

[54] SUPPORTING FRAME

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312/257 A, 257 SK, 257 R, 263-265, 138 R;
211/148; 248/165; 108/111, 153

[56] References Cited
UNITED STATES PATENTS

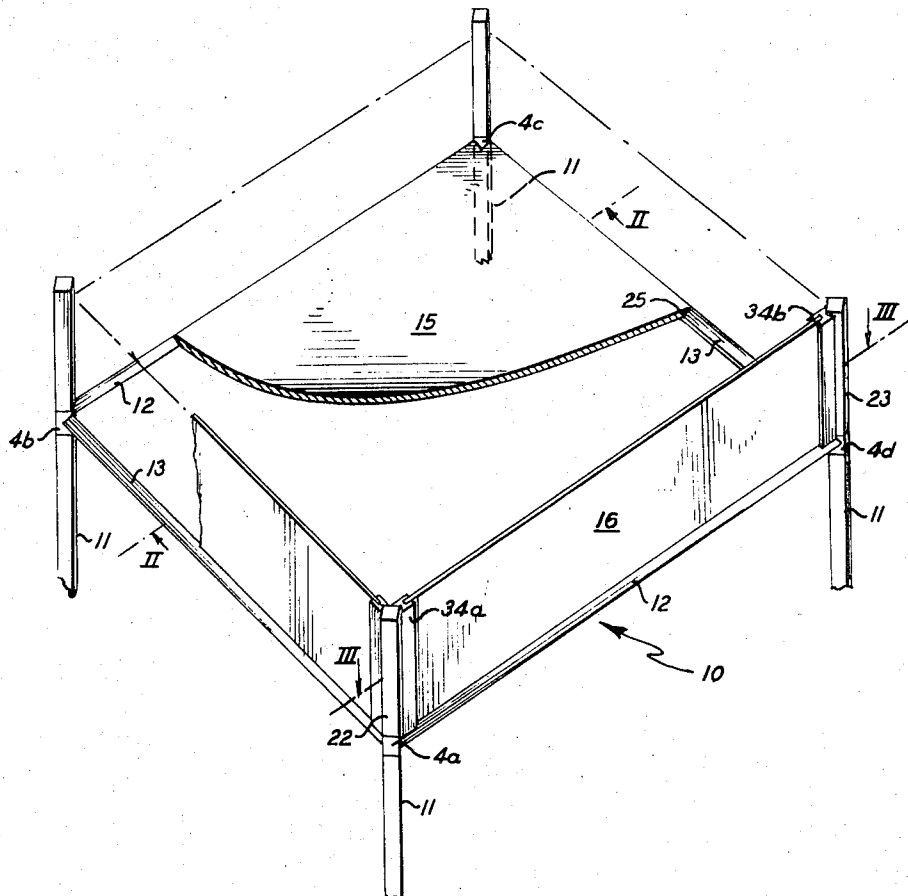
