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(54) Reinforcing members for display shelves

(57) A reinforcing member includes a metallic plate mounted to an upper edge of a back plate of a display shelf. The plate includes at least one first retainer piece extending outwardly from a first side thereof and at least one second retainer piece extending outwardly from a second side thereof in a direction parallel to the extending direction of the first retainer piece. A lateral distance between the first retainer piece and the second retainer piece is equal to a width of the upper edge.

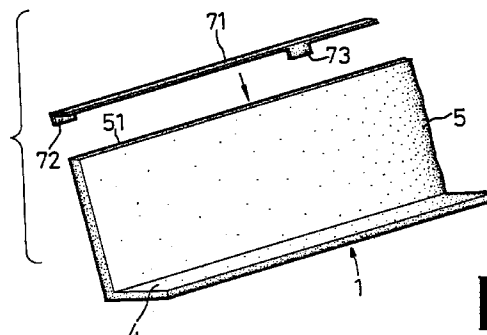


Fig 1

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Description

Background of the Invention

1. Field of the Invention

The present invention relates to reinforcing members for display shelves, especially for video tapes, audio tapes, compact disks, laser discs, etc.

2. Description of the Related Art

Video tapes, audio tapes, compact disks, and laser disks are widely used in daily lives, and the retailers or lenders thereof often place them on shelves for display purpose. Fig. 9 of the drawings illustrate a conventional display shelf which includes two side posts 2 and a plurality of vertically spaced racks 1 disposed between the side posts 2. Fig. 10 illustrate another type of conventional display shelf which includes a plurality of horizontally spaced posts 2 and a plurality of vertically spaced racks 1 mounted to the posts 2 and extending between the two outermost posts 2. Fig. 11 illustrates a further type of conventional display shelf which includes two spaced posts 2, a bracket 6 projecting outwardly from each post 2, and a back plate 5 mounted between the brackets 6. In addition, a bottom plate 4 as well as two side plates 3 are attached to the back plate 5. The side plates 3 reinforce the bottom plate 4 and the back plate 5 and prevent the displayed commodities from falling. The shelf in Fig. 11 allows the customers to pick out the displayed commodities more easily. The back plate 5 and the bottom plates 4 are formed by means of bending a thin steel plate to form an "L" shaped structure. However, the side plates 3 results in an obstacle to customers' eyesight, and thus are detrimental to good retailing of the items therein.

Fig. 12 illustrates a further conventional display shelf which is made from synthetic resin (e.g., polypropylene, acrylonitril butadiene styrene, etc) for reducing the cost (the cost for the steel plates is relatively high). The shelf in Fig. 12 includes a back plate 5, a bottom plate 4, and a plurality of reinforcing ribs 11 extending along a rear side of the back plate 5 and an underside of the bottom plate 4. In addition, the back plate 5 is thickened in an upper edge 51 thereof while the bottom plate 4 is thickened in the front edge 41 thereof to assist in the reinforcing function. Yet, the supporting effect is found unsatisfactory. As shown in Fig. 13, when the shelf is loaded with commodities with a total weight of "W", the back plate 5 and the bottom plate 4 bend (see the phantom lines in Fig. 13). This is because the back plate 5 and the bottom plate 4 may be considered as a plate 12 (see Fig. 14) which is subjected to two forces (each of a magnitude of $1/2 W$) respectively loaded on two lateral ends thereof and thus results in a bending.

The present invention is intended to provide an improved display shelf which mitigates and/or obviates the above problems.

Summary of the Invention

In accordance with one aspect of the present invention, a reinforcing member comprises a metallic plate mounted to an upper edge of a back plate of a display shelf. The plate includes at least one first retainer piece extending outwardly from a first side thereof and at least one second retainer piece extending outwardly from a second side thereof in a direction parallel to the extending direction of the first retainer piece. A lateral distance between the first retainer piece and the second retainer piece is equal to a width of the upper edge. Alternatively, the plate may be attached to a front edge of a bottom plate of the display shelf.

In accordance with a further aspect of the invention, a reinforcing member comprises a U-shaped metallic plate mounted to an upper edge of a display shelf. The plate includes a first retainer piece extending outwardly along a length of a first side thereof and a second retainer piece extending outwardly along a length of a second side thereof. A lateral distance between the first retainer piece and the second retainer piece is equal to a width of the upper edge of the display shelf. Alternatively, the plate may be attached to a front edge of a bottom plate of the display shelf.

In accordance with another aspect of the invention, the upper edge of the back plate of the display shelf has at least three slots defined therein, and the reinforcing member comprises a metallic plate mounted to the upper edge of the display shelf and having a plurality of protrusions extending downwardly therefrom and extending through the associated slots in the upper edge.

In accordance with still another aspect of the invention, a reinforcing member for two vertically disposed display shelves comprises a protrusion projecting upwardly from an upper edge of a back plate of the lower one display shelf, and the back plate of the upper one display shelf including a recess defined in a bottom thereof for receiving the protrusion of the lower one display shelf.

