Oct. 27, 1959 A. L. WHITON 2,910,221

CRATE

Filed Aug. 1, 1958 3 Sheets-Sheet 1

Fig. 1

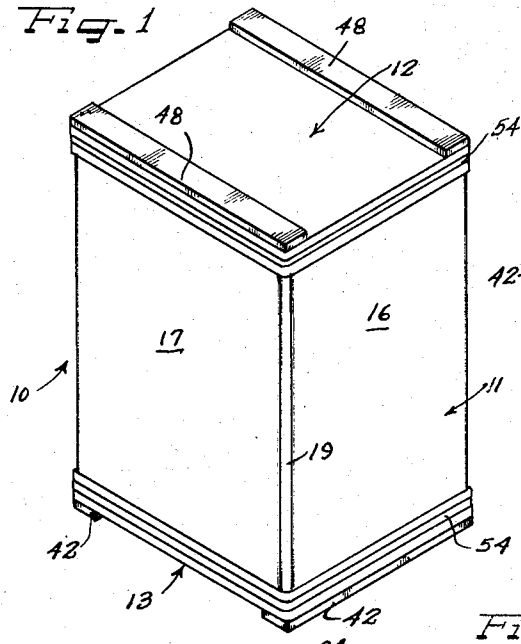


Fig. 8

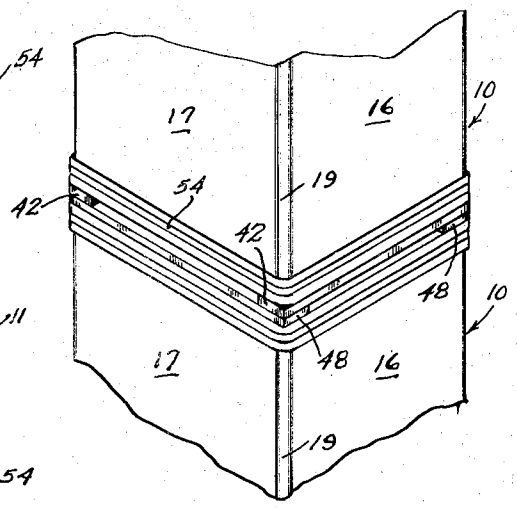


Fig. 2

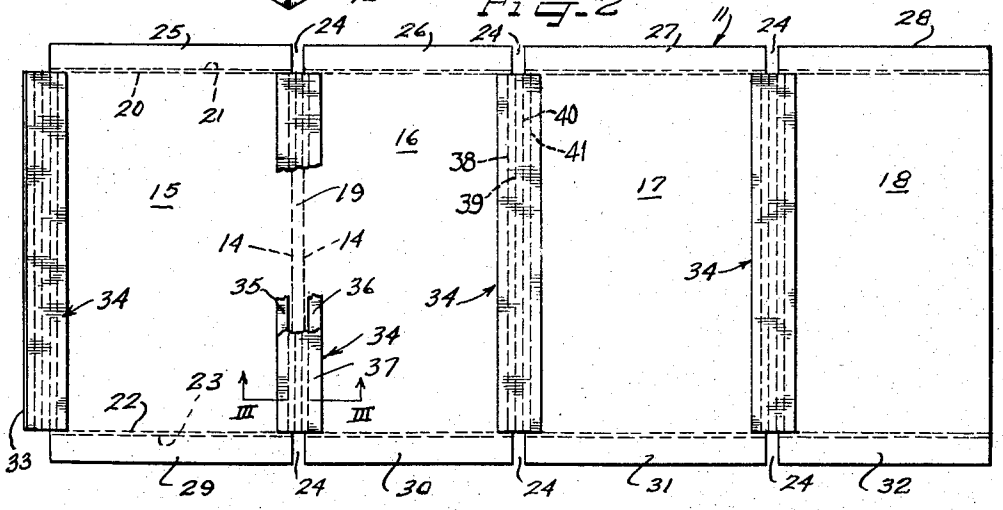
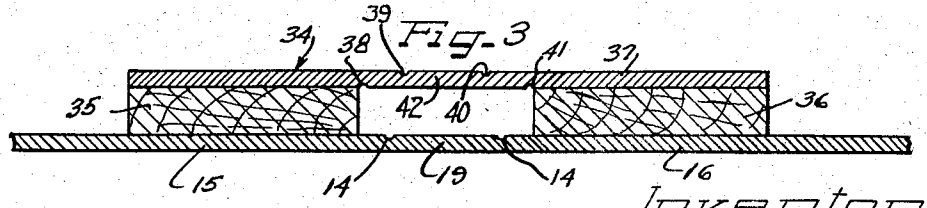


