

[54] **THICKNESS-ADJUSTABLE JOINT ASSEMBLY FOR BUILDING USE**[76] Inventor: **Tsukasa Yoshida**, Nikko Danchi 15-202, 1-3 Nikkoch, Fuchushi, Tokyo, Japan[22] Filed: **Feb. 5, 1971**[21] Appl. No.: **113,019**[52] U.S. Cl. **287/189.36 D, 287/20.92 G, 52/285**[51] Int. Cl. **F16b 5/06**

[58] Field of Search. 287/189.36 R, 189.36 C, 189.36 D, 287/20.92 D, 20.92 C, 20.92 R, 20.92 E, 20.92 G, 20.924; 52/285, 286, 284, 489, 509, 582, 584

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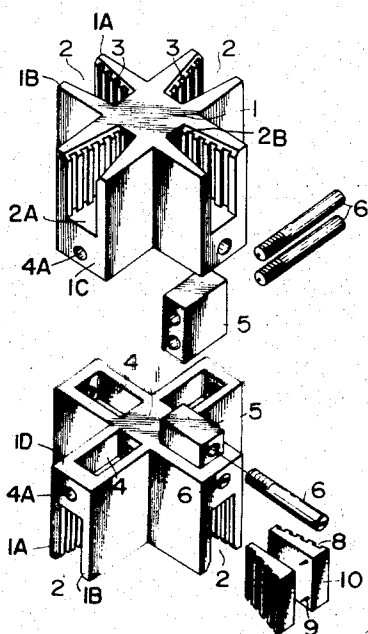
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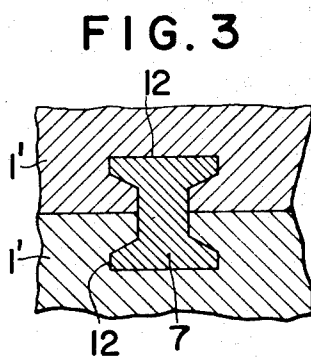
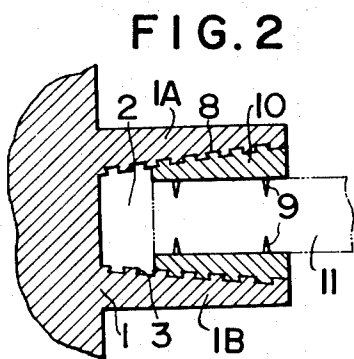
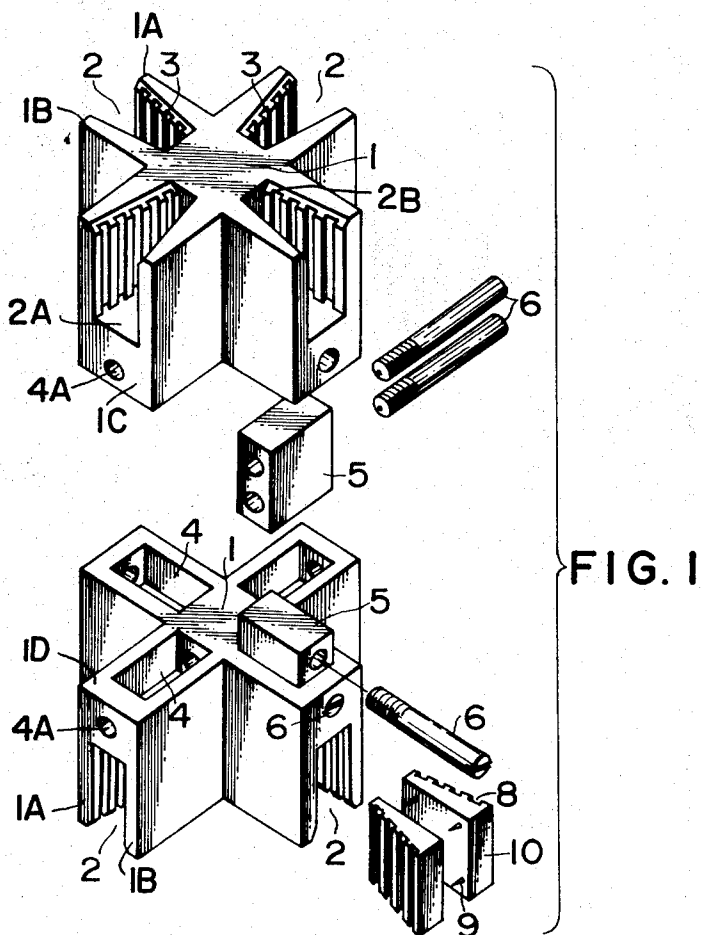
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Primary Examiner—David J. Williamowsky*Assistant Examiner*—Wayne L. Shedd*Attorney*—Wenderoth, Lind & Ponack[57] **ABSTRACT**

