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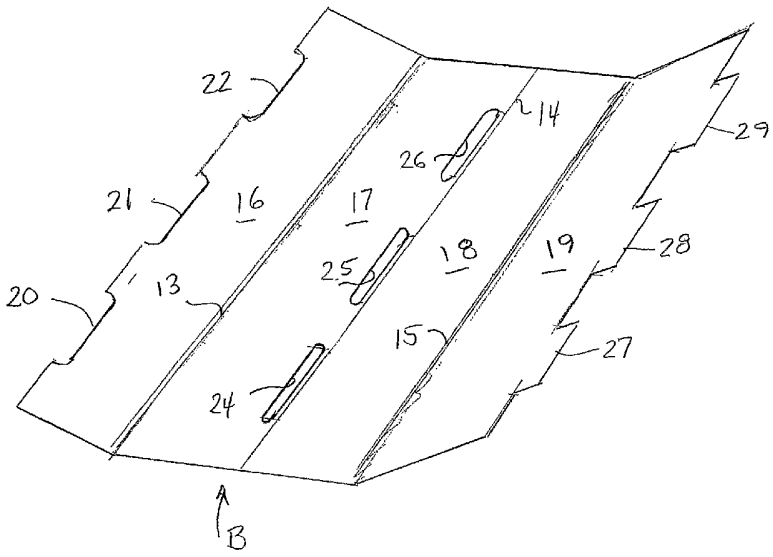
(54) Title: CONTAINER REINFORCING MEMBER



(57) Abstract: A container reinforcing member formed from a blank, comprising: a plurality of spaced-apart, substantially parallel score lines dividing the blank into at least four panels, the at least four panels including a first panel, a second panel, a third panel and a fourth panel, the first panel being foldable over the second panel to define a first leg of the member, the fourth panel being foldable over the third panel to define a second leg of the member; one or more tabs projecting from a side edge of the first panel; one or more slots provided in the third panel, at least one of the slots being positioned to receive one of the one or more tabs when the first panel is folded over the second panel; and, one or more notches provided in a side edge of the fourth panel, at least one of said notches being positioned to receive one of the one more tabs when the first leg is folded relative to the second leg.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CONTAINER REINFORCING MEMBER

Cross Reference to Related Application:

This application claims priority under 35 U.S.C. 119(e) to U.S. Patent Application Serial No. 60/526,929, filed on 04 December 2003.

Technical Field:

This invention relates to heavyweight packaging, and more particularly to a reinforcing member for providing structural integrity to a container adapted to ship, store and handle large objects.

Background Art:

Heavyweight packages are known in the prior are for packaging such things as vinyl fence products, cultural stone, lawn mowers, farm equipment, ATV's, jet skis, motorcycles, bulk food products, produce, poultry, raw food ingredients, textiles, and the like. Conventional packages may comprise enclosed boxes, or spaced frame members that only partially enclose the product but provide support, particularly when shrink-wrapped with the product, to enable stacking and handling, or boxes that are reinforced with spaced frame members. The spaced frame members, in particular, may be made of wood, plastic, corrugated cardboard, or any combination of these. Reinforcing corner posts of wood, corrugated cardboard, paper tubes, or solid fiber angle boards are commonly employed to improve the compression strength of the boxes, for example.

Wood is subject to pest infestation, is potentially unsafe during handling, and presents problems with disposal. Plastic and laminated containers are costly, and paper tubes and angle boards often have high-recycled content, negatively influencing their performance. Corrugated corner posts often can provide adequate compression strength that is cost-effective, without the potential problems encountered with some of the other materials. However, conventional corner post styles and materials are often costly, hard

to form into position, and may not remain in place during the life of the package.

Summary of the Invention:

The present invention is a corner post for forming a package to contain a product, especially large, heavy or bulky items, to improve the stacking strength and resistance to distortion of the package. The corner post of the invention is inexpensive, easy to form into position, and remains in place during the life of the package. It is formed from a unitary blank of corrugated material, and comprises panels that fold 180° onto one another to form double thickness panels that are then folded into 90° relationship with one another to form an angle-shaped reinforcing corner post that is self-locked in the 90° folded position.

The corner post of the invention preferably comprises a unitary blank of corrugated board divided by spaced parallel scores into at least four panels of substantially equal width. Outer panels one and four fold 180° onto inner panels two and three, respectively. Panel one has notched areas along its edge opposite that connected with panel two, and the notched areas line up with slots in panel two adjacent the score between panels two and three. Panel four has tabs along its edge opposite that connected with panel three, and the tabs lock into the slots of panel one and the notched areas of panel two when the folded-together panels one and two are folded 90° with respect to folded-together panels three and four, securing the panels in the 90° folded position.

Panels one and four may be laminated to respective adjacent panels two and three to enhance the compression strength of the corner post. The post can be stored in a flattened condition, or folded 90° in to the angled shape. Lamination together of the panels can be accomplished by use of adhesive, stitching, tape, or other suitable fasteners.

Top and/or bottom flanges may be provided on the post. A bottom flange could be utilized to secure the post to a pallet, and self-locking means on the top and/or bottom flange could be used to achieve complete pre-assembly of the post.

The post of the invention also could be made from a six-panel blank of corrugated,

die-cut with panels folding 180° and forming two 45° corners.

A die-cut cross beam can be provided for attachment between the upper ends of two adjacent corner posts to hold the corner posts in position against the product while the corner posts and product are being shrink wrapped or banded.

The cross beam can have flanged ends which fold over the product and overlap with one another, forming multiple thicknesses of the cross beam and corner posts, or the flanges can be triangularly shaped so that they do not overlap when folded inwardly over the product, or the flanges can be omitted.

The corner post of the invention can be stored and shipped in a flattened condition, and the self-locking means enables the post to be folded and locked and held in operate position without requiring the use of separate fasteners such as staples, tape, glue, or plastic grommets. The ability of the panels to fold 180° increases the top-to-bottom compression strength by increasing corrugated material in strategic areas within the package. The post provides protection against splitting or joint failures caused by the pressure exerted on package corners by flowable products, and improves flexural rigidity strength, thereby increasing the overall performance of the package.

According to one aspect of the present invention, a container reinforcing member is provided formed from a blank comprising: a plurality of spaced-apart, substantially parallel score lines dividing the blank into at least four panels, the at least four panels including a first panel, a second panel, a third panel and a fourth panel, the first panel being foldable over the second panel to define a first leg of the member, the fourth panel being foldable over the third panel to define a second leg of the member; one or more tabs projecting from a side edge of the first panel; one or more slots provided in the third panel, at least one of the slots being positioned to receive one of the one or more tabs when the first panel is folded over the second panel; and, one or more notches provided in a side edge of the fourth panel, at least one of said notches being positioned to receive one of the one more tabs when the first leg is folded relative to the second leg.

