

United States Patent

[11] 3,549,020

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| [22] | Filed | Mar. 13, 1970 |
| [45] | Patented | Dec. 22, 1970 |

- [54] SHELVING COMPRISING COMPOSABLE
MODULAR ELEMENTS
5 Claims, 13 Drawing Figs.**

- [52] **U.S. Cl.**..... 211/148,
108/91, 108/159
- [51] **Int. Cl.**..... **A47b 3/06**,
A47b 7/02; A47f 5/00
- [50] **Field of Search**..... 211/148,
134, 177; 108/91, 64, 53, 111, 159, 157, 153;
312/108, 263, 257; 248/165; 223, 250; 108/114

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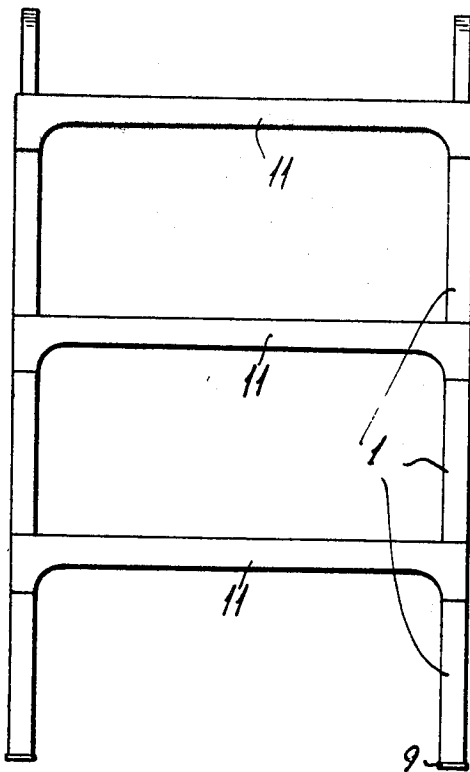
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Primary Examiner—Ramon S. Britts

Attorney—Edwin E. Greigg

ABSTRACT: A composable shelving formed by only two types of modular elements which can be interlockingly connected to each other to form shelving uprights and shelves; each of the upright elements comprises a hollow body having an open lower end, and having an intermediate portion of a reduced size relative to the underlying portion to provide a peripheral shoulder for the shelf element, and an upper portion of a reduced size relative to the intermediate portion for inserting in the open lower end of an overlying upright element; each of the shelf elements has at each end thereof an aperture, in which the intermediate portion of the associated upright element is inserted.



