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Brennan

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[54] **BOX AND CORNER CLAMP RETAINING BOX TO FORM**

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[51] **Int. Cl.** **A44b 21/00**

[58] **Field of Search** ..... 229/47, 49; 24/81 BF, 73 CF, 73 FT, 259 TF, 259 FS, 73 PC, 73 B, 81 B, 67 CF

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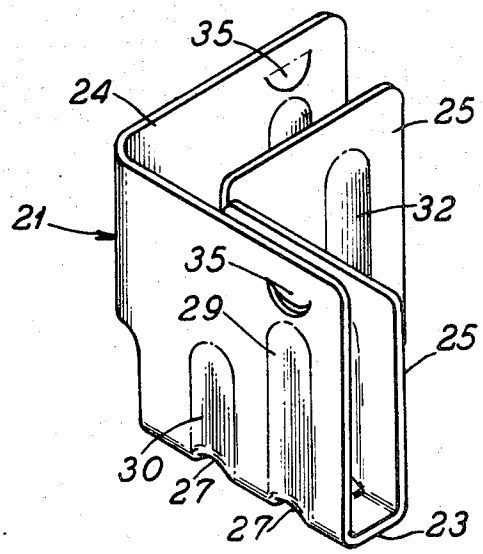
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[57] **ABSTRACT**

Heavy-duty box formed by corner clamps fitting along the corners of a folded box blank and locked thereto, to lock the side walls into a rectangular tray-like form without stapling or stitching. A set of four corner clamps is provided for a bottom tray of the box. A rectangular sleeve may fit into the bottom tray. A set of four corner clamps forms a top tray of the box closing the sleeve when loaded. Strapping or other fastening means may retain the trays and sleeve into a closed box-like form.