According to another aspect of the present invention, a container reinforcing

member is provided formed from a blank comprising: a plurality of spaced-apart, substantially parallel score lines dividing the blank into at least seven panels, the at least seven panels including a first panel, a second panel, a third panel, a fourth panel, a fifth panel, a sixth panel and a seventh panel, the first and second panels being foldable over the third and fourth panels, the sixth and seventh panels being foldable over the fourth and fifth panels, wherein the seventh panel is positionable between the first and fourth panels; one or more tabs projecting from a side edge of the first panel; one or more slots provided in the fifth panel; one or more slots provided in the sixth panel, the one or more slots of the sixth panel being in alignment with the one or more slots of the fifth panel when the sixth and seventh panels are folded over the fourth and fifth panels, the one or more tabs of the first panel being extendable through the one or more slots of the sixth panel and through the one or more slots of the fifth panel when the first and second panels are folded over the third and fourth panels.

According to yet another aspect of the present invention, a container for containing a product is provided, comprising: a base for supporting the product; and, one or more reinforcing members supported by the base and positioned thereon to surround the product, at least one of the reinforcing members comprising a first leg and a second leg disposed perpendicularly to the first leg, the first leg including a first panel folded over a second panel, the second leg including a third panel folded over a fourth panel, the first panel having one or more tabs projecting therefrom for engaging one or more slots provided in the third panel.

Brief Description of the Drawings:

The foregoing, as well as other objects and advantages of the invention, will become apparent from the following detailed description when taken in conjunction with the accompanying drawings, wherein like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a top perspective view of a package formed by a plurality of corner

posts according to the invention placed on a pallet, prior to application of any shrink wrap or banding, and without any product being shown;

Figure 2 is a side perspective view of a plurality of corner posts according to the invention placed around a product supported on a pallet, and with a preferred form of cross beam attached between upper ends of adjacent corner posts to assist in supporting the posts in position while they and the product are being shrink wrapped, whereby triangularly shaped flanges are provided on the ends of the cross beam to wrap around the corners of the package within overlapping one another;

Figure 3 is a top perspective view of an alternate package, wherein the cross beam does not have flanged ends;

Figure 4 is a top perspective view of a box-style container having reinforcing corner posts according to the invention placed in the corners thereof;

Figure 5 is a top plan view of a blank from which one embodiment of the corner post is made;

Figure 6, is a top perspective view of the blank of Figure 5, with the outer panels slightly folded about their respective score lines;

Figure 7 is a top perspective view of the blank of Figure 5, shown in a further folded condition with panel one folded 180° onto panel two;

Figure 8 is a perspective view of the corner post of the invention in a partially assembled, flattened condition for storage and shipment, wherein panels one and four are folded 180° onto respective adjacent panels two and three;

Figure 9 is a perspective view of the corner post of Figures 5-8 in its fully folded condition ready for use, with the tabs on panel four engaged in the slots of panel two and the notches of panel one to lock the post in the assembled condition shown;

Figure 10 is an enlarged, fragmentary sectional view taken along the line 10-10 in Figure 9;

Figure 11 is a top plan view of a blank for making a modified reinforcing corner post, wherein the post has flanged ends;

Figure 12 is a fragmentary perspective view showing how the flanges of the embodiment of Figure 11 can be fastened to a support to secure the post in position;

Figure 13 is a top plan view of a seven panel blank for making a further modified corner post;

Figure 14 is a fragmentary top perspective view of the seven panel blank of Figure 13 folded into operative relationship to form two 45° corners; and,

Figure 15 is a top view of a blank for making a preferred form of the cross beam for attachment between the upper ends of adjacent corner posts, as shown in Figure 2.

Best Modes for Carrying Out the Invention:

A first form of the self-locking, angle-shaped corner post of the invention is indicated generally at 10 in Figures 1-10. The post comprises two legs 11 and 12 disposed at 90° to one another, and the legs comprise pairs of panels 16, 17 and 18, 19, respectively, of corrugated paper material folded 180° into overlying relationship with one another. The post is adapted to be supported at a corner of a package P to form an economical package frame having good stacking or compression strength.

In the embodiment shown in Figures 1-10, the post is made from a single unitary blank B of corrugated paper material divided by a plurality of spaced parallel score lines 13, 14 and 15 into first, second, third and fourth panels 16, 17, 18 and 19, respectively, of substantially equal width. The first and fourth panels comprise outer panels of the blank, and the second and third panels comprise inner panels. A plurality of notches 20, 21 and 22 are formed along the outer edge of the first panel 16, resulting in a plurality of uniformly spaced outwardly projecting edge portions 23 on panel 16.

A plurality of slots or openings 24, 25 and 26 are formed in the second panel 17 adjacent the score between panels two and three, and a plurality of spaced tabs 27, 28 and 29 extend outwardly from the outer edge of fourth panel 19.

The notches, slots and tabs are in alignment with one another, so that when the first panel is folded inwardly 180° over the second panel, the notches are in registry with the

slots, and when the fourth panel is folded inwardly 180° over the third panel, the tabs are in aligned registry with the notches and slots. When the two of overlapped panels are then folded into 90° relationship with one another, the tabs extend into the slots to lock the panels in folded relationship, and the projecting edge portions of the first panel lie beneath the edge of the fourth panel, whereby the folded panels are held securely in folded relationship.

A modified corner post 10' may have flanges 30 and 31 on one or both ends, as depicted in Figures 11 and 12. These flanges may be used to fasten the post in position, e.g., by stapling the flanges to a support surface. In Figure 12, for example, staples S are shown extended through the flanges and into a pallet P.

A further modified corner post 10" may be formed from a six-fold, seven-panel blank 32, as depicted in Figures 13 and 14. In this form of the invention, the post has a center section or panel 33 and a pair of end sections or panels 34 and 35 extending at 45° to the center section, and at 90° relative to each other. As seen in Figure 13, the blank comprises the first panel 36, second panel 37, third panel 38, fourth panel 39, fifth panel 40, sixth panel 41 and seventh panel 42. Outwardly projecting tabs 43 and 44 are formed on the free edge of the seventh panel 42, and slots 45, 46 and 47, 48 are formed through the second and third panels near the edges thereof opposite their common edge.