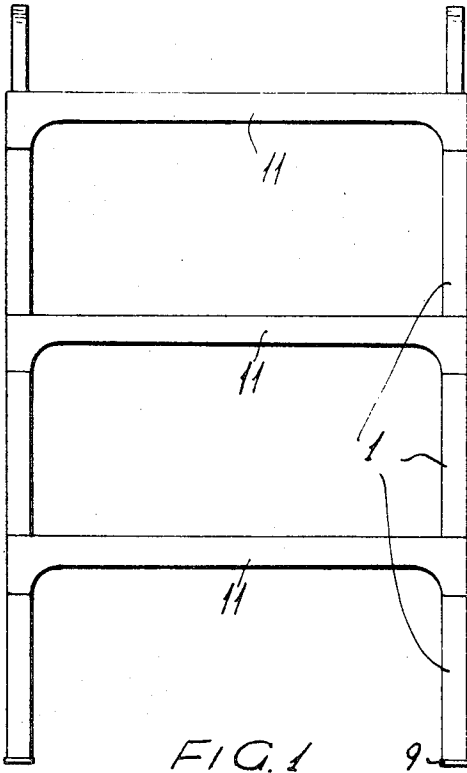


FIG. 1

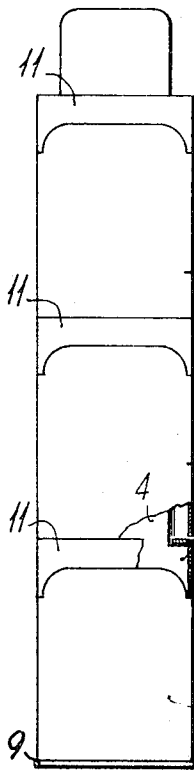


FIG. 2

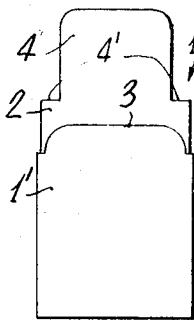


FIG. 4

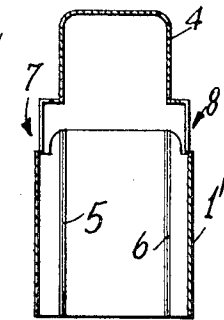


FIG. 6

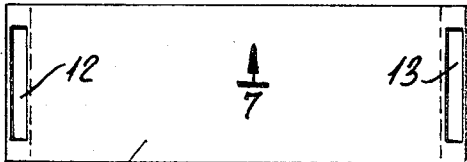


FIG. 3

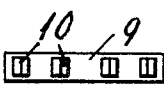


FIG. 9



FIG. 10



FIG. 8

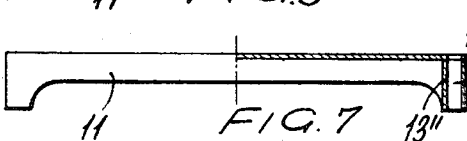


FIG. 7

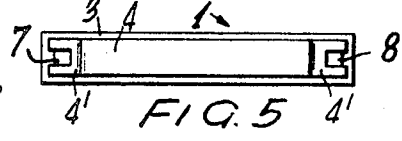


FIG. 5

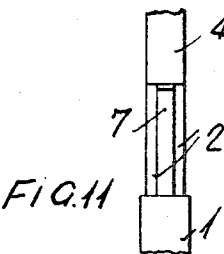


FIG. 11

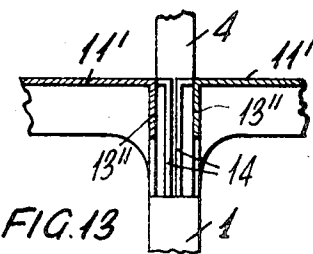


FIG. 13

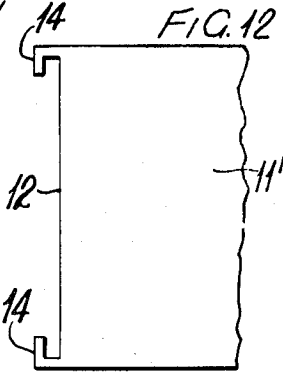


FIG. 12

SHELVING COMPRISING COMPOSABLE MODULAR ELEMENTS

This invention generally relates to a composable shelving substantially formed by combining only two types of modular elements with respect to the shelving shelves and uprights, which can be interlockingly connected and composable as desired to form bookcases or shelving of any shape and size.

The use of modular elements for the shelvings according to the invention allows an easier assembling and transportation thereof as the elements comprising the shelving can be separately shipped and then assembled by the user. Further, the use of composable modular elements enables the user to form, for example, bookcases of suitable size and shapes and, where the modular elements are made of molded plastic material, it will substantially reduce the production costs, as it will suffice to use only two molds for the upright and shelf elements of the bookcase, respectively.

The composable shelving according to the present invention substantially comprises a plurality of modular upright elements which can be joint inserted over one another, and a plurality of modular shelf elements which can be interlockingly connected at each end to an upright element, so that the assembly of the shelving elements will form a rigid structure.

In order that the invention be more fully understood, reference will be had in the following to the appended drawing showing an exemplary embodiment of the invention.

In the drawing:

FIG. 1 is a front view of a shelving as provided by using the two types of modular elements according to the invention;

FIG. 2 is a side view of the shelving in FIG. 1;

FIG. 3 is a top view showing a shelf element;

FIG. 4 is a side view showing an upright element;

FIG. 5 is an enlarged top view of the upright element shown in FIG. 4;

FIG. 6 is a vertical longitudinal sectional view of FIG. 4;

FIG. 7 is a front view of the shelf element, partly in full view and partly in sectional view as taken on line 7-7 of FIG. 3;

FIG. 8 is a side view of a leveling plate;

FIG. 9 is a top view of the plate in FIG. 8;

FIG. 10 is a vertical sectional view of the plate in FIG. 8;

FIG. 11 is a fragmentary, partly enlarged front view of the upper portion of an upright element;

FIG. 12 is a top enlarged view showing a second embodiment for the shelf element; and

FIG. 13 is a fragmentary vertical sectional front view showing two shelf elements, similar to those in FIG. 12, juxtaposed to each other. The direction of views in FIGS. 3-13 is based on the orientation of components in FIGS. 1 and 2.

