United States Patent [19]

Misenheimer, III

[11] **3,730,601**

[45] **May 1, 1973**

[54] **FURNITURE WITH ASSEMBLY-DISASSEMBLY FEATURE**

[75] Inventor: **Ernest Luther Misenheimer, III,** Drexel, N.C.

[73] Assignee: **U.S. Plywood-Champion Paper Inc.,** Hamilton, Ohio

[22] Filed: **Aug. 26, 1971**

[21] Appl. No.: **175,242**

[52] **U.S. Cl.** **312/108,** 312/111, 108/60, 108/111, 108/159, 211/148

[51] **Int. Cl.** **A47b 87/00**

[58] **Field of Search**.....108/91, 111, 153, 108/159, 60; 312/108, 111; 211/148

[56] **References Cited**

UNITED STATES PATENTS

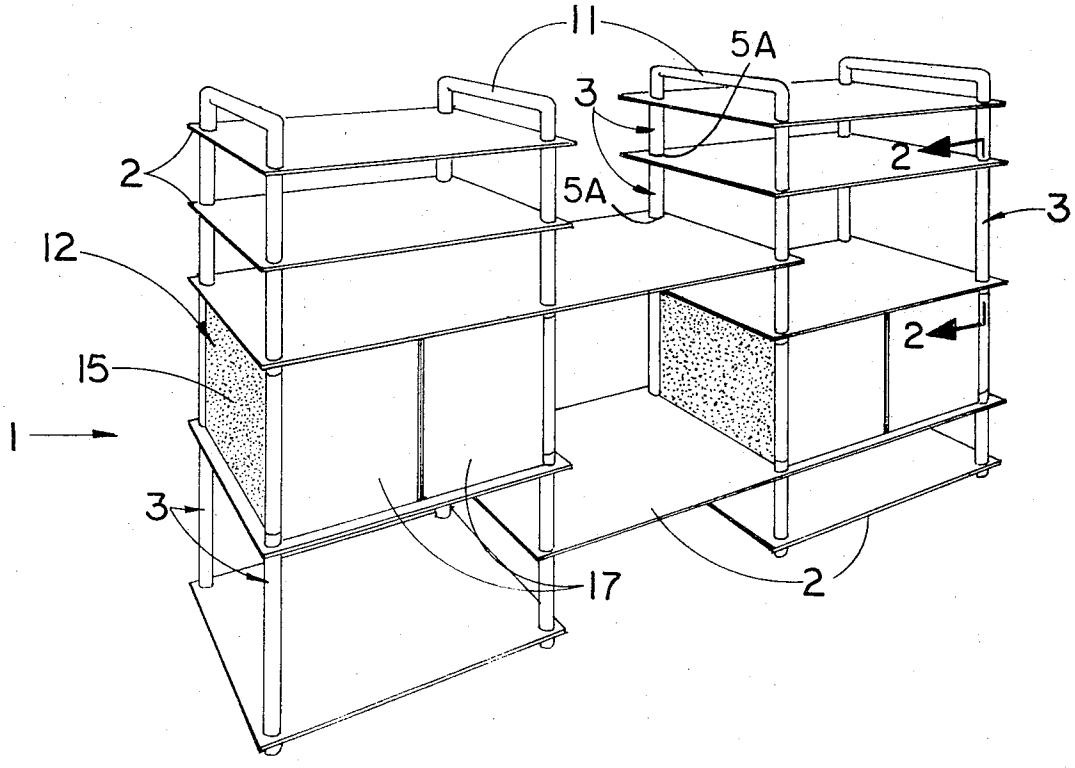
3,674,229	7/1972	Keeler	211/148 X
2,654,487	10/1953	Degener	108/91 X
1,209,157	12/1916	Heerdt	108/111
1,340,562	5/1920	Sandmann	312/108
387,267	8/1888	Talbot	108/111
2,557,766	6/1951	Ronfeldt	108/153 UX
2,944,780	7/1960	Monk	108/111 X
3,585,944	6/1971	Scheer	108/111

Primary Examiner—James C. Mitchell
Attorney—Daniel P. Worth

[57] **ABSTRACT**

Furniture is provided with a telescoping joint that secures and spaces shelves and other elements. A stud has a tight fit in a hole drilled at each corner of a rectangular shelf. A spacer member of tubular shape slips over the stud and extends vertically to the next stud joining to it in a similar telescoping fit. The stud can be of wound paper core material while the spacer may be of plastic pipe. No fasteners are required because of the snug fit between the elements.