To erect the post from the blank 32, the first panel 36 is folded into overlying relationship with the fourth panel 39, and the second panel 37 is folded into overlying relationship with the third panel 38, with the slots 45, 46 and 47, 48 disposed in aligned registry with one another. The sixth and seventh panels 41 and 42 are folded inwardly over the fifth and fourth panels, respectively, and the tabs 43 and 44 inserted through the slots 45, 46 and 47, 48 to secure the post in its operative folded position as shown in Figure 11. It will be noted that the two side panels 34 and 35 extend 45° relative to the center panel 33, and at 90° with respect to one another.

A blank 50 for forming a preferred form of cross beam 51 is shown in Figure 15. This form of the cross beam is shown assembled to a package in Figure 2. The ends of

the blank are die-cut with V-shaped notched 52, forming two triangularly shaped flanges 53 and 54, so that when the beam is put in position and the flanges are wrapped around the corners of the package, they do not overlap with one another, resulting in less thickness of the frame at this location and enabling shrink wrap to more closely engage the product and frame.

If desired, the ends of the blank may be square cut so that there are no flanges on the ends, and the beam simply includes the horizontal and vertical panels 55 and 56 as shown in Figure 3.

While the invention has been described with reference to preferred embodiments, those skilled in the art will appreciate that certain substitutions, alterations and omissions may be made without departing from the spirit thereof. Accordingly, the foregoing description is meant to be exemplary only and should not be deemed limitative on the scope of the invention set forth herein.

What is claimed is:

CLAIMS

1. A container reinforcing member formed from a blank, comprising:

a plurality of spaced-apart, substantially parallel score lines dividing said blank into at least four panels, said at least four panels including a first panel, a second panel, a third panel and a fourth panel, said first panel being foldable over said second panel to define a first leg of said member, said fourth panel being foldable over said third panel to define a second leg of said member;

one or more tabs projecting from a side edge of said first panel;

one or more slots provided in said third panel, at least one of said slots being positioned to receive one of said one or more tabs when said first panel is folded over said second panel; and,

one or more notches provided in a side edge of said fourth panel, at least one of said notches being positioned to receive one of said one more tabs when said first leg is folded relative to said second leg.

2. The container reinforcing member of claim 1, wherein said first leg is substantially perpendicular to said second leg when said first leg is folded relative to said second leg.

3. The container reinforcing member of claim 1, further comprising a first flange projecting from one end of said second panel, said first flange being foldable relative to said second panel.

4. The container reinforcing member of claim 3, further comprising a second flange projecting from one end of said third panel, said second flange being foldable relative to said third panel, wherein said first and second flanges are adapted to be in abutting relationship with one another when folded relative to the second and third panels, respectively.

5. The container reinforcing member of claim 3, further comprising a first top flange projecting from another end of said second panel, said first top flange being foldable relative to said second panel.

6. The container reinforcing member of claim 5, further comprising a second top flange projecting from another end of said third panel, said second top flange being foldable relative to said third panel, wherein said first and second top flanges are adapted to be in abutting relationship with one another when folded relative to the second and third panels, respectively.

7. The container reinforcing member of claim 1, wherein said container reinforcing member is constructed from a material selected from the group comprising: corrugated paperboard, substantially solid fiberboard, solid fiberboard, and paper.

8. A container for containing a product, comprising:

a base for supporting said product; and,

one or more reinforcing members supported by said base and positioned thereon to surround said product, at least one of said reinforcing members comprising a first leg and a second leg disposed perpendicularly to said first leg, said first leg including a first panel folded over a second panel, said second leg including a third panel folded over a fourth panel, said first panel having one or more tabs projecting therefrom for engaging one or more slots provided in said third panel.

9. The container of claim 8, wherein at least one of said first and second legs includes one or more flanges projecting therefrom for fastening said reinforcing member to said base.

10. The container of claim 8, further comprising at least one beam connecting one of said one or more reinforcing members to another of said reinforcing members.

11. The container of claim 9, wherein said at least one beam is formed from a blank comprising:

a first panel having at least one flange projecting from one end thereof; and,

a second panel foldable relative to said first panel, said second panel having at least one flange projecting from one end thereof; wherein, said flange of said first panel abuts said flange of said second panel when said second panel is folded relative to said first panel.

12. The container of claim 8, further comprising a side wall surrounding said one or more reinforcing members.

13. A container reinforcing member formed from a blank, comprising:

a plurality of spaced-apart, substantially parallel score lines dividing said blank into at least seven panels, said at least seven panels including a first panel, a second panel, a third panel, a fourth panel, a fifth panel, a sixth panel and a seventh panel, said first and second panels being foldable over said third and fourth panels, said sixth and seventh panels being foldable over said fourth and fifth panels, wherein said seventh panel is positionable between said first and fourth panels;

one or more tabs projecting from a side edge of said first panel;

one or more slots provided in said fifth panel;

one or more slots provided in said sixth panel, said one or more slots of said sixth panel being in alignment with said one or more slots of said fifth panel when said sixth and seventh panels are folded over said fourth and fifth panels, said one or more tabs of said first panel being extendable through said one or more slots of said sixth panel and through said one or more slots of said fifth panel when said first and second panels are

folded over said third and fourth panels.

14. The container reinforcing member of claim 13, wherein said first panel forms an obtuse angle with said second panel when said first and second panels are folded over said third and fourth panels, and wherein said sixth panel forms an obtuse angle with said seventh panel when said sixth and seventh panels are folded over said fourth and fifth panels.