The shelving according to the present invention is formed by combining with each other only two types of modular elements, particularly modular elements 1 superimposed to one another and suitable to constitute the shelving uprights, and elements 11 for making up the shelves, as clearly shown in FIGS. 1 and 2.

Each modular element 1 for the uprights, also referred to as upright module, is particularly shown in FIGS. 4, 5, 6 and 11 of the appended drawings.

Referring to the above figures, it will be seen that the upright element or upright module 1 has a hollow body formed of a base 1', at the top of which an intermediate portion 2 is formed of reduced size relative to the underlying base 1 to provide a peripheral step or shoulder 3 (FIGS. 4 and 5), so that the end of a shelf element 11 may rest thereon, and an upper end portion 4, the width of which being less than the intermediate portion 2 for providing two side shoulders 4'. The end portion 4 has its corners suitably connected and is adapted to be inserted in the lower open end of element 1 in order to joint two superimposed upright elements. As shown in FIG. 6, inside the base 1' of each upright element 1, two longitudinal ribs 5 and 6 are provided, parallel to each other and the inner sides of which are spaced apart from one another by a distance corresponding to the width of the end portion 4 of an upright element to avoid the relative side dis-

placement of the portion 4 inserted therebetween, for superimposed upright elements 1 to form a shelving upright.

As shown in FIGS. 5 and 6, the intermediate portion 2 has longitudinally extending end apertures or recesses 7 and 8, serving for a purpose to be explained hereinafter.

Referring now to FIGS. 8, 9 and 10 of the appended drawings, a leveling plate 9 is shown therein and provided with hollow projections or lugs 10, by which two or more leveling plates can be superimposed and jointed to one another. One or more leveling plates superimposed on one another can be inserted in the lower end of that upright element directly resting on the ground (FIGS. 1 and 2), thus to compensate for any gradient differential in the ground.

Referring now to FIGS. 3 and 7, it will be seen that therein a shelf element or shelf module 11 is shown as constituting the second type of modular element forming the shelving. The shelf module 11 has a horizontally extending shelf portion proper, the upper surface of which serves to support articles such as books or the like. As shown in said FIGS. at each end of a shelf element 11 a throughgoing opening or aperture is provided, respectively 12 and 13, which is so dimensioned that only the upper end portion 4 of an upright element or module 1 may pass therethrough. Thus, during the simple assembling operation, as a shelf module 11 is lowered onto two horizontally spaced uprights 1, the upper end portion 4 thereof passes through a corresponding opening 12 and 13, until the upper shoulder 4' of the intermediate portion 2 engages the underside of the shelf face adjacent said openings 12, 13 and the lower contour of the shelf module conforms to and abuts the shoulder 3 constituting the lower boundary of the intermediate portion 2. In this manner several elements forming the shelving may be assembled, as clearly shown in FIGS. 1 and 2 of the appended drawing. If the distance, in a shelf module 11, between the underside of the shelf portion and the lower contour thereof equals the distance, in an upright module 1, between the lower shoulder 3 and the upper shoulder 4', the dual support for shelf module 11 referred to herein above is ensured.

As shown in FIG. 7, at each end of the shelf element 11 the hole, such as 13, is defined between a first outer wall 13' and a second inner wall 13'' spaced apart from each other by an amount corresponding to the width of the intermediate portion 2 of an upright element, so that the connection between the two types of elements is rigid and slightly forced to allow a required rigidity to the shelving structure. Further, as seen in FIGS. 1 or 2, at the holes 12 or 13 the lower edge of element 11 rests on the shoulder 3 of the respective upright element 1 thereto connected, whereas the overlying upright element, as inserted on the underlying element, will rest by its lower edge on the upper face of the underlying shelf element 11. Thus, the shelving assumes a rigid structure.

The shelf element 11 shown in FIGS. 3 and 7 is only for composing a single shelf shelving, as shown in FIG. 1.

