Jan. 26, 1937. E. P. SHERMAN 2,068,771

CORNER PROTECTOR

Filed Oct. 30, 1934

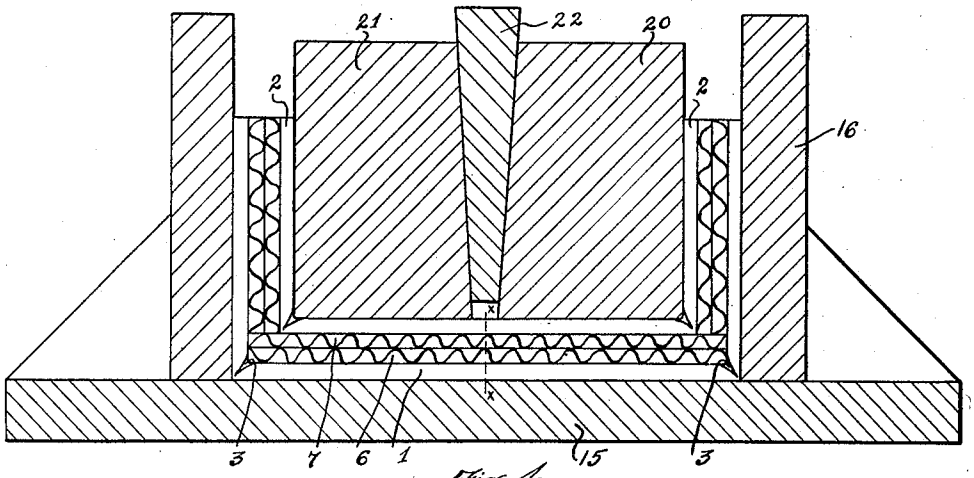


Fig. 4

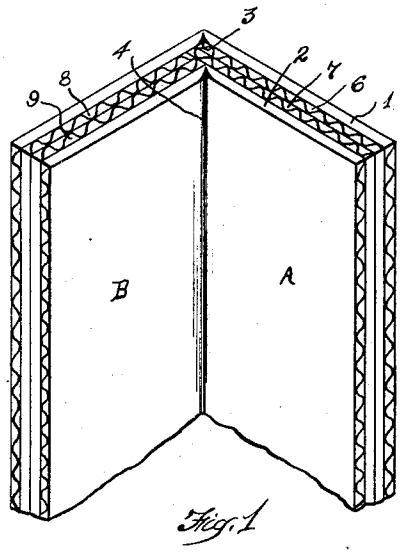


Fig. 1

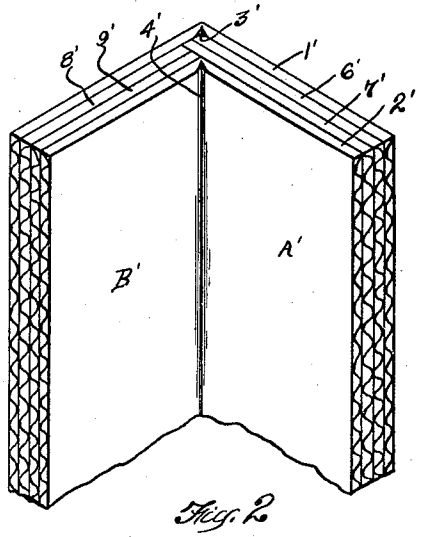


Fig. 2

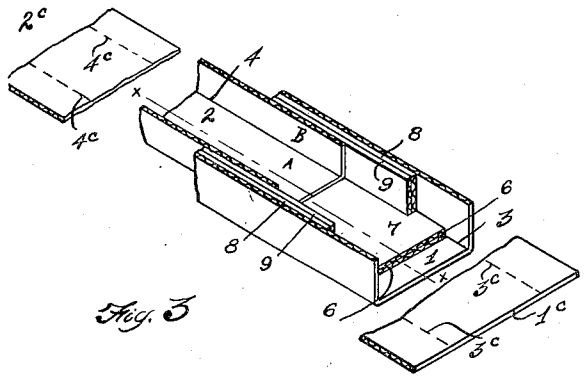


Fig. 3

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Patented Jan. 26, 1937 2,068,771

UNITED STATES PATENT OFFICE

2,068,771

CORNER PROTECTOR

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Application October 30, 1934, Serial No. 750,679

3 Claims. (Cl. 229—14)

This invention relates to a corner protector for articles being moved or shipped, serving one or more of the purposes of preventing damage to the angular edges, of spacing the articles from the walls of the container, and of holding the article in place; and also relates to a method of and apparatus for making the same.

An aim of my invention is to furnish such a protector, particularly adapted for manufacture from materials such as paper and paper-board, which will be characterized by strength, simplicity, ease of manufacture, ease of application, and that will combine a slight flexibility for cushioning effect with sufficient stiffness to afford full protection. It will be understood that the principles of the invention can be applied in various sizes and grades. It will also be understood that I do not limit myself to any particular material. Although I show and describe the invention as made of the usual commercial corrugated board, the disclosure is based on that material because it is at present the most suitable in general use for such purposes.