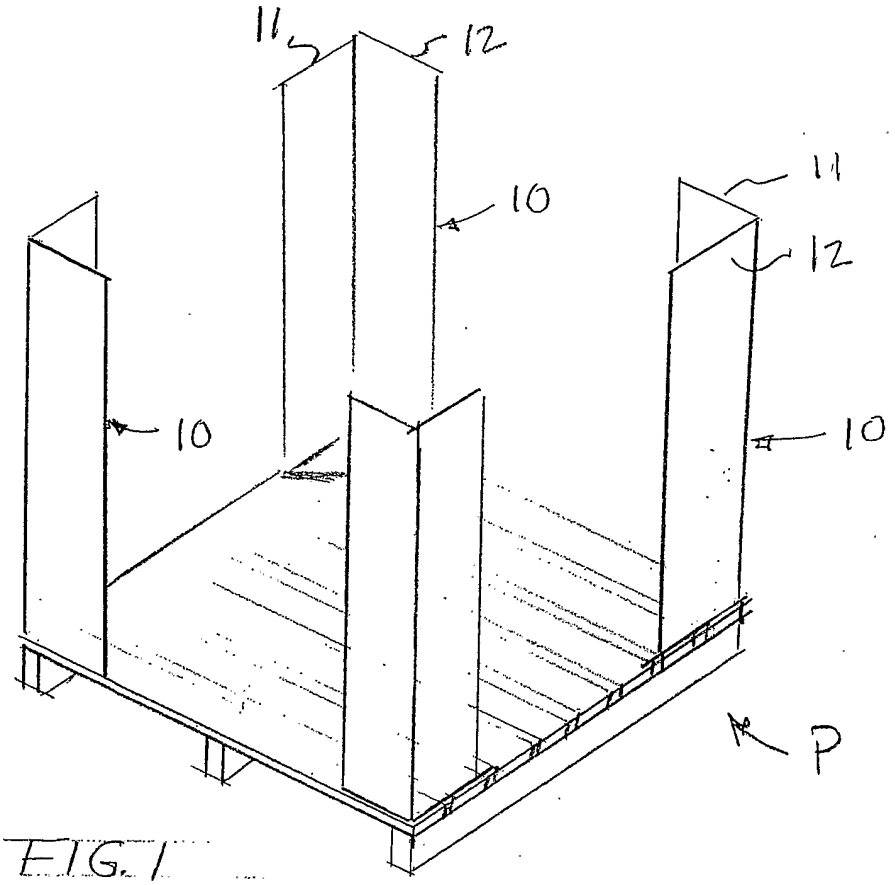

FIG. 1

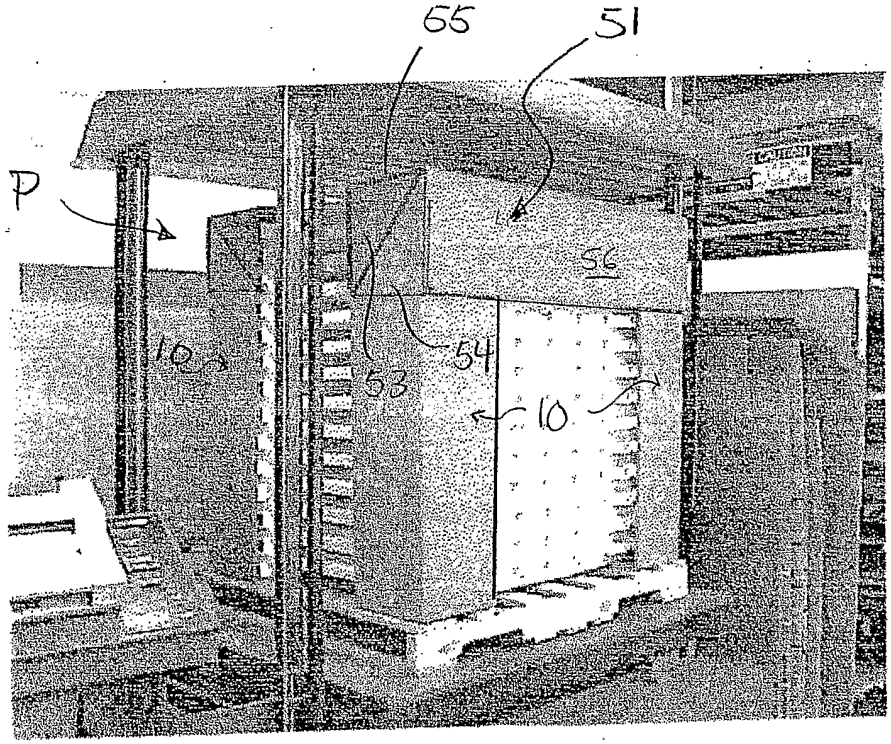

FIG. 2

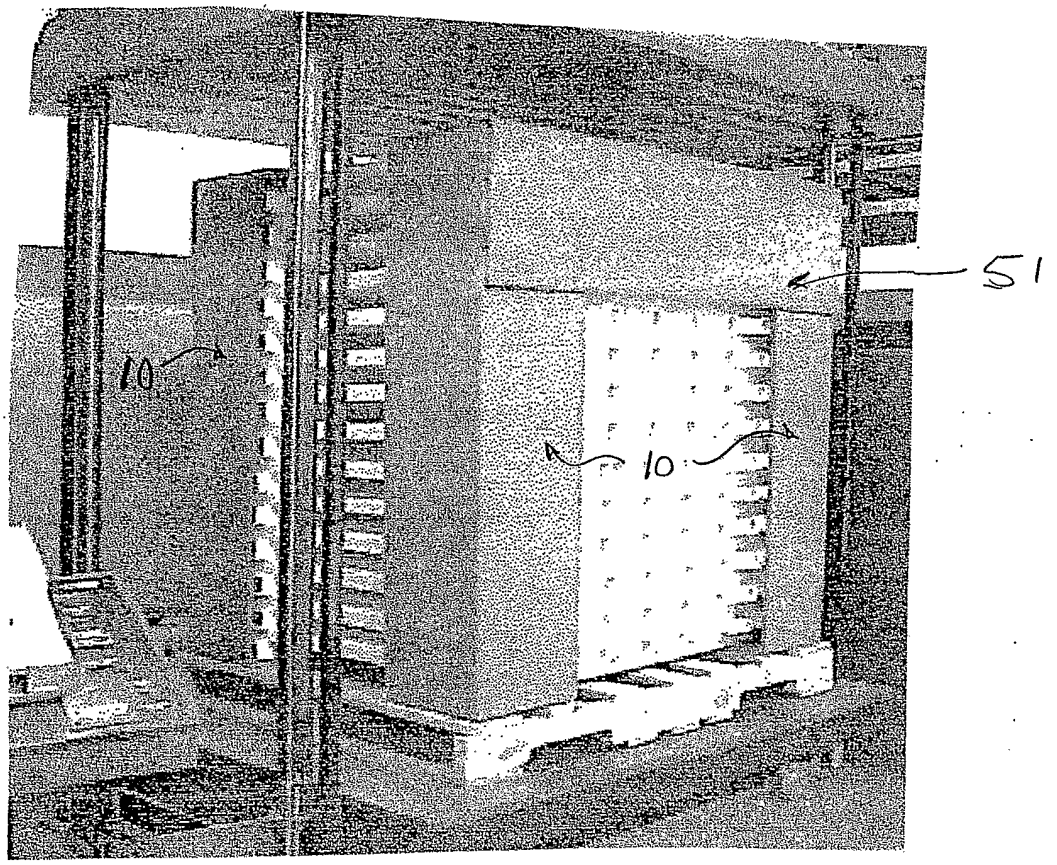

FIG. 3