In accordance with yet another aspect of the invention, a reinforcing member for two vertically disposed display shelves includes an upper section fittingly received in a recess of an upper one display shelf, a lower section fittingly received in another recess of the lower one display shelf, and a flange formed in a mediate portion thereof and having a size greater than that of the recesses.

In accordance with still another aspect of the invention, a reinforcing member for two vertically disposed display shelves includes a plate extending through a slot defined in a back plate of each of the display shelves.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is an exploded perspective view illustrating a first embodiment of a reinforcing member in accordance with the present invention for a display shelf;
 Fig. 2 is an exploded perspective view illustrating an alternative application of the first embodiment;
 Fig. 3 is an exploded perspective view illustrating a second embodiment of a reinforcing member in accordance with the present invention for a display shelf;

Fig. 4 is an exploded perspective view illustrating an alternative application of the second embodiment;

Fig. 5 is an exploded perspective view illustrating a third embodiment of a reinforcing member in accordance with the present invention for a display shelf;

Fig. 6 is an exploded perspective view illustrating an embodiment of a reinforcing member in accordance with the present invention for display shelves;
 Fig. 7 is an exploded perspective view illustrating another embodiment of a reinforcing member in accordance with the present invention for display shelves;

Fig. 8 is an exploded perspective view illustrating a further embodiment of a reinforcing member in accordance with the present invention for display shelves;

Fig. 9 is a perspective view illustrating a conventional display shelf according to prior art;

Fig. 10 is a perspective view illustrating a further conventional display shelf according to prior art;

Fig. 11 is a perspective view illustrating another conventional display shelf according to prior art;

Fig. 12 is a perspective view illustrating still another conventional display shelf according to prior art;

Fig. 13 is a schematic view illustrating bending of the display shelf in Fig. 12; and

Fig. 14 is a schematic view illustrating bending of the display shelf in Fig. 13.

Description

Figs. 1 to 8 of the drawings illustrate different embodiments of reinforcing members of the present invention for a display shelf 1 of the type having a back plate 5 and a bottom plate 4 mounted to a lower side of the back plate 5. Referring to Fig. 1, a first embodiment of the present invention includes a metallic plate 71 attached to an upper edge 51 of the back plate 5. The plate 71 includes a first retainer piece 72 extending outwardly from a first side thereof and a second retainer piece 73 extending outwardly from a second side thereof in a direction parallel to the extending direction of the first retainer piece 72. The first and second retainer pieces 72 and 73 are respectively mounted to two opposite sides of the back plate 5, thereby providing a reinforced strength for the back plate 5 and the bottom

plate 4. The plate 71 may extend to at least a portion of the longitudinal length of the upper edge 51. In a preferred embodiment of the invention, there are two first retainer pieces 72 respectively formed on two ends of the first side of the plate 71, and there is one second retainer piece 73 formed at a mediate portion of the second side of the plate 71. A lateral distance between the first retainer pieces 72 and the second retainer piece 73 is equal to a width of the upper edge 51 and thus allows the upper edge 51 to be fittingly received therebetween. The rigidity of the metal plate 71 may eliminate the bending of the back plate 5 and the bottom plate 4.

Alternatively, the metallic plate 71 may be attached to a front edge 41 of the bottom 4, as shown in Fig. 2, which also provides the required reinforcing function.

Referring to Fig. 3, the first retainer piece 72 and the second retainer 73 in Fig. 1 may extend along the overall length of the plate 71, thereby forming a U-shaped structure (see 72' and 73'). Thus, the plate 71 in Fig. 3 may be securely attached to the upper edge 51 of the back plate 5. Alternatively, the metallic plate 71 may be attached to the front edge 41 of the bottom plate 4, as shown in Fig. 4.

Fig. 5 illustrates a third embodiment of the invention, in which the upper edge 51 of the back plate 5 may include three slots 52 (only one is shown) defined therein, while the plate 71 may include three protrusions 78 extending outwardly therefrom for being respectively received in the slots 52, thereby providing the required reinforcing function. In an embodiment of the invention, two of the slots may be defined adjacent to two ends of the upper edge 51 and the remaining one may be defined in a mediate portion of the upper edge 51.

Fig. 6 illustrates an embodiment of the invention for display shelves, wherein the reinforcing member may include a protrusion 54 projecting upwardly from the upper edge 51 of the back plate 5. In addition, the back plate 5 includes a recess 56 defined in a bottom thereof. Thus, two vertically disposed display shelves 1 may be interconnected by means of inserting the protrusion 54 into the recess 56, which also may provide the required reinforcing function.

Fig. 7 illustrates another embodiment of the invention for display shelves, wherein the upper edge 51 of the back plate 5 includes a first recess 53 therein, while the back plate 5 includes a second recess defined in a bottom thereof (see "56" in Fig. 6). In addition, a reinforcing member 8 is provided to interconnect two vertically disposed display shelves 1. The reinforcing member 8 may include an upper section 83 fittingly received in the second recess 56 of the upper one display shelf, a lower section 82 fittingly received in the first recess 53 of the lower one display shelf, and a flange 84 formed in a mediate portion thereof and having a size greater than that of the first and second recesses. This also provides the required reinforcing function.

