest corner of the pocket made up by walls **24**, **26** and **28** and the geometrically corresponding corner of the carton within which the corner protector **10** is placed. This is in conformance with Rule **41** of the Uniform Freight Classification for Motor and Rail Freight. This is given strictly by way of example and it is obvious that the corner protector **10** may be made in various other sizes.

In use, it is assumed that the corner protectors **10** are to be used to secure a generally square or rectangular object within a generally square or rectangular shipping carton. As a variation on this it is, of course, possible to place the article within a first container and then suspend that container within an outer container by means of the corner protectors **10**. In either event the packing assembly is carried out by placing a corner protector, such as **10**, in each of the four bottom corners of the carton such that the pocket opens to the interior of the carton. In this orientation, the perimeter walls **12**, **14**, and **16** lie against the three mutually intersecting walls of the carton which make up a corner. The article to be supported is then placed within the container such that an exterior corner of the article fits into the interior corner of the pocket of each of the corner protectors **10**. With the article bearing against the pocket walls **24**, **26**, and **28** the corner protector **10** is urged firmly into the corner of the carton, thus, rigidifying the entire structure. The assembly packing process is completed by placing four corner protectors about the upper four corners of the article and closing and sealing the lid of the carton to complete the suspension of the article therein.

It is clear that the pocket which receives the article within the corner protector **10** need not be trihedral in character but may be shaped otherwise so as to conform to the geometry of the article. FIGS. 4 and 5 show a corner protector **30** which is similar to corner protector **10** of FIGS. 1 through 3 except that the pocket is semicylindrical in configuration, thus, to receive a cylindrical or rounded corner object.

Referring specifically to FIGS. 3 and 4, the corner protector **30** is shown to be made by injection molding a polymeric material such as polyethylene into a monolithic single sheet thickness having three linearly contiguous and flat L-shaped perimeter walls **32**. **34**, and **36**. These perimeter walls lie in mutually perpendicularly intersecting planes such as the trihedral planes of a carton corner. Corner protector **30** further includes three linearly contiguous spacer walls **38**, **40**, and **42** of which walls **40** and **42** are L-shaped and wall **38** is quasi L-shaped, i.e., with an arcuate interior border. The pocket of corner protector **30** is formed by a uniform radius

arcuate surface **44** which interconnects all three of the spacer walls **38**, **40**, and **42** and which follows the arcuate interior border of spacer wall **38**. The pocket is completed by a quandrant-shaped floor **46** which is contiguous with arcuate wall **44** and spacer walls **40** and **42**.

A corner protector **30** at FIGS. **4** and **5** is used in precisely the same manner as corner protector **10** of FIGS. **1** through **3** except that the article which is received by corner protectors **30** is more likely to be cylindrical rather than square or rectangular in geometry.

Although FIG. **4** and **5** shows the pocket to be semicylindrical in character and having a uniformly arching wall **44** it is clear that wall **44** may be nonuniformly curved or otherwise shaped to conform to the corner of the supported article.

It is to be understood that the two embodiments which are described in detail herein are illustrative of the invention and are not to be construed in a limiting sense.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A corner protector to be disposed between an article and the corner of a container for the article comprising: a monolithic single sheet thickness shell having three flat and linearly contiguous perimeter walls adapted to lie against the trihedral walls of a carton corner, three integrally molded flat and linearly contiguous spacer walls each of which lies perpendicular to a pair of perimeter walls, and a shaped pocket for receiving the article to be protected said pocket being integrally molded with, contiguous with, and bounded by said spacer walls, said perimeter walls extending beyond said spacer walls.

2. The corner protector defined in claim **1** wherein the pocket is made up of a trihedral arrangement of interior walls which are parallel with respective perimeter walls.

3. A corner protector defined in claim **1** wherein the walls are formed of polyethylene.

4. The corner protector defined in claim **1** wherein the pocket includes at least one nonflat pocket wall.

5. The corner protector defined in claim **4** wherein the pocket includes a uniformly curved pocket wall and a flat quadrant-shaped wall.

6. The corner protector defined in claim **4** wherein the material from which the walls are fabricated is polyethylene.

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