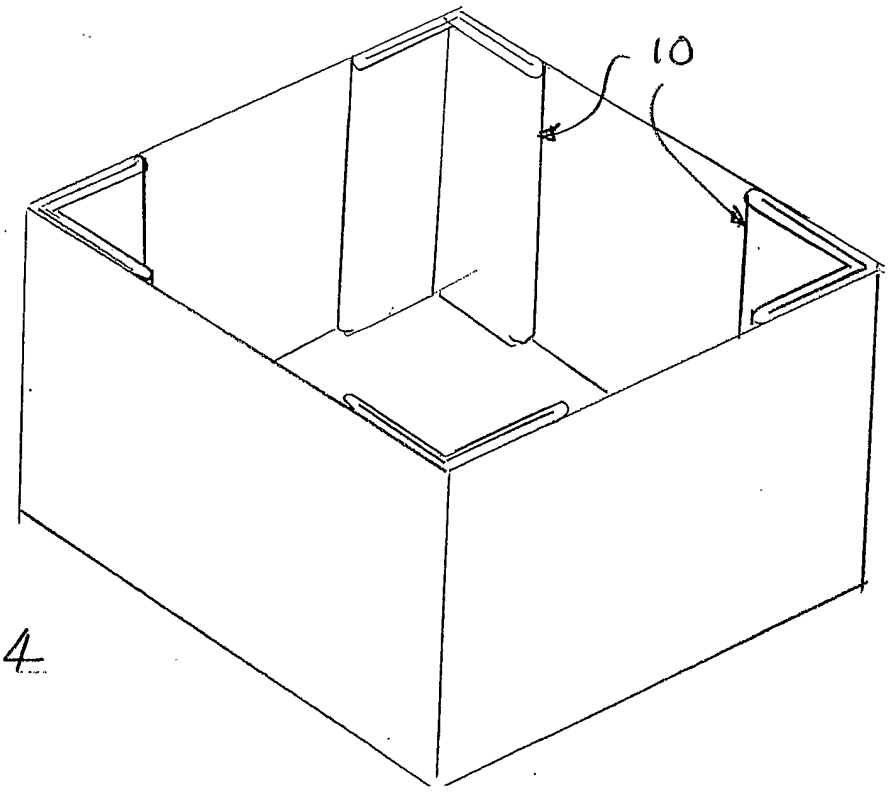

FIG. 4

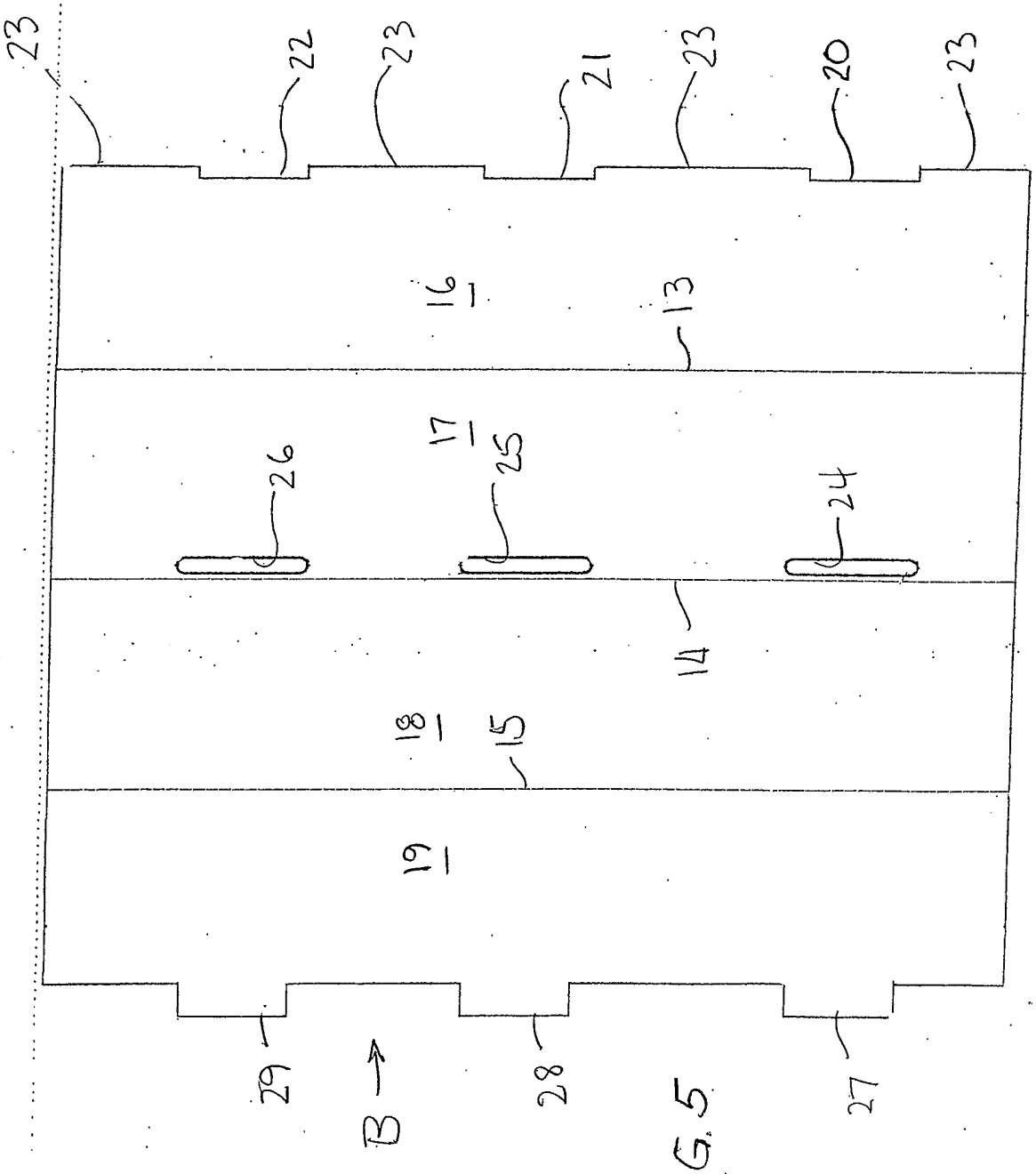

FIG. 5

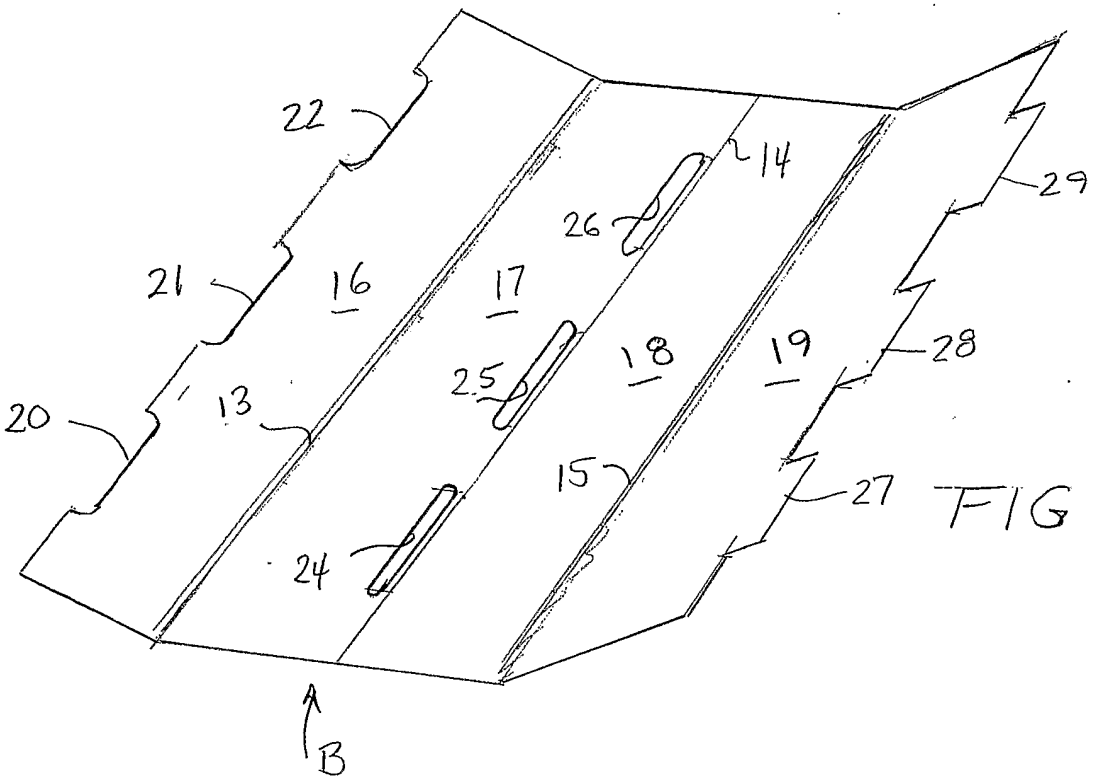
