# United States Patent

[11] **3,580,618**


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[54] **COMBINATION CLEAT AND CLIP MEANS FOR ASSEMBLING COLLAPSIBLE CONTAINERS**
**1 Claim, 5 Drawing Figs.**


[52] **U.S. Cl.** ..... **287/20.924,** 217/13
[51] **Int. Cl.** ..... **F16b 7/00**
[50] **Field of Search** ..... 287/189.36 (D), 20.924, 20.92 (C), 20.92 (D), 20.92 (DB); 312/263; 52/285, 489, 582; 211/177, 178; 108/111, 153; 217/12, 13; 220/7, 4 (Cursory)



[56] **References Cited**

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**ABSTRACT:** A combination cleat and clip means for interconnecting the sides of a collapsible container with the bottom or floor thereof, the cleat being secured to said bottom or floor and having a recess, the principal axis of which is parallel to the plane of said bottom or floor; the clip being secured to a surface of a wall, and having resiliently expandable means extending laterally from the plane of said wall and engaging said recess in such manner that said cleat is gripped on opposite sides thereof between said resiliently expandable means and a surface of said wall, to maintain said wall substantially at a right angle with respect to said bottom or floor. The invention has application to other structures, as for example the assembly of furniture and the like.

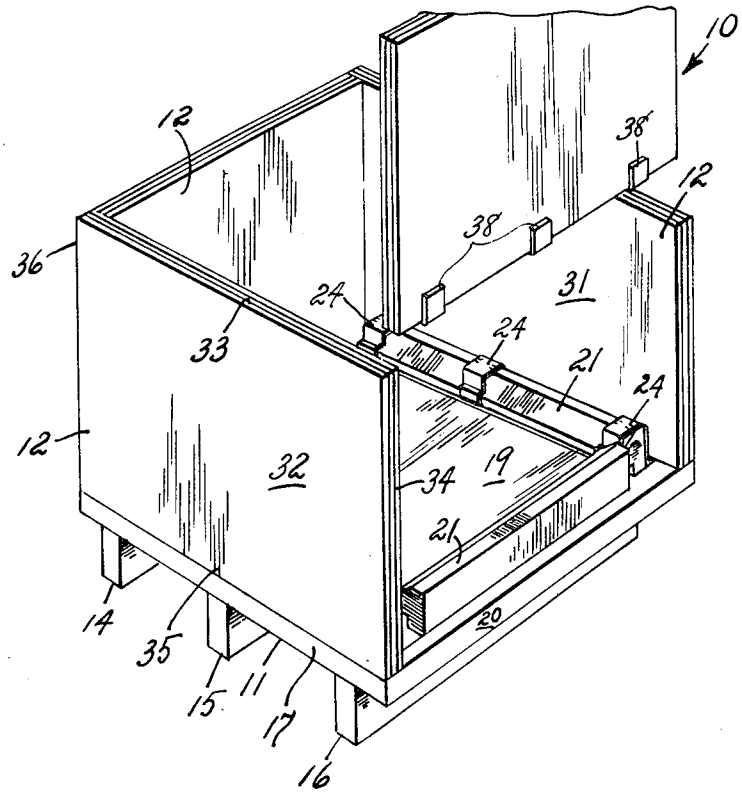
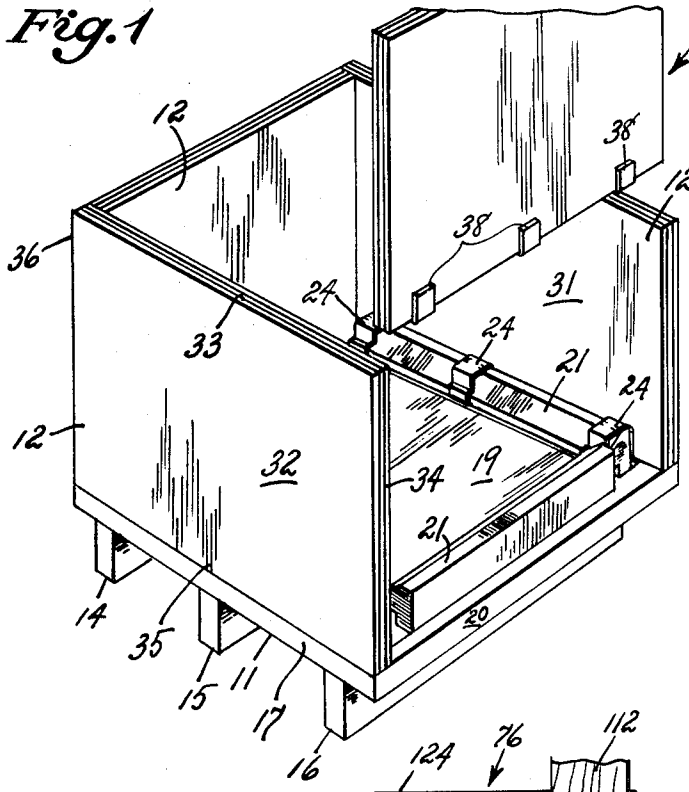



