

[54] **MULTI-PURPOSE BUILT-UP SHELVING**
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 [51] Int. Cl. **A47b 87/00**
 [58] Field of Search 312/107, 111, 324, 198,
 312/330; 217/18, 36 H, 17 H, 56 H; 229/9 F;
 220/24 A

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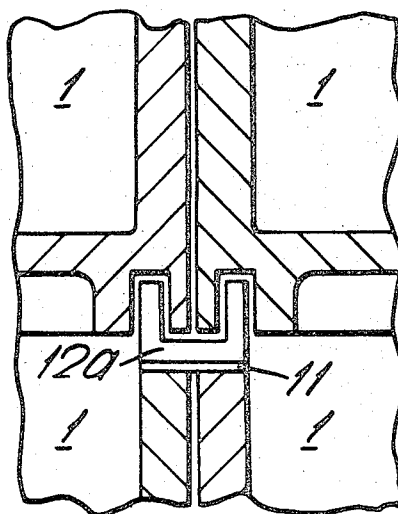
Primary Examiner—James T. McCall
Attorney, Agent, or Firm—Melvin A. Crosby

[57] **ABSTRACT**

A multi-purpose built-up shelving consisting of at least one vertical row of superposed box-type elements which, when installed, are open both to the front and on top; the uppermost box-type element is fitted on its upper side with a lid. The superposed box-type elements preferably made of foamed plastics are held together by positive locking components; if the shelving includes two or more vertical rows, adjacent box-type elements are joined together by connecting pieces.

Each box-type element is adapted to be fitted with a slide-in element and/or a door.

6 Claims, 17 Drawing Figures



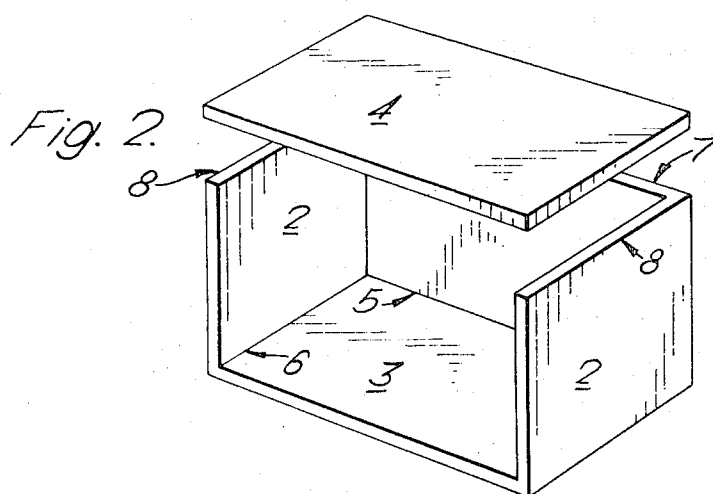
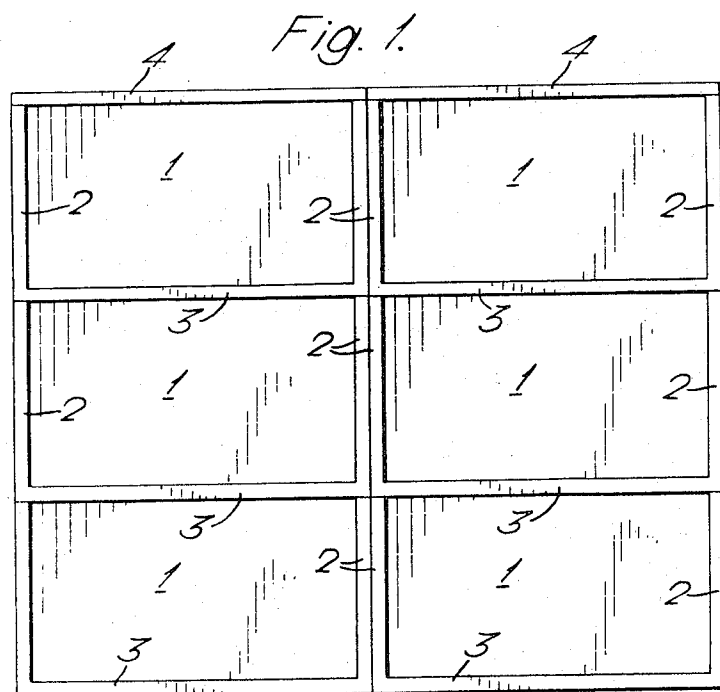


Fig. 3.

