

[54] FRAME CONSTRUCTION

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[58] Field of Search.....**211/148, 182, 183, 176; 287/54 C, 54 A, 189.36 R, 189.36 H, 189.35, 54 B; 248/250, 239, 243; 108/110, 107; 46/29; 52/656**

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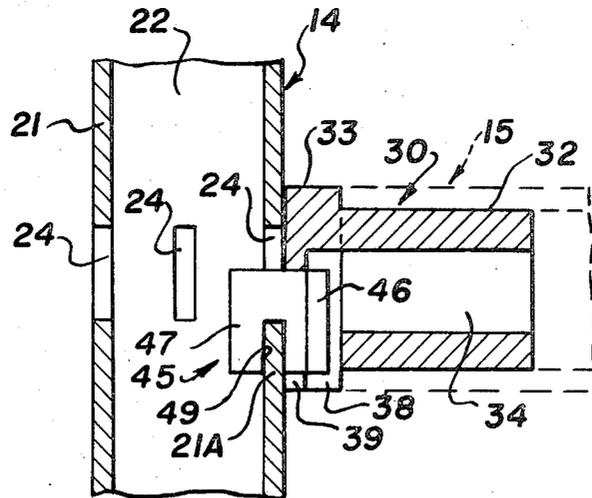
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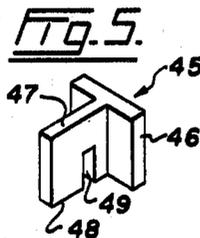
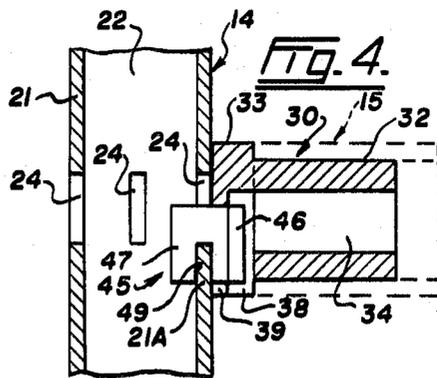
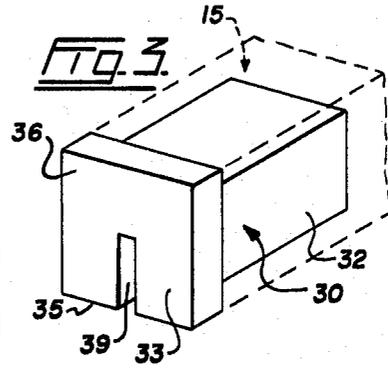
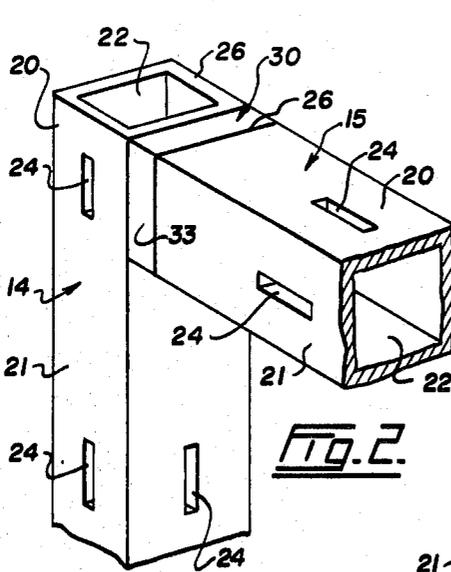
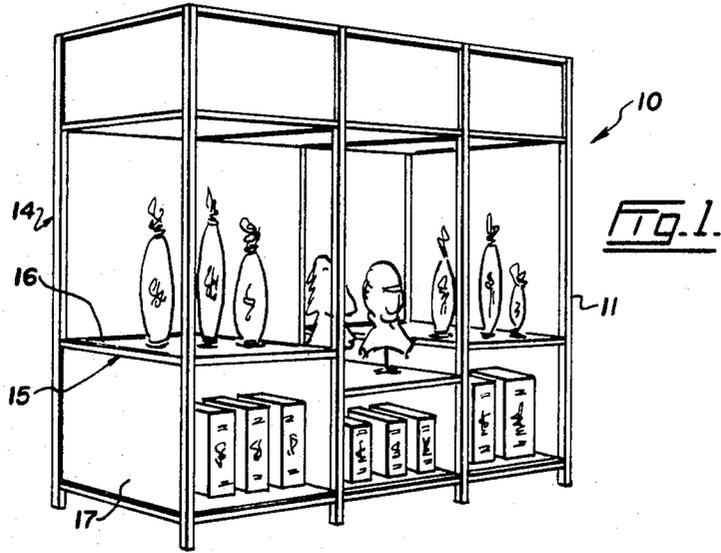
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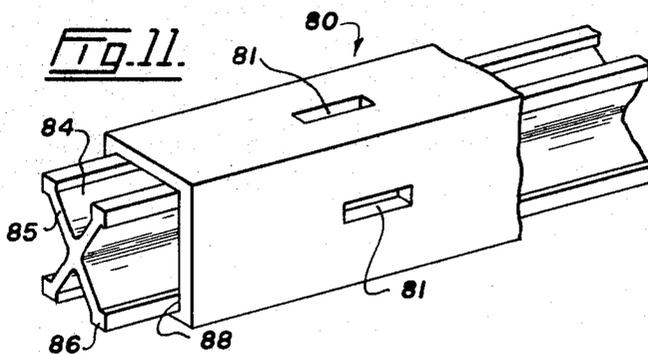
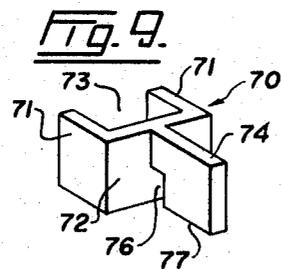
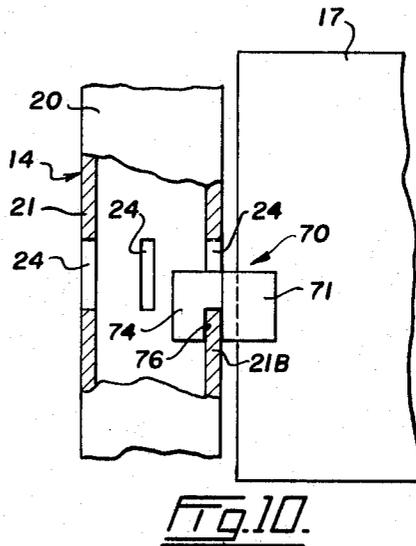
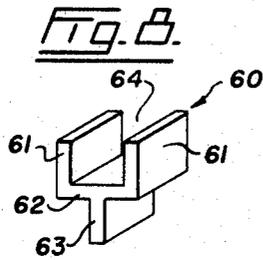