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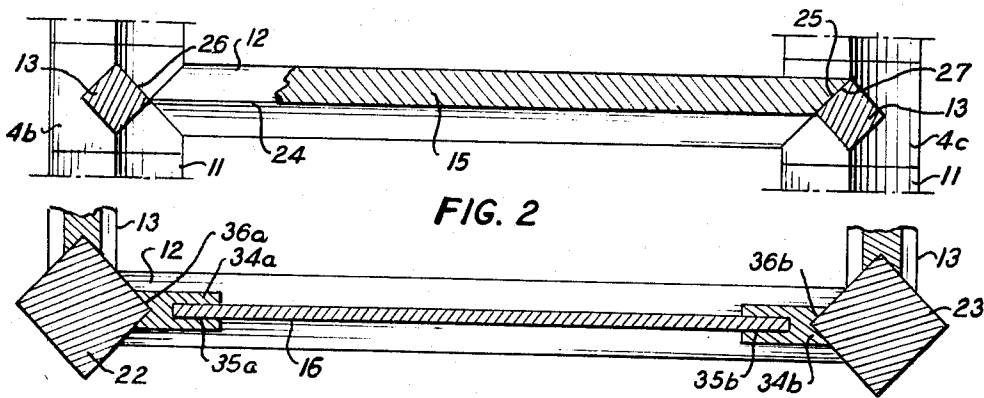
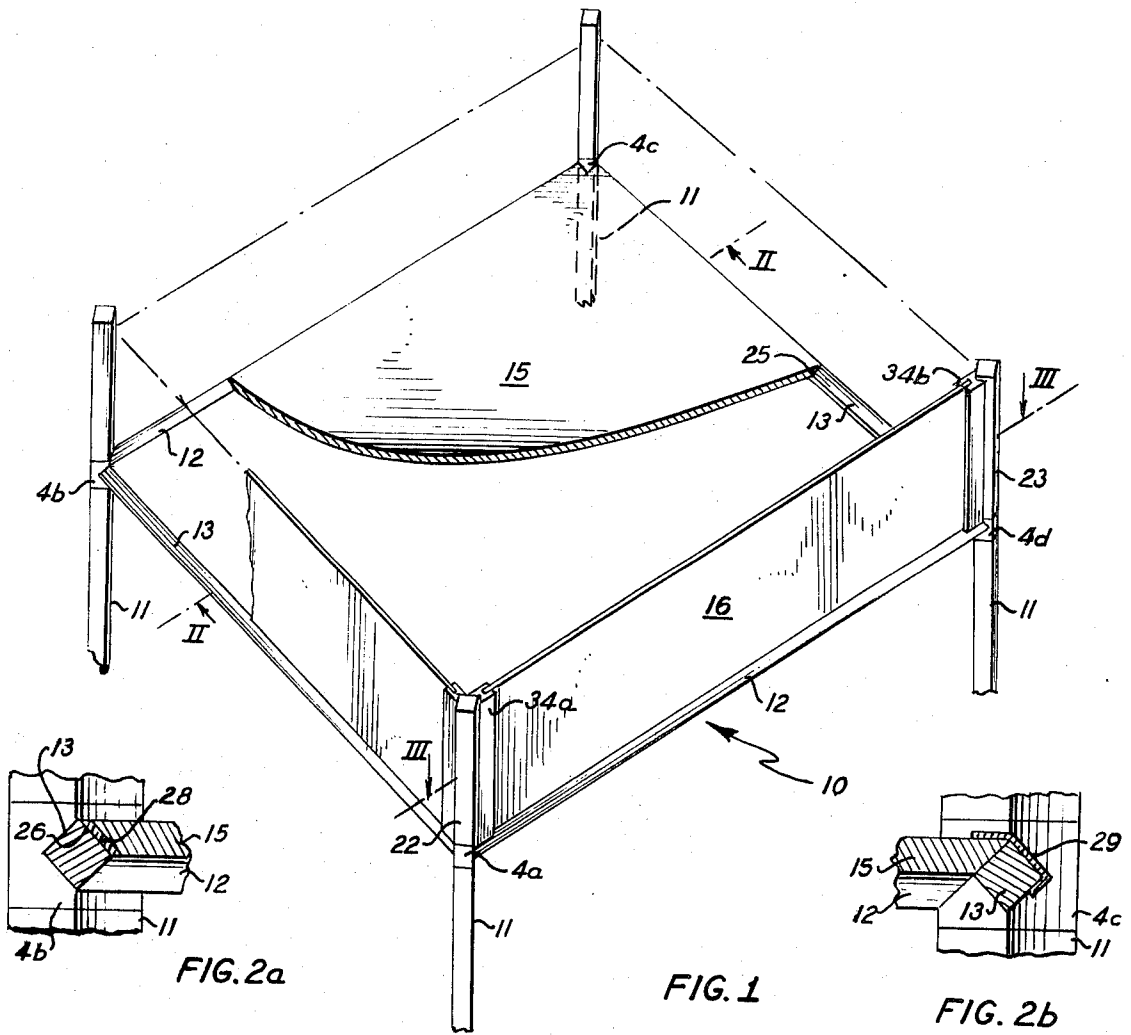
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[57] ABSTRACT