3 Claims, 6 Drawing Figures



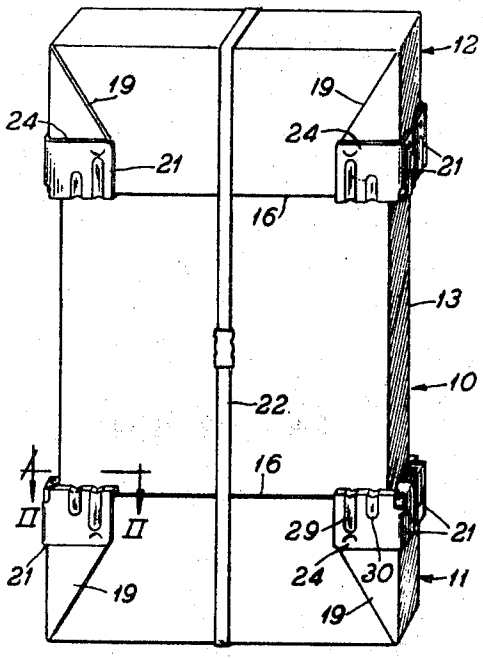


Fig. 1

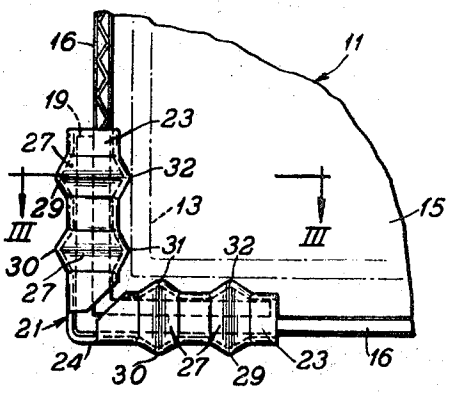


Fig. 2

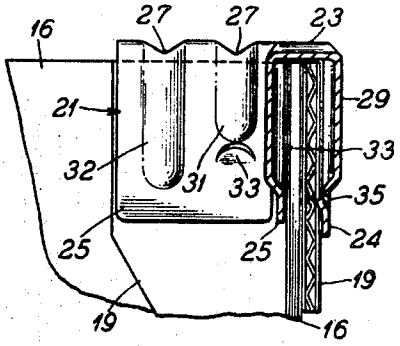


Fig. 3

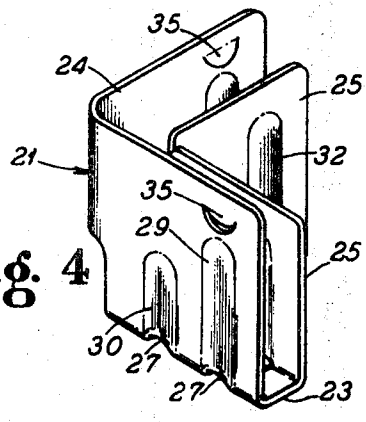


Fig. 4

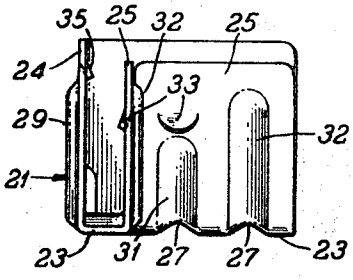


Fig. 5

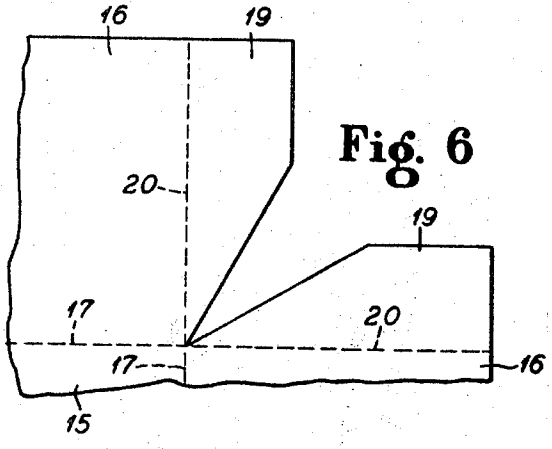


Fig. 6

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BOX AND CORNER CLAMP RETAINING BOX TO FORM

FIELD OF THE INVENTION

This invention relates generally to boxes and clamping means for the side walls of the boxes replacing the customary stitching or stapling.

SUMMARY OF THE INVENTION

According to the present invention, corner clamps for the corners of a box are preformed in the form of a downwardly opening right-angled channel with webs extending at right angles with respect to each other and parallel legs extending from the webs and along the side walls of a folded box blank to fit over and clamp the side and end walls of the folded blank to a tray-like form. The inner and outer legs of the corner clamps have shear forms having sharp ends embossed inwardly, which cut into the adjacent surfaces of the side walls of the box, to permanently retain the side walls in right-angled relation with respect to each other with no stitching or stapling.

A sleeve may fit within the side walls of the tray and a second box-like tray clamped at its corners by corner clamps, may fit over the top of the sleeve and form a cover therefor, and complete the box when strapped or otherwise secured thereto.

While the present corner clamps are particularly adapted for corrugated boxes, they also may be used to clamp the corners of trays made from wood or from various other forms of material commonly used for boxes and the like.

The present invention provides an inexpensive corner clamp which may be assembled to the side walls of a box at the corners thereof to provide a rugged quickly assembled box for heavy-duty use, in which no stitching or stapling is required.

The invention also provides an inexpensive and rugged means for forming box-like trays for carrying material by the simple operation of slipping corner clamps along the corners of the folded end and side walls of a blank, and locking the clamps thereby by interengagement therewith.

The invention further secures the side and end walls of a folded blank of a tray or box together by the use of corner clamps extending along and locked to the side and end walls of the box or tray at the corners thereof, which may be removed for future use in forming boxes or trays, or may be thrown away as the boxes or trays are unloaded and have fulfilled their purposes.

Other objects, features and advantages of the invention will be readily apparent from the following description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a box constructed in accordance with the principles of the present invention.

FIG. 2 is a fragmentary sectional view taken through a corner portion of the box along line II—II of FIG. 1.

FIG. 3 is a fragmentary transverse sectional view taken substantially along line III—III of FIG. 2.

FIG. 4 is a perspective view of a corner clamp, looking downwardly on the clamp along the open ends of the legs thereof toward the webs connecting the legs together.