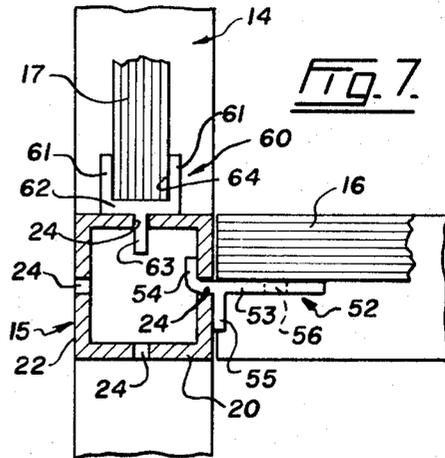
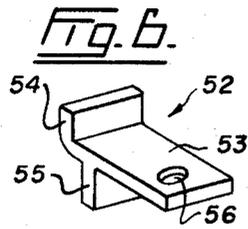
[57] **ABSTRACT**

Construction providing a frame for a display stand or the like and utilizing frame members formed of square plastic tubing having slotted side walls. A connector clip attachable to an upright frame member cooperates with a slotted plug enterable into an end of a horizontal frame member to provide means for joining one member to another. The construction includes hanger clips for shelves carried by the frame and support clips for vertically disposed side wall panels enclosing parts of the frame with both of these clips being received in side wall slots of the frame members. The frame construction includes reinforcing rods which can be inserted into the plastic frame members to strengthen them where required.