Fig. 3



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CRATE

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Fig-4

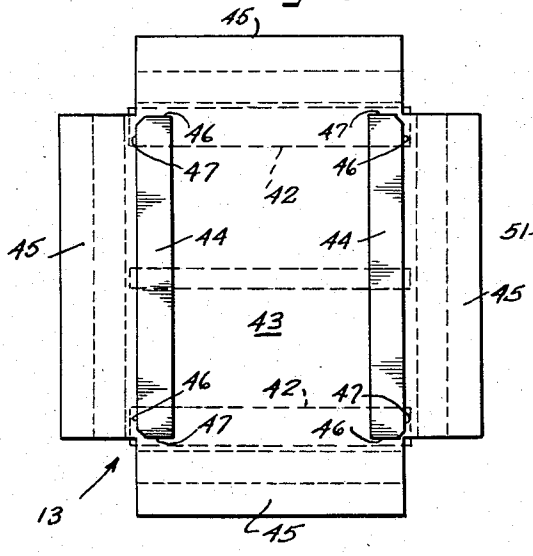


Fig-5

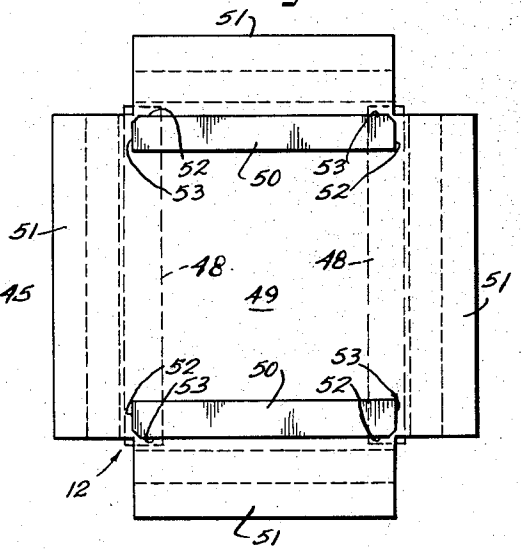


Fig-6

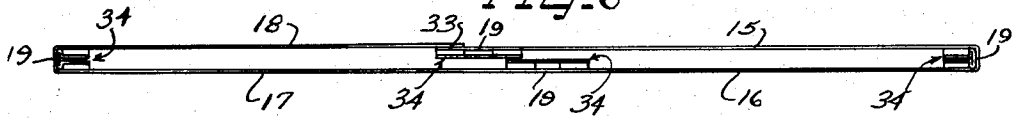
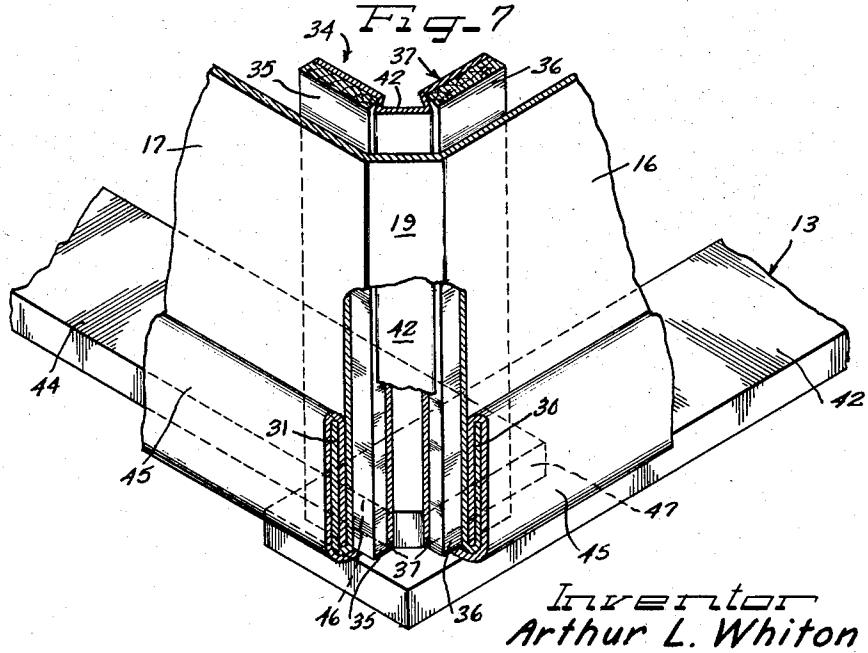


