United States Patent [19]

Becker, Jr.

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[45] **Sept. 10, 1974**

[54] **FURNITURE MODULE AND FURNITURE ITEMS RESULTING FROM MODULE COMBINATIONS**

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[21] Appl. No.: **265,321**

[52] **U.S. Cl.** **312/108,** 312/111, 297/118

[51] **Int. Cl.** **F16b 12/00**

[58] **Field of Search** ..... 312/107, 108, 111, 140, 312/198; 211/183; 220/97 B; 297/118

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Primary Examiner—James C. Mitchell

Attorney, Agent, or Firm—Max R. Kraus

[57] **ABSTRACT**

This invention relates to a novel furniture module and to furniture items obtainable with the use of such modules. The basic module consists of a generally I-shaped unit provided with a backing wall. By proportioning the module portions as set forth in equations, various items of furniture may be obtained from combining any one of a number of modules. The individual modules may be in one piece of plastic or other moldable material or may be built up from flat panels of wood or plastic suitably united to provide a module structure. The various panels which are used to make a module when made from individual pieces may be cemented or may be attached in any other suitable fashion as by screws or by slip interlocking fit. Preferably, locking clips having a general shape of a T with a laterally extending piece may be provided for use in assembling modules to lock them in position. Various items of furniture such as tables, chairs, bookcases, cabinets and the like may be made by using the modules in different relations. An important feature of the new module resides in its susceptibility to interfitting a number of modules into a package whose dimensions are of the same order as a module.