A joint assembly for the fabrication of building units, furniture display cases and the like, including basically at least two main joint bodies having a plurality of panel receiving grooves, each formed in a different direction, and a plurality of coupling grooves for combining the two main joint bodies. The coupling grooves are provided on the bottom of the joint main bodies and coupling pins are used to couple at least two such bodies with each other. The panel receiving grooves are each provided with two opposite side walls formed to have at least the forward and upper sides opened. The inner side faces of the respective side walls are inclined and provided with a plurality of dovetail grooves. A pair of wedges are associated with each panel receiving groove. Each wedge has two sides faces, one of which acts to fit on a panel end portion, and the other of which is provided with dovetail protrusions. The use of these wedges allows panels of uniform or different thicknesses to be combined. By this construction, the present joint assembly offers easy connection of panels without the need of any other supporting elements.

5 Claims, 13 Drawing Figures



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FIG. 4a

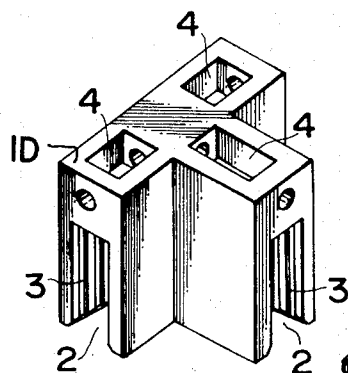
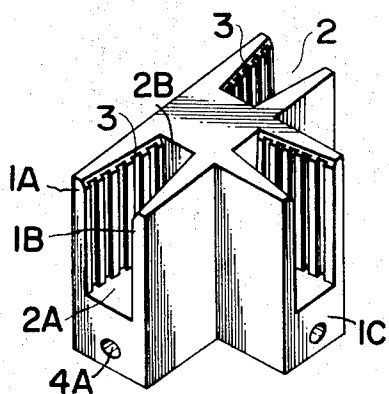


FIG. 4b

FIG. 5a

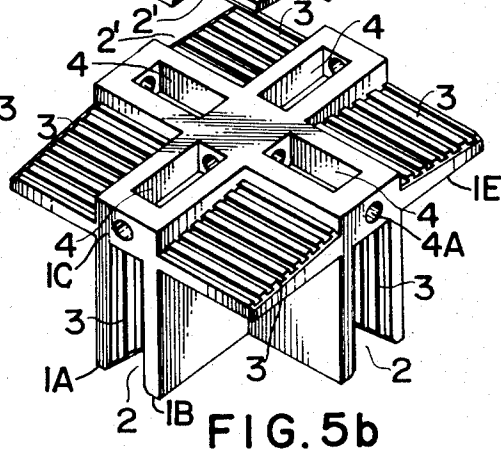
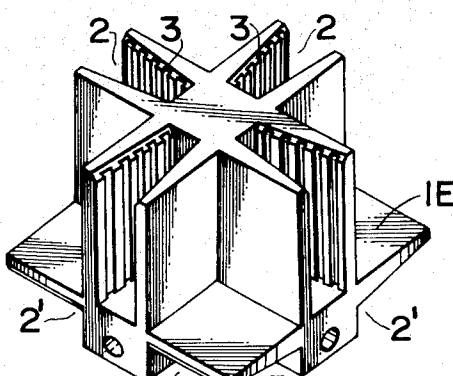