9 Claims, 10 Drawing Figures



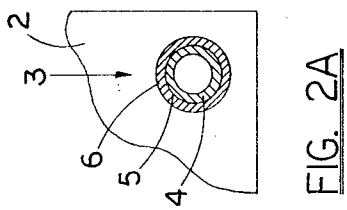


FIG. 2A

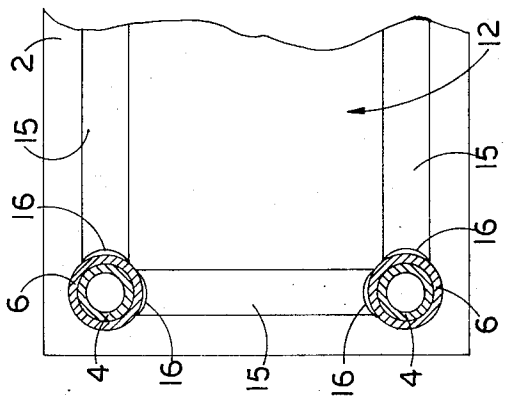


FIG. 4

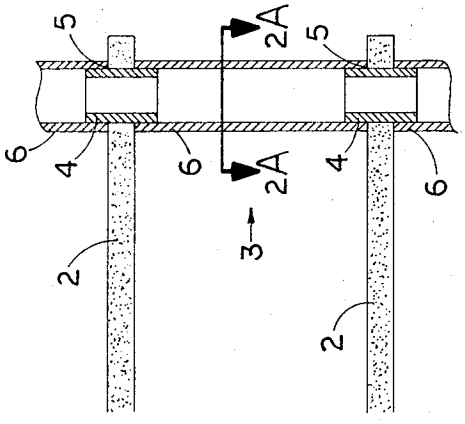


FIG. 2

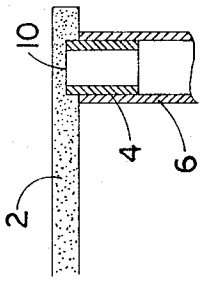


FIG. 3A

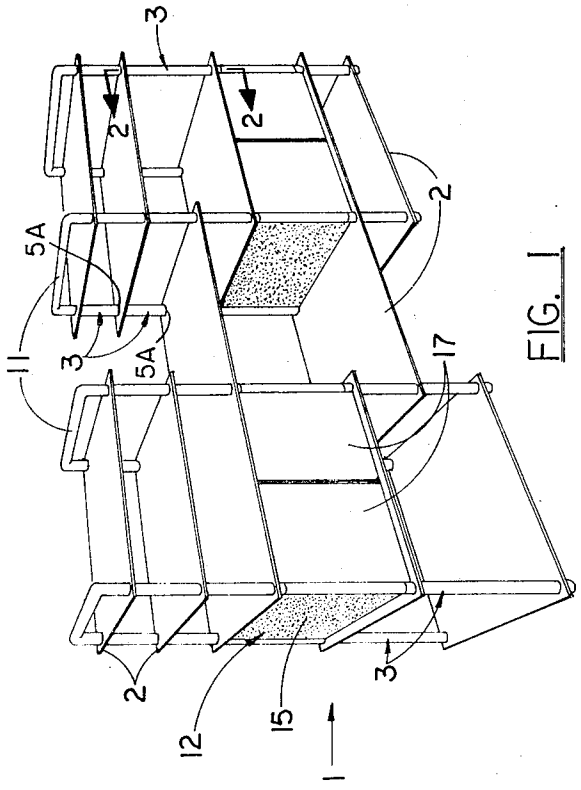


FIG. 1

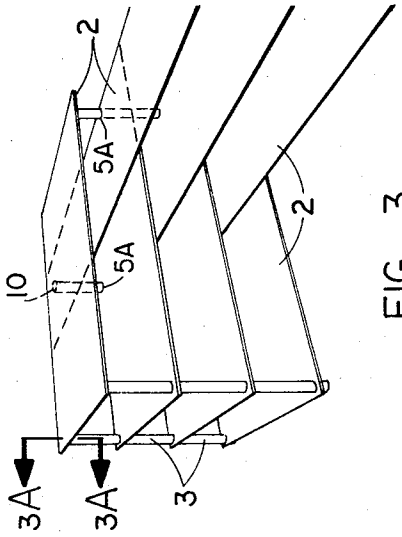


FIG. 3

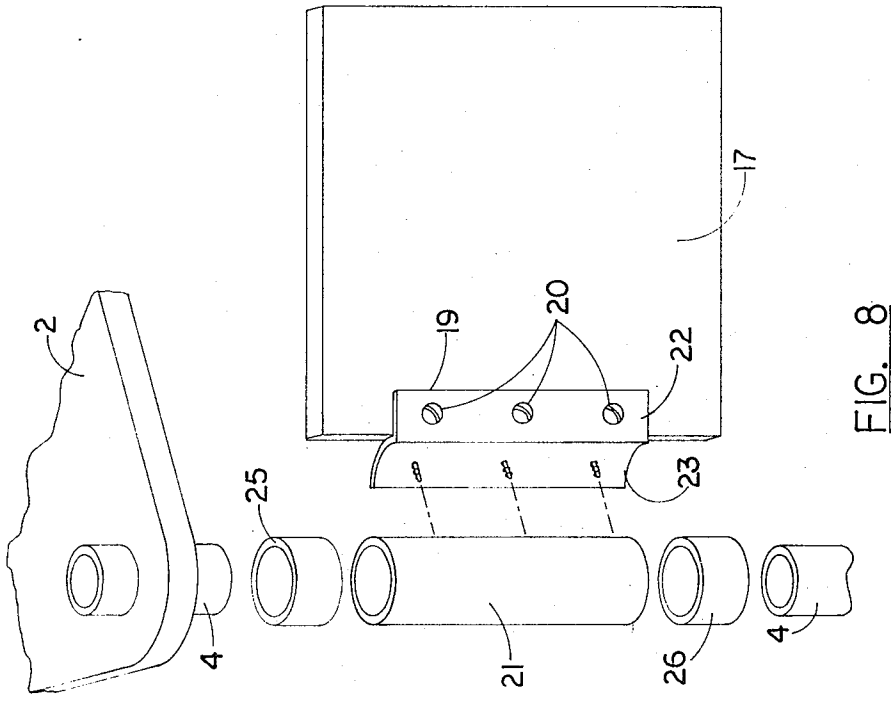


FIG. 8

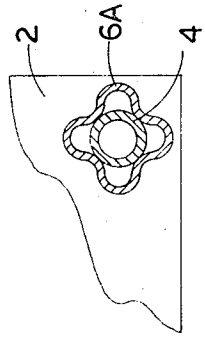


FIG. 5

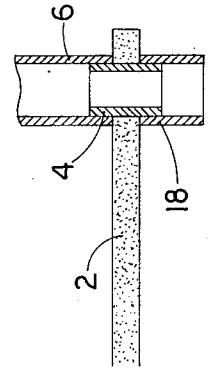


FIG. 6

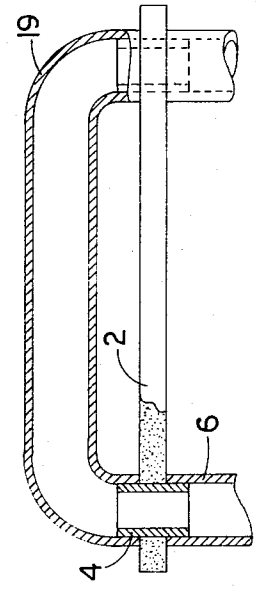


FIG. 7

FURNITURE WITH ASSEMBLY-DISASSEMBLY FEATURE

SUMMARY AND BACKGROUND OF INVENTION

This invention relates to improvements in furniture, cabinet ware, and the like. One aspect of the invention provides furniture which may be readily assembled and disassembled. Another aspect of the invention provides furniture which does not require or use fasteners for assembly.

It is known to make furniture such as file cabinets by stacking together cases having sockets or tubes integral therewith and then locking the cases together with a wire or rod stuck down through the sockets or by assembling them into a skeleton of rods and cross-members. Tubular frame furniture may occasionally have internal studs connecting tubular members. U.S. Pat. Nos. 1,340,562 (FIG. 3) and 1,994,159 (FIGS. 7,8) exemplify a number of these features.

The present invention does not employ boxes or cases having integral tubular members at the corners nor does it apply horizontal connectors or other supplementary structural elements. Neither does the present invention require the use of preexisting boxes, cases, or like structures to provide structural elements for a cabinet or similar piece of furniture.