2 Claims, 19 Drawing Figures

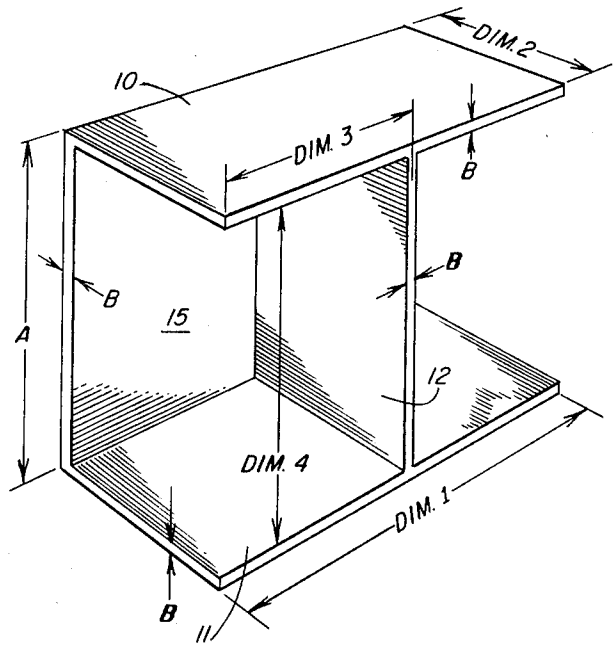


FIG. 1

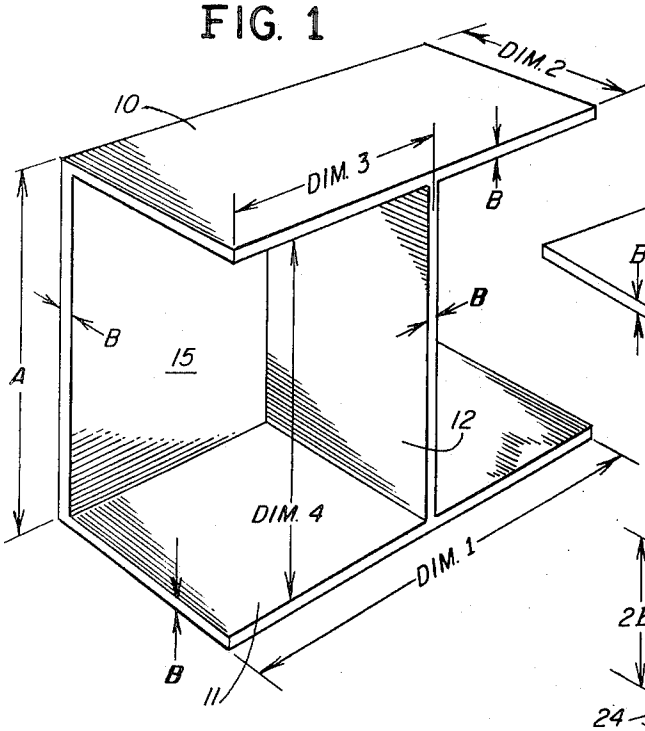


FIG. 2

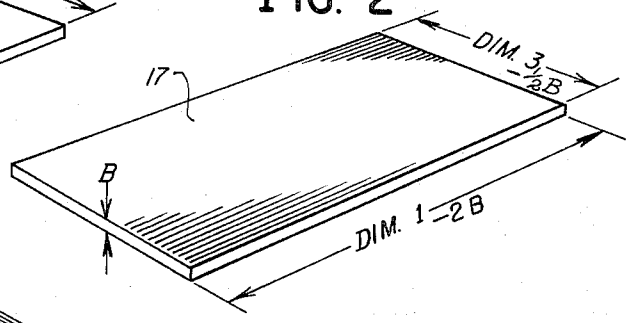


FIG. 3

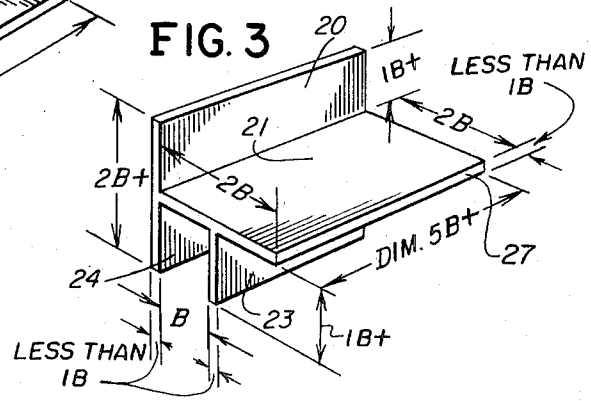


FIG. 4

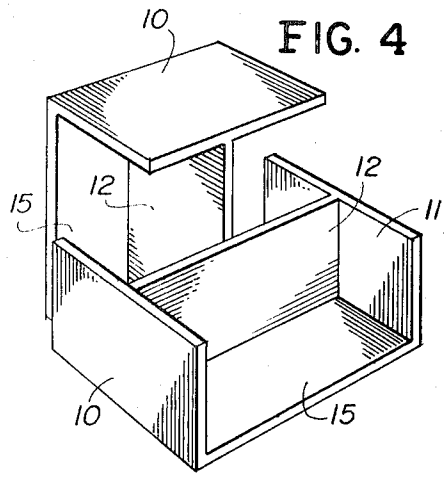


