United States Patent [19]

Erickson

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[54] **CORNER SHELF STRUCTURE**

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[52] **U.S. Cl.** **108/92;** 108/101; 108/111; 108/153

[51] **Int. Cl.²** **A47B 57/00**

[58] **Field of Search** 108/92, 99, 101, 111, 153, 108/155; 211/90, 148, 134; 248/222

[56] **References Cited**

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Assistant Examiner—William E. Lyddane
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[57] **ABSTRACT**

A knock-down corner shelf structure comprises three uprights interconnected at upper portions to form a skeletal pyramidal corner structure with one of the uprights positioned at the corner of a pair of adjoining walls and the other uprights extending forwardly and downwardly along the two walls. Shelf support rods interconnect the forward uprights and the entire structure is held together in a rigid assembly by a number of triangular shaped shelves connected only at the rear corners to the rear upright. The shelves rest at their forward portions on the forward shelf supports and have outer forward corners that extend forwardly and laterally outwardly of the forward uprights to provide a wedging action that restrains forward motion of the forward uprights.

8 Claims, 5 Drawing Figures

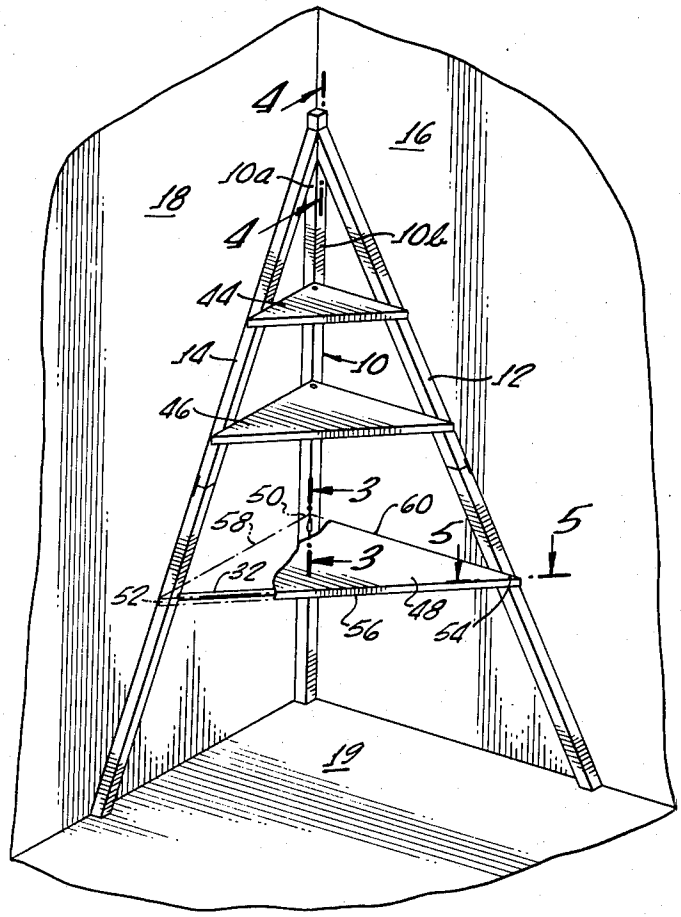


FIG. 1.