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FIG 6

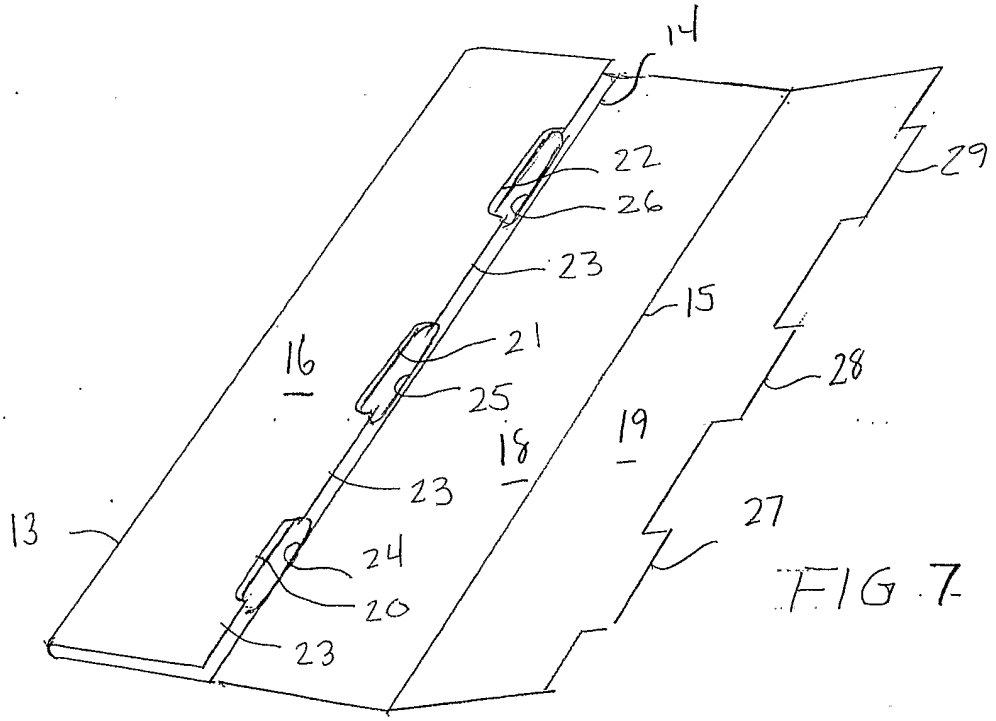
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FIG 7