FIG. 5

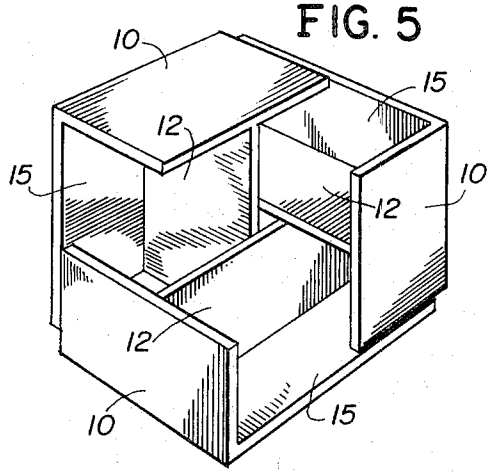


FIG. 6

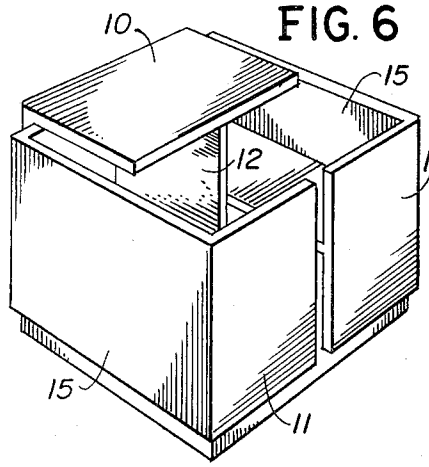


FIG. 7

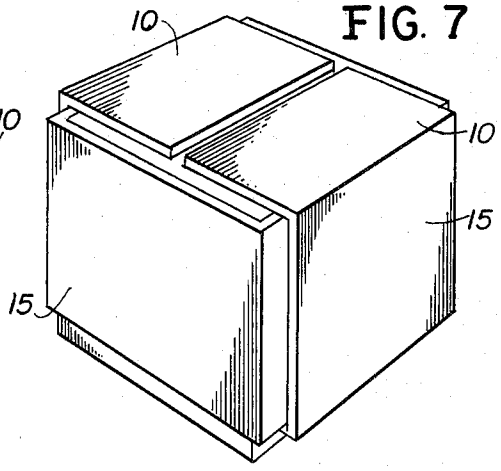


FIG. 8

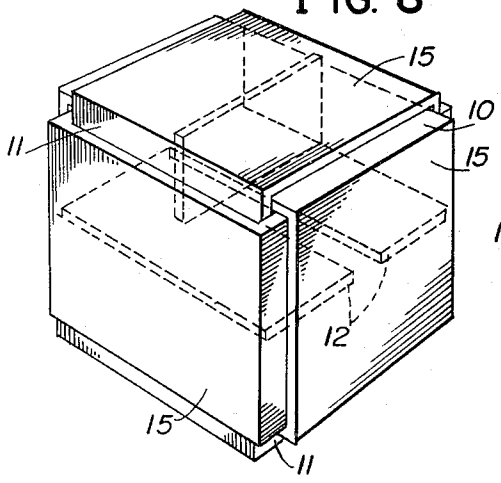


FIG. 9

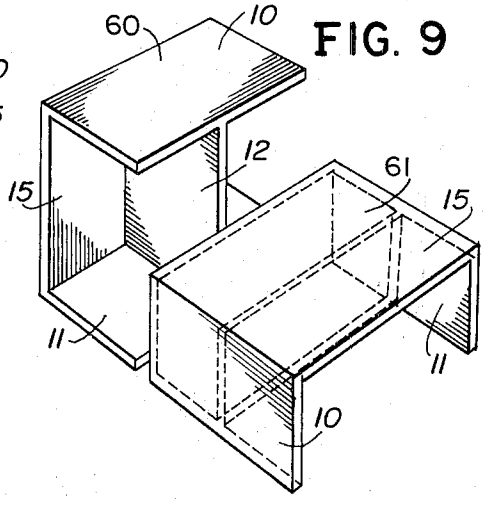