The method and apparatus disclosed are those which I have invented and found to be the most satisfactory for the manufacture of my improved protector, although such manufacture can be otherwise accomplished.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain structure and steps embodying the invention, such disclosed means constituting, however, but one of various structural forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a perspective of a finished corner protector, one end being broken away;

Fig. 2 is a perspective of a modified form of protector;

Fig. 3 is a diagrammatic perspective showing the preferred method of making the protector;

Fig. 4 is a transverse vertical section through an apparatus for making the protector.

The preferred form of the invention here shown comprises a unitary protector which may be made in any length or width desirable and formed to any angle which may be required. For convenience of illustration and description, and because square corners are most frequently met with, the protector is herein shown as square.

The protector consists of an outer and an inner layer of corrugated board, 1 and 2 respectively, each bent along the lines 3 and 4 to the finished angle of the protector, and a sufficient number of intermediate layers of corrugated board, such as 6 and 7, 8 and 9, to give the required stiffness and cushioning effect.

All these are secured together by a suitable adhesive (for example, silicate of soda or some form of glue or paste) into a unitary laminated structure. The width of the sides or wings A and B of the protector will be whatever is suitable for the intended uses, and need not necessarily be equal, and the protector will be made in whatever length may be desirable.

The direction of the corrugations may be varied according to the stresses to which it is expected the protector will be subjected. Thus, in the exemplary form shown in Fig. 1, the corrugations of the intermediate layers 6 and 7, 8 and 9 run vertically to give longitudinal strength for piling, while the corrugations of the inner and outer layers 1 and 2 run horizontally to give that stiffness which is needed to hold the protector flat.

In the modification shown in Fig. 2 the corrugations of all layers are indicated as running horizontally, for the reason that Fig. 2 illustrates the form which is intended only for cushioning and protective effect and is not designed for columnar strength. The reference characters in the modified form shown in Fig. 2 correspond to those used in the other figures of the drawing except that they are distinguished by prime marks.

A preferred method of building this corner protector consists of assembling the parts in U-shape as shown in Figs. 3 and 4, then cutting this assembly along the longitudinal line X—X, Figs. 3 and 4, thus making two protectors out of each manufactured assembly.

The best method of building up the assembly is illustrated diagrammatically in Fig. 3. The first step of the operation includes longitudinally creasing a corrugated board 1C, preferably double faced, along its upper surface, as indicated by the dotted lines 3C, 3C, so as to define side areas, and a double width center area. The side areas are then turned upward 90° on the crease lines, thus forming the folds 3 of the finished product. Two or more lengths of board 6 and 7, according to the desired thickness of the finished product, of proper width to occupy the space between the upstanding side walls of the layer 1, are fastened together in an even-sided pile by the use of adhesive, the pile is coated with adhesive and is laid on the bottom surface between the sides.

After this the intermediate layers 8 and 9 are applied in a similar manner.

The inner sheet 2 is formed in the same manner as the outer sheet, that is by creasing it in the flat condition, 2C, along the lines 4C, which, after the sheet has been folded into its trough shape, become the inner fold lines 4 of the completed protector. The inner sheet, so folded, is then applied as shown in Fig. 3. The assembly is pressed together and, after the adhesive has had time to set, is cut longitudinally along the line X—X thus making two complete corner protectors.

A suitable apparatus for carrying out the foregoing operations consists of a press having outside and inside forms of proper length, such as are shown in transverse vertical section in Fig. 4. This figure shows a double protector built up in the press and ready for removal.

The outer form consists of a bottom 15 and sides 16, braced to prevent spreading. The inner form is made in three pieces consisting of blocks 20 and 21 and a wedge 22 to fit between the blocks. The entire arrangement is such that the blocks 20 and 21 can be laid in and forced sideways by the wedge 22. The weight of the blocks and wedge holds down the bottom layers of material and the spread due to the wedge action clamps the side members. The wedge is to be applied with just sufficient force for clamping and not enough to crush the material. After the made-up double protector has been allowed to stay in the press long enough for the adhesive to set, it is removed and cut apart lengthwise along the line X—X.

Other modes of applying the principles of my invention may be employed instead of the one explained, change being made as regards the structure and steps herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A corner protector comprising a sheet of corrugated board bent to a dihedral angle, and additional sheets of corrugated board secured to the wings of said angle and interfacially adhering rigidly to each other throughout each wing, said additional sheets being flat and all those in each wing of said angle abutting with full edge thickness against the side of an element of the other wing and being adhered thereto.

2. A corner protector comprising an outer sheet longitudinally creased and folded along such crease into a dihedral angle, stiffening elements behind each wing of said angle and rigidly secured thereto and to each other, said stiffening elements being separate in each wing, those of one wing secured in bearing on full edge thickness against an interior side of the other wing, and an inner sheet creased and folded correspondingly to said outer sheet and rigidly secured to the inner surface of said stiffening elements.

3. A corner protector comprising an outer corrugated sheet longitudinally creased crosswise of the corrugations and folded along such crease into a dihedral angle, one or more stiffening sheets behind each wing of said angle and adhesively secured thereto and to each other throughout the structure, said stiffening elements being separate in each wing, those of one wing secured in bearing on full edge thickness against an interior side of the other wing, said end-to-side junctions forming a plurality of cleavage planes none of which lies in the bisector plane of the structure, and an inner sheet creased and folded correspondingly to said outer sheet and adhesively secured to the inner surfaces of said stiffening sheets.

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