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Messina

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[54] **MODULAR FURNITURE STRUCTURE**

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[52] **U.S. Cl.** **312/111**

[51] **Int. Cl.** **F16b 12/00,** A47b 77/00

[58] **Field of Search** 312/107, 108, 111

[56] **References Cited**

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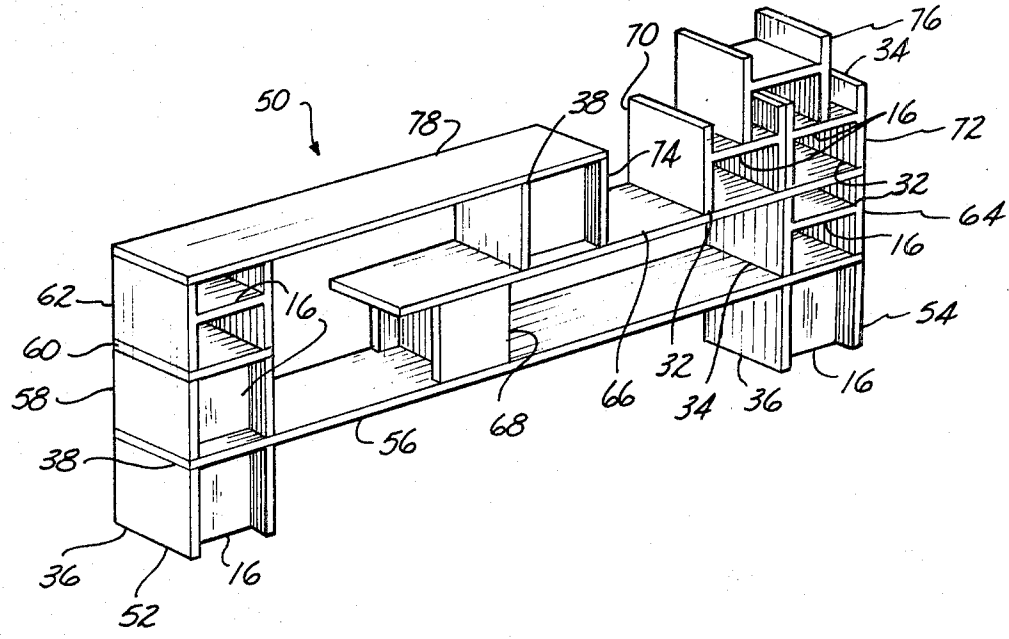
Primary Examiner—James C. Mitchell

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[57] **ABSTRACT**

A modular furniture structure comprising a plurality of furniture modules, each module having a pair of square sidewalls connected at a point offset from their mid-section by a transverse wall member to form a cubic envelope having an H-shaped cross section. The furniture modules may be stacked one upon the other with the edges of the sidewalls of one furniture module being adapted to support the edges of the module thereabove with a selected number of the modules being disposed at different orientations with respect to adjacent furniture modules to define different shelf depth and shelving configurations with at least one horizontally disposed transverse shelf member being carried between a pair of horizontally spaced furniture modules. The furniture modules may be so arranged as to have their sidewalls interlocking in a selected manner with the upper edges of the sidewalls supporting a horizontally disposed member to form a table, desk or the like.