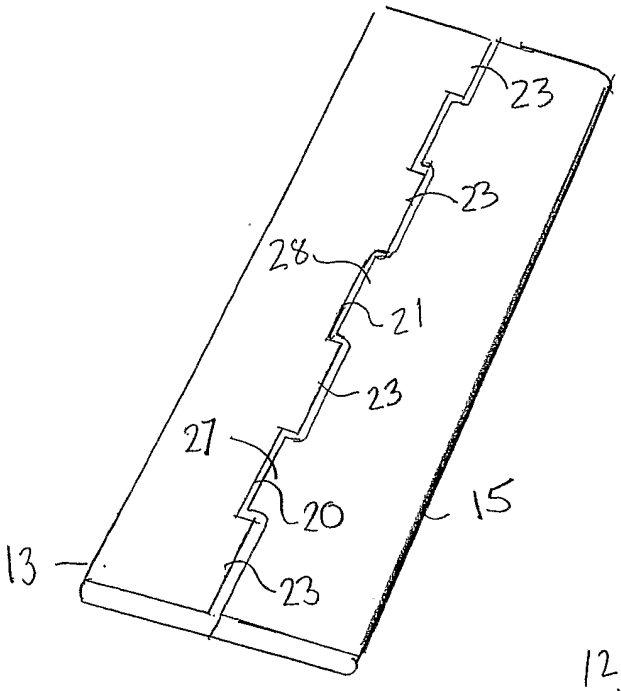


FIG 8

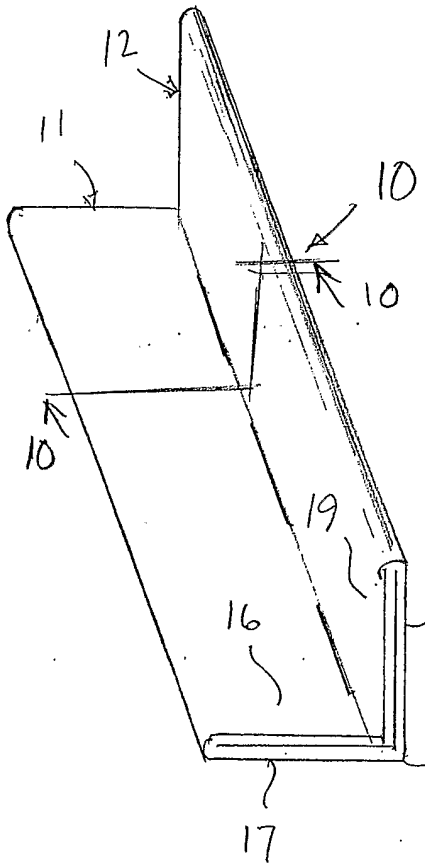
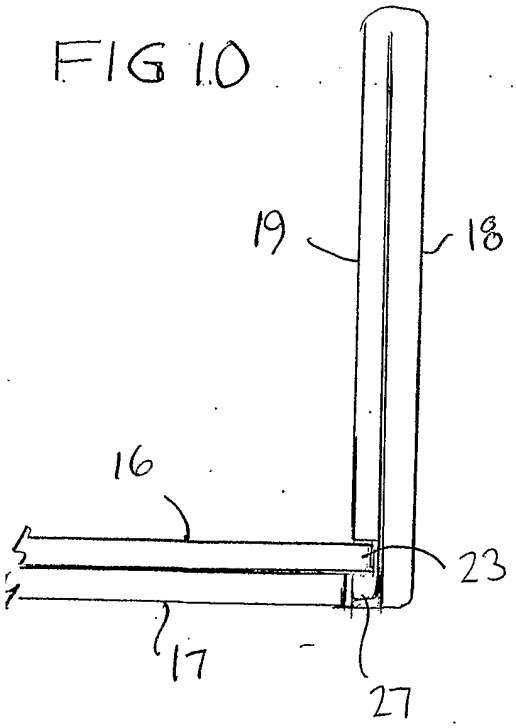