Fig-7



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CRATE

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Fig-9

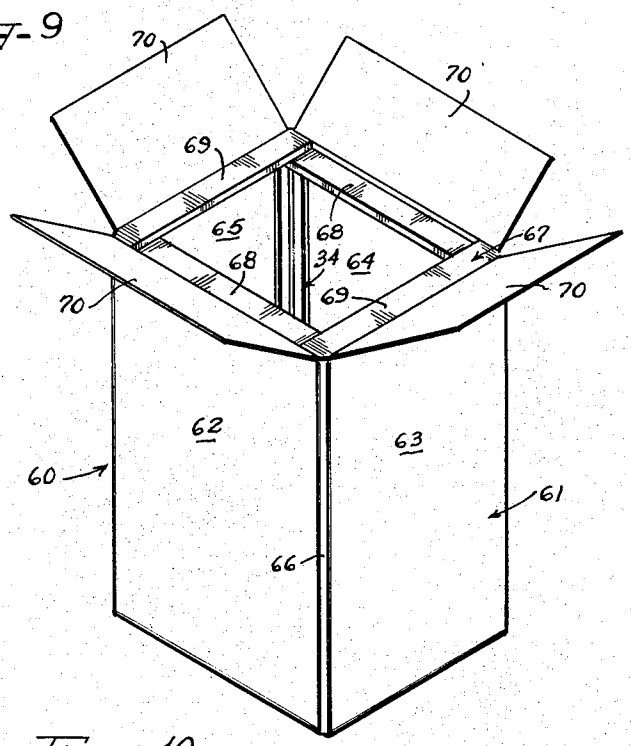
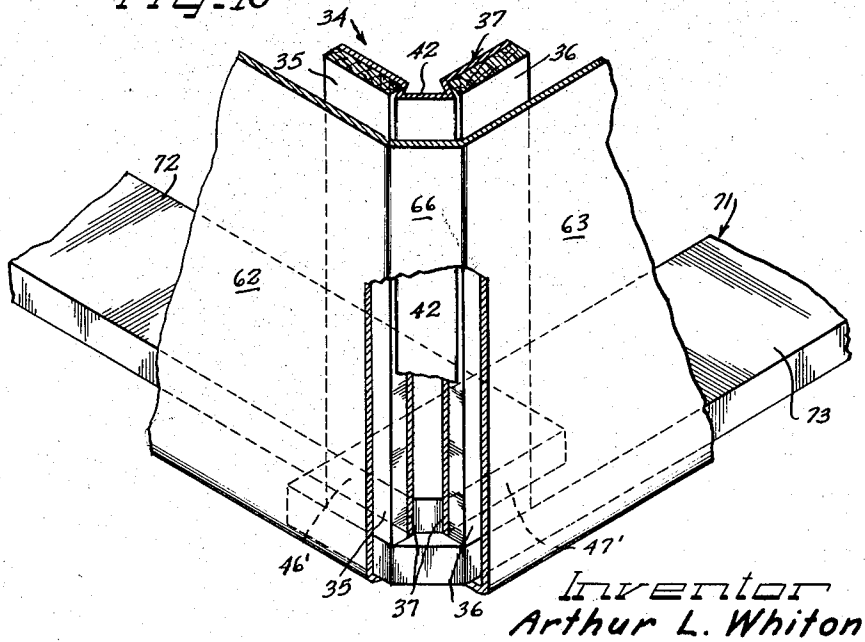


Fig-10



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United States Patent Office 2,910,221 Patented Oct. 27, 1959

2,910,221

CRATE

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Application August 1, 1958, Serial No. 752,551

8 Claims. (Cl. 229—23)

This invention relates generally to crates, and more specifically to an improved collapsible crate having a novel reinforcing structure incorporated therein.

Although the principles of the present invention may be included in various crates, a particularly useful application is made in crates of the drum type, and of the flap type. In particular, when crates of this general type are made collapsible, they frequently have a tendency to spring back to a partially erected condition. Accordingly, it is an object of the instant invention to provide an improved crate which is collapsible to a flat condition, and which will not spring back when so disposed.

Further, when crates of this general type are filled with structures, it is frequently desired to stack the crates on each other, without employing palletizing. When several such crates are stacked on top of each other, there is a tendency for the crates to twist and collapse, or to crush. Accordingly, another object of the present invention is to provide an improved crate which has somewhat greater resistance to crushing, and hence a greater stacking strength than has been heretofore provided.