9 Claims, 11 Drawing Figures







FRAME CONSTRUCTION

My invention relates to a type of frame construction which is particularly intended for use in erecting merchandising stands, shelving and the like.

There are a number of products presently available which are intended to be erected in show rooms and elsewhere by interconnecting a variety of prefabricated parts but known products of this type are sometimes found difficult to assemble, particularly by unskilled store personnel, and the stands which can be erected using such prefabricated parts usually are limited to a few designs which are not always suitable for every installation. Very often the parts are quite costly to produce and no appreciable saving is realized by a merchant who might have ordered the display stand in knock-down form with the object in mind of reducing his operating expenses.

I have overcome the above as well as other disadvantages of conventional frame construction by providing one with a minimum number of parts all of which are relatively inexpensive to produce. The simplicity of assembly of these parts makes it possible for almost anyone to erect a frame of a preselected design by following a simple set of instructions. A frame is produced by the assembly of these parts which is rigid and strong enough to carry any normal load in complete safety. Frame members which form long spans can be strengthened and made rigid by means of telescoping reinforcing rods which are hidden from view on the finished frame so as not to distract from its appearance. The multi-purpose frame can be reassembled later as another design without major or total dismantling and a slightly modified single-purpose frame can be erected as substantially permanent structures such as store fixtures and furniture units.

In drawings which illustrate preferred embodiments of the invention,

FIG. 1 is a perspective view of a display stand erected using frame construction in accordance with the present invention,

FIG. 2 is a perspective view showing interconnected members of the frame,

FIG. 3 is a perspective view of an end plug forming part of the present construction,

FIG. 4 is a longitudinal section showing the end plug in position of use,

FIG. 5 is a perspective view of a connector clip used in this construction,

FIG. 6 is a perspective view of a hanger clip for shelves supported by the display stand frame,

FIG. 7 is a section showing the hanger clips in position of use,

FIG. 8 is a perspective view showing a support clip for a side panel of the display stand,

FIG. 9 is a perspective view of a modified support clip,

FIG. 10 is an elevational view, part in section, showing the modified support clip in position of use, and

FIG. 11 is a perspective view showing a plastic frame member fitted with a reinforcing rod.

Referring to the drawings, the numeral 10 in FIG. 1 indicates one of the many frames which can be constructed by means of the present invention. This typical frame 10 is for a stand 11 intended to display merchandise and, for this purpose, it is formed of vertical and

horizontal members 14 and 15. Shelves 16 and side panels 17 are supported by some of these frame members to finish off the display stand 11.

The members 14 and 15 are both formed of suitable lengths of square tubing 20, see particularly FIG. 2. In this particular embodiment of the invention, the material used for the tubing 20 is extruded plastic, preferably polyvinyl chloride (PVC), with the tubing having plane side walls 21 which define a through bore 22. The frame 11 can be assembled in a variety of shapes and sizes and, for such multi-purpose use, each side wall 21 is provided with a plurality of uniformly spaced slots 24 which are located along the center of the wall. The aligned slots 24 are rectangular with their major dimensions extending longitudinally of the tubing and, of course, the slots communicate with the bore 22. The members 14 and 15 have open ends 26 which are cut so that they are disposed exactly at right angles to the longitudinal axis of the member.