FIG 9

FIG 10



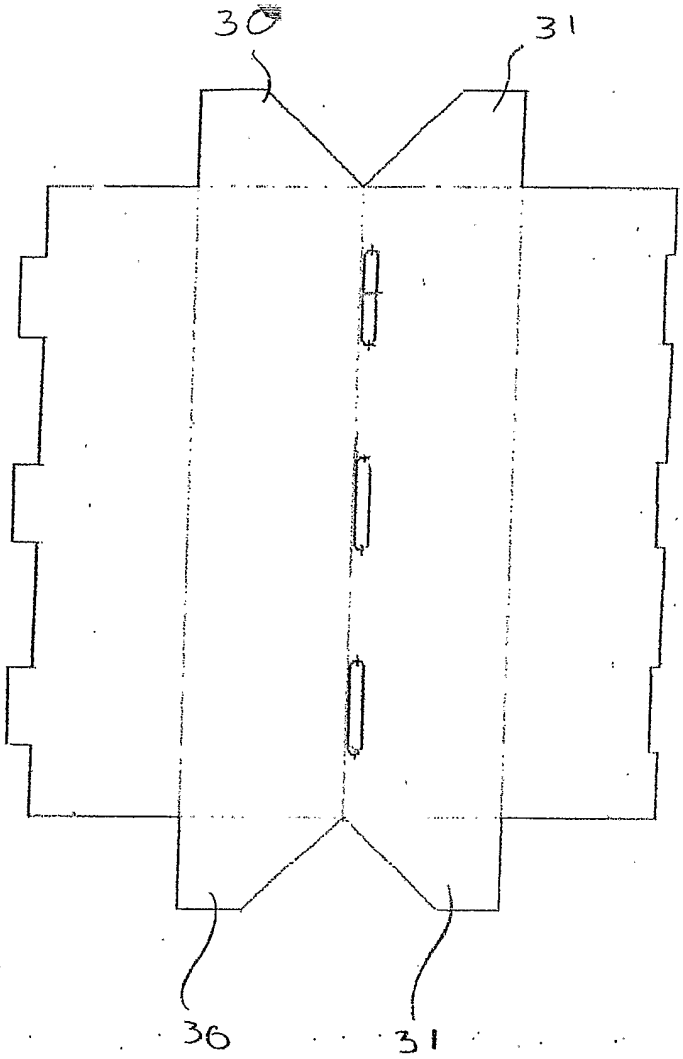


FIG 11

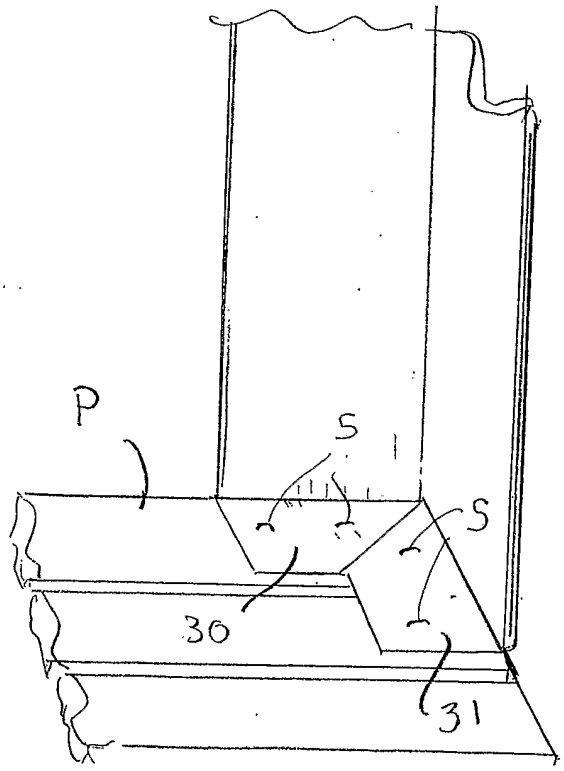


FIG. 12

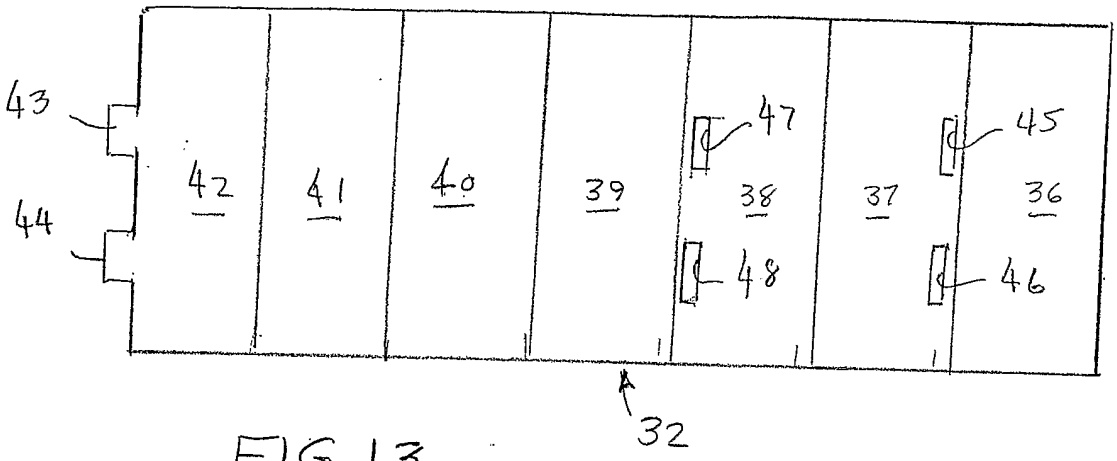

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FIG 13

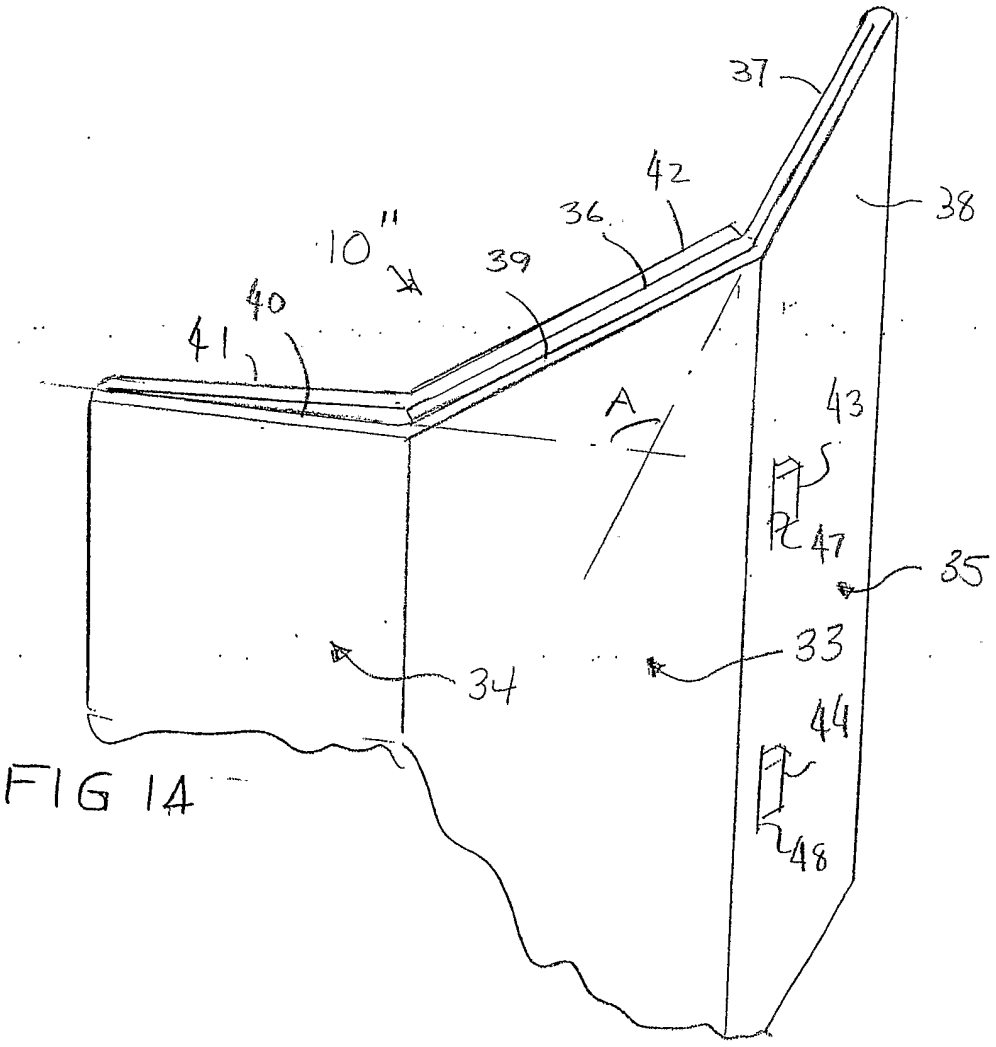
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FIG 14

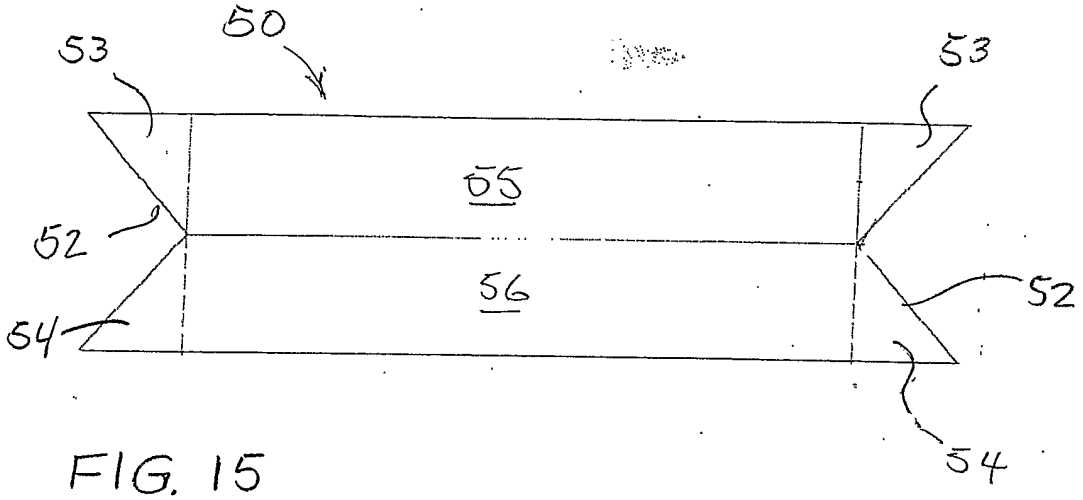

FIG. 15