11 Claims, 9 Drawing Figures



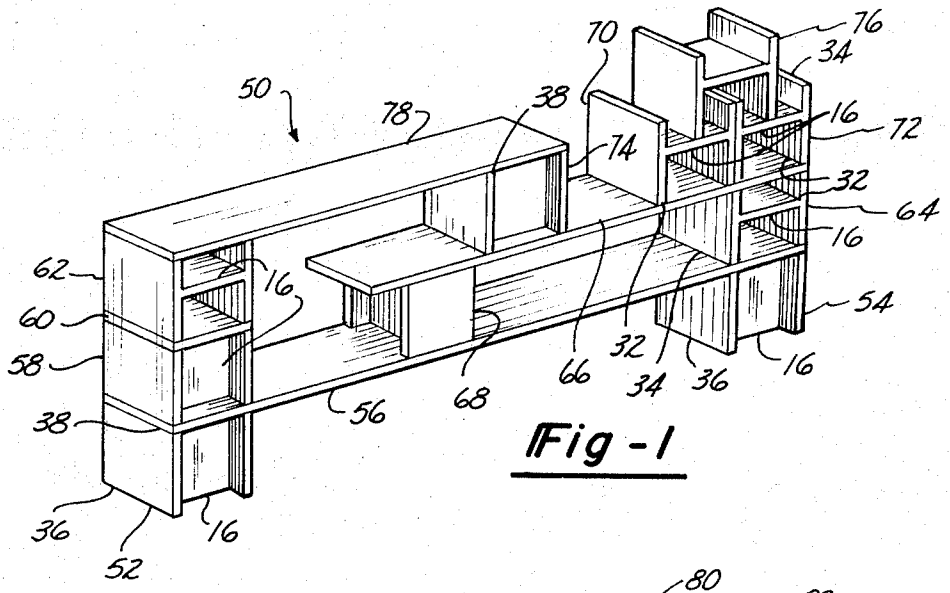


Fig - 1

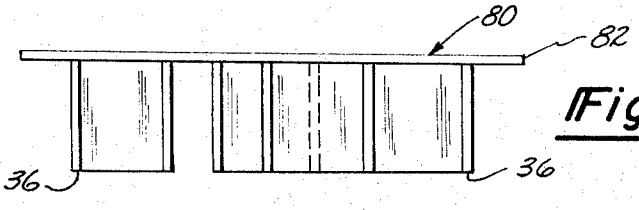


Fig - 2

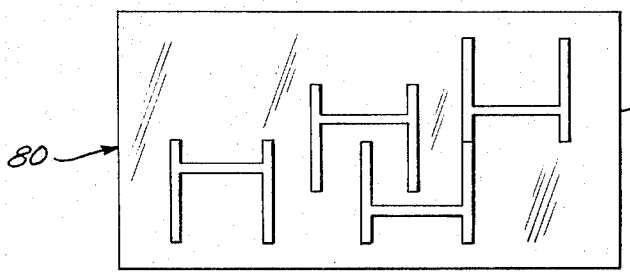


Fig - 3

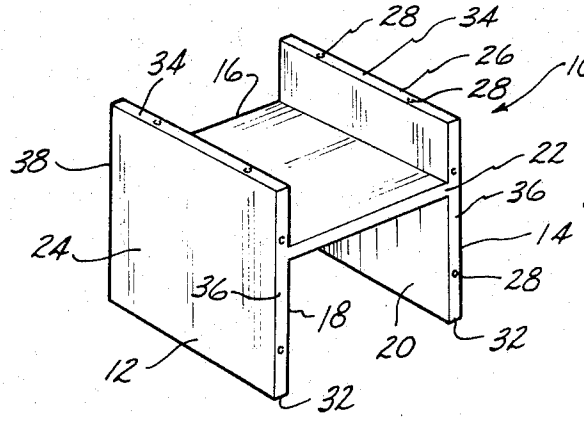


Fig - 4

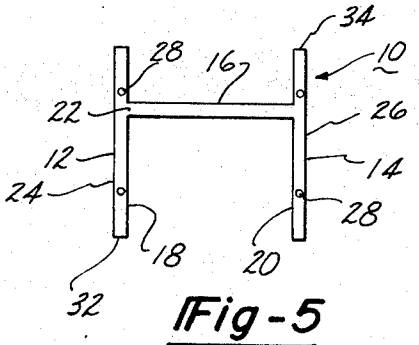


Fig-5

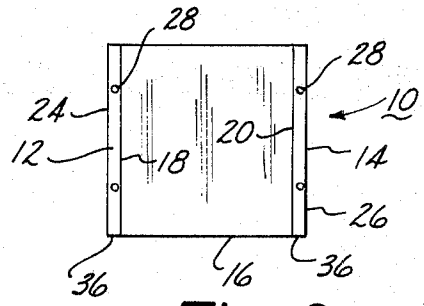


Fig-6

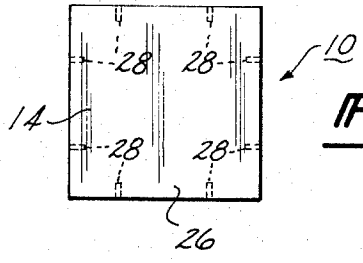


Fig-7

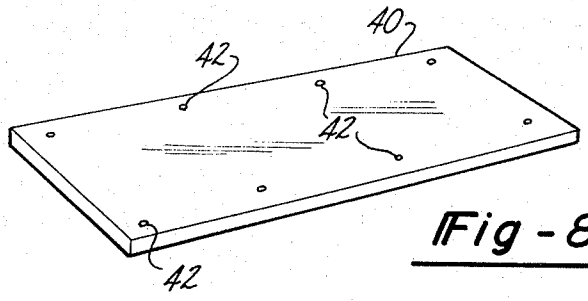


Fig-8

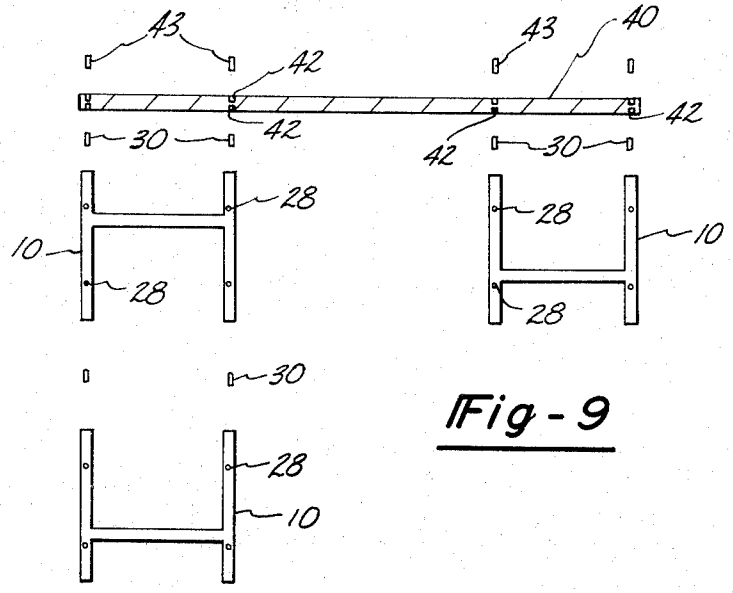


Fig-9

MODULAR FURNITURE STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a new modular furniture structure having stackable furniture modules from which furniture, wall shelves and the like may be constructed, each furniture module being fabricated on a mass production basis from a high strength moldable material.

2. Description of the Prior Art

Heretofore, numerous module constructions have been employed for such things as file cabinets, bookcases, stackable containers and the like, such as the structures disclosed in U.S. Pat. Nos. 3,334,942; 3,347,186; 3,549,020; 3,517,828; 3,655,065; 3,368,856; 3,506,321; 3,644,008; 3,563,624; 3,567,298; and 3,606,506. In general, these prior art structures consist of two types of constructions. The first generally comprise a plurality of modules which are merely stacked one on the other and in some preselected horizontally sequenced arrangement, all of which have several disadvantages making them generally unsatisfactory for most purposes and thus generally accounting for their lack of commercial success. Their greatest disadvantage consists of the difficulty in packaging and shipping such modules. In many situations in order to provide easy packing and shipping, the module is disassembled to such an extent that the same requires a considerable amount of assembly effort on the part of the user and thus discourages their use. If the modules are pre-assembled by the manufacturer, they are very bulky, expensive and difficult to package and ship. A major disadvantage of the aforementioned module units due to their design and shape is that type of stacking arrangement that is permitted is quite limited, and thus, the user in many instances must assemble the furniture modules in a limited number of ways not necessarily in accordance with the taste of the user.