FIG. 10

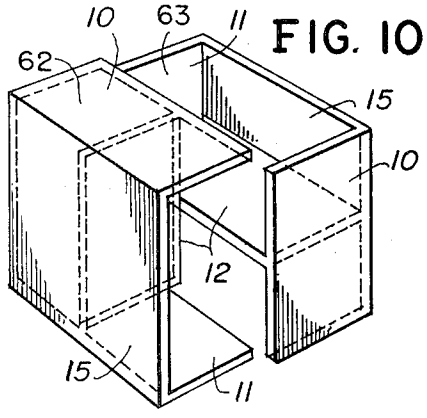


FIG. 11

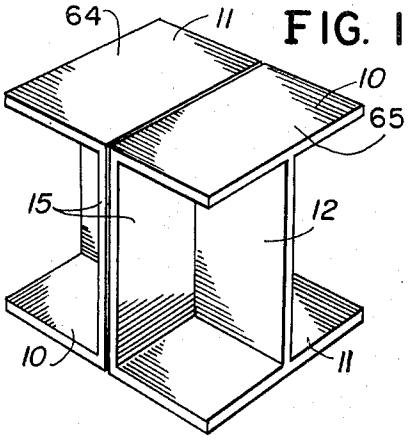


FIG. 12

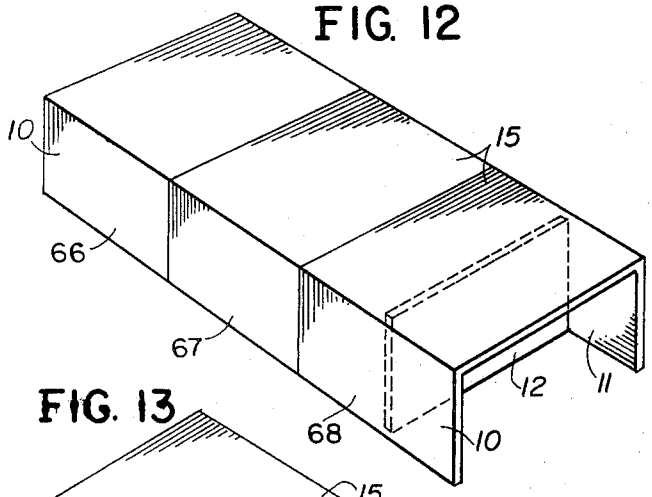


FIG. 13

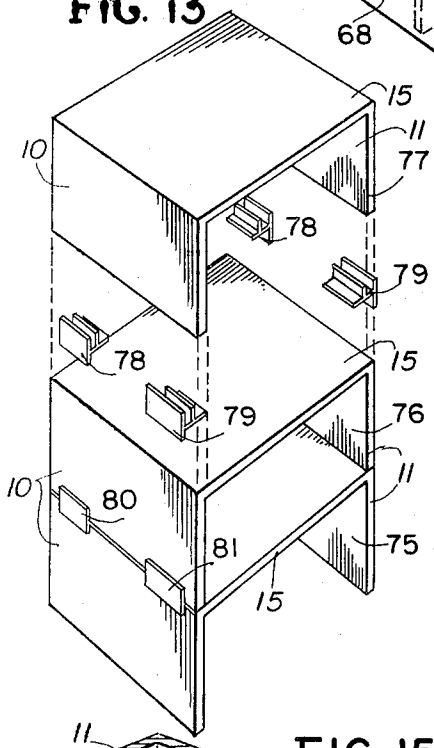


FIG. 14

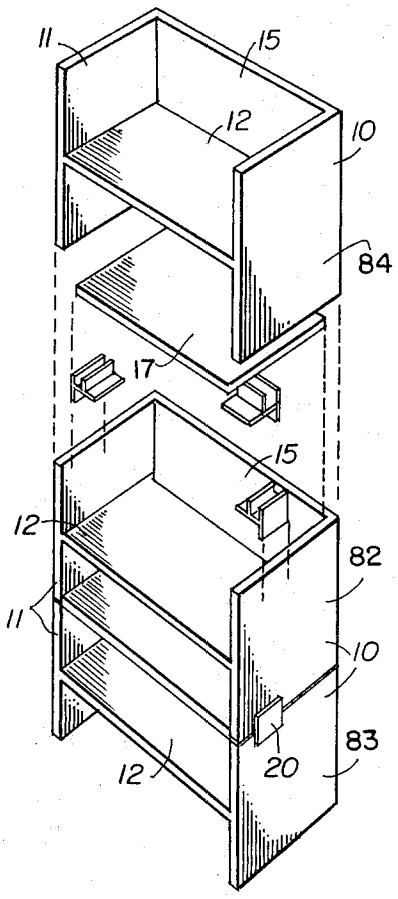