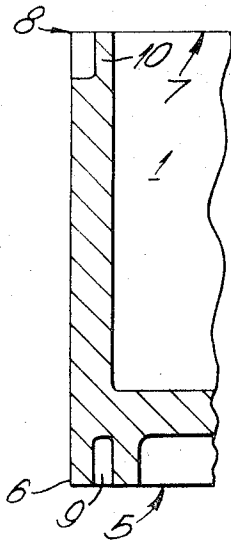


Fig. 4.

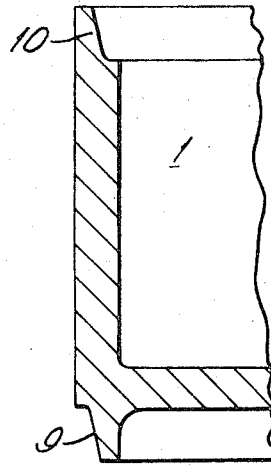


Fig. 5.

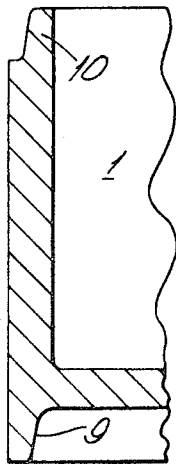


Fig. 6.

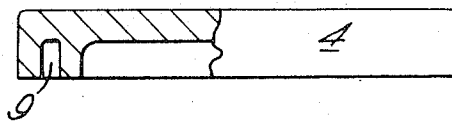


Fig. 7.

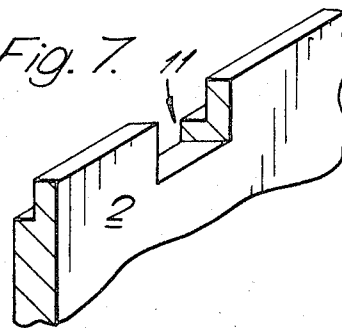


Fig. 8A.

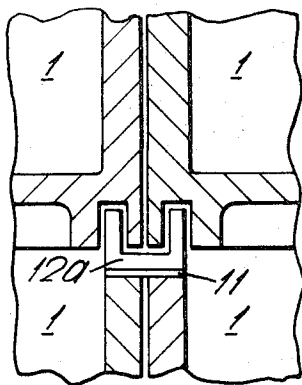


Fig. 8B.

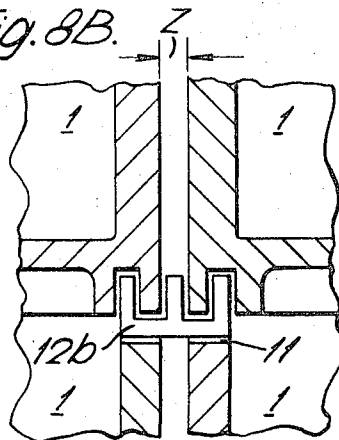


Fig. 9A.

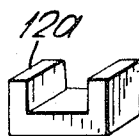


Fig. 9B.

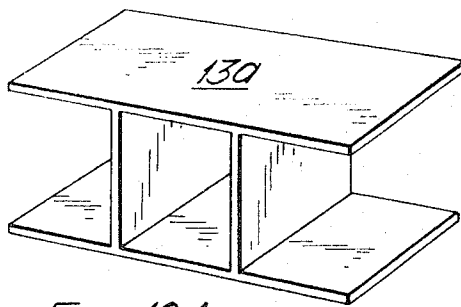
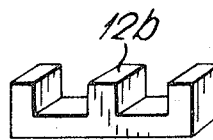


Fig. 10A.

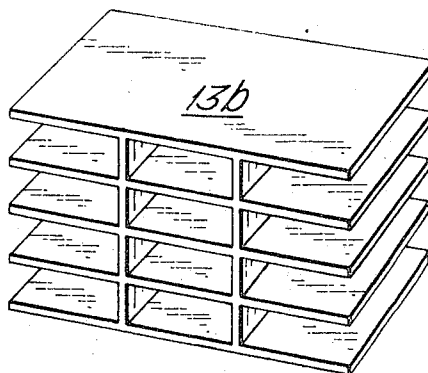


Fig. 10B.

Fig. 11.

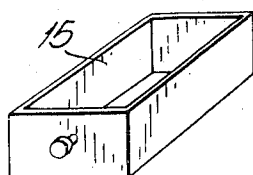


Fig. 12.