A supporting frame includes vertical support elements and transverse support elements with polygonal cross-sections. The elements and members have longitudinal edges disposed within the interior of the supporting frame to provide a supporting surface along at least a portion of the surfaces of said elements or members facing the interior of the frame. Enclosing wall elements include bearing surfaces which conform to the shape of the supporting surfaces so that the wall elements may be located in a predetermined position on the supporting frame. Positioning means may be provided to hold the enclosing wall elements against the supporting surfaces. Specific types of holding mechanisms are provided in various embodiments.

9 Claims, 7 Drawing Figures





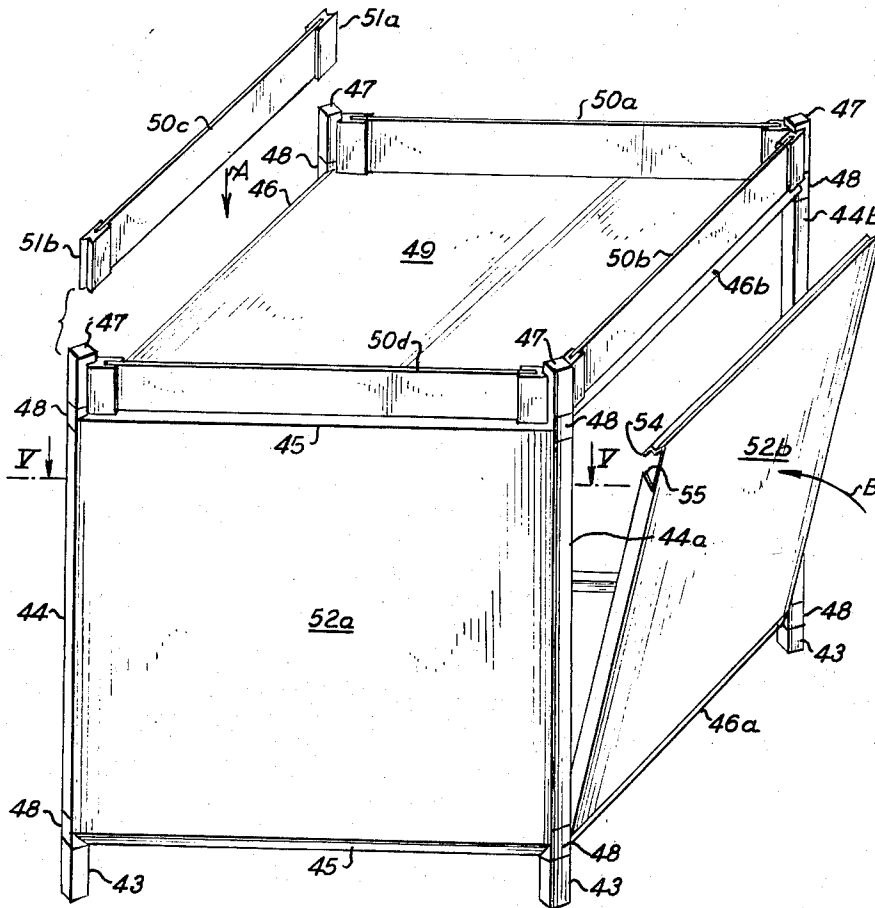


FIG. 4

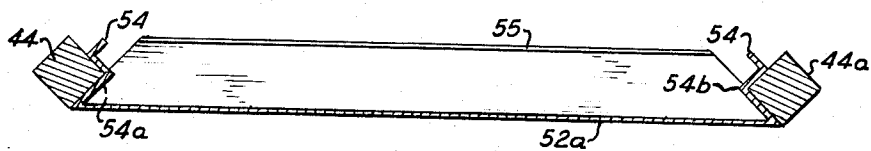


FIG. 5

SUPPORTING FRAME

BACKGROUND OF THE INVENTION

The present invention relates to a supporting frame having substantially vertical columns or elements and substantially horizontal, transverse members. Each of the vertical elements or transverse members comprise a continuous hollow or solid polygonal section having longitudinal edges situated inside the contour envelope of the frame thereby defining areas situated within the interior of the supporting frame.

