May 5, 1959 A. A. WERNER ET AL 2,885,139

CORNER PROTECTOR

Filed Aug. 24, 1955 2 Sheets-Sheet 1

Fig. 1

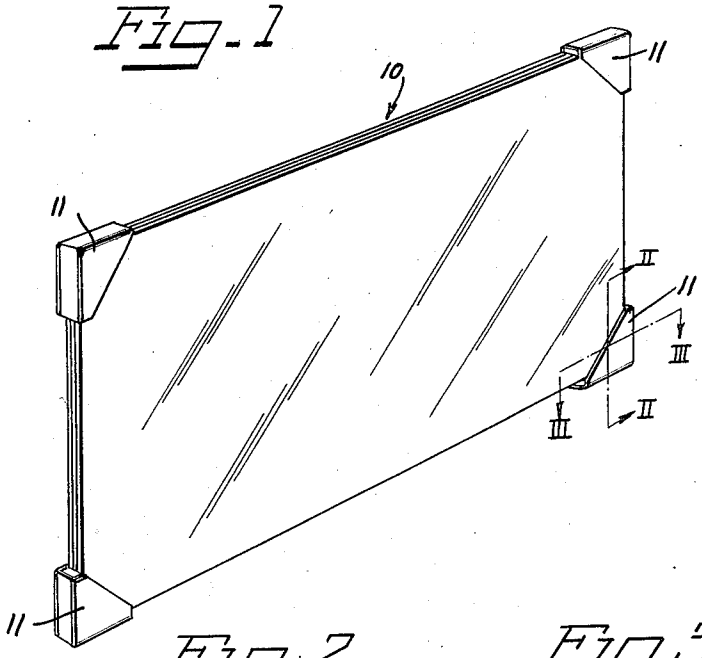


Fig. 2

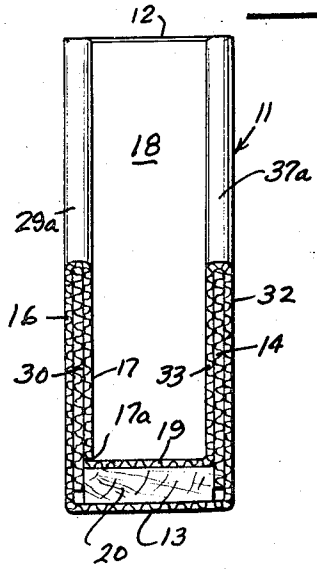
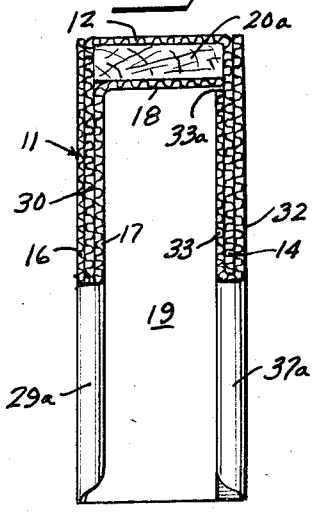