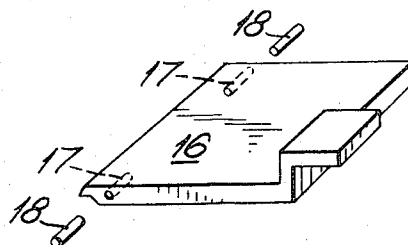
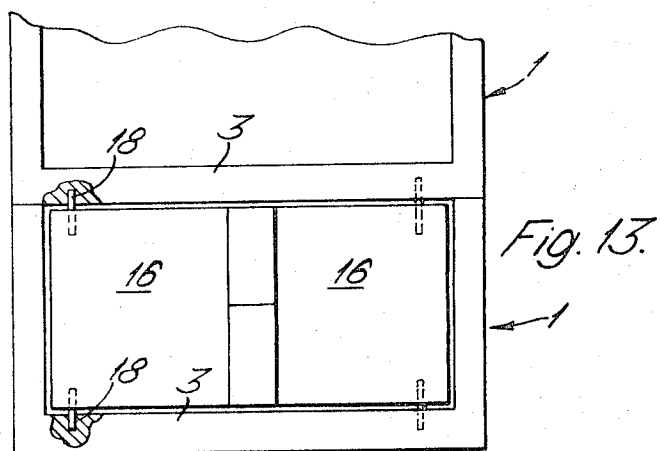
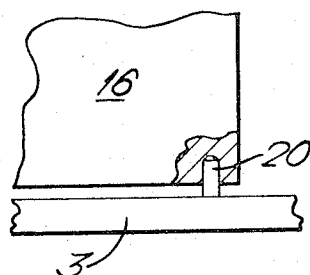


Fig. 14.



MULTI-PURPOSE BUILT-UP SHELVING

BACKGROUND AND OBJECTS

This invention relates to a multi-purpose built-up shelving.

Built-up shelvings made of metal are already known, in which sheet metal bearing surfaces in the form of shelves are inserted into vertical perforated piles. It is true that, for the assembly and dismantling of such shelving, nothing more than a hammer is required; none the less, apart from the high costs of manufacture, they have other disadvantages.

One of the most serious disadvantages lies in the fact that the vertical piles which, for reasons of rationalisation, are usually supplied in one size only, are not of a height which is suitable for every purpose, with the result that the available space cannot be utilized to the fullest possible extent when, for example, the height of one shelf space is considerably smaller, and the height of two shelf spaces, one above the other, is only slightly greater than the height of the room. A further disadvantage of such shelving is the unsightly appearance of the perforated vertical piles which, in addition, are not as a rule connected to one another by a wall at the sides of the shelving, with the result that the shelving, in an office, for example, does not harmonise with the rest of the office furniture. As a result of the hammer blows necessitated by repeated assembly and dismantling, the vertical piles become even more unsightly. Finally, with this type of shelving, the subdivision of the spaces between the individual shelves gives rise to considerable difficulties, unless one is prepared to punch further ugly holes in the shelves themselves for the insertion of intermediate partitions; in consequence, the range of application of this shelving is in practice limited to warehouses, basements and storerooms.

The basic purpose of this invention is the creation of a built-up shelving which can be easily and quickly assembled and dismantled without the aid of tools, which permits maximum utilization of headroom and, because of its pleasing appearance and practical design, can be used for a very wide variety of purposes.

SUMMARY

This problem is solved through a shelving of the above mentioned type by means of the combination of the following features:

- a. the shelving consists of at least one vertical row comprising a plurality of box-type elements in the form of hollow, rectangular polyhedra with right-angled sides which, when installed, are open both to the front and on top,
- b. each box-type element is fitted on its underside, within at least a part of its horizontal periphery, with one component, and on its upper side, within an equivalent zone, with the other component of at least one pair of positive locking components,
- c. the uppermost box-type element is fitted on its upper side with a lid, the underside of which has the same positive locking element in the same zone as the underside of the associated box-type element.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated by way of example in the following figures:

FIG. 1 is a front view of a multi-purpose built-up shelving according to the invention, made up of two ad-

jacent vertical rows of superposed box-type elements, with lids placed on the uppermost box-type elements.

FIG. 2 is a perspective representation of an uppermost box-type element in FIG. 1, with lid.

FIGS. 3 to 5 are longitudinal sections through part of the box-type elements, showing the positive locking components which prevent them from being laterally displaced. FIG. 6 is a longitudinal section through part of a lid as shown in FIG. 2.

FIG. 7 is a detail of a box-type element with a recess to take a connecting piece.

FIGS. 8A and 8B are vertical part sections through box-type elements joined together by connecting pieces.

FIGS. 9A and 9B are perspective views of the connecting pieces shown in FIGS. 8A and 8B.

FIG. 10A is a one version of a slide-in element.