The second type of module constructions are the wall rail type which consist of a plurality of vertical wall rails that are attached to a wall at selected horizontally spaced locations usually conforming to the distance between the wall studs. Each wall rail has a set of notches or other suitable means for receiving and holding horizontally and outwardly extending shelf brackets which are adapted to support horizontally disposed shelves. Other wall rails have wall brackets adapted to extend into or support by any suitable means, wall cabinets and the like in lieu of shelves. Although this type of arrangement has become very commercially successful, they have many disadvantages, in particular, the underlying wall rails and the shelf brackets are visible and owing to their comparatively large width are rather conspicuous, and as a rule, hardly decorative. In addition, once the rails have been attached to the wall, it is usually a semi-permanent structure which, although it may be removed, it leaves the wall in a rather unsightly condition requiring subsequent repair. Further, the versatility of such wall rails is very limited both in the design and location of the wall rails and the shelf arrangements. The most obvious limition for such wall rails is that the same may never be used to function as a room divider and the ability of the user to design, arrange and rearrange such wall rail type structures is severly limited.

SUMMARY OF THE INVENTION

The present invention which will be described subsequently in greater detail comprises a plurality of individual furniture modules adapted to be arranged in a selected orientation with respect to one another either in a vertical or horizontal plane in conjunction with horizontal shelves for forming tables, room dividers, wall shelves and the like.

It is therefore an object of the present invention to provide a module furniture structure fabricated from a plurality of furniture modules which may be easily assembled and disassembled to form a variety of furniture structures, for example, bookcases, tables, desks and the like.

It is also an object of the present invention to provide such a modular furniture structure which is extremely simple in its design and construction, and thus, it can be simply and inexpensively manufactured, packaged, transported and assembled.

It is still a further object of the present invention to provide a modular furniture structure which can be assembled into many shapes or forms limited only by the size of the area in which the structure is to be located and the imagination of the user.

Other objects, advantages and applications of the present invention will become apparent to those skilled in the art of module furniture structures when the accompanying description of one example of the best mode contemplated for practicing the invention is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views and in which:

FIG. **1** is a perspective view of one example of a modular furniture structure constructed in accordance with the principles of the present invention;

FIG. **2** is a side elevational view of a second example of a modular furniture structure constructed in accordance with the principles of the present invention;

FIG. **3** is a top view of the modular furniture structure illustrated in FIG. **2**;

FIG. **4** is a perspective view of a furniture module employed in the assembly of the modular furniture structures illustrated in FIGS. **1, 2** and **3**;

FIG. **5** is a front elevational view of the furniture module illustrated in FIG. **4**;

FIG. **6** is a top elevational view of the furniture module illustrated in FIG. **4**;

FIG. **7** is a side elevational view of the furniture module illustrated in FIG. **4**;

FIG. **8** is a perspective view of a horizontal element used in the construction of the modular furniture structure illustrated in FIG. **1**; and

FIG. **9** is an exploded side elevational view of a modular furniture structure in partial cross section and embodying the principles of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and, in particular, to FIG. **4** through **7** wherein there is illustrated a furniture module **10** constructed in accordance with the principles of the present invention and comprising as viewed