Fig. 8 illustrates a further embodiment of the invention for display shelves, wherein the upper edge 51 of the back plate 5 includes a slot 58 defined therein, and

a reinforcing member, in the form of a plate 81, may vertically extend through the slots 58 of the vertically disposed display shelves 1. This also provides the required reinforcing function.

Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

Claims

1. A reinforcing member for a display shelf of the type having a back plate with an upper edge and a bottom plate with a front edge, the reinforcing member comprising:

a metallic plate mounted to one of the upper edge and the bottom edge, the plate including at least one first retainer piece extending outwardly from a first side thereof and at least one second retainer piece extending outwardly from a second side thereof in a direction parallel to the extending direction of said at least one first retainer piece, a lateral distance between said at least one first retainer piece and said at least one second retainer piece being equal to a width of said one of the upper edge and the front edge.

2. A reinforcing member for a display shelf of the type having a back plate with an upper edge and a bottom plate with a front edge, the reinforcing member comprising:

a U-shaped metallic plate mounted to one of the upper edge and the bottom edge, the plate including a first retainer piece extending outwardly along a length of a first side thereof and a second retainer piece extending outwardly along a length of a second side thereof, a lateral distance between said first retainer piece and said second retainer piece being equal to a width of said one of the upper edge and the front edge.

3. A reinforcing member for a display shelf of the type having a back plate with an upper edge and a bottom plate with a front edge, the upper edge having at least three slots defined therein, the reinforcing member comprising: a metallic plate mounted to the upper edge of the display shelf and having a plurality of protrusions extending downwardly therefrom and extending through the associated slots in the upper edge.

4. A reinforcing member for two vertically disposed display shelves of the type having a back plate with an upper edge and a bottom plate with a front edge,

the reinforcing member comprising: a protrusion projecting upwardly from the upper edge of the back plate of the lower one display shelf, and the back plate of the upper one display shelf including a recess defined in a bottom thereof for receiving the protrusion of the lower one display shelf.

5. A reinforcing member for two vertically disposed display shelves of the type having a back plate with an upper edge and a bottom plate with a front edge, the upper edge of the back plate of the lower one display shelf including a first recess therein, and the back plate of the upper one display shelf including a second recess defined in a bottom thereof, the reinforcing member comprising:

an upper section fittingly received in the second recess of the upper one display shelf, a lower section fittingly received in the first recess of the lower one display shelf, and a flange formed in a mediate portion thereof and having a size greater than that of the first and second recesses.

6. A reinforcing member for two vertically disposed display shelves of the type having a back plate with an upper edge and a bottom plate with a front edge, the upper edge of the back plate having a slot defined therein, the reinforcing member comprising:

a plate extending through the slots of the back plates of the display shelves.