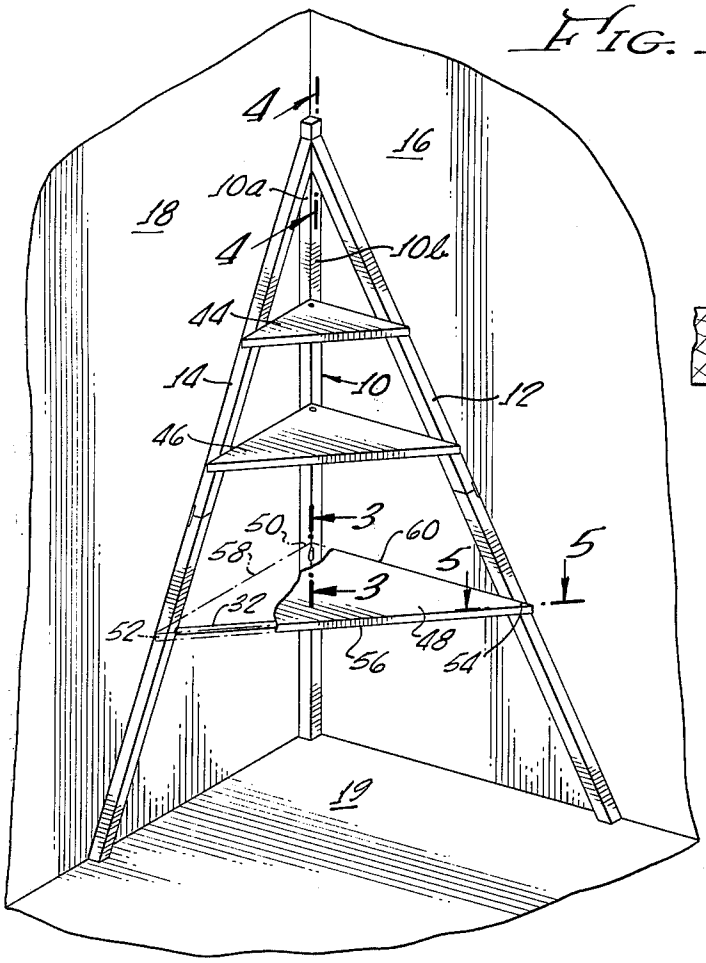


FIG. 3.

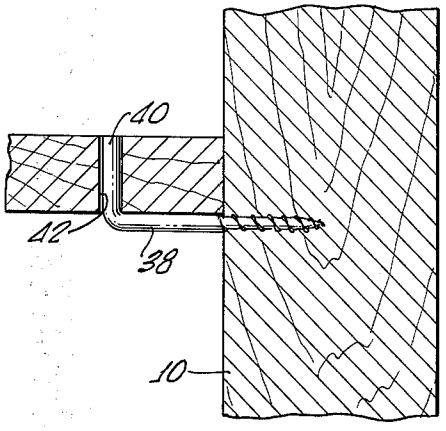


FIG. 4

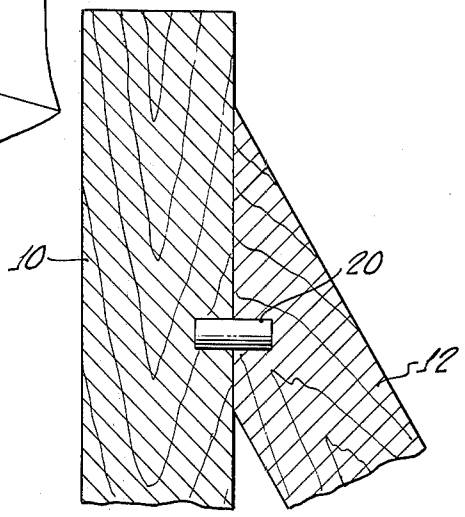


FIG. 2.