in FIG. 5 left and right sidewalls 12 and 14 connected by a transverse connecting wall member 16. The sidewalls 12 and 14 have a square configuration, that is the length and width are equal and in the preferred embodiment are a 14-inch square with a 1-inch thickness. The transverse wall member 16 is connected to the inner faces 18 and 20, respectively, of the left and right side walls 12 and 14 at a point offset from the midsection of the sidewalls and preferably two-thirds above the lower edges of the sidewalls as shown at 22. The transverse wall member 16, as can best be seen in FIG. 6, has a length which is equal to the length of the sidewalls, that is, a 14-inch length, while the width of the transverse members, that is a distance between the opposing faces 18 and 20 of the sidewalls 12 and 14, is such that the distance between the outer faces 24 and 26 of the module 10 is 14 inches, whereby the envelope defined by the sidewalls is a 14-inch cube. The four edges of each of the sidewalls 12 and 14 are provided at each corner with bores 28, each of which is adapted to receive a connecting pin 30 (FIG. 9) for a purpose which will be described hereinafter. The modules 10 are preferably of an integral one-piece construction fabricated with a moldable material such as polyurethane foam having either a polyester or polyether base. Other suitable materials include polyureas, formed phenolic resins and polyester foam.

The furniture module 10 has five basic orientations which may be employed by the user in order to assemble a modular furniture structure such as a bookcase, room divider, table or desk as will be described hereinafter. With reference to FIGS. 4 and 5 the first orientation is the positioning of the bottom edges 32 of the sidewalls 12 and 14 on a horizontal surface such that the front view of the module 10 will appear as shown in FIG. 5 creating a dual shelf effect with the bottom shelf spacing being about twice as deep as the upper shelf spacing. The second orientation is the positioning of the sidewall edges 34 on a horizontal surface. That is the module shown in FIG. 5 would be rotated 180° such that the transverse member 16 is closer to the bottom surface. The third orientation as illustrated in FIG. 6 would be the positioning of the edges 36 of the sidewalls 12 and 14 on the horizontal surface such that the transverse member is disposed in a vertical plane with the transverse member 16 being closest to the viewer. The fourth orientation would be the positioning of the module 10 on the edge 36 but rotated 180° such that the transverse member 16 is furthest away from the viewer. The fifth orientation would be the positioning of the module on the edges 36 with one of the sidewalls 12 or 14 facing the viewer such as illustrated in FIG. 7.

As will be described in greater detail hereinafter with respect to the embodiments illustrated in FIGS. 1, 2 and 3, the various aforementioned orientations of the module 10 provide the user with a tremendous flexibility in designing and assembling a modular furniture structure whether the same be a bookcase, table, desk or room divider.

Referring momentarily to FIG. 8 wherein there is illustrated one example of a horizontal shelf unit 40 having a width which is equal to the width of the sidewalls 12 and 14 such that the same may be placed upon the upper edges of the sidewalls, those edges being whichever edges are at the upper portion of the sidewalls depending upon the particular orientation chosen by the user. The thickness of the shelf member 40 is approximately 1 inch, the same as the thickness of the sidewalls 12 and 14 for the purposes of uniformity and decorative appearance. The length of the shelf member 40 may be of any selected length and it is envisioned that such members will be fabricated in 1-foot, 2-foot, 3-foot, 4-foot, and 6-foot lengths to enable the user to purchase whichever lengths are necessary in order to design and assemble the desired modular furniture structure such as examples to be described hereinafter. It should also be noted that the opposite faces of the shelf member 40 are provided with bores 42 which are placed at distances from each other that correspond to the four bores on the edges of the transverse member such that the pins 30 may be inserted into the bores 28 in the upper edges of the sidewalls 12 and 14 and received by the pin holes 42 in the transverse member 40 as shown in the exploded view in FIG. 9.