Fig. 1



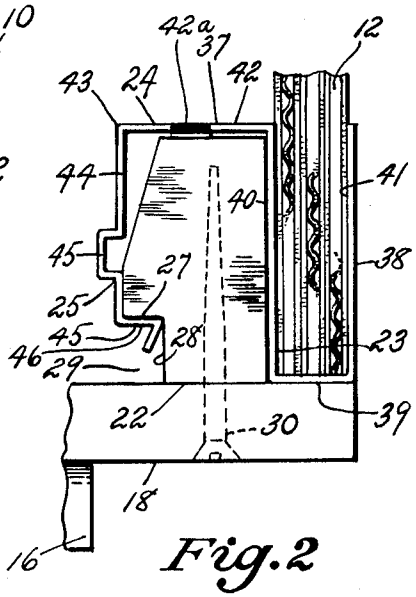




Fig. 2

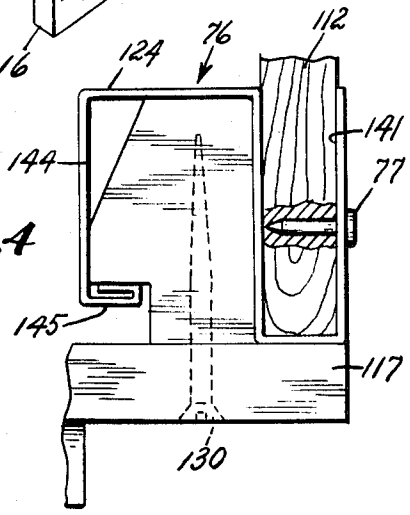



Fig. 4

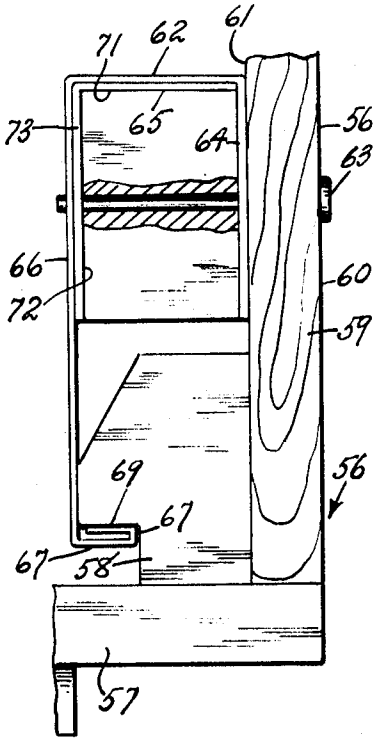



Fig. 3

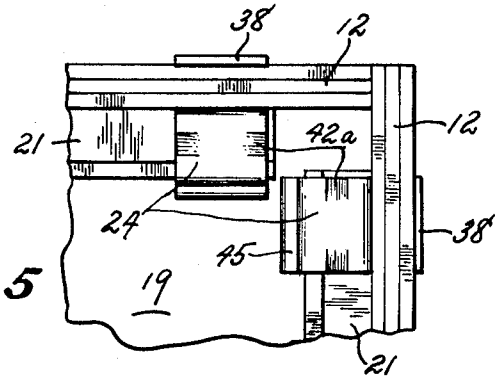



Fig. 5

# COMBINATION CLEAT AND CLIP MEANS FOR ASSEMBLING COLLAPSIBLE CONTAINERS

This invention relates generally to the field of collapsible containers of the type disclosed in my prior U. S. Pat. No. 3,452,346; granted June 24, 1969, and more particularly to an improved means for interconnecting the sidewalls of such containers with a bottom or floor.

In those constructions in which the sidewalls are of appreciable thickness, so as not to be readily foldable with respect to the bottom or floor, it has been necessary to attach and detach, with each use, the sidewalls from the bottom member. Where a large number of such containers are involved, this operation involves substantial labor time, with added cost, and has been found, in some cases to be objectionable.

It is therefore among the principal objects of the present invention to provide an improved construction, by means of which the sidewalls of the container may be conveniently attached to the bottom using a combination cleat and clip means which may be readily and selectively engaged and disengaged using only simple tools.

Another object of the invention lies in the provision of an improved cleat and clip means of the class described, which upon engagement, will align the sides of the container with respect to the bottom member at a proper angle.

Yet another object of the invention lies in the provision of improved clip and cleat means which will not interfere with storage of the container, when the same has been disassembled and the component parts stacked for storage.

Yet another object of the invention lies in the provision of improved interconnecting means of the class described, in which the cost of fabrication may be of a relatively low order, and which may be incorporated into existing constructions at very little added cost, thereby permitting consequent wide sale, distribution and use.

These objects, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIG. 1 is a fragmentary view in perspective of a first embodiment of the invention.

FIG. 2 is a fragmentary enlarged end elevational view, corresponding to the lower right-hand portion of FIG. 1.

FIG. 3 is a fragmentary elevational view, corresponding to that seen in FIG. 2, but showing a second embodiment of the invention.

FIG. 4 is a similar fragmentary elevational view showing a third embodiment of the invention.

FIG. 5 is a fragmentary plan view as seen from the upper portion of FIG. 1.