Supporting frames having vertical columns or elements and horizontal, transverse members joined together by connecting elements to facilitate assembly and removal thereof are well known in the prior art. The vertical elements, transverse members and connecting elements are all stocked in standard sizes. Such prior art frames are advantageously used for display purposes or the like.

PURPOSE OF THE INVENTION

The primary object of this invention is to provide a suitable design and arrangement of the vertical and horizontal sections or elements so that the supporting frame may be adapted for more exacting applications such as found in shops.

SUMMARY OF THE INVENTION

The supporting frame as disclosed herein includes vertical elements and horizontal, transverse members having polygonal cross-sections wherein at least some of the polygonal faces of the section portions are directed toward the interior of the frame. The polygon faces form supporting surfaces for wall elements which may be attached to the supporting frame. The wall elements are adapted to be anchored to the supporting surfaces through the use of a particular anchoring mechanism.

In a specific embodiment of a supporting frame made in accordance with this invention, the frame elements have triangular or rectangular cross-sections. The inwardly directed section edge is advantageously placed along the axis of symmetry with respect to the lateral projection. With this relationship, at least one of the adjacent section faces forms a supporting surface. If the wall element is a flat panel, the edge of the panel is inclined at substantially the same angle as the associated supporting surface on at least two mutually opposed sides of the panel.

Another feature of the invention is directed to the construction of the wall element itself which may have at least some of its peripheral edge provided with a retaining element which connects the bearing surface of the wall element to the supporting surface or to a retaining surface associated with the latter supporting surface. A retaining element may be a removable adhesive. The retaining element may also comprise at least one insert which is connected to at least part of a section portion and to the wall element which is to be retained. If a resilient wall element mounting is desired, the wall element may be advantageously retained within at least one resilient insert or guide member.

BRIEF DESCRIPTION OF DRAWINGS

Other objects of this invention will appear in the following description and appended claims, reference being made to the accompanying drawings forming a

part of the specification wherein like reference characters designate corresponding parts in the several views.

FIG. 1 is a fragmentary perspective view of a supporting frame made in accordance with this invention in which the top part of the frame forms an upwardly open compartment,

FIG. 2 is a sectional view taken along line II—II of FIG. 1,

FIG. 2a is a fragmentary sectional view showing a modification of the frame shown in FIG. 2,

FIG. 2b is a fragmentary sectional view of another modification of the frame shown in FIG. 2,

FIG. 3 is a sectional view taken along line III—III of FIG. 1,

FIG. 4 is a perspective view of a complete supporting frame made in accordance with this invention and shown in a partially exploded manner, and

FIG. 5 is a sectional view taken along line V—V of FIG. 4.

DESCRIPTION OF SPECIFIC EMBODIMENTS

More specifically, reference being made to FIG. 1, a supporting frame, generally designated 10, is shown having the top portion thereof forming an upwardly open compartment. The supporting frame 10 includes columns or vertical elements 11, longitudinal transverse cross member 12 and 13 and connecting elements 4a, 4b, 4c and 4d. The vertical elements 11 and transverse members 12 and 13 constitute sections having the same cross-sectional shape and dimensions in this particular embodiment. Other polygonal cross-sections such as triangular or hexagonal cross-sections may, of course, be substituted for the square cross-sections of this particular embodiment. It is only necessary that the cross-sections be suitable for making esthetically acceptable and efficient connecting elements 4a through 4d.