As shown best in FIG. 2, the ends 26 of the horizontal members 15 are connected to the side walls 21 of the vertical or upright members 14 and, to effect this connection, the present construction includes plugs 30 which are adapted to be fitted to the opposite ends of said horizontal members. FIGS. 3 and 4 show that each end plug 30 has a body 32 and a flange 33. The outer dimensions of the oblong body 32 are such as to closely fit the bore 22 and the outer end flange 33 is of the same square shape as the end 26 of the tubular member. Thus, the plug 30 is forced into the bore 22 and is bonded therein by means of a suitable adhesive. The flange 33 of the plug abuts the end 26 of the member. The body 32 desirably has a recess 34 as shown in FIG. 4. This recess 34 serves to reduce the weight of the plug but, more particularly, it makes the body slightly compressible so that the desired force fit can be achieved quite readily. Flange 33 has a bottom edge 35 and an outer face 36. Extending upwardly into the bottom edge 35 of the flange, is a transverse slot 38 and an outer face slot 39 which are connected to one another, the former slot extending into the recess 34 and the latter slot being open to the flange face 36.

The plug 32 is designed to form a joint with a connector clip 45, see particularly FIG. 5. This clip 45 has rectangular flanges 46 and 47 which are disposed at right angles to one another to define a T. Flange 47 has a bottom edge 48 which is provided with an upwardly extending slot 49 spaced from and extending parallel to the flange 46.

The several parts thus far described are adapted to be connected together as shown in FIG. 4. After the plug 32 is inserted and bonded in the end of the horizontal member 15, the flange 47 of the T-shaped connector clip is entered into a side wall slot 24 until the slot 49 of said connected clip is vertically aligned with the side wall 21. The clip 45 is then pressed downwardly so that portion 21A (FIG. 4) enters the slot 49 and is frictionally held therein. This supports the clip 45 so that the flange 46 is disposed spaced from and parallel to the wall 21 whereupon said flange can be entered into the slot 38 of the plug with the flange 39 projecting outwardly through the slot 39. Thus, the plug 30 and the clip 45 are capable of forming a joint which locks the two members together in a manner which provides a particularly firm or slack-free connec-

tion for the frame members. The same simplified joint is made over and over again by interlocking other plugs 30 and clips 45 until a strong and rigid frame 10 is constructed of the required size and shape. The members 14 and 15 can only be separated by applying a fairly strong upward force on the end of the horizontal member 15 and, since this is unlikely to be done while the display stand 11 is in use, there is almost no danger of accidental separation of the frame parts.

The present frame construction includes hanger clips which are generally indicated by the numeral 52. As shown in FIGS. 6 and 7, each clip 52 comprises a bearer 53 having integrally formed braces 54 and 55 at one end thereof. Brace 54 extends vertically upwards to define with the bearer 53, an L-shaped configuration. The downwardly extending brace 55 is disposed parallel to the brace 54 and spaced therefrom a distance equal to the thickness of the walls 21. A screw hole 56 is provided in the bearer 53.

In FIG. 7 it will be seen that each clip 52 is attached to a wall 21 of the horizontal member by entering the brace 54 through a slot 24 and then rotating the clip clockwise until the opposite faces of said walls are clamped by the braces 54 and 55. This supports the bearer 53 in a horizontal position extending away from the frame member 15 while being firmly held against downward movement. A rectangular shelf 16, which is precut to fill the space between the horizontal members 15, is then placed on the bearers 53 and is adequately supported to carry merchandise as shown in FIG. 1, for example. If the display stand 11 is intended to be a more or less permanent structure, a screw (not shown) is used passed through the shelf 16 and hole 56.

Included in the present construction are support clips generally indicated at 60 and shown in FIGS. 7 and 8. Each clip 60 is substantially Y-shaped, that is, it has transversely spaced arms 61 connected by a base web 62 on which an oppositely directed and centrally disposed arm 63 is integrally formed. The arms 61 define a channel 64 of a width only slightly wider than the thickness of the vertical panels 17.

Referring again to FIG. 7, a support clip 60 is shown resting on the top of a horizontal member 15 with the center arm 63 entered into a slot 24. Other such Y-shaped clips 60 are suitably spaced apart along the member 15 so that the channels 64 provide a cradle for the lower edge of a panel 17. Still other clips 60 (not shown) are used on the underside of the member 15 spaced vertically above the first mentioned horizontal member to support the top edge of the same panel.