FIG. 5b

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FIG. 6a

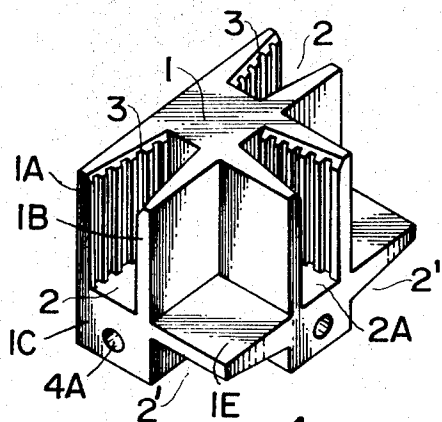


FIG. 6b

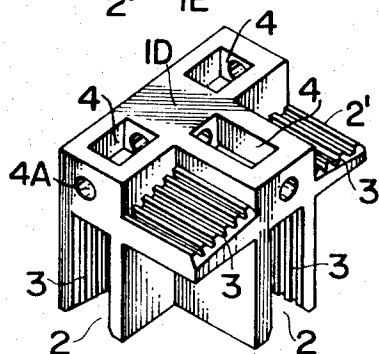


FIG. 7a

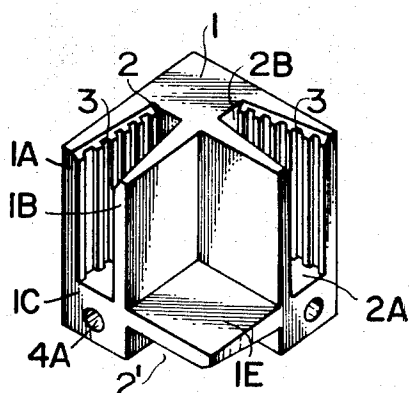
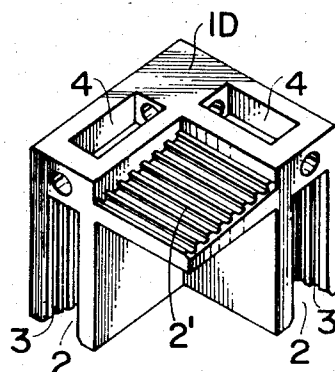


FIG. 7b



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FIG. 8a

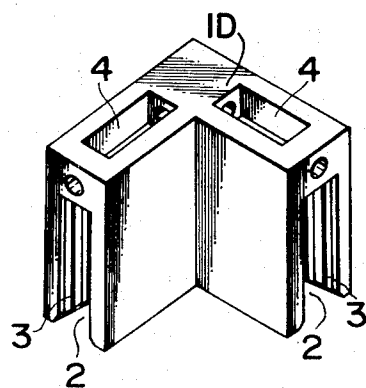
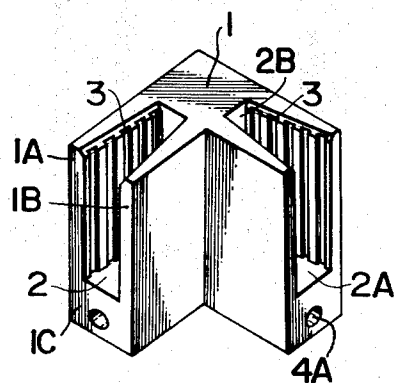


FIG. 8b

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THICKNESS-ADJUSTABLE JOINT ASSEMBLY FOR BUILDING USE

The present invention relates to a joint assembly employed with various wall or sheet panels for the construction of buildings, furniture, display cases and the like.

According to the present invention, a joint assembly of at least two main joint bodies each having a plurality of panel receiving grooves is provided wherein a plurality of coupling pieces are interposed between the overlapped two main joint bodies to lock the bodies with pins.

Alternatively, the two main joint bodies are joined together by the use of dovetail joints and dovetail pins.