The present invention provides furniture secured together by telescoping members which are assembled at the corners of the furniture and feature a horizontal shelf having a vertical hole at each corner with a vertical stud tightly fitted into the hole and extending on both sides of the shelf. Spacer members are slidably or telescopically fitted over each stud and extend vertically to the adjacent shelf where it engages the stud on such shelf in similar manner. Preferably a stud may be permanently fixed in one end only of the spacers. No fasteners are employed by the party assembling the furniture nor are horizontal connectors other than the shelf per se employed. As may be readily visualized, each shelf is preferably rectangular and has a plurality of holes, preferably one hole at each corner, in each of which a vertical stud is fitted.

An enclosure can be made between each parallelepiped formed by a pair of vertically adjacent shelves and their connecting structures at each corner by providing vertical walls extending between each of the spacers. The walls are coped so that each end has a groove shaped to fit the spacer. Since the spacers are ordinarily of circular cross-section, the groove is likewise.

In a preferred embodiment the shelf is of wood, the stud is of spirally wound paper core material, and the spacers are of plastic tube or pipe. The shelves are preferably horizontal and rectangular for the most part, with a hole to receive the stud snugly at each corner.

Other objects, advantages and features should become apparent from the following disclosure wherein:

FIG. 1 is a perspective assembly view of one embodiment of the cabinet;

FIG. 2 is a side cross-section of a joint as viewed along section 2—2 of FIG. 1;

FIG. 2A is a plan cross-section of a joint as viewed along section 2A—2A of FIG. 2;

FIG. 3 is a perspective of an assembled shelving unit designed to go around a corner;

FIG. 3A shows a side cross-section of a blind hole suitable for top, bottom and intermediate shelving members as viewed along section 3A—3A of FIG. 3;

FIG. 4 is a plan view showing enclosure wall details;

FIG. 5 is a plan sectional view along section 2—2 of FIG. 1 showing a modified joint having a corrugated or irregularly shaped spacer.

FIGS. 6 and 7 are cross-sections of leg and arch details; and

FIG. 8 is a door mounting detail.

FIG. 1 illustrates an assembled shelving unit 1 comprising a plurality of vertically spaced apart horizontal shelves 2 which are respectively held together by a plurality of connecting assemblies 3 constructed as generally illustrated in FIGS. 2 and 5. Each connector assembly 3 comprises a stud 4 extending outwardly of the planes of the shelf surfaces and which fits tightly into a hole 5 drilled in each shelf. A tubular spacer member 6 comprised conveniently of plastic pipe or tubing fits snugly in telescoping fashion over each stud and extends vertically to an adjacent stud aligned therewith in order to form a complete corner joint and structural spacing member. Spacers are cut the length desired for vertical shelf spacing. No fasteners are necessary.

Circular cross-sections (FIG. 2A) for the stud spacers and holes in the shelves are preferred because of the ease of their formation and availability of materials from which to make the respective studs, spacers, etc. The tight fit of the stud in the hole is desirable so that the stud can be a short member, far shorter than the various spacers, and yet because of the right fit helps to prevent the ultimate assembly from being shaky and wobbly. The snug fit of the spacers with the studs also contributes to a rigid structure. Other cross-sections than round, as seen in FIG. 5, may be provided for any of the elements. In FIG. 5 only the spacer 6A is shown non-circular in cross-section, although the other elements could be similarly or congruently shaped. For example, a square hole, square stud and square spacer could be provided but the availability and ease of machining, especially in drilling the hole, suggests the circular as the most convenient and least expensive mode.

As seen in FIGS. 1, 3 and 3A certain shelves such as top, bottom and some intermediate shelves require blind holes 10 in order to leave one surface unobstructed, e.g., a top surface. The alternative to the blind holes is to employ an arch 11 or similar corner architectural member as illustrated in FIG. 1. However, a blind hole is constructed as in FIG. 3A, and basically involves a hole going only part of the way through the shelf into which a stud 4 or a half length stud is snugly fitted. A spacer member 6 is attached to the stud and extends to the vertically adjacent stud in another shelving member.

The shelves per se are the only horizontal connectors. Even the enclosure walls (FIG. 4), described below, are not structural, i.e., load bearing members as are the shelves, studs, and spacers.