Furthermore, when crates are handled in the full condition, the vertical corners thereof are frequently subjected to blows. While corner stiffening, broadly speaking, is old, it is another object of the instant invention to provide an improved novel stiffening or reinforcing means which will render the corners of the crate resistive to somewhat greater blows than could be applied heretofore without damage.

Yet another object of the instant invention is to provide crate reinforcement coupled with means for protecting the goods from scratching or damage such as might arise from contacting internal crate reinforcement.

Yet another object is to provide a crate which may be stacked on top of other like crates, and which may be picked up by a lift fork entering from any one of the four sides of the crate to be lifted.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which preferred structural embodiments incorporating the principles of the present invention are shown by way of illustrative example.

On the drawings:

Figure 1 is a perspective view of the crate of this invention in its assembled form;

Figure 2 is a plan view, partially broken away, of the wrap-around body portion forming the sidewalls of the crate;

Figure 3 is an enlarged view taken along line III—III of Figure 2;

Figure 4 is a plan view of the platform assembly or bottom portion of the crate;

Figure 5 is a bottom or inside plan view of the cover assembly or top portion of the crate;

Figure 6 is an end elevational view of the tubular body member in its folded form ready for shipment or storage;

Figure 7 is an enlarged fragmentary sectional view of a lower corner portion of the crate shown in Figure 1;

Figure 8 is a fragmentary perspective view of a crate such as shown in Figure 1 stacked on top of another crate such as shown in Figure 1;

Figure 9 is a perspective view of a modified form of crate incorporating the principles of this invention, and shown with the top flaps thereof open to expose the cover member thereof to view; and

Figure 10 is an enlarged fragmentary sectional view generally similar to Figure 7, showing a lower corner of the crate of Figure 9.

As shown on the drawings:

The principles of this invention are particularly useful when embodied in a crate such as illustrated in Figure 1, generally indicated by the numeral 10. The crate includes a tubular body member 11 of rectangular configuration, a rectangular cover member or assembly 12, and a rectangular platform or platform assembly 13.

The tubular body member 11, as best seen in Figure 2, comprises paperboard, such as corrugated board, and is here shown to be made of a single sheet of material, rectangular in form, and provided with eight vertical score lines, such as indicated at 14, which lines 14 extend for the height of the body member 11. The vertical score lines 14 define a series of side walls or panels 15—18. Between each adjacent pair of side walls, such as 15, 16, there is a corner panel 19 which also extends for the entire height of the tubular body member 11. The corner panels 19 are thus defined by a pair of closely adjacent vertical score lines 14. A series of horizontal score lines 20—23 together with a series of slits or cutouts 24 jointly define a series of flap panels 25—32, severally disposed at the upper and lower edges of the side walls 15—18, and integral therewith. The tubular body member 11 also includes a side flap 33 which is integrally secured to one of the corner panels, which in turn is integral with one of the vertical edges of the side wall 15.

As best seen between the side walls 15 and 16, and also in Figure 3, each of the corner panels 19 is provided with a corner reinforcing means generally indicated by the numeral 34. Each of the corner reinforcing means 34 includes a pair of vertical cleats 35, 36, and a liner member of paperboard 37. The vertical cleats 35 and 36 extend substantially for the entire height of the side walls 15—18, the upper ends of the vertical cleats 35 and 36 being disposed adjacent to the score lines 20 and 21, while the lower ends of the cleats 35, 36, are disposed adjacent to the score lines 22, 23 of the body member 11. The liner member 37 is provided with a series of score lines 38—41 which extend vertically for the entire length of the liner member 37. The score lines 38 and 41 are disposed on the outer surface of the liner member 37 and are located to register with the confronting edges of the cleats 35, 36. The score lines 39, 40 are located on the inner surface of the liner member 37 and are spaced from the score lines 38 and 41 so as to provide an intermediate portion 42 which is disposed adjacent to the corner panel 19 in parallel relation thereto. Thus, as best seen in Figure 3, the score lines 14 in the tubular member are spaced apart by a distance which is equal to the horizontal length of a corner panel 19, while the score lines 39, 40 in the liner member 37 are spaced apart by an amount not exceeding the same distance minus twice the thickness of the liner member material. It will thus be noted that the linear member 37 is secured at its outer surface to the inwardly directed surfaces of the cleats 35, 36 and is bonded thereto, preferably by gluing. Thus the inwardly directed surfaces of the cleats 35, 36 are covered and are free of any metal which could scratch any structure which is disposed within the crate 10. The corner reinforcing as-

sembly 34 may be secured as a unit to the interior of the tubular body member 11 by any convenient means, and is disposed as shown in Figure 2, wherein the vertical cleats 35, 36 are secured to interior vertical edge portions of the side walls 15—18, slightly spaced from the corner panels 19. The slight spacing is at least twice the thickness of the member 37. When the body member 11 is bent to a tubular form, the portion 42 buckles toward and against the adjacent corner panel 19, as best seen in Figures 6 and 7.