Fig. 3



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Fig. 4

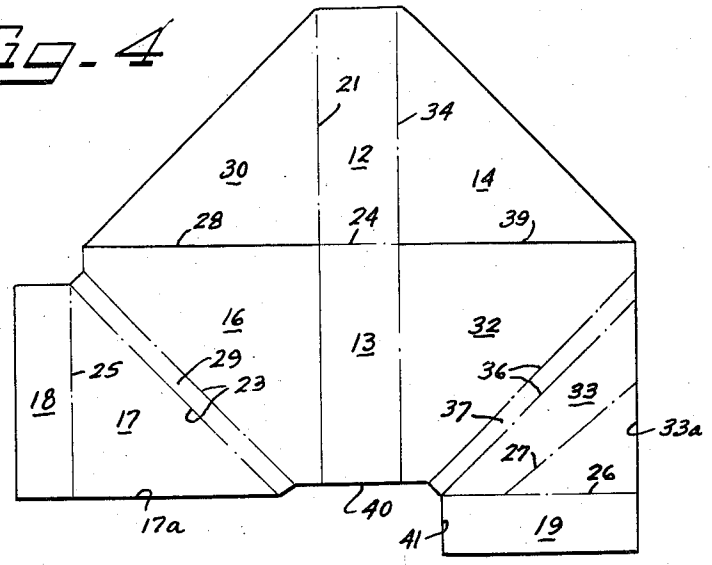
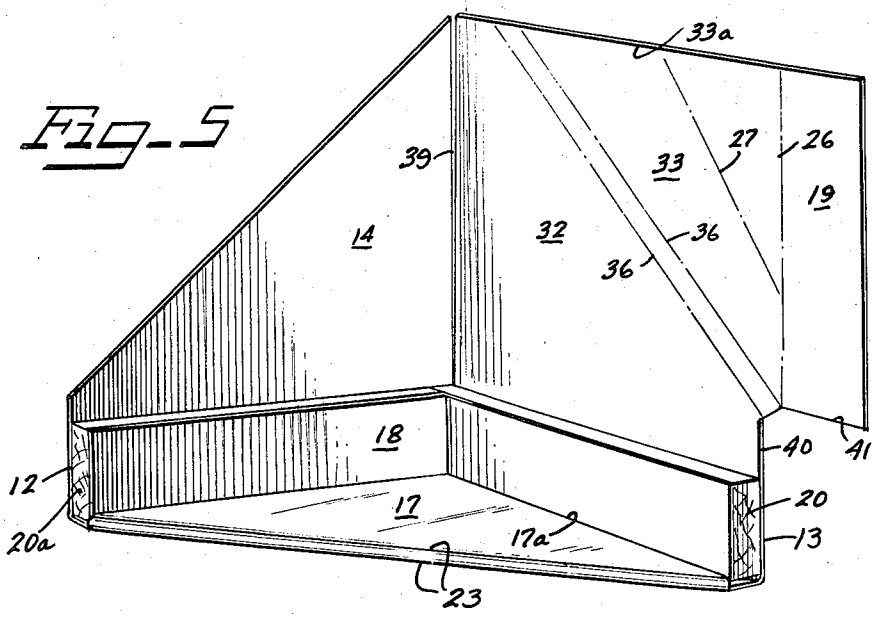


Fig. 5



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CORNER PROTECTOR

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Application August 24, 1955, Serial No. 530,375

7 Claims. (Cl. 229—14)

The present invention relates to an improved corner protector which affords substantial protection to the corners of sheet-like materials, such as sheets of glass, while being transported or stored in single or multiple sheet units.

Specifically, this invention relates to a corner protector for sheets of glass or other brittle materials.

The corner protector of this invention is preferably formed from corrugated paper board and wooden strips, and is so constructed as to provide maximum protection to corners with a minimum amount of material.

The walls of the protector are preferably made from a single blank of material such as corrugated paper board or the like, folded and cut so that the assembled protector structure has integral rectangular edge walls disposed at right angles to one another. Each edge wall in the assembled corner protector comprises spaced layers of material and between the spaced layers of each edge wall is inserted a rigidifying strip of material having some degree of resilience, such as wood, for primarily protecting the sheets from edgewise blows at the corners. A pair of triangular side walls, each comprising a plurality of layers of cushioning material, extends between corresponding side edges of the edge walls for confining and protecting the sheets laterally. Furthermore, due to the cushioning properties of the material from which the corner protectors are made, the corner protectors are capable of engaging the sheet material to be protected with a resilient fit that renders the corner protectors self-retaining once they are positioned in place.

Heretofore, corner protectors constructed from a single blank and having no rigidifying edge wall strips afforded very little resistance to compressive forces resulting from stacking bundles of the sheets flat-wise, one on top of the other. As a result, the product being shipped or stored and having only such prior art protectors, frequently and easily became damaged and unmerchantable even though reasonable care was exerted by agencies handling the product.

A primary object of the present invention, therefore, is to provide a corner protector having walls composed of a plurality of layers of cushioning material, with its edge walls equipped with rigidifying means having some resilience, thus affording much more effective protection for the corners of material to which the protector is applied.

Another object of the present invention is to provide an improved corner protector structure which is particularly designed for the safe storage and transportation of fragile materials in sheet form, and which is simple to manufacture and assemble and which also affords ample protection for corners.

Another object of the invention is to provide an improved corner protector structure which is substantially more durable and rigid than corner protectors heretofore used, and which has greater flexibility and cushioning properties.

Another object of the invention is to provide a corner protector which is self-retaining and which will also aid in holding packed sheets of frangible material together against damage during storage and transportation.

Other and further objects of the invention will be apparent to those skilled in the art from the following detailed description taken with the accompanying sheets of drawings, which, by way of a preferred example only, illustrate one embodiment of the invention.