FIG. 15

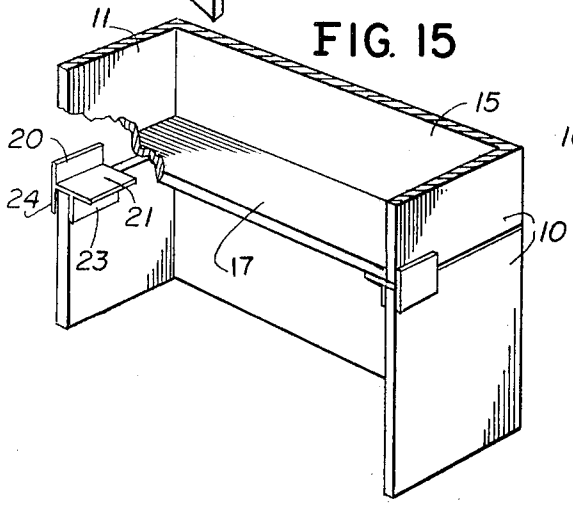


FIG. 16

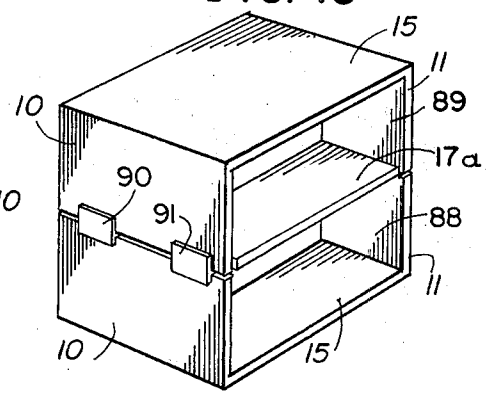


FIG. 17

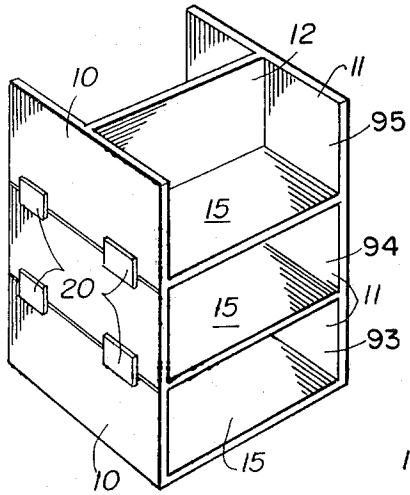


FIG. 18

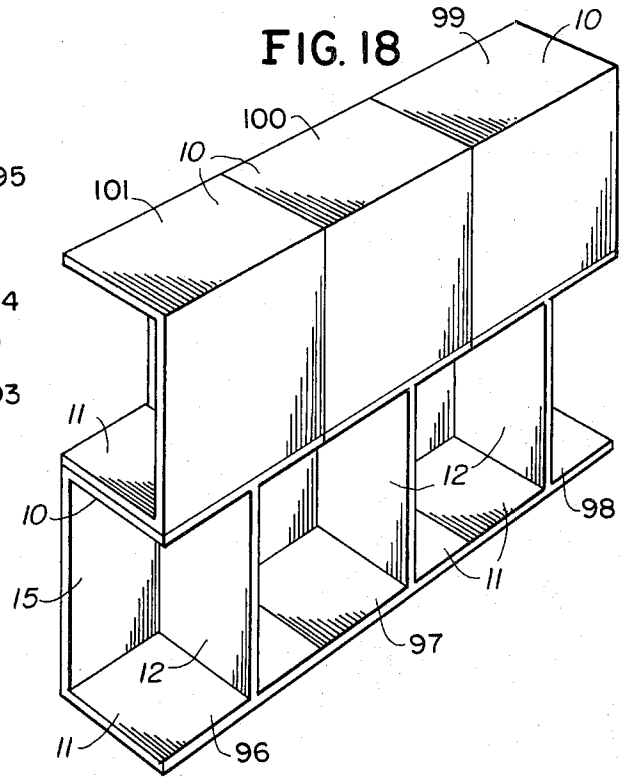
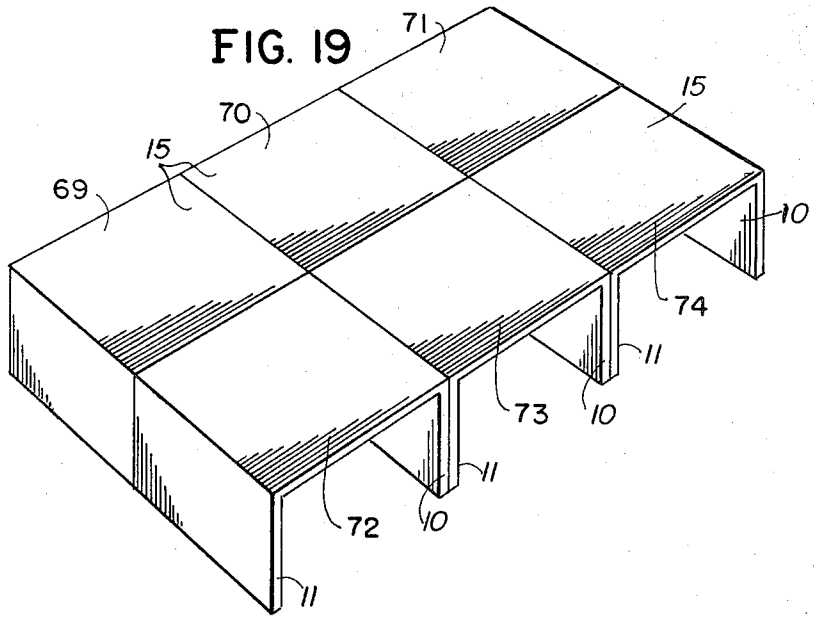