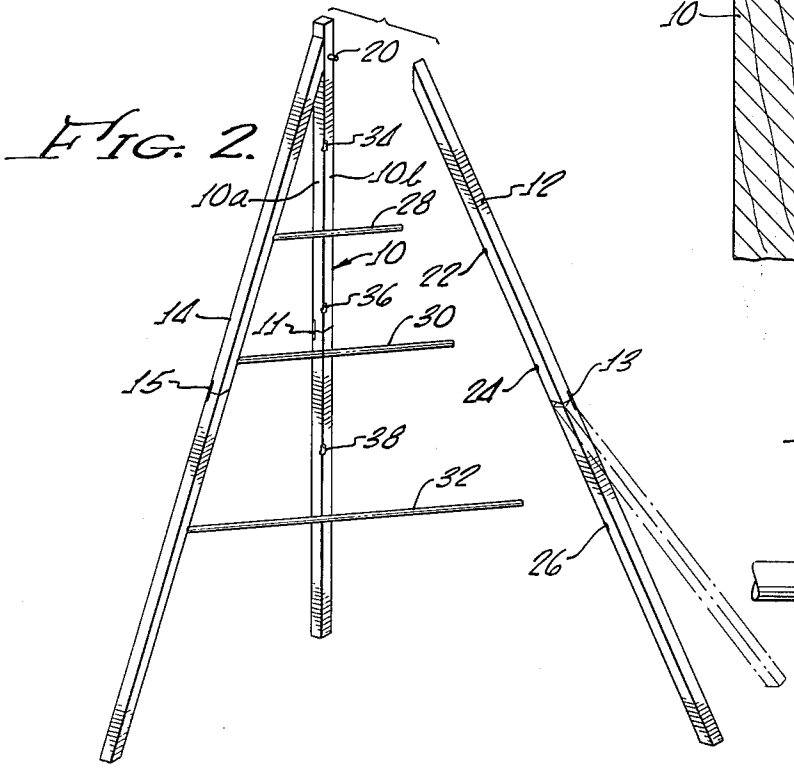
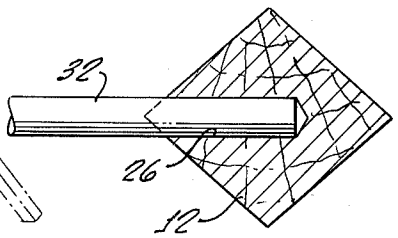


FIG. 5.



CORNER SHELF STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to knock-down support structures and more particularly concerns a knock-down corner shelf structure that employs a minimum number of connecting devices.

2. Description of Prior Art

Knock-down and readily assembled structures of various sizes are of many different designs and find a wide application. Among advantages of such knock-down structures are the ready transportability and handling and decreased manufacturing cost due to minimized manufacture and assembly time. Major disadvantages of structures of this type include the skill, manual dexterity, know-how and tools often required for assembly. Further, where parts are made to interfit, dimensional and configurational tolerances are greatly increased, thus increasing manufacturing cost.

Various types of shelf structures have been devised to meet major requirements of rigidity, stability, ease of assembly, utility and esthetics. Examples of such structures are shown in the U.S. Pats. No. **1,374,633** to Boyle; Kraemer U.S. Pat No. **2,167,483**; McKenzie U.S. Pat. No. **2,883,064**; Heftel U.S. Pat. No. **3,028,016**; and the design patent to Hermann U.S. Pat. No. D-**23,079**.

These structures are merely exemplary of many such devices of the prior art. They are generally either foldable, being substantially pre-fabricated rigid structures hingedly interconnected, as in the patent to Heftel, screwed or bolted together by means of connecting devices at the junctions of the various elements, as in the patents to Hermann and Boyle, or involve some combination of interconnecting elements and foldability as in McKenzie and Kraemer. The structures of the prior art are of relatively complex configurations and difficult to manufacture. They require a significant degree of preassembly by the manufacturer, and require skill, patience and various tools for assembly by the user.

Accordingly, it is an object of the present invention to provide a knock-down corner shelf structure of improved design, stability and appearance that substantially minimizes the above-mentioned disadvantages.

SUMMARY OF THE INVENTION

In carrying out principles of the present invention, in accordance with a preferred embodiment thereof, a rear upright and a pair of forward uprights form a skeletal pyramidal corner structure adapted to stand at the junction of a pair of adjoining walls. Forward shelf support means interconnects the forward uprights and restrains laterally outward motion thereof. One or more shelves each having a rear portion connected to the rear upright and a forward portion carried by a forward shelf support are provided. Each shelf is arranged so that its forward portion includes means for wedging against the forward uprights to restrain forwardly directed motion of the uprights. In the exemplary embodiment, the entire structure may be assembled in a matter of minutes with no tools whatsoever by simply positioning the several parts in the indicated relation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the assembled corner shelf structure of an embodiment of the present invention with parts broken away to show support elements;

FIG. **2** is a partially exploded view of the supporting structure before the shelves are assembled;

FIG. **3** shows an enlarged detail of one form of connection of the rear shelf corner;

FIG. **4** shows an enlarged detail of connection of the upper portions of the uprights; and

FIG. **5** shows an enlarged detail of connection of the forward shelf support to the forward uprights.