When desiring to compose a multiple shelving, that is a shelving with shelves vertically superimposed and correspondingly also horizontally drawn near one another, a modified form of the shelf element, as shown in FIG. 12, is to be used.

The shelf element 11' shown in FIG. 12 differs from the shelf element 11 shown in FIGS. 3 and 7 only in that at least at one end thereof an aperture 12 or 13 has been provided, this aperture being laterally open by removing the above-mentioned outer wall 13', and in lieu thereof two side lugs 14 have been provided, the lugs being inward facing and suitably spaced apart from the inner wall 13'' by an amount such that the lugs 14 for two adjoining shelf elements (FIG. 13) will insert just in the apertures 7 and 8 provided at the ends of the intermediate portion 2 of said upright element 1. The width of the lugs 14 of a shelf module 11 is not more than half the width of an aperture 7 or 8.

Thus, shelvings can be composed having both superimposed and juxtaposed shelf elements 11. Further, the shelf elements 11' can be readily obtained by using the mold for the shelf ele-

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ments 11, suitably adapting it by introducing suitable shim at the two ends to enable said lugs 14 to be formed.

It should be understood that what has been stated in the foregoing and shown in the appended drawings was given by example only, and that further changes and modifications can be made thereto, without departing from the scope of the present invention.

I claim:

1. In a shelving composable by modular elements, the improvement comprising:

A. a shelf module having:

1. a shelf portion;
2. two end portions;
3. an elongated opening at least at one end portion, said opening having a closed outline;
4. a lower contour spaced from said shelf portion; and

B. an upright module having:

1. a base portion including a bottom edge face;
2. a hollow portion open towards said bottom edge face;
3. an intermediate portion adjoining said base portion and reduced in dimension with respect to said base portion to define a first shoulder means; and
4. an upper end portion adjoining said intermediate portion and reduced in dimension with respect to said intermediate portion to define a second shoulder means disposed above and spaced from said first shoulder means; the spacing between the first and second shoulder means being equal to the spacing between the undersurface of said shelf portion and said lower contour, said upper end portion having a cross-sectional shape substantially corresponding to that of said elongated opening, whereby in an assembled condition said upper end portion of said upright module projects vertically beyond and is surrounded by said elongated opening, said shelf portion rests on said second shoulder means, and said lower contour rests on said first shoulder means, said projecting upper end portion of an upright module being insertable into said hollow portion of another upright module for securing to one another a desired number of upright modules in a superposed, nested position.

4

2. An improvement as defined in claim 1, wherein an upright module superposed on another upright module rests solely on an upper face of said shelf portion.

3. In a shelving composable by modular elements, the improvement comprising:

A. a shelf module having:

1. two end portions;
2. an opening adjacent each end portion, at least one of the openings having an open outline;
3. side lugs adjacent said opening of open outline, said lugs directed inwardly towards one another; and

B. an upright module having:

1. a base portion including a bottom edge face;
2. a hollow portion open towards said bottom edge face;
3. an intermediate portion adjoining said base portion and reduced in dimension with respect to said base portion to define a shoulder means;
4. an upper end portion adjoining said intermediate portion and reduced in dimension with respect to said intermediate portion, said projecting upper end portion of an upright module is insertable into said hollow portion of another upright module for securing to one another a desired number of upright modules in a superposed, nested position; and

5. vertically extending lateral recess means provided on said intermediate portion; in an assembled condition said upper end portion projects vertically beyond and is partially surrounded by said opening having an open outline, said shelf module rests on said shoulder means of said upright module and said side lugs extend into said lateral recess means.

4. An improvement as defined in claim 3, wherein the width of said recess means is so dimensioned, as to accommodate the lugs of two adjoining shelf modules; said elongated apertures of two adjoining shelf modules, when secured to the same upright module, jointly entirely surround said upper end portion of the upright module.

5. An improvement as defined in claim 3, including at least one leveling plate inserted in the bottom edge of an upright module.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,549,020 Dated December 22, 1970

Inventor(s) Olaf Von Bohr

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

┌ In the heading, after "Patented Dec. 22, 1970" insert
-- [32] Priority March 18, 1969
Italy
No. 14238/69 --

Signed and sealed this 13th day of August 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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