Similarly, as also seen in FIG. 9, the pins 30 are received in the bores disposed in the upper edges of the module 10 shown in the lower left-hand corner of FIG. 9 while the upper ends of the pins 30 are received in the bores 28 in the next upper module which, in turn, has its bores 28 on the upper edges thereof receiving the pins 30 that, in turn, are received in the bores 40 of the horizontal member all of which functions to provide a means for interconnecting the modules 10 and the transverse members 40 to prevent the same from moving laterally with respect to each other and provide stability and rigidity to the entire structure whichever shape or form the same may take. As can also be seen in FIG. 9, small plugs 43 having a size equal to the shape and depth of the bores 42 in the shelf member 40 are provided for insertion within the exposed shelf bores on the upper surface thereof to fill the same in the event they are not adapted to receive pins that support a shelf or module thereabove whereby the upper exposed surface of the shelf member 40 takes on a smooth finished appearance.

Referring now to FIG. 1, there is illustrated a perspective view of one example of a modular furniture structure in the form of a bookcase which may be used either against a wall or as a room divider. The structure 50 has at the bottom two modules 52 and 54 oriented such that the transverse connecting wall members 16 are both disposed in a vertical plane with the upper edges 38 of the modules 10 supporting a shelf member 56 with the pins 30 connecting the shelf member 56 to the modules 52 and 54 in the manner aforementioned. On the left-end section as viewed in FIG. 1 a module 58 is supported on the upper left-end surface of the shelf member 56 with the module 58 having a similar orientation as the modules 52 and 54 therebelow. Immediately above and supported on the upper edges 38 of the module 58 is a square shaped shelf member 60 which, in turn, supports the upper most module 62 having the same orientation as the module 10 illustrated in FIG. 5. At the right end of the module structure 50 a module 64 is supported by the shelf member 56 with the module 64 being oriented such that the transverse wall member 16 is disposed in a horizontal plane but closer to the bottom thereof, and the edges 34 rest against the shelf member 56. Immediately above the module 64, the sidewall edges 32 thereof support the right end of another horizontal shelf member 66 which extends across for support by a module 68. The module 68 is, in turn, supported by the shelf member 56 as shown. Both the modules 64 and 68 support the hori-

zontal shelf member **66** and are interconnected by means of pins **30** as aforementioned. The horizontal shelf member **66**, in turn, supports three more modules, **70, 72** and **74**. The adjacent modules **70** and **72** are disposed in an orientation such that the transverse connecting members **16** are disposed in a horizontal plane and the edges **32** rest on the horizontal shelf member **66**, that is, the transverse connecting members **16** are furthest away therefrom. The modules **70** and **72** have supporting thereon an upper module **76** which is disposed in the same orientation but with the sidewalls thereof extending downwards for support by the transverse connecting members respectively of the modules **70** and **72** so that there is a certain interlacing of the modules to achieve a further decorative effect. At the left end of the horizontal shelf member **66** the module **74** is supported and disposed in an orientation similar to the lower modules **52** and **54** with the upper edges **38** of the module **74** supporting another horizontal shelf member **78** which, in turn, has its other end supported by the upper edges of the module **62**. It should be noted that the insertion of the horizontal member **60** in between modules **58** and **62** maintains the upper edges of the modules **62** and **74** in the same horizontal plane so that the horizontal shelf member **78** is properly disposed in a horizontal plane.

FIGS. **2** and **3** illustrate a second example of the present invention in the form of a table **80** which is assembled by positioning a plurality of modules on a horizontal support with the modules in the embodiment illustrated all resting on their edges **36** and being positioned in a selected interlocking geometric relationship to provide a pleasing visual appearance when viewed through a table top or support member **82** which is preferably glass so that the modules, as best can be seen in FIG. **3**, are visible through the top of the table, providing, in addition to the functional aspects of the design, an ornamentation which is highly esthetic. It should be noted that the table shown in FIG. **3** could be provided with an additional number of modules supporting the table top **82** with said additional modules or any of those illustrated rotated 90° from the illustrated views to provide shelving arrangements underneath the table top in the desired fashion.

Thus it can be seen that the present invention has provided a module furniture structure employing modules that have great versatility in permitting the construction of tables, bookcases, wall dividers and the like having shelves of various heights and depths and all of which can be accomplished in a very simple manner by the simple orientation of the basic module in any desired place and location.