DETAILED DESCRIPTION

As illustrated in FIG. **1**, the preferred embodiment of the corner shelf structure of the present invention includes a rear post or upright **10** and first and second forward posts or uprights **12, 14** interconnected at the upper ends thereof to form a skeletal pyramidal corner structure. The rear post **10**, in use, will stand at the corner formed by adjoining walls **16, 18** of a room in which the structure is located. The two forward posts **12, 14** extend downwardly and forwardly from the rear post along the respective walls **16** and **18**. As illustrated in the drawings, the posts are formed with a square cross-section, with the ends of posts **12** and **14** being cut at appropriate angles so that the bottoms will rest evenly upon the floor **19** on the one hand and the upper ends thereof will rest flat against the side **10***a* and **10***b* of the rear post **10**. Motion of the forward posts **12, 14** downwardly or upwardly relative to the rear post **10** is restrained by post interconnection means comprising a pair of dowels or pins such as pin **20**, best seen in the enlarged detail of FIG. **4**. Pin **20** is a snug fit in mating blind holes drilled in rear post **10** and the beveled edge of forward post **12**. Similarly, post **14** is restrained against motion with respect to the post **10** by an identical arrangement of a pin and mating holes (not shown). The interconnection between the posts at the upper portion thereof need not be a rigid connection nor need the pins be a tight or press fit in the respective holes because other elements of the structure, more particularly described below, provide restraints on motion of the two forward posts. Accordingly, the interconnection, specifically the pin **20** and its counterpart for post **14**, need merely act to position the forward post with respect to the rear post and to restrain the downward motion of the upper portions of the forward post relative to the rear post.

The posts are illustrated as formed of solid wood of rectangular cross-section. It will be readily appreciated that the posts may be of other configuration, circular, rectangular, triangular or the like and may be either solid or tubular. Of course, other materials such as plastic or metal tubing may be readily employed for the posts if deemed necessary or desirable.

For improved portability each of the posts are foldable about a hinge axis at the adjoining wall. Thus, each post is made in two substantially equal lengths connected by hinges **11, 13** and **15** to fold outwardly as illustrated in dotted lines for post **26** in FIG. **2**.

As seen in FIG. **2**, each forward post is provided with a plurality of horizontally extending (when the apparatus is assembled) blind holes **22, 24, 26**, there being one for each of the shelves of the finished structure. For each of the horizontally extending holes in the post **12** there is a corresponding opposed hole in the post **14** so that a pair of mutually aligned holes in the posts **12** and **14** respectively, each may receive a forward shelf support such as one of the rigid rods **28, 30** and **32**

shown in FIG. 2. Each rod has a respective end thereof entering the posts 12, 14 with a snug fit in the holes of the respective posts 12 and 14. The holes are positioned so that the rods 28, 30 and 32 extend horizontally between the forward posts when the posts 10, 12 and 14 are in assembled condition.

Fixed to the rear post 10 are a plurality of rear shelf supports in the form of hooks 34, 36, and 38, best shown in the enlarged detail of FIG. 3. Each of the hooks has a first portion extending substantially horizontally into fixed engagement with the rear post, as by being screwed into the post as indicated in FIG. 3. The free end of the hook includes an upstanding leg 40 that is adapted to be received in an aperture 42 provided in the rear corner of each shelf.

A plurality of shelves, 44, 46 and 48, of triangular configuration are shown in the illustrated embodiment. More or fewer shelves may be used. The shelves are formed of solid triangular members such as triangular wood panels or the like, each having a rear corner 50 and first and second forward corners 52, 54. The aperture 42, which may be a through aperture or a blind aperture opens at the bottom of the rear corner of the shelf to receive the upstanding portion 40 of the hook 38. The forward portion of each shelf, just inwardly of the forward edge 56 thereof, rests upon the forward shelf support rod such as rod 32 for the lower shelf. It will be understood, of course, that each of the shelves is identical in configuration and support to each of the other shelves, differing only in the shelf size as may be readily seen in FIG. 1. The shelves include side edges, such as 58, 60 for shelf 48, which extend from the rear post respectively toward and beyond the respective forward posts 12 and 14. Each shelf is connected by means of the hook 38 and aperture 41 at its rear corner to the rear post, and is otherwise unconnected to any of the other structure. Each shelf merely rests at its forward portion upon its forward shelf support and engages the two forward posts 12 and 14 at the forward portions of the shelf side edges.