FIG. 19



FURNITURE MODULE AND FURNITURE ITEMS RESULTING FROM MODULE COMBINATIONS

INTRODUCTION

This invention relates to furniture modules and furniture items obtainable with the use of such modules in various arrangements. Modular furniture has many desirable features which render it attractive to individuals who lack the facilities for or do not want to accurately and quickly cut sheet material of wood or plastic to prescribed dimensions but who can assemble modules in various arrangements, temporary or permanent, for items of furniture. Such items of furniture may be used for children, or for use in play areas, or home, or limited quarters for creating a finished piece of furniture.

Such modules have certain advantages among which are their comparative economy and the opportunity to a person to create or arrange or change furniture as needed or desired. As far as economy is concerned, since the materials come in knockdown form, shipping charges are usually at a minimum and possible damage from shipping rarely, if ever, must be considered. In particular, many homes may find such modular furniture desirable during the first years of a growing family with space and care at a premium.

GENERAL DESCRIPTION OF THE INVENTION

The invention generally comprises a basic module which is assembled or contains a number of flat panels to provide an I-shaped structure with a backing panel (as seen from the front of the I) to close the module. The module itself may be manufactured in one molding operation from suitably strong plastics, such as polyurethane, and other rigid plastics which are coming into wide use in the furniture industry. A module may also be made of wood, either natural or the so-called compressed type, and may be assembled to form a rigid structural module. The various panels making up a module may be united by cements available in the furniture industry. The dimensions of the panels have certain relationships among them, as more fully explained later, but such dimensions may vary within wide limits depending upon the ultimate objective of the furniture — use by children or adults.

In connection with production of items, such as the module or parts thereof, from plastics by injection or other molding procedures, it is necessary to provide draft or taper for removing a finished plastic item from the die or mold. As a rule, the draft will run a minimum of about one degree and preferably may be somewhat higher, such as about two or three degrees. The changes in dimensions resulting from the presence of draft in plastic molding are small and have negligible effect on the dimensional relationships set forth herein. The requirements for draft for plastic molding are well-known and may be readily accommodated by a designer while still maintaining the general structural features and dimensional relationships hereinafter set forth.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages of the new modular construction will become readily apparent in connection with the drawings wherein exemplary embodiments of the invention are illustrated, it being understood that such exemplary

embodiments form but a small part of the possible embodiments utilizing the present invention and the furniture items possible by the use of the new modules.

Referring now to the drawings:

FIG. **1** is a perspective view of a module embodying the present invention.

FIG. **2** is a perspective view of a shelf panel which is adapted to be used in conjunction with the module of FIG. **1.**

FIG. **3** is a perspective detail of a length of locking clip to be used in conjunction with various modules of FIG. **1** for locking adjacent modules together.

FIGS. **4** to **8** inclusive are perspective views illustrating the manner in which a number of modules embodying the present invention may be assembled to form a compact, generally cubical package.

FIGS. **9** to **12** inclusive are perspective views illustrating various items of furniture obtainable with the use of new modules embodying the present invention.

FIGS. **13** to **16** inclusive illustrate the manner in which clips shown in FIG. **3** may be used in connection with articles of furniture obtained by assembling modules to provide articles of furniture.

FIG. **17** is a perspective view of a book organizer or open top storage article of furniture consisting of a number of new modules, maintained in desired position by clips illustrated in FIG. **3.**

FIGS. **18** and **19** are respectively perspective views of a bar or counter on the one hand, and a bed or platform on the other hand, made possible by the new modules.