FIG. 10B is another version of a slide-in element.

FIG. 11 is a perspective view of a drawer.

FIG. 12 is a perspective view of a leaf of a door.

FIG. 13 is the front view of a door consisting of two leaves as shown in FIG. 12, fitted into a box-type element.

FIG. 14 shows a locking device fitted between door leaf and the bottom of a box-type element.

DETAILED DESCRIPTION

The shelving, of which the front view appears in FIG. 1, consists altogether of six box-type elements 1, arranged three one above the other, and two alongside one another. Each of these box-type elements is in the form of a hollow, right-angled polyhedron with rectangular, preferably square sides 2 and open both to the front and on top. When the box-type elements are fitted one on top of the other, the bottom 3 of each box-type element 1 simultaneously forms the lid of the box-type element below it; in this way, any deformation of a bottom 3 cannot leave a gap such as would be caused with two box-type elements located one on top of the other which are open only to the front. Each of the uppermost box-type elements 1 has a detachable lid 4.

FIG. 2 is a perspective view of a top box-type element 1 with raised lid 4.

The box-type elements 1 shown in FIGS. 1 and 2 have the further advantage of saving material and — if they are made of plastics — of being easier to remove from the mould (because of the deliberate omission of conicalness in the region of the bearing areas). At the same time, painting with automatic or hand-operated spray guns does not cause any reflections, which give rise to paint mist and thus to rough surfaces. Finally, the special shape of box-type elements of this kind permits the simultaneous transport of two box-type elements, while requiring for this a space which, in effect, is no greater than that needed for a single box-type element.

The box-type elements 1 arranged one above the other as shown in FIG. 1 can, for example be secured against lateral movement by fitting each box-type element 1, in accordance with FIG. 3, at the bottom in the region of the rear edge 5 and the two side edges 6, with the one component 9, and in corresponding regions at the top with the other component 10 of at least one pair of positive locking components. The positive locking components 9, 10 to be seen in FIG. 3 take the form of a groove and tongue joint, and extend along a part only

of the corresponding edge lengths. They could, however, extend over the entire edge lengths or, alternatively, there could be several pairs of locking components, e.g., pegs and holes, in each edge length. Especially simple pairs of positive locking components are illustrated in FIGS. 4 and 5.

The lid 4 of the uppermost box-type elements 1 in FIG. 1 has — as shown in FIG. 6 — on its underside the same positive locking component 9 in the same region as the associated box-type element (FIG. 3) on its underside.

To prevent sideways movement of the adjoining, vertically arranged rows of box-type elements 1 shown in FIG. 1, each box-type element 1 has — as shown in FIG. 7 — at at least two points, for example, on the upper side near the center of each side edge 8, a recess 11 to take a connecting piece 12a which positively holds together two laterally adjacent box-type elements, and which is shown in FIG. 8A in the installed position and in FIG. 9A in perspective. The recesses 11 and the connecting pieces 12a are, of course, not restricted to any particular shape, but can be adapted to the prevailing requirements; for example, if a connecting piece 12b, such as illustrated in FIG. 9B, is used between two laterally adjoining box-type elements 1, there will be a corresponding gap Z, as shown in FIG. 8B.

To enable the built-up shelving to meet all possible requirements, any desired number of the box-type elements 1 can be provided with a slide-in element 13a, as shown in FIG. 10A. By means of such slide-in element 13a, the interior of the box-type element 1 is divided into three adjoining smaller spaces; the size of such a smaller space can be so adjusted that, for example, there is room for two upright box files side by side. The slide-in element 13a can, of course, be replaced by another suitable one, for example by a slide-in element as shown in FIG. 10B, whereby the interior of the box-type element 1 is divided into twelve horizontal smaller spaces which can be used, e.g., for storing forms, typing paper, etc.

A suitably sized drawer 15, shown diagrammatically in FIG. 11, can be inserted into one or more of the subdivisions, making it possible to keep small articles, such as screws, nuts, paper clips, pencils, buttons, etc., tidily and safely.

To use the multi-purpose built-up shelving in the home as well, a box-type element or a number of such box-type elements can be covered to the front by an easily fitted door consisting of at least one leaf. This door should preferably be two-leaved, both leaves of the door being, for reasons of economy of manufacture, of identical shape. Such a door leaf 16, as shown in perspective in FIG. 12, can serve as either the left-hand or right-hand door leaf. It has, at the top and bottom, two vertical holes 17, into which hinge pins 18 can be inserted; the hinge pins 18, when inserted in this way to give a tight fit, are, as shown in FIG. 13, pivoted so that they can rotate in corresponding holes in the bottoms 3 of box-type elements 1 (or of the lids of the uppermost box-type elements) to form the hinges of the door leaves 16.