It can also be seen that the present invention provides a modular furniture structure which can be assembled and disassembled and redesigned in any fashion suitable to the taste of the user and which is simple and inexpensive in its construction and of long life and durability.

Although only one form of the present invention which has been disclosed, it should be apparent to those skilled in the art of modular furniture structures, that other forms may be had all coming within the spirit of the invention and the scope of the appended claims.

What is claimed is as follows:

1. A furniture module comprising:

first and second opposed sidewalls, said first sidewall having the same length, width and thickness respectively as said second sidewall, the length and width of said sidewalls being equal to form square sidewalls;

a rectangularly shaped transverse member having opposing lengthwise edges respectively attached to the opposing faces of said sidewalls for maintaining said sidewalls in a spaced parallel relationship with the lengthwise edges of said sidewalls being parallel, said transverse member being perpendicular to both of said sidewall faces, said transverse member lengthwise edges having a length equal to the length of said lengthwise edges of said sidewalls and being parallel to said lengthwise edges, said transverse member edges being attached to their respective sidewalls along a line offset from the mid-section of said sidewalls, the distance between the outer faces of said opposing sidewalls being equal to the length of said sidewalls such that said furniture module defines a cubic envelope.

2. A furniture module defined in claim **1** wherein said sidewalls and said transverse members are of an integral one piece construction.

3. The furniture module defined in claim **2** wherein said integrally formed sidewalls and transverse member are fabricated from a polyurethane foam.

4. The furniture module defined in claim **2** wherein said integrally formed sidewalls and transverse member are formed from a material selected from the group consisting of polyester, polyether, polyureas, foamed phenolic resins and polyurethane.

5. A modular furniture structure comprising a plurality of furniture modules each furniture module comprising first and second opposed rectangularly shaped sidewalls, said first sidewall having the same length, width and thickness as said second sidewall; a rectangularly shaped transverse member having opposing lengthwise edges respectively attached to the opposing faces of said sidewalls for maintaining said sidewalls in a spaced parallel relationship with the lengthwise edges of said sidewalls being parallel, said transverse member being perpendicular to both of said sidewall faces, said transverse member lengthwise edges having a length equal to the length of said lengthwise edges of said sidewalls and being parallel to said lengthwise edges, said transverse member edges being attached to their respective sidewalls along a line offset from the midsection of said sidewalls; a selected number of said modules being stacked one upon the other with the edges of said sidewalls of one of said modules being supported above the edges of the module immediately therebelow, a selected number of said modules being disposed in different orientations with respect to adjacent modules; and at least one transverse member carried in a horizontal plane and supported by a selected number of said modules.

6. The module furniture structure defined in claim **5** wherein a pair of adjacent modules are supported on their sidewall edges and a second module has one sidewall edge supported on the transverse member of one of said modules while the other sidewall of said second module has its sidewall edge supported on a transverse member of the other of said pair of modules such that the transverse member of said second module extends above the adjacent sidewalls of said pair of modules.

7. The module furniture structure defined in claim **5** wherein the sidewalls and transverse members of each

of said modules are of an integral one piece construction.

8. The module furniture structure defined in claim **7** wherein said integrally formed modules are fabricated from a polyurethane foam.

9. The module furniture structure defined in claim **7** wherein said integrally formed sidewall and transverse members are formed from a material selected from the group consisting of polyester, polyether, polyureas, foamed phenolic resins and polyurethane.

10. The module furniture structure defined in claim **5** wherein the length and width of the sidewalls of each module are equal whereby each module has square sidewalls and the distance between the outer faces of the sidewalls of each module is equal to the length of a sidewall such that each of said furniture modules define a cubic envelope.

11. The furniture module structure defined in claim **5** wherein each of said module units are releasably attached to adjacent upper and lower modules and selectively to said horizontally disposed transverse units.

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