The square sections are shown as being solid in the present embodiment. Alternatively, tubular sections may be advantageously used in the construction of the supporting frame 10 primarily for the purpose of saving weight. The section edges and particularly those section faces which form bearing surfaces for wall elements are so directed in the frame 10 that they can receive the wall elements in an as-it-were seamless manner. This function is described more fully hereinbelow.

Referring to FIG. 2, the longitudinal or transverse members 13 are on opposed sides of the frame 10. Transverse members 13 have square cross-sections including two mutually opposite supporting surfaces 26 and 27. The panel 15 is composed of glass or other material and lies parallel to a straight line 24 which connects the horizontal diagonals of the sections in the transverse members 13. Straight line 24 is in a plane defined also by the other two sections 12 disposed along the two other opposing sides of the supporting frame 10. Panel 15 includes bearing surfaces 25 on at least two mutually opposite ends thereof. Bearing surfaces 25 are contiguous to and have an inclination substantially identical to the inclination of the adjacent supporting surfaces 26 and 27 on the transverse members 13.

If the panel 15 is square or rectangular, the edges disposed along the two other opposing sides of the panel 15 are perpendicular to the bearing surfaces 25. These edges may include bearing surfaces contiguous to the transverse members 12 which are located on opposite

sides of the frame 10. The bearing surfaces of these other edges may be the same as the surfaces 25 which are contiguous to the transverse members 13. Alternatively, these other edges of the panel 15 may be formed by walls that are perpendicular to the plane of the panel 15. In this case, the distance between the walls must be adapted to the internal width of the frame area concerned.

Usually the panel 15 is centered and held between the transverse members 13 by gravity. If the panel is to withstand large chance or unexpected forces exerted unilaterally or from below, the mutually opposite bearing surfaces 25 and inclined surfaces 26 and 27 may be secured to one another by interposing an adhesive or friction increasing insert 28 as shown in FIG. 2a.

Another means for securing the panel 15 to the bearing elements 13 comprises a plurality of clips 29 adapted to the external shape of the bearing elements as shown in FIG. 2b. Clips 29 engage around both an upper and a lower edge of the section or transverse members 13 and extend beyond the edge of the panel 15 along the top thereof. Wall enclosing elements having the structural configuration of panels 15 are generally used as horizontal partitions or roofs in supporting frames made in accordance with this invention. The panel 15 is placed on the transverse members 12 and 13 as shown in the sectional view of FIG. 2.

The mounting of an enclosing wall element 16 is shown mounted between two vertical sections 22 and 23. The wall element 16 is disposed substantially parallel to a straight line connecting the diagonals in the cross-sections of elements 22 and 23. Guide members 34a and 34b retain the wall element 16 between the sections 22 and 23 by overlapping lengthways with at least part of the respective width of the element 16. The element 16 is disposed in grooves 35a and 35b formed in each respective guide 34a and 34b. The guides 34a and 34b are held between the sections 22 and 23 within V-shaped recesses 36a and 36b which conform to the shape of the anchoring portions of the vertical sections 22 and 23. The conforming shapes facilitate application of the guides 34a and 34b.

Where it is desired to have transparent wall elements 16, they are formed of glass panels which are cut to standard sizes and fitted into the grooves 35a and 35b. The guides 34a and 34b or similar inserts may be made from relatively rigid material such as rigid plastic material which will provide a relatively rigid mounting for the wall element 16. Alternatively, the guide members 24a and 24b may be made from flexible materials to form a suitably flexible mounting as desired.

A supporting frame 20 shown in FIG. 4 has at least a partially closed bottom portion. Supporting frame 20 comprises foot or base members 43, column or vertical sections 44, transverse, longitudinal members 46, 46a and 46b and top sections or pieces 47. All of the elements in the frame 20 are fitted together by connecting elements 48 and form the basic supporting structure on which the wall enclosing elements 49, 50a, 50b, 50c, 50d, 52a and 52b may be placed. The bearing panel 49 and the compartment edgings 50a and 50b constitute wall elements which are shown in place. Compartment edging 50c and its connecting elements 51a and 51b are shown in a position immediately before they are inserted between the associated top pieces 47 by movement in the direction indicated by the arrow A.