FIG. 9 shows another clip 70 which is a slightly modified version of the previously described clip 60 and which is used to secure side edges of the panel 17 to the upright members 14 as shown in FIG. 10. This modified support clip 70 has arms 71 and a web 72 defining a channel 73 as well as an arm 74. A slot 76 is formed in bottom edge 77 in the arm 74 alongside the web 72.

The center arm 74 of each support clip 70 is entered into a slot 24 of an upright frame member 14 so that the V-shaped clip hangs on the wall 21 as shown in FIG. 10 with a side wall portion 21B lodged in the slot 76. Arm 71 then extends forwardly to embrace the side edges of a panel 17. A panel held in this manner by the clip 70 as well as the clip 60 is adequately supported against displacement on the frame 10.

Referring now to FIG. 11, the numeral 80 indicates generally one of the modified frame members which may be a vertical or horizontal member and which has the same arrangement of slots 81 and is otherwise constructed in the same manner as the previously described frame members. The plastic material used for the members 80 is quite strong enough to carry most loads likely to be placed on the frame 10. However, sometimes a horizontal member 15 which forms a particularly long span may be required to carry a heavy load in which case the present construction includes metal reinforcing rods 84. As shown in FIG. 11, the rods 84 are X-shaped in cross-section so as to have radially disposed legs 85. The outer ends of the legs 85 are enlarged and squared-off to provide the rods 84 with right angular corner edges 86. These edges 86 are spaced apart to tightly fit the inner corners 88 of the members 80. Such metal reinforcing rods 84 are inserted into the members 80 wherever they are deemed necessary and when so inserted they provide the plastic tubing 20 with the required strength and rigidity to carry any heavy load.

As previously mentioned, the above described frame construction will provide display stands and the like of a wide variety of sizes and shapes or designs. These multipurpose frames can be altered quite readily after assembly so as to serve a particular function which may differ considerably from the function for which it was intended originally. The invention also contemplates the use of a single-purpose frame constructed substantially in the same manner as before except that most of the slots 24 are eliminated while only those of said slots which are actually required are punched in the side walls of the plastic tubing. Store fixtures, articles of furniture such as cabinets et. made of the slightly modified tubing as well as the other previously mentioned fittings are displayed in a catalogue for selection by a purchaser who orders a design of his choice which is shipped to him in knock-down form. Such a fixture or the like is assembled as before but, since it is intended as a permanent installation, it can be assembled using a suitable adhesive. For example, the outer faces 36 may be bonded to the side walls 21 to ensure a more positive interlocking action therebetween. The clips 60 and 70, or simply plastic channels in which the side panels can be supported may be secured to the frame members using adhesive tape, for example, which is glued on both sides.

From the foregoing, it will be apparent I have provided a form of frame construction which is extremely economical and exceptionally versatile. In other words, it is easily adaptable to any design, dimension and function likely to be required for an industrial, commercial, institutional or domestic installation. The system of erecting the frame 10 lends itself to quick and easy assembly without the need for special tools and skilled workmen and it can readily be dismantled for storage or reassembly at another site. My system of assembling the frame construction permits changes to be made in the design of an erected structure and this is due mainly to the fact that the vertical frame members are one-piece uprights rather than being made up of connected sections as is so often the case. The simple interlocking fittings which connect the horizontal frame members to the vertical frame members can be separated if a design change is necessary and there are no other connector

parts between the members which need be broken as in other systems.

To finish off any structure constructed in accordance with the present invention, the open ends 26 of the vertical members 14 may be closed using end caps and feet, not shown, these end closures being wedged or otherwise secured in position.