SPECIFIC DESCRIPTION OF BASIC MODULE

Referring first to FIG. **1,** a module consists of sides **10** and **11** between which extends insert **12** to form a generally I-shaped structure (depending upon its orientation) and back panel **15.** In considering the possibilities of various modules, it will be convenient to refer to individual dimensions both generally and specifically. For example, sides **10** and **11** are equal in length, which length will be referred to as dimension **1.** Dimension **2** is the width between the front and rear edges of panels **10** and **11.** Dimension **3** is one-half of dimension **1** and extends from the end of panel **10** or **11** to the center line of part **12** of the module. The thickness of the various panels, such as parts **12, 15, 10** and **11,** are generally the same and uniform, except for draft for removal of molded part from a die, and is indicated by B. The entire distance between the outer faces of panels **10** and **11** is indicated by A while dimension **4** is the inside distance between the opposing inner faces of panels **10** and **11.**

The dimensions may vary greatly, particularly A, dimension **1** and dimension **2.** Such dimensions may range from a few inches to as much as ten feet as desired by customers. The dimensions will be determined by such factors as strength of plastic, end use of the module (such as for children or adults), cost of plastic, die and molding requirements, commercial and sales considerations, such as avoiding appearance of skimpiness or weakness. No attempt is made to show actual dimensions or drawings to scale.

The entire module illustrated in FIG. **1** may be made from plastic as one piece or may be assembled from flat panels of wood or plastic and suitably secured together.

Referring to FIG. 2, a shelf 17 is a flat member whose thickness is B and whose length and width are respectively indicated as dimensions 1 minus 2*B* and 3 minus ½*B*.

Insofar as the various modular dimensions are concerned, dimension 1 is equal to *A* minus 2B minus *X*, wherein *X* is the required clearance between relatively movable surfaces. For most purposes, the clearance may be of the order of one-eighth of an inch, although under certain conditions clearances may be smaller. The clearance itself is simply that necessary to provide a sliding fit.

Dimension 2 is equal to *A* plus *B* minus *X*, all divided by two. Dimension 3 is equal to *A* minus 2*B* minus *X*, all divided by two. Dimension 4 is equal to *A* minus 2*B*.

Referring now to FIG. 3, a length of clip is illustrated in enlarged scale, such clip being made of extruded metal or plastic and being thick and strong enough to function in a manner desired. The clip itself may have an indefinite length and for the purposes of locking modules together, clips may be cut into any desired lengths such as, for example, 5*B* plus, as illustrated in the drawing. The clip consists of head portion **20**, from the midpoint of which extends, laterally therefrom at right angles, support portion **21** to form a generally T-shaped construction. Laterally extending from support portion **21** from one face thereof is clip portion **23**, which is parallel to and spaced from opposed portion **24** of head portion **20**. The inside faces of portions **24** and **23** are separated by a distance equal to *B*. The distance from edge **27** of the clip and portion **23**, for example, may be as desired and will be generally sufficient to provide good mechanical support, such as, for example, a distance equal to at least *B*. The plus addition to dimensions will be dictated by mechanical considerations of strength, etc.

A clip portion may be securely fastened at various regions to one or more modules by means of clip fit, friction, cement, or a clip may have suitable apertures therethrough for accommodating screws, rivets or other retaining means. The regions where clips may be used will be explained in connection with the various assemblies of modules. The nature of attachment of clips and module parts will depend upon desired permanence of the furniture item to be provided. Thus for temporary use, the clips may be used by themselves. For more permanent use, cement, nails, screws, etc. may be utilized.

Referring now to FIGS. 4 to 8 inclusive, the views illustrate a sequence of module nesting for making a convenient shipping package of as many as six modules. It is understood that the modules of a package are the same size. Two modules are illustrated in FIG. 4, the modules being arranged as shown, one module being on its back or front of rear panel and the other module having its shelf extending perpendicularly to the shelf of the first module. Next, additional modules are positioned as illustrated in FIGS. 5 and 6 to provide a nesting relationship. Finally, additional modules are added as illustrated in FIGS. 7 and 8, the additional modules combining to form a compact, generally cubical package having great strength. It is evident that such a package as illustrated in FIG. 8 can be shipped with minimum charges and maximum protection against damage. A package of modules as illustrated in FIG. 8 will have sufficient space within the interior thereof so that a substantial number of clips, as illustrated in FIG. 3, may be stored.