On the drawings:

Figure 1 is a perspective view of the assembled corner protector showing by way of illustration the manner in which the protector is used on a pack of sheets, such as glass;

Figure 2 is an enlarged sectional view taken along the lines II—II of Figure 1;

Figure 3 is an enlarged sectional view taken along the lines III—III of Figure 1;

Figure 4 is a plan view of the blank used in fabricating the corner protector of our invention;

Figure 5 is an enlarged side elevational view showing the corner protector in a partially assembled form.

As shown on the drawings:

Referring to Figure 1, reference numeral 10 indicates generally a pack of glass sheets such as window glass, the corners of which are collectively protected by corner protectors 11 embodying the present invention. The corner protectors are preferably formed of corrugated board or other suitable cushioning material.

The construction of each assembled corner protector is more particularly shown in Figures 2 and 3. The two side walls of each protector 11 are triangular in shape and multi-layered, having, respectively, outer layers 16 and 32, intermediate layers 30 and 14 and inner layers 17 and 33. The intermediate layers 30 and 14 are formed from paired flaps integral with a rectangular outer edge wall 12, and the outer layers 16 and 32, and the inner layers 17 and 33 are formed from paired flaps integral with and folded from opposite edges of a rectangular outer edge wall 13, which in the assembled corner protector lies at right angles to said edge wall 12. Inner edge walls 18 and 19 extend from said inner layers 17 and 33 at right angles thereto, respectively, in spaced parallel relationship to said outer edge walls 12 and 13 to lie under the edges 33*a* and 17*a* of the inner side walls 33 and 17, respectively, and thus be locked in place. Rigidifying strips 20 and 20*a*, which may suitably be made of wood, are inserted in the spaces so formed between outer and inner edge walls 13 and 19, and 12 and 18, respectively.

In Figure 4, showing the one-piece blank from which each of said corner protectors 11 is formed, the reference numerals 12 and 13 indicate the two rectangular panels forming the outer edge walls just described, which are joined together endwise by a line of fold 24. To each side of the edge wall panel 12 is integrally attached one of a pair of right-triangular flaps 30 and 14, and to each side of the edge wall 13 is integrally attached one of a pair of triangularly-shaped flaps 16 and 32. The flaps 30 and 16 are joined to the edge wall panels 12 and 13, respectively, by a continuous line of fold 21 and are separated from each other by a line of severance 28. The flaps 14 and 32 are joined to the edge wall panels 12 and 13, respectively, by a continuous line of fold 34, and are separated from each other by a line of severance 39.

Integrally attached to the triangular-shaped flaps 16 and 32 by the respective paired lines of fold 23, 23 and 36, 36, are triangular flaps 17 and 33, respectively. The width of the strips 29 and 37 between the respective paired lines of fold is preferably slightly greater than the thickness of the blank material to facilitate folding over

an edge thereof to provide the folded edges 29*a* and 37*s* (Figs. 2 and 3). The triangular flaps 17 and 33 are integrally attached by the respective lines of fold 25 and 26 to the outer rectangular flaps 18 and 19, respectively, that form the inner edge walls. In the act of assembly, the rectangular flap 18 is positioned so that it lies parallel to and spaced from the outer rectangular edge wall 12, while the rectangular flap 19 is positioned so that it lies parallel to and spaced inwardly from the outer rectangular edge wall 13.

Rectangular panels 12 and 13 form the outer edge walls in the assembled corner protector, while flaps 30 and 14 become the intermediate side walls; flaps 16 and 32 become the outer side walls; flaps 17 and 33 become the inner side walls; and flaps 19 and 18 become the inner edge walls.

To aid in assembling the corner protector from the blank, a line of fold 27 is provided, shown approximately parallel to the paired lines of fold 36, 36 and located in the inner side walls; and flaps 19 and 18 become the inner fold in said side wall 33.

The free edge of the panel 13 and the adjacent edges of the flaps 16 and 32 are offset inwardly, as at 40, from the edge 17*a* and the line of fold 26, so that when assembled the edge 40 will lie flush with an adjacent edge 41 of the flap 19.