A wall panel 52a is shown in position on the nearer side of the supporting frame 20. Another wall panel 52b is shown in a position immediately before being pressed onto the right hand side of the supporting frame 20. The lower long side 54 of panel 52b is placed in a locking position on the appropriate longitudinal member 46a. The panel 52b is then moved as indicated by the arrow B to anchor it to the upper longitudinal member 46b. It is possible that the panel 52b could be turned 90° and the locking members 54 be anchored to the columns 44a and 44b. This is the position of the panel member 52a as shown in FIG. 5 wherein the locking or spring sections 54 are engaged with the vertical elements 44 and 44a.

The wall element 52a may be composed of material such as sheet metal or plastic material and include resilient clamping flaps or flanges 54 along its periphery. As shown in FIG. 5, the clamping flanges are shown on mutually opposite sides of the periphery of the wall element 52a and engage the vertical elements 44 and 44a. The bearing portions of the wall element 52a are inclined and perform in fundamentally the same manner as those of the panel 15 as shown in FIG. 2. The upright flange or edge 55 as shown in FIG. 5 is substantially as long as the diagonal surface or face of the section 45. The upright flange 55 serves chiefly to reinforce the wall element 52a and may be shaped as desired for this purpose.

To place the panel 52a on the frame 20, the bulge portion 54a is placed on upright element 44 and the wall panel 52a is moved inwardly and fixed in place by pressing the mutually opposed edge including bulge portion 52b in place onto the upright member 44a. In this way, the upper clamping flaps or flanges 54 snap over the inner edge of the longitudinal members 44 and 44a. The adherence of the wall panels 52a or 52b may be improved by providing clamping flaps or flanges 54 along the entire periphery of the surface defining said wall panels.

While the supporting frame has been shown and described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of the invention, without departing from the spirit thereof.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In a supporting frame having vertical support elements and transverse support members with polygonal cross-sections, the combination comprising:

- a. said elements and members having longitudinal edges disposed within the interior of the supporting frame to provide a supporting surface along at least a portion of the surfaces of said elements or members facing the interior of the frame,
- b. enclosing wall elements having bearing surfaces to conform to the shape of the supporting surfaces so that the wall elements may be located in a predetermined disposition on the supporting frame.

2. A supporting frame as defined in claim 1 wherein positioning means are provided to hold the enclosing wall elements against the supporting surfaces.

3. A supporting frame as defined in claim 2 wherein said positioning means includes at least one clamping element to hold a wall enclosing element against a supporting surface,

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said clamping element is formed as a part of the wall enclosing element,
said clamping element being resiliently disposed along the edge of the wall enclosing element to removably engage either a vertical support element or a transverse support member. 5

4. A supporting frame as defined in claim 3 wherein at least one of the enclosing wall elements includes at least one clamping element disposed along two opposing edges of the wall element so that the wall element may be engaged with the supporting surfaces of the said vertical or transverse support members. 10

5. A supporting frame as defined in claim 1 wherein said polygonally shaped elements and members have at least three sides with the axis of symmetry of the profile thereof passing through a profile edge directed toward the interior of the frame so that at least one of the profile surfaces abutting against said profile edge serves as a supporting surface for 20

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an enclosing wall element.

6. A supporting frame as defined in claim 1 wherein supporting surfaces are disposed on at least two opposite sides of the frame material to abut against an enclosing wall element,
each enclosing wall abutting surface being inclined at substantially the same angle as the supporting surface against which it abuts.

7. A supporting frame as defined in claim 1 wherein said positioning means includes a holding means that connects the supporting surface with the abutting surface of the enclosing wall element.

8. A supporting frame as defined in claim 7 wherein said holding means is a removable adhesive agent.

9. A supporting frame as defined in claim 7 wherein said holding means includes at least one clamping element to removably hold a wall enclosing element against a supporting surface.

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