At at least one point between the door leaf 16 and the bottom 3 (or lid 4) of the box-type element, a catch 20 can be fitted which holds the door leaf 16 in the closed position; in its simplest form, this catch 20 can, as shown in FIG. 14, consist of a plug of highly resilient

material, such as rubber or plastics, which fits tightly into a vertical blind hole in the door leaf 16, is slightly rounded at its outer end and, when the door leaf 16 is in the closed position, provides a friction contact closure with the adjoining part, e.g., the bottom 3 of a box-type element 1, thus preventing unintentional opening of the door leaf 16. Any other type of closure in common use can, of course, also be used as the catch 20, e.g., a plastic latch, a magnetic catch, etc. A sliding door known per se can also be used instead of a single or double leaf door, in which case the left and right sliding sections can each be slid towards the center of the door opening, thus freeing half of this opening.

It is especially advantageous if the box-type element 1, the connecting pieces 12a and 12b, the lid 4, the slide-in elements 13a and 13b, the drawers 15 and the door leaves 16 are made of plastics. Preferably, the box-type elements 1, the lids 4 and the door leaves 16 in particular should be of formed plastics, as this ensures accurate dimensioning and at the same time a reduction to the minimum of the manufacturing costs for mass production; the fact that these components can be made in various colours or covered with self-adhesive sheeting means that the multi-purpose built-up shelving can also be used in the home, where, where a shelving unit or a double shelving unit (consisting of two units, back to back) can serve as a movable partition; by means of such a movable partition, the room can be rearranged at any time as required without much trouble. The brightly-coloured box-type elements are particularly suitable for children's rooms, and also for offices in which the various subjects are denoted by different colours. The multi-purpose built-up shelving is also equally suitable for storerooms and shop premises in which the available headrooms is utilized to the maximum by placing the box-type elements appropriately one on top of another up to or to within a short distance of the ceiling, especially in those cases where box-type elements or lower height are envisaged.

I claim:

1. In a shelving arrangement; at least one shelf unit having a horizontal bottom wall, a vertical rear wall upstanding from the rear edge of said bottom wall, a pair of vertical side walls upstanding from the side edges of said bottom wall, the upper edges of said side walls and back wall being disposed in the same horizontal plane and said walls being integrally interconnected along the contiguous edges thereof, first means on the upper edges of said side walls and rear wall for interfitting locking engagement with complementary shaped means on the bottom of an element which is the same size as the shelf unit when viewed from above and placed on top of the shelf unit, second means on the bottom of said bottom wall in vertical alignment with said first means and complementary in shape to said first means for interfitting locking engagement with complementary shaped means on the top of an element which is the same size as the shelf unit when viewed from above and on which said shelf unit is placed, and at least one upwardly opening recess formed in the upper edge of at least one of said side walls, and a connecting member receivable in said recess and having a pair of legs protruding upwardly above the top of the upper edge of said side wall, said legs adapted for interfitting locking engagement with the element placed on said shelf unit and with a like element placed on a sec-

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ond shelf unit which is disposed in side to side relation with the first mentioned shelf unit.

2. A shelf unit according to claim 1 in which said connecting member includes a third leg upstanding between said pair of legs and serving as a spacer between the elements placed on the shelf units.

3. A shelf unit according to claim 1 which includes a second shelf unit substantially identical with the first mentioned shelf unit and in side by side relation therewith, the recesses in the side walls of said shelf units being in registration and said connecting member extending from the inside surfaces of the side wall of one unit which is nearest the other unit to the inside of the adjacent side wall of the other unit.

4. A shelf unit according to claim 1 which includes an element the same size as the shelf unit when viewed from above and resting thereon and having means on the bottom in registration with and interengaged with

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said first means on the upper edges of said side walls and rear wall of said shelf unit, and holes in the bottom wall of said shelf unit near the ends thereof for receiving the lower hinge pins of doors, said element having holes therein in vertical registration with the holes in said bottom wall for receiving the upper hinge pins of the doors.

5. A shelf unit according to claim 4 which includes a pair of doors in the space between the side walls of said shelf unit and between the front edge of said bottom wall of said shelf unit and the said element on top of the shelf unit, and hinge pins protruding from the upper and lower edges of said doors and extending into the said holes in said bottom wall of said shelf unit and in said element for hingedly supporting said doors.

6. A shelf unit according to claim 1 in which said shelf unit is molded from foamed plastic.

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