Prior art conventional joint assemblies are known, wherein panel receiving grooves are designed to connect only panels of a pre-determined thickness. Thus, additional different joint devices are required when thicker or thinner panels are to be connected. It is, moreover, impossible to connect such panels in respective different directions by the use of one joint device, since the panel receiving grooves for the known joint assemblies are made uniform in width.

It is a principal object of the present invention to provide a joint assembly consisting of at least two main joint bodies each provided with a plurality of panel receiving grooves.

It is another significant object of the present invention to provide a joint assembly which can connect panels in multiple directions, whereby easy completion of intended construction can be carried out by connecting said panels.

Still another object of the present invention is to provide a joint assembly which consists of at least two joint main bodies coupled with each other for connection of more numerous panels and in more multiple directions to set up rather complicated construction.

Still another object of the present invention is to provide a joint assembly with panel receiving grooves which can accommodate varying thicknesses of building sheet materials in order to join them together.

Additional objects and advantages of the present invention will become apparent upon consideration of the following description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective part-assembly view of an embodiment of the present invention representing the assembly condition;

FIG. 2 is a section view of a panel receiving groove showing the connected condition;

FIG. 3 is a section view representing another embodiment of the present invention wherein upper and lower main bodies are assembled and joined one to another;

FIGS. 4a and 4b are perspective views of upper and lower half joint assemblies of the present invention, each provided with three receiving grooves each in a different direction;

FIGS. 5a and 5b are perspective views of upper and lower joint assemblies which, when combined, provide 12 receiving grooves, each in a different direction;

FIGS. 6a and 6b are perspective views of upper and lower joint assemblies similar to FIGS. 5a and 5b;

FIGS. 7a and 7b are perspective views of upper and lower joint assemblies also similar to FIGS. 5a and 5b; and

FIGS. 8a and 8b are perspective views of upper and lower joint assemblies similar to FIGS. 4a and 4b.

Referring to the drawings, and particularly to FIG. 1, two main joint bodies 1 are provided. One is the upper and the other is the lower. Each includes panel receiving grooves 2 shaped integral together in four different directions and a base section 1C. The panel receiving grooves 2 are each provided with a bottom wall 2A, an end wall 2B and two side walls 1A and 1B. A plurality of dovetail grooves 3 are formed on the inner walls 1A and 1B along the right and left sides, and these walls diverge away from each other in the direction of the open forward side. Four cavity portions 4 are provided on the bottoms 1D of the two main joint bodies which are to be overlapped on each other. Elongated coupling means 5 having substantially the same shape as the cavities, but having twice the height are fitted into the respective cavity portions 4 when the bottoms of the two main joint bodies are in registration with each other the two main joint bodies can be secured one on another by the use of the coupling means 5 and pins 6 which can be screwed into the coupling means through pin holes 4A in the base 1C of the joint bodies.

As shown in FIG. 3, dovetail grooves 12 can be provided on the bottoms 1' of the two main joint bodies as an alternative to the cavity portions 4, as above. The two main joint bodies can be secured to each other by insertably placing a two-faced dovetail pin 7 in the dovetail groove 12 to provide a dovetail joint. The four lower halves of coupling means 5 are secured into the four cavity portions 4 of the bottom of the inverted main joint body 1 with four pins 6, while the upper halves of the coupling means 5 are mounted into the four bottom cavity portions of the upper main joint body 1. In this way, the two main joint bodies are secured to each other by the insertion of four pins 6, as described above, to provide a joint assembly having panel receiving grooves in eight different directions.

Alternatively, the upper and lower main joint bodies can be secured to each other by aligning the corresponding dovetail grooves 12 of the respective bottoms and by insertion of the two-faced dovetail pin 7, as shown in FIG. 3.

As shown in FIG. 2, each panel receiving groove is provided with a pair of wedges 10. The outer side faces 8 of the wedges are provided with dovetail protrusions corresponding to the grooves 3 of sides 1A and 1B. The inner faces of the wedges carry projections 9, which aid in securing the panels 11.