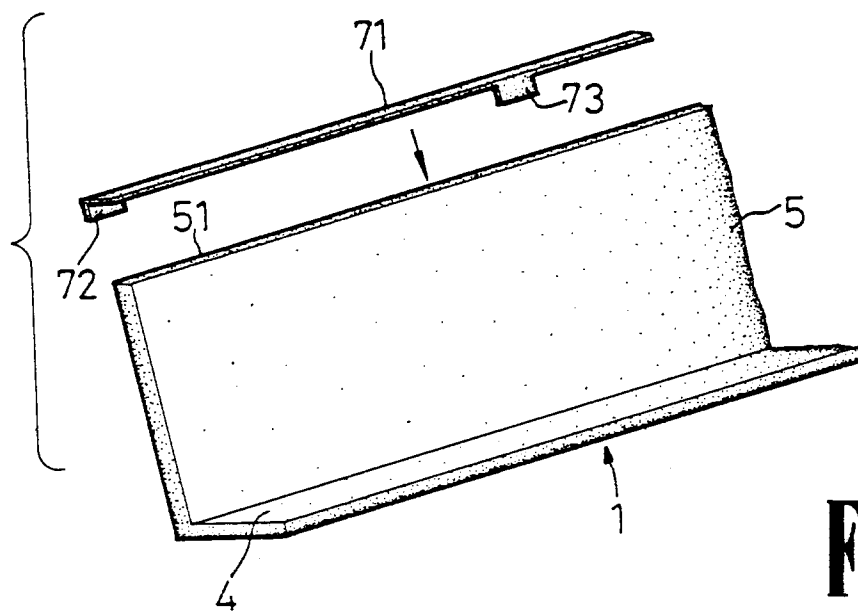


Fig 1

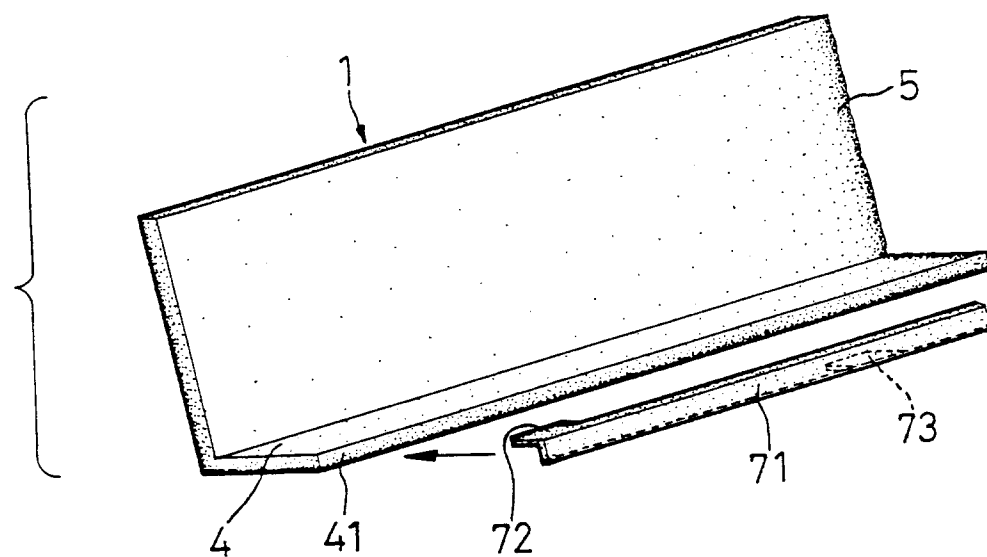


Fig 2