In accordance with the first embodiment of the invention, generally indicated by reference character **10**, there is illustrated in FIG. 1 a base or pallet element **11** and a plurality of sidewalls **12** selectively engageable therewith.

The base or pallet element **11** may be as disclosed in my prior U.S. Pat. No. 3,452,346, and includes a plurality of transversely extending support members **14**, **15** and **16** interconnected to the undersurface of a bottom or floor member **17** at a lower surface **18** thereof (see FIG. 2). The floor member **17** is bounded by an upper surface **19**, and side surfaces **20**.

Disposed parallel to the side surfaces **20** and on an area of the upper surface **19** abutting the same are elongated cleat members **21**. As best seen in FIG. 2, each cleat member is bounded by a lower surface **22**, an outer surface **23**, an upper surface **24** and an inner surface **25**. An angularly disposed camming surface **26** interconnects the upper and inner surfaces. A horizontal surface **27** and vertical surface **28** defines a recess **29**, the principal longitudinal axis of which is parallel to the upper surface **19** of the floor member **17**. Most conveniently, the cleat members **21** are maintained on the surface **24** by screw means **30**, either as a sole means, or in conjunction with glue (not shown).



The sidewalls **12** are preferably of multi-ply corrugated construction are bounded by an inner surface **31**, an outer surface **32**, an upper edge **33**, side edges **34** and a lower edge **35**. These are abuttable with each other in well-known manner, and may employ folds **36** or other suitable interconnecting means.

Again referring to FIG. 2, the sidewalls **12** are selectively interconnected with the pallet element **11** by a plurality of expandable clip elements **37** secured at periodic intervals thereto at the lower edges **35**. The elements **37** are preferably formed as steel stampings, and include an outer wall member **38**, a bottom wall member **39**, and an inner wall member **40**. Locking teeth **41** are cut from the plane of the inner and outer wall members and provide means for permanently securing the elements **37** to the walls **12**.

Interconnected with the upper edge of the inner wall member **40** is a laterally extending member **42** having resilient tabs **42*a***, in turn interconnected by a fold at **43** to a downwardly extending member **44**. Another bend portion **45** interconnects the member **44** with an inwardly extending member **46** having a terminal edge member **47**. An offset portion **48** permits entry by a screwdriver or other suitable tool to effect easy release of the clip element from the cleat member **21**.

In relatively untensed condition, the edge member **47** will be positioned to contact the camming surface **26** when the inner surface **31** of the wall abuts the outer surface **23** of the cleat member **21**. Thus, during assembly, the wall is positioned above the floor member a distance of several inches, and after abutting the inner surface of the wall with the outer surface of the cleat, a downward motion serves to spread the clip element to a point where the edge member **47** passes the inner surface **25** and springs into position within the recess **29**.

To disengage the wall from the floor member, a screwdriver may be inserted into the interstice formed by the offset portion **48**, and a prying action exerted to cause the edge member **47** to be moved outwardly of the recess. Normally, this separation will be performed in a serial manner, in which a first clip is partially disengaged and allowed to rest upon the inner surface of the cleat, while a similar operation is performed on the next adjoining clip.

Turning now to the second embodiment of the invention, illustrated in FIG. 3, and generally designated by reference character **56**, the floor member **57** and cleat **58** are similar to those of the first embodiment. The sidewall **59** is of wooden construction, rather than corrugated board, and is bounded by an outer surface **60** and an inner surface **61**. The clip element **62** is secured to the wall **59** by a nail or rivet **63**, and lies entirely inside the wall. A first vertical wall **64** interconnects with an upper wall **65**, and a second vertical wall **66**, in turn interconnected with a horizontally disposed lower wall **67**, having fold edge **68** and folded strip **69**. A wood spacing member **70** includes upper and inner surfaces **71** and **72**, respectively, which are provided with a reinforcing member **73**, the bolt **63** penetrating the entire device.

In the third embodiment, illustrated in FIG. 4, and generally designated by reference character **76**, parts corresponding to those of the first embodiment have been designated by similar reference characters with the additional prefix "1". The third embodiment differs from the first embodiment in the elimination of the locking teeth **41**, and the substitution of a rivet **77** performing the same function as the bolt **63** in the second embodiment.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. Improved means for assembling collapsible containers including first and second generally planar parts detachably interconnected at abutting edges thereof, at substantially a mu-

tual right angle, said means comprising: a cleat attached to a surface of said first part in the area of an abutting edge, said cleat including means forming a recess having a principal axis and a planar surface substantially perpendicular to said last mentioned surface; a resilient clip attached to said second part, in an area adjacent to an abutting edge thereof, said clip including means extending laterally from a surface of said last mentioned part, and selectively engaging said recess in said cleat, in which condition, said surface of said second part is juxtaposed to a planar surface of said cleat; said clip including a first member extending laterally from the plane of said second part, a second member disposed at an angle with respect to said first member, and a third member lying in a plane substantially parallel to said first member; said cleat including a camming surface slidably engaging with said third member to spread said clip to the width of said cleat prior to engagement with said recess, said second member having an offset portion forming an interstice for the insertion of a tool to spread said clip to facilitate disengagement from said cleat.