In the foregoing preparation, wall panels, sheet bodies, or glass sheet (in this case, projections 9 are not used but corrugated or non-skid coatings are applied) are forcibly fitted into the respective panel receiving grooves to be assembled and built in a desired pattern. The panel receiving grooves can be provided in any desired direction and in any desired number.

The present joint assembly can be provided with panel receiving grooves in any number required according to the intended purpose, as shown in FIGS. 4-8. Further, more than two joint bodies can be assembled to achieve a wide variety of designs for the fabrication of displays, building units, or the like.

According to the embodiments in FIGS. 5a, 5b, 6a, 6b, and 7a and 7b, the main joint bodies can be provided with additional half panel receiving grooves 2'. These are composed of side walls 1E horizontally ex-

tended from the lower sides of the side walls 1A and 1B. Two of the so constructed main joint bodies are coupled with each other to form a panel receiving groove by the combination of their corresponding halves 2'. In this way, a new panel can be connected in one more different direction.

With the use of this invention, there is no fear of accidental disengagement of respective joint bodies with each other due to the screw pins and coupling means 5, or due to the dovetail joints. The engagement of the wedges and panel receiving grooves is insured due to the plurality of dovetail grooves 3. In addition, the connection between wall bodies, sheet bodies, glass or the like and the wedges 10 is assured by means of projections 9 or other convenient anti-skid devices. The panel receiving grooves can be used with various thicknesses of wall bodies, since they are tapered to enable the possibility of freely adjusting the thickness between the wedges by simply moving the wedges further in or out of the panel receiving grooves.

I claim:

1. A joint assembly for connecting a plurality of panels of appropriate thickness, each in a different direction, comprising a main joint body having a base and at least two panel receiving grooves, each directed in a different direction and mounted on said base, said panel receiving grooves each comprising an end wall, a bottom wall, and two opposite side walls, the remaining uppermost and outermost ends of said grooves being open, the inner side faces of said two side walls diverging away from each other toward the open forward side and being provided with a plurality of dovetail grooves; and a pair of wedges engagable with each of said panel receiving grooves, one side face of each of said wedges being provided with dovetail protrusions corresponding to the dovetail grooves of said panel receiving grooves and the inner side faces of said wedges being suited to fit on the side faces of the panels.

2. A joint assembly for connecting a plurality of panels, each in a different direction as defined in claim 1, wherein at least two of said main joint bodies are

coupled with each other at the bottom faces of their bases, each body being provided with an elongated cavity located in the base beneath the bottom wall of said panel receiving grooves, each cavity being open at the bottom face of the base; pin holes on the forward side of said bases communicating with the interior of said cavities, elongated coupling means having substantially the same shape as said cavities, but having twice the height thereof and being insertable into said cavities, said coupling means having two threaded bores which register with said pin holes when inserted into said cavities; and two pins for fixedly mounting said main joint bodies on said coupling means, said pins having a male threaded portion on one end and passing through said pin holes then screwed into said threaded bores.

3. A joint assembly for connecting a plurality of panels, each in a different direction as defined in claim 1, wherein at least two of said main joint bodies are coupled with each other at the bottom faces of their bases; the bottom faces being provided with dovetail shaped grooves running parallel to the bottom walls of said panel receiving grooves; and a pin in the form of two such dovetail grooves as said dovetail-shaped grooves are arranged symmetrically to each other and being insertable into the dovetail grooves when the bottoms of the two main joint bodies are in registration with each other.

4. A joint assembly for connecting a plurality of panels, each in a different direction as defined in claim 2, wherein said main joint bodies are each further provided with half of a panel receiving groove in the base thereof which forms a full panel receiving groove when the two main joint bodies are coupled together.

5. A joint assembly for connecting a plurality of panels each in a different direction as defined in claim 3 wherein said main joint bodies are each further provided with half of a panel receiving groove in the base thereof which forms a full panel receiving groove when the two main joint bodies are coupled together.

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