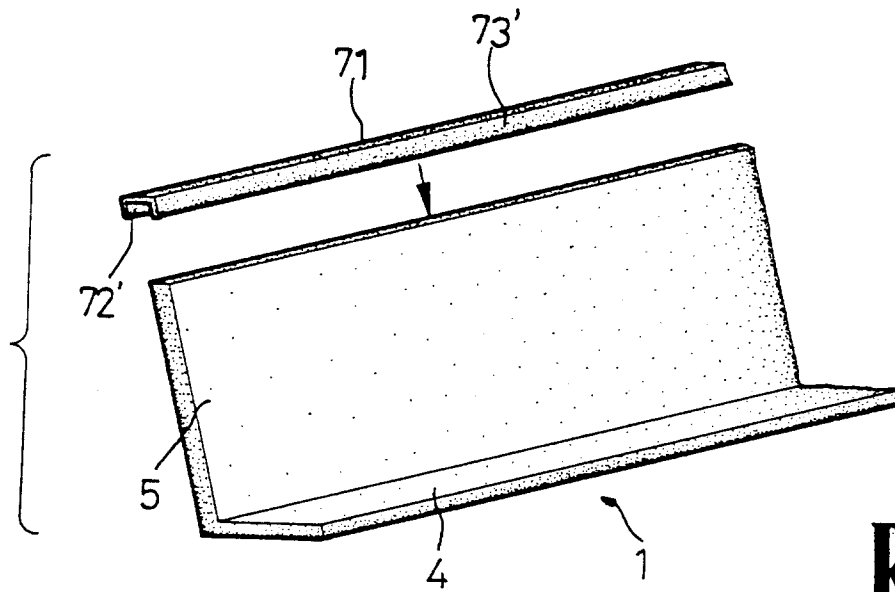


Fig 3

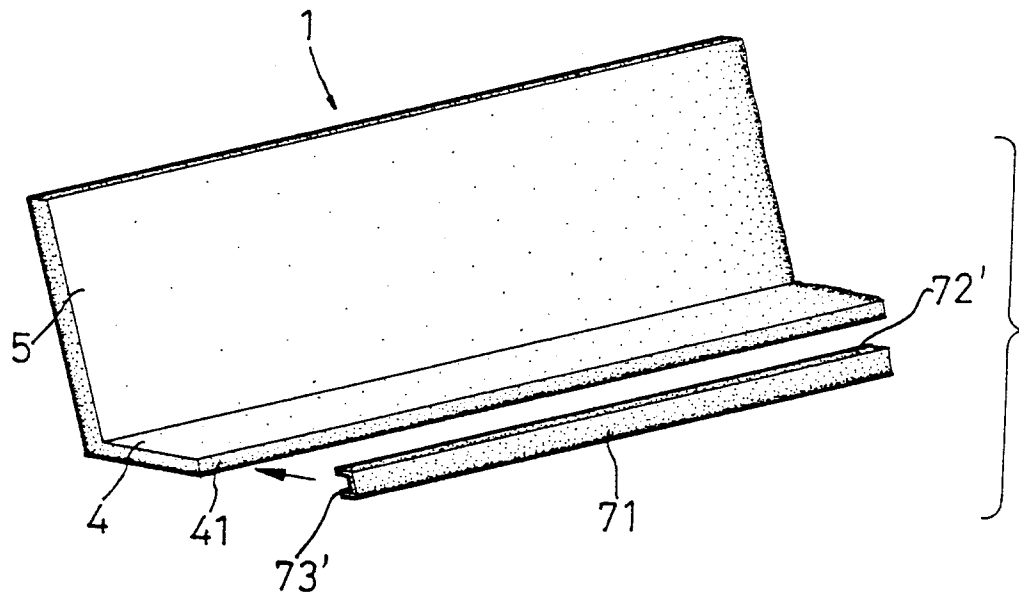


Fig 4