To assemble the corner protector from the blank, the two outside edge walls 12 and 13 are folded at right angles to each other at the line of fold 24. The intermediate side walls 30 and 14 are folded inwardly at the lines of fold 21 and 34 so that they lie at right angles to the outer edge wall 12, with their edges abutting the end wall 13. Outer side wall 16 is then folded inwardly about the line of fold 21 to lie alongside the intermediate side wall 30. The flap 17 with its attached panel 18 is folded inwardly about the paired lines of fold 23, 23 to lie inside of the intermediate side wall 30, with the rectangular panel 18 parallel to and spaced from the outer edge wall 12. The outer side wall 32 and inner side wall 33 are next folded up along the line of fold 34 and inwardly along the paired lines of fold 36, 36, while being temporarily buckled inwardly at the intermediate line of fold 27, to cause the flap 33 to lie alongside and against the inner surface of the intermediate side wall 14. The inner rectangular panel 19 is at the same time thereby positioned in a plane parallel to but spaced from the outer edge wall 13, with its edge underlying the edge 17*a* to be locked in place thereby. As the flap 33 is folded inwardly, in the manner just stated, to provide the inner side wall, its one edge 33*a* is caused to overlie the adjacent free edge of the inner edge wall 18 to lock the same in place.

The rigidifying strips 20 and 20*a* are either positioned in place prior to these last folding operations or are inserted in the spaces alotted them between the outer and inner edge walls 13 and 19, and 12 and 18, respectively, as shown in Figure 5.

The corner protector illustrated in the drawings has substantial advantages over the more common protectors used for shipping and storing products such as window glass. The cushioning qualities of this protector are considerably better than achieved with protectors heretofore previously employed since the multiple layers of material coupled with rigidifying strips in the edge walls make the protector resistant to all kinds of damaging shocks or blows to corners. The structure is less expensive than many former types of corner protectors while at the same time it is simple to make and to assemble, and has a self-retaining feature not possessed by former corner protectors, due to the tendency of the inner side walls 17 and 33 to move inwardly against the surfaces of the sheets 10 with which they are placed in contact.

The corner protector of this invention lends itself readily to simple assembly procedures, is self-locking when assembled to hold the strips 20 and 20*a* and the inner edge wall panels 18 and 19 in place, and does not require the use of nails or other separate fastening means in assembling. The constituent blanks can be prefabricated at preferred localities remote from the assembly point, thereby saving shipping costs, and the assembled protector can be disassembled easily.

These features and others indicate that the corner protector of the present invention has numerous advantages over the more conventional corner protectors used to transport materials in sheet form which have a tendency to sustain damage to corners in transit or storage due to their brittle or frangible character.

While specifically described in connection with sheets of glass or other brittle material, the corner protectors of our invention can also be used with sheets of other materials such as enameled or painted metal sheets. Where the stacked sheets are stored flat, with one bundle or package of corner protected sheets stored on top of the other, the relatively rigid yet somewhat resilient strips 20 and 20*a* keep the piles from collapsing and bear the compression load of the superimposed bundles. This was not achieved with previously known constructions of corner protectors.

It will, of course, be understood that each pack of sheets, after the corner protectors have been positioned in place as shown in Figure 1, may have an outer wrapping, or be placed in cartons, or the corner protectors may be held against displacement by means of pressure sensitive tape or the like, or by wrapping paper. The multi-layer lateral and edge walls of the corner protectors keep the outer wrap from direct contact with the edges and faces of the sheets. This is another protective feature of our device.

It will be evident that various modifications can be made in the described embodiment without departing from the scope of this invention.

We claim as our invention:

1. A corner protector having a pair of edge walls connected by a right angular bend forming a corner therebetween, one of said edge walls having a first set of integral triangularly shaped flaps extending along opposite side edges of said edge wall to form intermediate side walls, the other of said edge walls having a second set of triangularly shaped flaps forming outer side walls, and integral triangularly shaped extensions of said second set of flaps folded inwardly over said intermediate side walls to form inner side walls lying inwardly of, parallel to and coextensive with said intermediate side walls, one of said extensions having a rectangular portion folded from an edge thereof to lie parallel to and spaced from one of said edge walls and the other of said extensions having a rectangular portion folded from an edge thereof to lie parallel to and spaced from the other of said edge walls, both of said rectangular portions being of a width sufficient to extend under the corresponding inside edges of said inner side walls when the corner protector is fully assembled and rigidifying strips having some resiliency positioned in the spaces provided between said outer and inner edge walls.