The parts of the described corner shelf structure may be manufactured, shipped and sold to the user in completely knock-down condition with no part interconnected to any other part, except for the fact that it may be preferable for the manufacturer to mount the hooks 34, 36, 38 into the rear post 10 and further to mount the two pins, such as pin 20 into the holes in the rear posts. Of course, the pins 20 may be provided in unassembled condition since these are merely inserted as a snug but not necessarily tight fit in the holes. Instead of premounting the hooks 34, 36, 38, pilot holes may be drilled into the rear post 10 so that the hooks 34, 36, 38 may be readily screwed into such holes by the buyer of the shelf during assembly.

In assembly of the shelf structure described herein, the rear post is placed in vertical position in a corner formed by two walls at which the structure is to stand and the pins 20 inserted in the appropriate holes in the rear post if they have not been previously so inserted. Then the forward posts 12, 14 are positioned substantially as illustrated in FIGS. 1 and 2 with the holes in the upper portions of these posts receiving the pins 20 extending from the rear posts. Hooks 34, 36, 38 are inserted into the appropriate points of the rear post if they are not previously so assembled, making sure that the upper portions 40 of the hooks are substantially vertically orientated.

Now the shelf support rods 28, 30 and 32 are simply inserted in the appropriate apertures in the forward posts, moving the posts slightly forwardly as may be required for insertion of the second end of each rod. The shelves are then mounted. Mounting of each shelf simply comprises positioning its aperture 42 to receive the upstanding portion 40 of the appropriate hooks 34, 36, 38 and resting the bottom surface of the forward portion of the shelf upon the appropriate forward shelf support. Thus, no connecting devices have to be handled and no tools are required to complete this simple assembly procedure.

It will be seen that the assembly provides for a rigid, sturdy and stable structure in which the interconnection of the parts locks the several elements in the desired configuration and wherein weight placed upon the shelves will act to enhance the rigidity of the structure. The forward shelf supports, even though the ends thereof are snug but not tight fits in the posts 12, 14, will act to restrain motion of each of these posts in a direction exactly parallel to the adjacent wall. For such motion to occur, the two forward posts, 12 and 14, must move apart from each other along the length of the rod 32 or forward shelf support and such tendancy will be restrained by the binding action of the rod ends within the post apertures. Of course, if deemed necessary or desirable, the rods may be fixed to the posts 12, 14, to more positively restrain withdrawal of the rods from the post apertures, by any suitable connecting means such as adhesive, pins or other mechanical connecting devices. However, it is found that such additional connecting devices are not required and adequate restraint against the spreading apart of the forward legs 12 and 14 is provided by the forward shelf supports when merely inserted in the post apertures.

The triangular shelf completes the assembly of the structure and provides a locking or wedging action which restrains forward motion of the forward posts 12 and 14. Each shelf is restrained against motion forwardly of the rear post by means of the hook and aperture connection. Further, its forward corners 52, 54 extend forwardly and outwardly of the posts 12 and 14. The forward edge of the shelf is forwardly of the front post because it is further from the rear corner than is the front surface of the forward post, at the height of the shelf, as measured in a direction parallel to a plane bisecting the angle between the walls. As measured in a direction perpendicular to such plane, the front corners of the shelf extend outwardly, that is, further out than the surface of the forward post that contacts the side edge of the shelf.