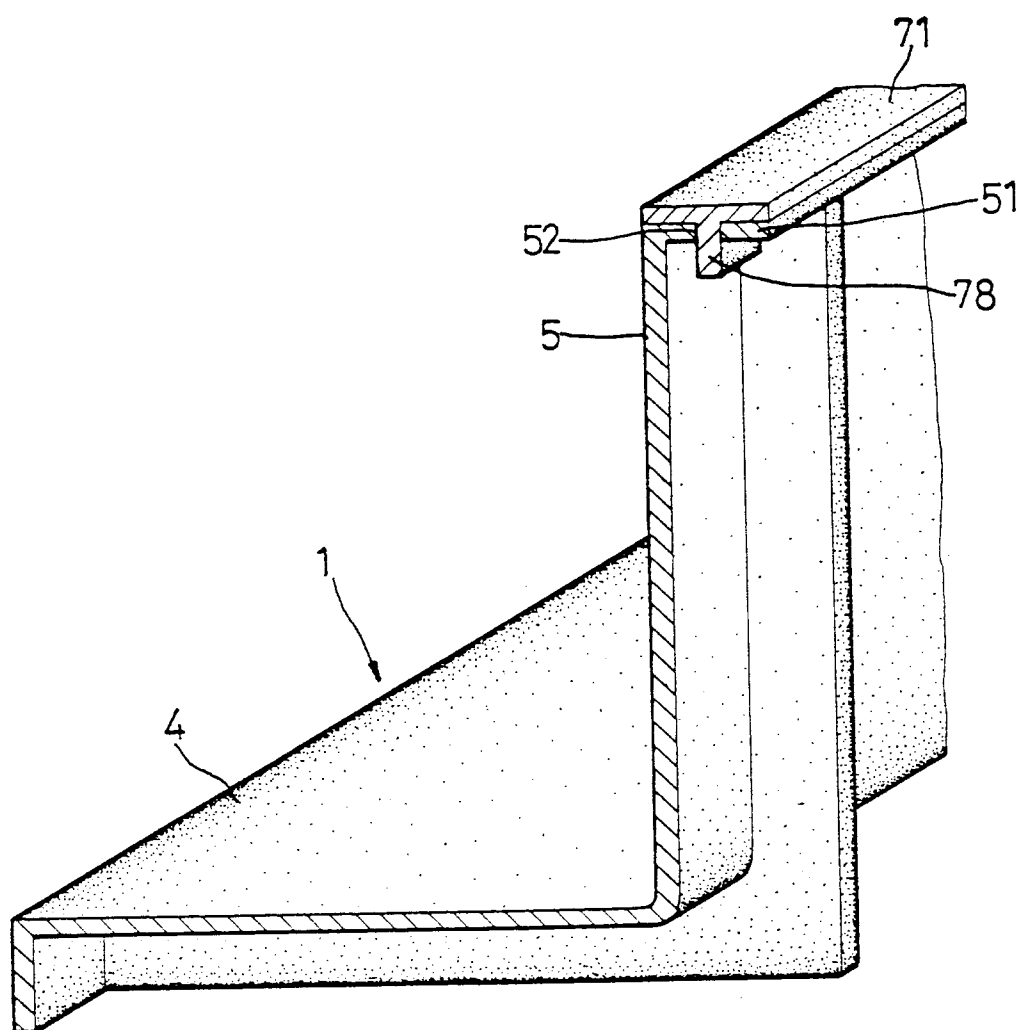


Fig 5

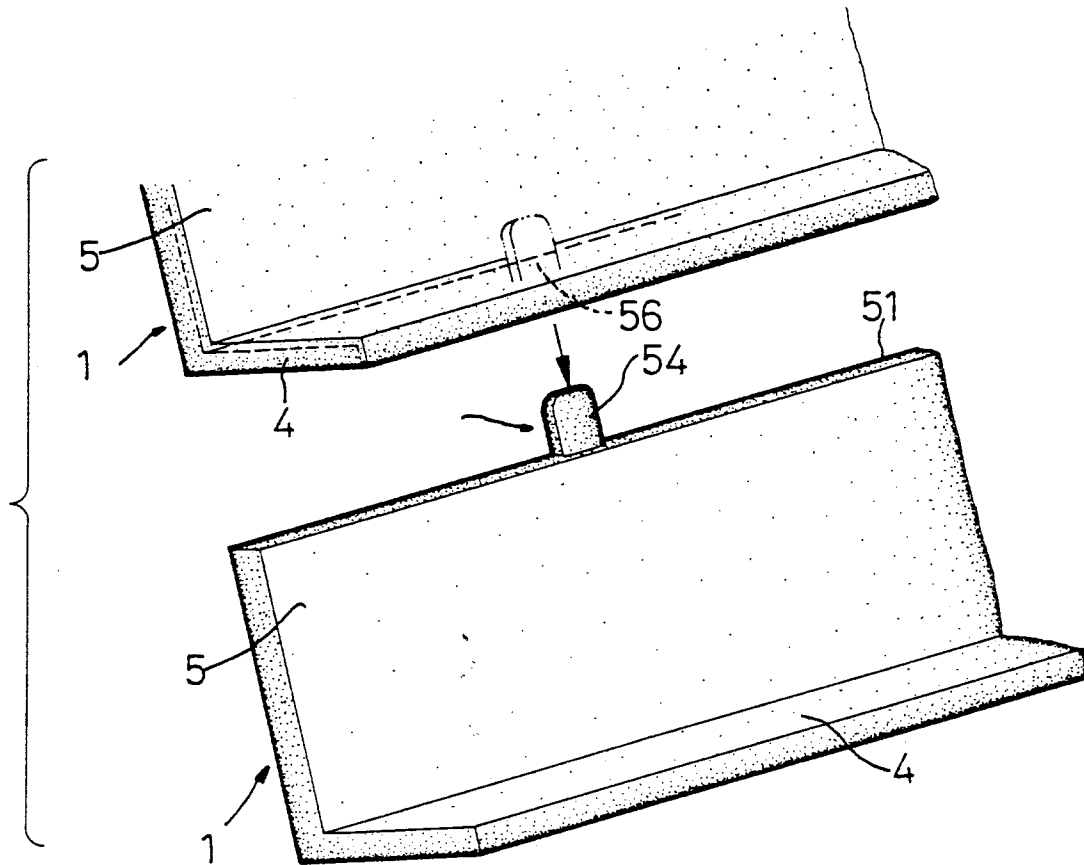


Fig 6

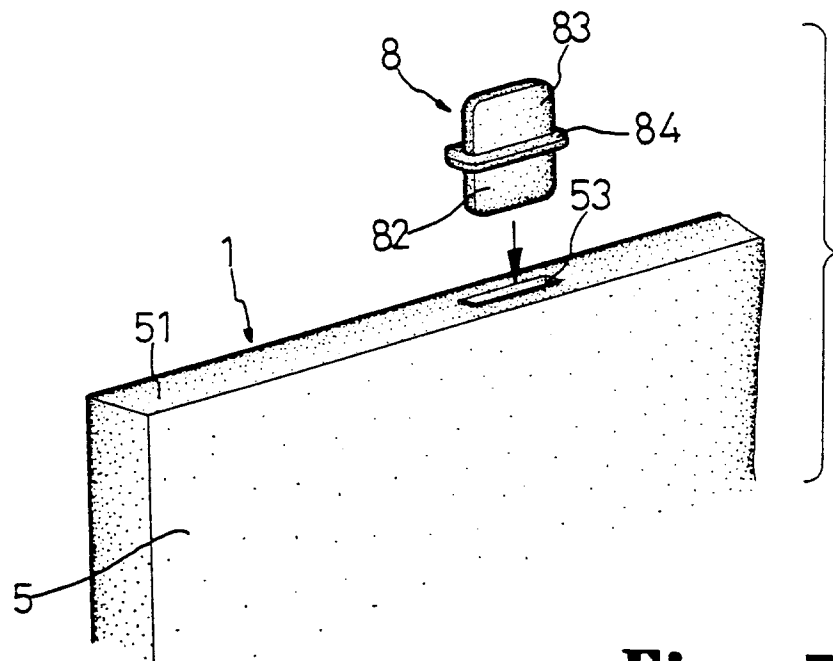