2. A corner protector having a pair of edge walls connected by a right angular bend forming a corner therebetween, one of said edge walls having a first set of integral triangularly shaped flaps extending along opposite side edges of said edge wall to form intermediate side walls, the other of said edge walls having a second set of triangularly shaped flaps forming outer side walls, and integral triangularly shaped extensions of said second set of flaps folded inwardly over said intermediate side walls to form inner side walls lying inwardly of, parallel to and coextensive with said intermediate side walls, one of said extensions having a rectangular portion folded from an edge thereof to lie parallel to and spaced from one of said edge walls and the other of said extensions having a rectangular portion folded from an edge thereof to lie parallel to and spaced from the

other of said edge walls, both of said rectangular portions being of a width sufficient to extend under the corresponding inside edges of said inner side walls when the corner protector is fully assembled.

3. A blank for a corner protector of corrugated paper board and like material comprising a pair of rectangular panels extending end-wise through the mid-portion of said blank and separated from each other at their adjoining ends by a line of fold, a first pair of right-triangular flaps integrally attached respectively along one leg of the triangle by a line of fold to opposite sides of one of said rectangular panels, each said right triangular flap having a free leg edge toward the second of said rectangular panels; a second pair of triangularly-shaped flaps each integrally attached respectively by a line of fold to opposite sides of the second of said rectangular panels, each such second triangularly shaped flap being separated from the adjacent corresponding first right-triangular flap by a line of severance; pairs of triangularly-shaped extensions each integrally attached by paired lines of fold to the hypotenuse of one of the second pair of triangularly-shaped flaps; and a pair of rectangular flaps hinged by lines of fold to respective sides of said triangularly-shaped extensions.

4. A blank for a corner protector of corrugated paper board and like material comprising a pair of rectangular panels extending end-wise through the mid-portion of said blank and separated from each other at their adjoining ends by a line of fold, a first pair of right-triangular flaps integrally attached respectively along one leg of the triangle by a line of fold to opposite sides of one of said rectangular panels, each said right-triangular flap having a free leg edge toward the second of said rectangular panels; a second pair of triangularly-shaped flaps integrally attached respectively by a line of fold to opposite sides of the second of said rectangular panels, each such second triangularly shaped flap being separated from the adjacent corresponding first right-triangular flap by a line of severance; pairs of triangularly-shaped extensions each integrally attached by paired lines of fold to the hypotenuse of one of the second pair of triangularly-shaped flaps; and a pair of rectangular flaps hinged by lines of fold to respective sides of said triangularly-shaped extensions, the construction and arrangement of said blank and component panels, flaps and extensions being such that when said blank is folded to set the same up into a corner protector free edges of said rectangular flaps extend under free edges of said triangularly shaped flaps to be locked in place thereon in assembly protector.

5. A unitary blank divided by suitable lines of fold and severance into: a pair of elongated rectangular panels positioned at the mid-portion of said blank and joined end-wise to each other by a line of fold; a first pair of right triangular flaps attached to the respective longer

sides of one of said rectangular panels; a second pair of right triangularly-shaped flaps foldably attached to the respective longer sides of the other of said rectangular panels and separated from said first pair of flaps by a line of severance; each of said second pair of flaps having foldably attached along its hypotenuse by paired lines of fold one of a pair of right triangular extensions; each of such extensions having foldably attached thereto along one edge thereof a rectangular flap; the said blank being foldable into a corner protector having two sets of paired, spaced inner and outer edge walls lying at right angles to each other, and paired triangularly shaped side walls each of three layers joining edges of said edge walls and extending between the outer ends of said edge walls, with the inner of said pairs of edge walls having a free edge extending behind a free edge of an inner layer of said side walls to be retained in place thereby.

6. A corner pad comprising two spaced triangular structures formed of paperboard, each triangular structure including a pair of first and second hingedly connected panels of paperboard arranged in parallel spaced relation, and a third layer of paperboard interposed between the two triangular panels of each of said structures, an edge wall hingedly connected to said third panels and connecting the same, a second edge wall connected to an edge of one of said hingedly connected panels of each of said triangular structures and connecting the same, and said edge walls being hingedly connected together at their ends.

7. A corner pad comprising two spaced triangular structures formed of paperboard, each triangular structure including first and second hingedly connected generally triangular panels of paperboard arranged in parallel spaced relation and a third panel of paperboard interposed between the first and second panels of each of said structures, an edge wall hingedly connected to said third panel of each of said structures and connecting the same, a second edge wall connected to an edge of the first panel of each of said structures and connecting the same, said edge walls being hingedly connected together at their ends, and said second panel of each of said structures having a flange thereon folded into parallel relation to one of said edge walls.

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