Referring now to FIG. 9, a perspective view is illustrated of two separate modules **60** and **61** arranged as illustrated to provide an occasional table and seat. In FIG. 10, two modules **62** and **63** are used. In FIG. 11 two modules **64** and **65** are arranged in back-to-back relation to provide a multi-purpose table. Referring to FIG. 12, modules **66, 67** and **68** are arranged in end-to-end relation, the modules resting on their front edges to provide a coffee table. Modules may be rearranged so that six modules **69, 70, 71, 72, 73** and **74** are arranged as shown in FIG. 19 to provide a bed.

Referring now to FIG. 13, a combined table and storage unit may be provided by arranging three modules **75, 76** and **77** one above the other as illustrated. In fact this arrangement can utilize as many modules as desired. To impart stability and desired permanence, clips **78** to **81** inclusive are arranged as shown, the clips joining adjacent modules.

FIG. 14 illustrates a still different module arrangement whereby clips are utilized to arrange the module assembly to provide a combined bookshelf and storage item. It will be noted that in FIG. 14, shelf 17 described in connection with FIG. 2 is utilized to provide a top cover for the storage cabinet created by superposed modules **82** and **83**. In this arrangement, shelf panel **17** is disposed not only to cover the top of the storage cabinet but in addition to provide an extra shelf for top module **84** constituting a bookshelf. There is no reason why the inserts provided by modules **82** and **83** cannot function also as bookshelves.

FIG. 15 is an enlarged view illustrating the manner in which clips are used, shelf panel **17** in this instance lying within the inside walls of a module.

FIG. 16 illustrates a still different arrangement whereby two modules **88** and **89** are in superposed relation and joined together by clips **90** and **91** and may have a suitably dimensioned shelf **17***a* dividing the space between the superposed modules to one side of rear panel **15**.

FIG. 17 shows a still different arrangement of modules **93, 94** and **95**, top module **95** being so arranged that the three edges of panels **10** and **11** and partition **12** are at the top.

FIG. 18 shows a still different arrangement of two tiers of modules **96** to **101** inclusive, to provide a bar or counter arrangement. Such an item may have clips or not to maintain the various modules in desired relationship to each other. In general, if a bar or counter is to be useful for any length of time, clips may be used to join the various modules so that the entire construction is stabilized.

It is evident that the number of possibilities for the use of the new module is far greater than illustrated here and will depend upon the imagination and skill of the owner of a set of modules embodying the new invention.

The dimensions of the various parts of a module will depend upon the end use. For example, if furniture for children is to be designed, dimension *B* (thickness) can be less than for adults. In general the thickness should be adequate for the desired purposes. Similarly dimension A will depend upon the end use. If a module is to be used for benches or the like by adults, dimension A may be 2 or 2½ feet, while dimension *B* may have an appropriate value such as ½ inch. The module dimen-

sions must conform to the relationships hereinbefore set forth.

What is claimed is:

1. A combination comprising at least four and no more than six identical modules useful for combining with each other for creating various items of furniture, each said module comprising an I-shaped part having spaced opposed parallel sides (**10** and **11**) with a flat cross panel (**12**) extending between said opposed sides midway between the free edges of the sides and a back panel (**15**) closing one end of the I-region as viewed from the front of the I, all forming an integral structure, said opposed sides (**10** and **11**) being substantially equal and having a length designated as dimension **1**, a width designated as dimension **2**, all thicknesses being designated as dimension *B*, the distance between the outer faces of the parallel sides of the module being dimension A, the distance between opposed inside faces of said sides being designated as dimension **4**, said flat cross panel (**12**) having its width dimension substantially equal to dimension **2** minus B, dimension **1** being substantially equal to *A* minus 2*B* ; dimension **2** being substantially equal to *A* plus *B* divided by two; dimension **3** being substantially equal to one-half of dimension **1** and being substantially *A* minus 2*B* divided by two; and dimension **4** being the distance between opposed inside faces of the sides (**10** and **11**) of the module and constituting *A* minus 2*B*, the dimensional relationships between the various module parts permitting a wide variety of functional module arrangements, dimensions *A* and *B* being determined by the ultimate use of such modules as for a child or adult furniture, the relationship between the module dimensions permitting from four to six identical modules susceptible to nesting into a compact cubical package whose volume is substantially equal to the volume defined by two I-shaped modules in edge to edge contacting relation.

2. The construction according to claim **1** wherein fastening means are provided for maintaining two adjacent modules in desired relative position.

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