Fig 7

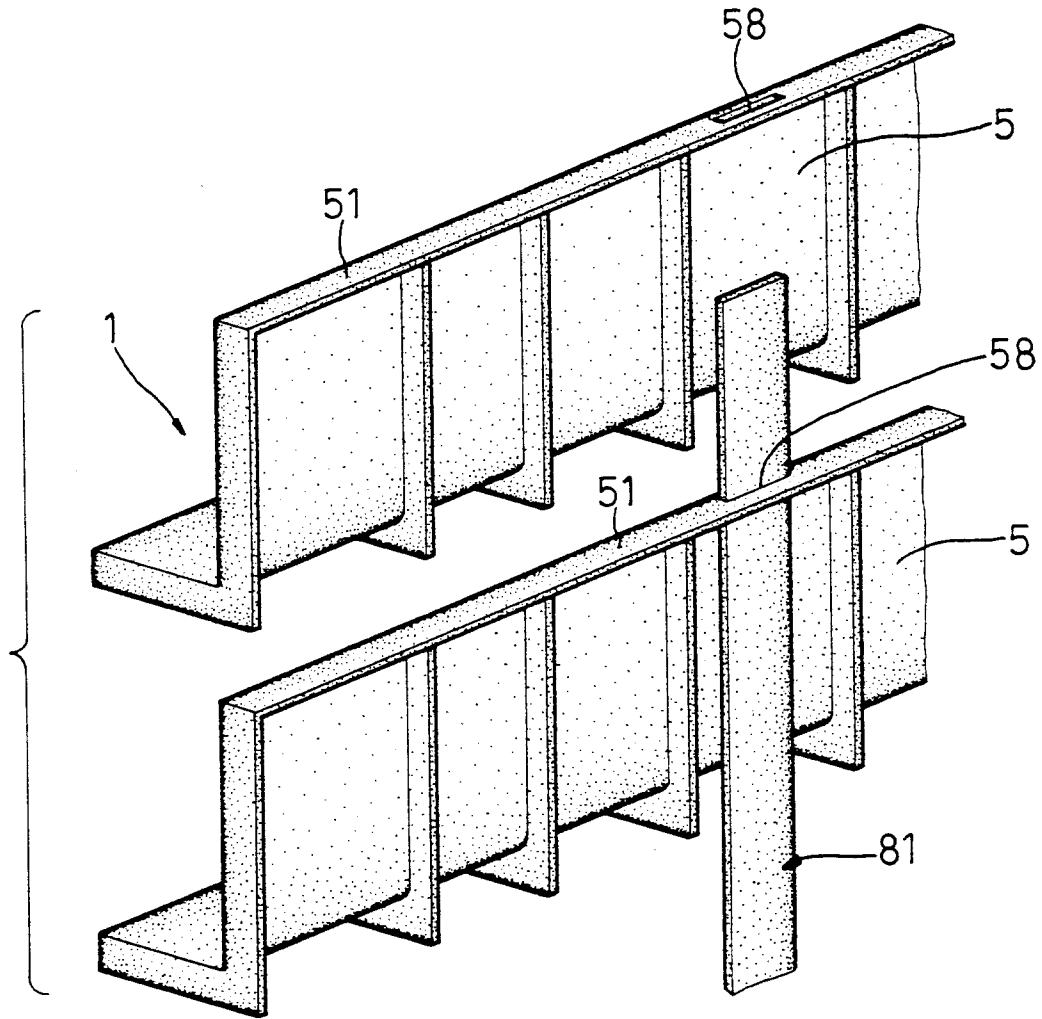
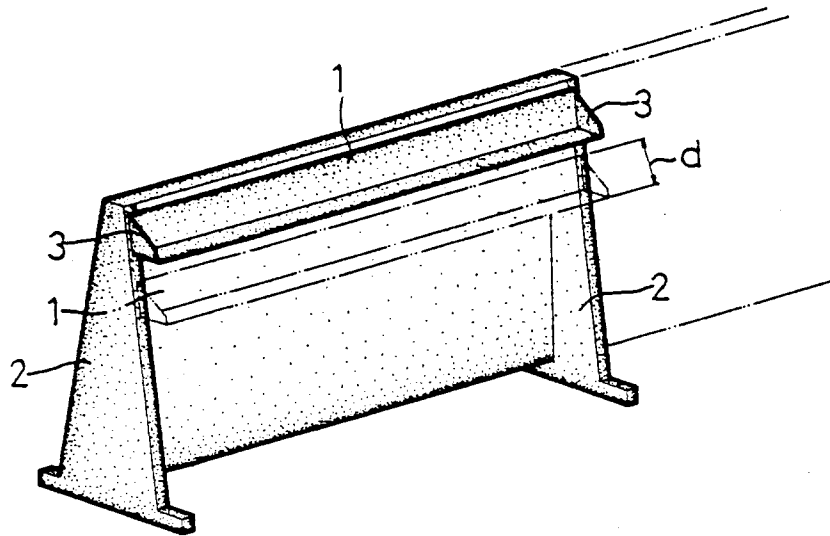