FIG. 5 is an end view of the clamp shown in FIG. 4; and

FIG. 6 is a fragmentary plan view of a form of blank that may be used to form the top and bottom trays of the box.

DESCRIPTION OF PREFERRED EMBODIMENT OF INVENTION

In FIG. 1 of the drawings, I have shown a box, carton or container **10**, which may be formed from corrugated cardboard, or any other suitable material. The container **10** is shown as including a bottom tray **11**, a top tray **12** and a rectangular sleeve **13**, which also may be formed from corrugated board and fitting within the bottom tray **11** and closed by the top tray **12**, when the container is loaded with articles to be stored or transported.

The trays **11** and **12** are each of a similar form and are formed in the same manner, so one tray only need herein be shown and described in detail.

In FIG. **6**, I have fragmentarily shown a blank for a tray **11** including a generally rectangular bottom **15** and side and end walls **16**, which may be bent upwardly from the bottom **15** along score lines **17** at right angles with respect to each other. The adjacent ends of the side and end walls **16** have flaps **19** extending therefrom toward each other and bent along score lines **20** so one flap **19** will underlap a wall **16** and the other flap **19** will overlap a wall **16** when the walls **16** are bent upwardly along the score lines **17** into perpendicular relation with respect to the bottom **15** as shown in FIGS. **2** and **3**. The flaps **19** thus form two plies at the corners of the tray, along the upper end portion thereof which are adapted to be clamped together to retain the side and end walls to a rectangular form perpendicular to the bottom **15** of the tray by a corner clamp **21**, at each corner of the tray, and having interlocking engagement therewith, to reinforce the corners of the tray and retain the tray into its rectangular form without stitching or stapling the flaps to the end and side walls of the tray, as will hereinafter more clearly appear as this specification proceeds.

As the trays **11** and **12** are formed to their rectangular form and locked in this form by the corner clamps **21**, a rectangular sleeve **13** which may be made from corrugated board or any other suitable material and conforms to the interior of the tray is slipped into the tray from the top thereof into close engagement with the corner clamps **21**. The tray and sleeve may then be loaded with the required material. As the tray and sleeve are loaded, the tray **12** is slipped over the top of the sleeve to close the container. Strapping **22** may then extend about the container to retain the container closed for shipment to its destination. While I have shown strapping **22** extending along the sides and over the top of the container, other strapping (not shown) may extend about the container perpendicular to the strapping **22** as it extends across the top of the top tray **12**.

Referring now in particular to the corner clamps **21**, each corner clamp is adapted to be formed from relatively heavy gauge sheet metal, and is L-shaped in plan where the tray is to be a rectangular tray and conforms

to a corner of the tray. Each corner clamp **21** is generally channel-like in form to extend downwardly along the walls of the tray to clamp the flaps **19** to the walls of the tray and reinforce the corners of the tray.

Each clamp **21** includes a web **23** extending along each leg of the L and terminating adjacent the corner of the clamp to accommodate bending of the clamp into its L-shaped form, with an outer right-angled leg **24** depending from the webs **23** along the outer sides of the tray and inner legs **25** extending downwardly from the webs **23** parallel to the leg **24** and having clamping engagement with the inside of a wall **16** and flap **19** of the tray, and thereby clamping the corner clamp to the corner of the tray, and clamping the flaps and walls of the tray into tight engagement with each other. The spacing between the legs **24** and **25** may be sufficiently close to the thickness of the walls **16** and flaps **19** to engage said walls and flaps with each other under a certain amount of compressive force as the clamp is slipped over the corners of the tray.

As shown in FIGS. **2,3** and **5,** the webs **23** have embossments **27** which are shown as being pressed therein from the tops thereof to reinforce said webs. The outer leg **24** has embossments **29** and **30,** which are shown as being pressed outwardly therefrom and as extending parallel with respect to each other. The outer embossments **29** are shown as being longer than the inner embossments **30.** The two embossments **29** and **30** in each angle of the leg **24** extend downwardly along the leg **24** in parallel relation with respect to each other, to provide reinforcements for said legs and thereby rigidify said legs for the length thereof.