The flap panel 33 may now be directed toward the right hand edge of the sidewall 18, as shown, whereby the body member 11 takes on a generally tubular form such as shown in Figure 1. The tubular body member 11, of course, may be collapsed and stored in a flat condition for shipment, as best seen in Figure 6.

In this view, it is particularly apparent that the horizontal length of the cover panel 19 is no less than the combined thickness of the cleats 35, 36, plus twice the thickness of the liner member 37. Therefore, there is substantially no tendency on the part of the liner member 37 or on the part of the cleats 35, 36 to spring the adjacent side panels or walls apart, whereby the tubular body member 11 remains in a flat condition. On the other hand, when the collapsed body member 11 is opened to a form such as shown in Figure 1, the attachment between the sidewalls and the cleats 35, 36 acts to fully open the corner reinforcing means 34.

The rectangular platform assembly 13 includes at least two exposed parallel spaced skid members 42 on top of which there is disposed a closing member 43 such as of corrugated board. On top of the member 43 there is disposed a pair of slats 44. The slats 44 are secured at each end to the skid members 42 by any convenient means, thereby also securing the closing member 43 therebetween. The closing member 43 is provided with extensions on each side thereof, each of which has a pair of score lines, such extensions thereby each comprising a closing flap 45 which interlocks at assembly with one of the flaps 29—32. At each of the corners of the platform assembly 13, the slats 44 are angularly cut off in a manner corresponding to the angle formed by the corner panels 19. More significantly, however, there is provided a vertically extending surface, such as 46 and 47 which is engageable with the liner member 37 at the lower end of the cleats 35, 36, in a manner wherein the slat 44 opposes inward movement of one of the cleats in a first direction, and opposes movement of the other cleat in a direction at right angles thereto. A similar structure is provided at each of the four corners of the platform 13.

Referring to Figure 5, it will be seen that a similar structure is provided for the cover member 12, except that lighter weight members may be employed, and a brace or a skid may be omitted. The cover 12 includes a pair of upwardly directed exposed parallel spaced skid members 48, 48 on which there is disposed a cover member 49, against which there is disposed a pair of interior slats 50, 50. The slats 50 are secured to the skid members 48 in any convenient manner, and thereby secure the cover member 49 also therebetween. The cover member 49 is likewise provided with a plurality of closing flaps 51 which have score lines which enables the flaps 51 to interlock with one of the body member flaps 25—28. It is to be noted that the skid members 42, 42 of the base are at right angles to the skid members 48, 48 of the cover assembly 12, one having the skids extending the short direction of the rectangular shape, while the other having the skids extending the long direction of the rectangular shape. The slats 50 likewise are provided with vertically extending external surfaces 52, 53 at each corner thereof.

To assemble the crate, the platform 13 is first disposed as shown in Figure 4 and the tubular body member 11 is opened to fit on the platform 13. Of course, any structure which is to be crated is preferably first secured to the slats 44. The cover assembly 12 as shown in Figure 5 is then inverted so that the slats 50 extend into the tubular body member 11. The various flaps 45 and 51 are then interfolded with one of the flaps 25—32 of the body member and a steel band 54 is secured thereabout.

Once the carton is so closed, a relationship between the various parts exists such as shown in Figure 7. It will be seen that the cleats 35, 36 extend to the platform 13 and are supported in endwise relation by it, and more specifically are supported by one of the skids 42. Further, the lower end of the cleats 35, 36 is backed up by the vertically extending surfaces 46, 47 which oppose inward movement of either of the cleats. Thus a blow given to the crates at a corner thereof is positively opposed. Usually, such blows will be generally normal to the surface, whereby a positive resistance to yielding is provided. Further, even though one of the cleats should deflect under the force of such a blow, its interior surface being fully covered by the liner 37 cannot damage the structure in the crate.

Since the skids 48 of the cover are at right angles to the skids 44 of the base, crates 10 may be stacked on top of each other as shown in Figure 8 with a space left at each one of the exposed surfaces for the fingers of a fork lift truck to enter. This feature enables a stack of crates to be unstacked from any one of the sides.