As should be evident from the embodiment of FIG. 3 secondary holes 5A and accompanying connecting assemblies 3 are intermediate of the shelf corners to provide a means of making furniture or cabinet goods capable of fitting into a corner or with shelving ele-

ments at angles (normally at right angles) to each other. Secondary holes 5A and assemblies 3 likewise are useful in lateral or horizontal extension of a shelf as shown in FIG. 1. Also, both FIGS. 1 and 3 show how to make either a directly lateral or angular horizontal extension wherein one shelf extends in the direction desired from between a pair of other shelves. At least one of the pair of shelves has a blind hole 10 at a location on its back edge between the two holes 5 at the back corners.

FIG. 4 shows how an enclosure 12 is formed. A vertical wall member 15, which may be of wood, cardboard, pressed board, or the like extends between each two vertical spacers. It fits snugly with the spacers and has a groove 16 coped on each side of the wall with a shape substantially that of the outside of the adjacent spacers, whereby a nice fit is maintained. The parts are dimensioned so that a fairly snug fit results. Where the spacers are circular in cross-section, the [rabbetted are] groove 16 has a circular section [s]. During assembly, the wall 15 slides into place between the spacers at its respective ends.

An enclosure 12 of the sort shown in FIGS. 1, 3 and 4 may require a door 17 or the like on its front edge. The door 17 is vertically smaller than the walls 15 whereby there is sufficient clearance for the doors to swing in and out between the shelves. In FIG. 8 is a preferred door and hinge construction having a rigid (metal, plaster) plate 19 secured by screws 20 to a hinge barrel 21. The plate has a flat part 22 and a carved part 23 for respectively securing to the flat panel 17 and rounded surface of barrel 21. The barrel 21 turns on studs 4 which extend a short way into each end. Between the barrel 21 and the shelves 2 above and below it are washers 25 and 26. The barrel and washers may all be lengths of plastic pipe as are spacer 6. The washers are vertically shorter than studs and so the latter can engage the bore of the barrel.

Components such as stud and spacer and door, plate, and barrel may be packaged at the factory, shipped to retail outlets, and completely assembled by the purchasing public. Preferably a stud is permanently secured (as by glue) into one end of each spacer at the factory so that one component results: e.g., in FIG. 6 stud 4 would be glued into spacer 6 to form a spacing assembly which the assembler uses as shown in FIGS. 1, 2, 2A, 6 and 7, the other end of the spacer 6 being open so that it can receive the stud from the next adjacent spacing assembly.

I claim as my invention:

1. In furniture secured together by telescoping members assembled at corners of the furniture the improvement comprising:

a horizontal shelf having a vertical hole at a corner;

a single vertical stud tightly fitted into said hole and extending on both sides of said shelf;

a spacer slidably fitted over said stud and extending vertically to where it can engage another shelf around a corresponding vertically aligned hole therein, said single stud being the only member internally engaging said spacer adjacent said shelf hole;

said shelf being the sole and only horizontal connector between said stud and any other stud engaging said shelf.

2. A furniture improvement according to claim 1 comprising a plurality of vertically spaced horizontal shelves each with a plurality of such holes through each said shelf, a stud in each hole as aforesaid, each hole and stud being vertically aligned with a corresponding hole and stud on the vertically adjacent shelf, and the connectors each extending between a pair of such vertically aligned holes and studs.

3. A furniture improvement according to claim 1 comprising said hole, stud, and spacer each having a circular cross-section.

4. A furniture improvement according to claim 1 comprising said hole and stud each having a circular cross-section.

5. A furniture improvement according to claim 2 further comprising an enclosure having vertical walls each wall extending between vertically adjacent shelves and adjacent spacers.

6. A furniture improvement according to claim 2 further comprising an enclosure having vertical walls each wall extending between vertically adjacent shelves and adjacent spacers,

each said hole, stud, and spacer having a circular cross-section or cylindrical external surface,

each of said walls being shaped at each end with a groove with a circular section that will fit said spacers, each wall having a sliding fit engagement with two spacers.

7. A furniture improvement according to claim 2 which is made to provide shelves extending at an angle from each other as at a corner wherein at least one shelf extends in its longitudinal direction between a pair of other shelves which pair extends longitudinally at an angle to said one shelf, at least one of which pair has a hole at an intermediate location along its back edge between the two holes at the back corners, a stud snugly fitted in said back edge hole, and a spacer extending from said back edge hole to said one shelf.

8. A furniture improvement according to claim 1 wherein said stud extends through said hole and protrudes outwardly from the plane of each surface of said shelf.

9. A furniture improvement according to claim 1 wherein said stud is a paper core and said spacer is a length of plastic pipe the inner diameter of which spacer is substantially the same as the outer diameter of said core.

* * * * *