The inner legs **25** each have embossments **31** and **32** pressed outwardly therefrom and extending downwardly from the embossments **27** in parallel relation with respect to each other to rigidify and reinforce the inner legs **25.** The outer embossments **32** are shown as being longer than the inner embossments **31** and each embossment extends along its leg in registry with the embossments **27** extending across the web **23.**

As shown in FIG. **5,** the inner legs **25** are shorter than the outer leg **24** and each inner leg has a shear form **33** pressed inwardly therefrom and shown as being disposed in alignment with the embossment **31** just beneath the bottom thereof when the corner clamp is applied to the end and side walls of a lower tray **11.** The shear forms **33** form a sharp projection shown as being crescent shaped and having interlocking engagement with the inside of the wall and a flap of the tray at the corner thereof and cooperating with shear forms **35** pressed inwardly of the leg **24** beneath the embossments **29** to have interengagement with the overlapping flap **19** and side wall **16** at the corner of the tray. The shear form arrangement just described adjacent the corners on the inside of the tray and adjacent the outer ends of the flaps on the outside of the tray provides a rugged and positive clamping means for the corners of the tray, difficult to remove without disfiguring the tray.

The embossments **29** and **30,31** and **32** thrust outwardly of the respective legs **24** and **25** of a corner clamp give said legs sufficient rigidity to clamp the flaps **19** to the side and end walls of the tray and to compressively engage said flaps and side and end walls. The shear forms **33** and **35** respectively at the bottoms of the long embossments of the outer legs and the bottoms of the short embossments of the inner legs are so formed and located as to cut into the corrugated board of the tray or other material from which the tray may be made and to positively hold the tray to its rectangular form and reinforce the corners thereof.

While the shear forms are herein shown as being in the form of crescents punched inwardly from the legs **24** and **25,** it should be understood that they need not be crescents but may be rectangular in form or may be V-shaped in form depending upon the material from which the tray is made and the depth required for the shear forms to cut into the material to retain the corner clamps to the tray to clamp and reinforce the corners of the tray.

The difference in length between the inner and outer legs and the staggered location of the shear forms on the inner and outer legs facilitates the placing of the clamp in position along the corner of the tray and increases the gripping ability of the shear forms, making it difficult to remove the corner clamps by lifting and back and forth rocking movement of the clamps with respect to the tray without tearing the wall and flaps of the tray at the corners thereof.

It should here be understood that while the shear forms are shown as adapted to a rectangular tray, they may be adapted to hexagonal, circular or various other forms of trays, which may be used for article carrying purposes, or to be formed into boxes or other forms of containers.

I claim as my invention:

1. A clamping means for the corners of containers and the like, rigidly clamping the walls of the container to form, comprising,

a corner clamp for each corner of the container,

each clamp being L-shaped in plan view and of a downwardly opening generally U-shaped form in cross section and including webs conforming to the corner of the container and extending along the tops of the walls thereof, having

inner and outer legs depending therefrom arranged to extend along the inner and outer sides of the adjacent walls of the container at a corner thereof, the inner legs being shorter than the outer legs,

said webs having spaced embossments extending transversely thereacross and extending inwardly of the top surfaces of the webs, and said inner and outer legs having parallel embossments extending therealong and outwardly of the legs and in alignment with the embossments extending across the webs,

the embossments extending along the outer legs being longer than the embossments extending along the inner legs, and the outermost embossments of the inner and outer legs being longer than the innermost embossments,

integral locking means on the outer legs beneath the outermost embossments, and

integral locking means on the inner legs disposed beneath the innermost embossments.

2. The clamping means of claim **1,**

wherein the locking means are in the form of shear form crescents pressed inwardly of the inner and outer legs and formed with sharp material engaging surfaces facing angularly inwardly toward the webs of the corner clamp for locking engagement with the walls of the container.

3. The corner clamp of claim **2,**

wherein the webs extend at right angles with respect to each other and the outer leg is a continuous leg of a right-angled form in plan, and

wherein the shorter inner legs extend for substantially the lengths of the webs from which they depend.

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