Referring now to Figures 9 and 10, it can be seen that the principles of this invention can be incorporated into other crates constructed in slightly modified forms.

In Figure 9, the crate 60 includes a tubular body member 61 having sidewalls 62—65 between each of which is disposed a corner panel 66. A cover member 67 includes two pairs of crossed slats 68, 69. The cover member 67 is similar to the cover shown in Figure 5, except that the paper member 49 has been omitted and the tubular body member 61 has been provided with larger inwardly folding flaps 70. Thus when the flaps 70 are closed, the cover member 67 is disposed entirely within the crate.

The tubular member 61 is provided with cover reinforcing means 34 such as shown in Figure 3 and with vertical score lines such as shown in Figure 2.

A rectangular platform assembly 71 includes crossed slats 72, 73, which are generally similar to the slat and skid members shown in Figure 4, but wherein the base member 43 has been omitted, and suitable surrounding flaps integral with the tubular body member 61 have been provided.

As best seen in Figure 10, it will be noted that a substantially identical corner is provided, except that a flap extends under the slat 73 instead of over it as in Figure 7. As in the case of the other embodiment, a similar structure is present at each of the eight corners of the crate.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a series of vertical cleats each secured to one of said side walls slightly spaced from one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to said

cleats and covering the inwardly directed surface of said cleats.

2. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a vertical cleat secured to each interior vertical edge portion of said side walls slightly spaced from one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to a pair of said cleats at one of said corner panels and covering the inwardly directed surface of each of said pair of cleats.

3. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls; a cover member overlying the tubular body member; a series of vertical cleats each secured to one of said side walls slightly spaced from one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to at least one of said cleats and covering the inwardly directed surface of said cleats, said liner members each having a portion disposed parallel to and in engagement with one of said corner panels.

4. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a series of vertical cleats each secured to one of said side walls slightly spaced from one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to said cleats and covering the inwardly directed surface of said cleats; said platform and said cover member each having a vertically extending surface abutting the inner surface of each of said liner members adjacent to the ends of said cleats.

5. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a series of vertical cleats each secured to one of said side walls slightly spaced from one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to said cleats and covering the inwardly directed surface of said cleats; said platform and said cover member each being adapted to oppose inward movement of one cleat at a corner, and to oppose similar movement at right angles to said inward movement by a second cleat at said corner.

6. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a series of vertical cleats each secured to one of said side walls adjacent to one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member at each of said corner panels, each of said liner members being secured to said cleats and covering the inwardly directed surface of said cleats; two non-adjacent corner panels each having a horizontal length no less than the combined thicknesses of said cleats at said corner plus twice the thickness of said liner member, and the cleats at said two corner panels each being spaced from the adjacent edge of the supporting side wall by at least twice the thickness of said liner member.

7. In a crate for a structure having a rectangular platform for fastening to the bottom of the structure, a tubular body member of paperboard, said member having a series of vertical score lines defining four vertical side panels and a vertical corner panel intermediate each of said side panels, and a cover member overlying the tubular body member, the improvement of a corner reinforcing means, said means comprising: a pair of parallel spaced cleats; and a liner member bonded to one side of each of said cleats, and having a portion extending intermediate said cleats; the other side of each said cleats being secured to a pair of the side panels with said intermediate liner portion adapted to be disposed in backing relation against the intermediate corner panel, said cleats extending substantially the full length of the body member so that they may engage the platform at their lower ends and the cover member at their upper ends.

8. A crate for a structure comprising: a rectangular platform for fastening to the bottom of the structure; a tubular body member of paperboard including four side walls and a corner panel intermediate each of said side walls; a cover member overlying the tubular body member; a vertical cleat secured to each interior vertical edge portion of said side walls adjacent to one of said corner panels, and extending substantially the full length of said body member so that they are supported by the platform at their lower ends and support the cover member at their upper ends; and a liner member of paperboard at each of said corner panels, each of said liner members being secured to and covering the inwardly directed surface of each of a pair of said cleats at one of said corner panels, said liner members each having a portion adapted to be disposed parallel to and in engagement with one of said corner panels; two non-adjacent corner panels each having a horizontal length no less than the combined thicknesses of said cleats at said corner plus twice the thickness of said liner member, and the cleats at said two corner panels each being spaced from the adjacent edge of the supporting side wall by at least twice the thickness of said liner member; said platform and said cover member each having a vertically extending surface abutting the inner surface of each of said liner members adjacent to the ends of said cleats.

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