Therefore, the shelf restrains any motion of the forward posts in a forward direction, along a line parallel to the plane bisecting the angle between the walls 16, 18. It is found that the simple wedging action of the forward corners of the shelf at the side edges 58, 60 thereof provides an adequate locking of the entire structure in the assembled condition. Nevertheless, if deemed necessary or desirable, suitable means may be secured to the underside of each shelf to restrain forward motion (in a direction substantially along the plane bisecting the angle between the two walls) of the support rods 28, 30, 32 and thus restrain forward motion of the forward posts. Such a restraint on the shelf supports may be in the form of a groove extending substantially parallel to the shelf support rod and receiving at least a portion of the upper surface of the rod or it

may be a depending lip, flange or bracket or the like fixed to the underside of the shelf and extending downwardly in front of the shelf supporting rod.

The assembly is further stabilized by action of the weight of objects placed on the shelves. Further repeated disassembly and assembly may be readily carried out as may be desired without degradation of rigidity or stability.

It will be readily appreciated that variations in the specific elements and interrelations of parts may be made without departing from principles of the present invention. Nevertheless, it is significant that, with no screws, bolts or clamping devices, but merely by the use of one pair of pins, a single hook and front support rod for each shelf, and the wedging action of each triangular shelf which is free of any other connection with the posts and shelf support, the entire structure may be readily assembled to provide a rigid, stable and sturdy support of pleasing appearance.

The foregoing detailed description is to be clearly understood as given by way of illustration and example only, the spirit and scope of this invention being limited solely by the appended claims.

What is claimed is:

1. A corner shelf structure comprising

a rear post and first and second forward posts, all interconnected at upper ends thereof to form a skeletal pyramidal structure,

a forward shelf support comprising a substantially horizontally extending support member connected at opposite ends thereof to said first and second forward posts,

a substantially horizontal shelf having a rear corner, and first and second forward corners, having first and second side edges extending from the rear post to the first and second forward posts respectively, and having a forward edge extending substantially between said first and second forward posts, and

means for connecting said rear corner to said rear post,

said shelf being free of connection with said forward shelf support and being free of connection with said first and second forward posts but having a forward portion resting upon said shelf support,

said forward edge extending forwardly of said shelf support and said forward corners extending forwardly of said first and second forward posts respectively, and said side edges of the shelf being in contact with said forward posts, motion of said forward posts away from one another being resisted by said forward shelf support and motion of said forward posts away from said rear post being resisted by the forward shelf corners, whereby the forward posts are locked in position by the collective restraints exerted by the forward shelf support and the forward corners of the shelf.

2. The corner shelf structure of claim **1** wherein said shelf is of a substantially triangular configuration and wherein said means for connecting said rear corner to said rear post comprises hook means secured to said rear post and connected with said rear shelf corner

3. The shelf structure of claim **1** wherein said shelf is of a substantially triangular configuration, and wherein said side edges are in wedging engagement with said forward uprights to restrain forward motion of said forward uprights away from said rear upright.

4. The shelf structure of claim **1** wherein said forward shelf support comprises a rod connected at opposite ends thereof to said first and second forward post and extending therebetween, and wherein said shelf comprises a flat member having its forward portion resting on said rod.

5. The corner shelf structure of claim **2** wherein said hook means comprises a hook fixed to one of said rear post and said shelf and a hook receiver fixed to the other of said rear post and shelf.

6. The shelf structure of claim **1** wherein said means for connecting said rear corner to said rear post comprises a hook in the rear post and a hook receiving aperture formed in the rear corner of the shelf.

7. The shelf structure of claim **1** wherein said forward shelf support member comprises a substantially rigid horizontally extending rod, each of said forward posts having an aperture that snugly receives a respective one of the ends of said rod.

8. The corner shelf structure of claim **7** including means for interconnecting said posts at upper portions thereof, said interconnecting means comprising a pair of pin-receiving holes formed in an upper portion of said rear post, a third pin-receiving hole formed in an upper portion of one of said forward posts and a fourth pin-receiving hole formed in an upper portion of the other of said forward posts, a first pin received in one of the holes of the rear post and in a corresponding hole of said one forward post and a second pin received in the other of the holes in the rear post and in a corresponding hole of the other of said forward posts.

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