I claim:

1. Frame construction comprising horizontal and vertical frame members each having a bore and side walls in which slots are formed, a connector clip having a first flange and a second flange extending across an end of said first flange, said first flange being received in a side wall slot of a vertical frame member and having a bottom edge slot entered by a portion of said side wall whereby the second flange is supported in spaced and parallel relation to said side wall, a plug secured within an end of a horizontal frame member, said plug having an outer edge flange provided with a bottom edge and an outer face, said outer end flange having an outer face slot and a connecting transverse slot both open at the bottom edge of said outer flange, said second flange of the connector clip being lodged in the transverse slot of the plug with the first flange extending outwardly through the outer face slot whereby the horizontal frame member is removably secured to the vertical frame member against downward and horizontal displacement.

2. Frame construction as claimed in claim 1, and including a hanger clip adapted to be attached to a horizontal frame member to support a shelf, said hanger clip comprising a horizontal bearer having upwardly and downwardly extending braces spaced apart at one end thereof, said hanger clip entering a side wall slot whereby the braces engage opposite faces of that side wall and the horizontal bearer is disposed at right angles thereto and in a shelf-supporting position.

3. Frame construction as claimed in claim 1, and including a support clip adapted to be attached to a frame member to support a vertical panel, said support clip comprising transversely spaced arms and an oppositely directed arm, the last mentioned arm entering a side wall slot of the frame member and said transversely spaced arms embracing opposite faces of the vertical panel along an edge thereof.

4. Frame construction as claimed in claim 2, and including a support clip adapted to be attached to a vertical frame member to support a vertical panel, said support clip comprising transversely spaced arms and an oppositely directed arm enterable into a side wall slot of a vertical frame member, said oppositely directed arm having a bottom edge slot entered by a portion of a side wall to attach the support clip thereto with the transversely spaced arms embracing opposite side faces of the vertical panel along an edge thereof.

5. Frame construction as claimed in claim 1, in which said frame members are formed of plastic, and including a metal reinforcing rod insertable into a selected

frame member.

6. Frame construction as claimed in claim 5, in which said metal reinforcing rod is X-shaped in cross-section and has corner edges shaped to conform to the inner corners of the frame members.

7. Frame construction as claimed in claim 4, in which said frame members are formed of plastic, and including a metal reinforcing rod insertable into a selected frame member.

8. Frame construction as claimed in claim 7, in which said metal reinforcing rods is X-shaped in cross-section and has corner edges shaped to conform to the inner corners of the frame members.

9. Frame construction comprising horizontal and vertical frame members each having a bore and side walls in which spaced and longitudinally extending slots are formed, a connector clip having a first flange and a second flange extending across an end of said first flange, said first flange being received in a side wall slot of a vertical frame member and having a bottom edge slot entered by a portion of said side wall whereby the second flange is supported in spaced and parallel relation to said side wall, a plug secured within an end of a horizontal frame member, said plug having an outer edge flange provided with a bottom edge and an outer face, said outer end flange having an outer face slot and a connecting transverse slot both open at the bottom edge of said outer flange, said second flange of the connector clip being lodged in the transverse slot of the plug with the first flange extending outwardly through the outer face slot whereby the horizontal frame member is removably secured to the vertical frame member against downward and horizontal displacement, a first hanger clip adapted to be attached to a horizontal frame member to support a shelf, said hanger clip comprising a horizontal bearer having upwardly and downwardly extending braces spaced apart at one end thereof, said hanger clip entering a side wall slot whereby the braces engage opposite faces of that side wall and the horizontal bearer is disposed at right angles thereto and in shelf-supporting position, a first support clip adapted to be attached to a frame member to support a vertical panel, said first support clip comprising transversely spaced arms and an oppositely directed arm, the last mentioned arm entering a side wall slot of the frame member and said transversely spaced arms embracing opposite faces of the vertical panel along an edge thereof, and a second support clip adapted to be attached to a vertical frame member to support the vertical panel, said second support clip comprising transversely spaced arms and an oppositely directed arm enterable into a side wall slot of a vertical frame member, said oppositely directed arm having a bottom edge slot entered by a portion of a side wall to attach the support clip thereto with the transversely spaced arms embracing opposite side faces of the vertical panel along an edge thereof.

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