Fig 8

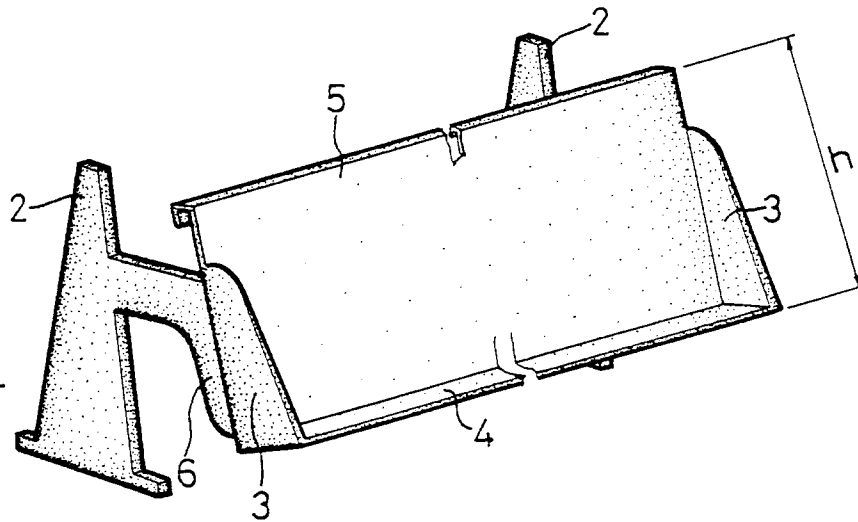
PRIOR ART

Fig 9



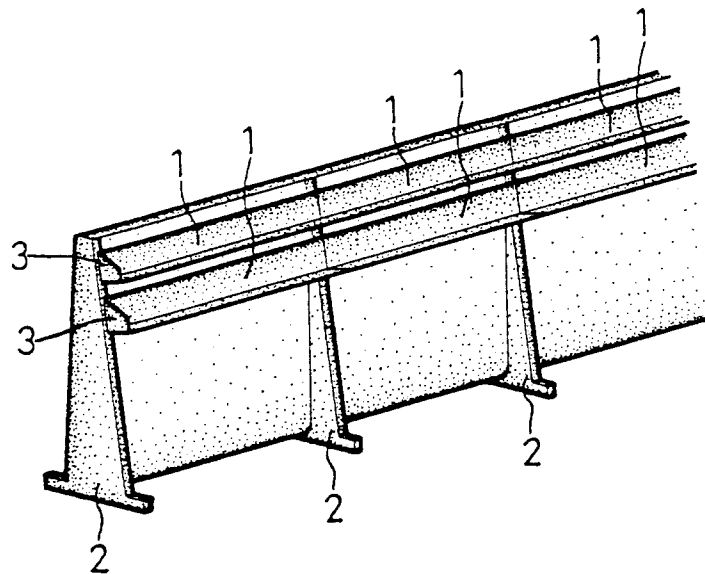
PRIOR ART

Fig 11



PRIOR ART

Fig 10



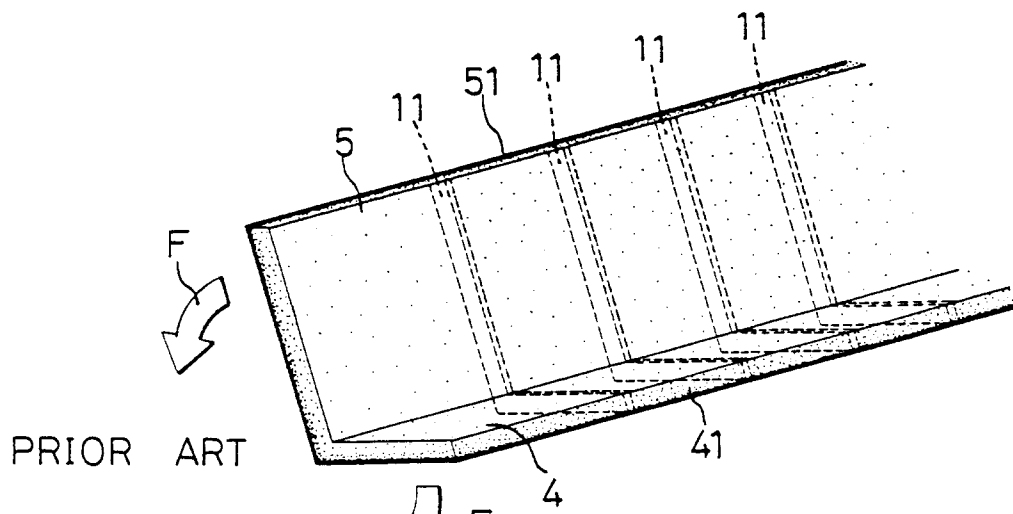


Fig 12

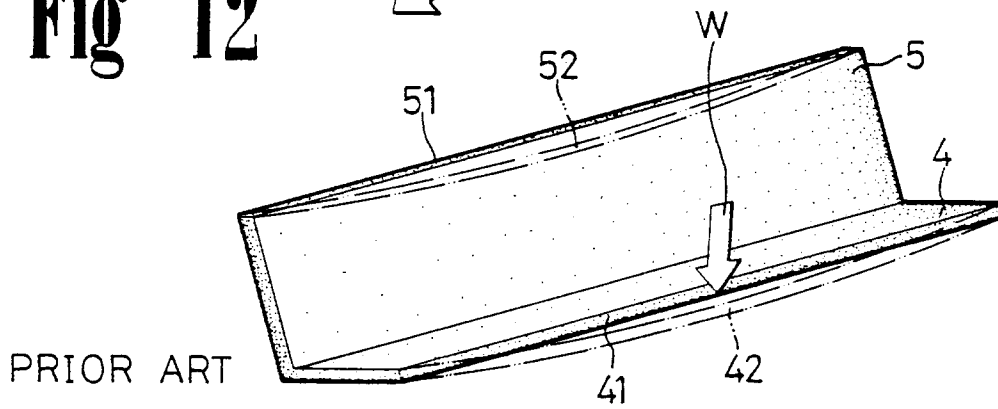


Fig 13

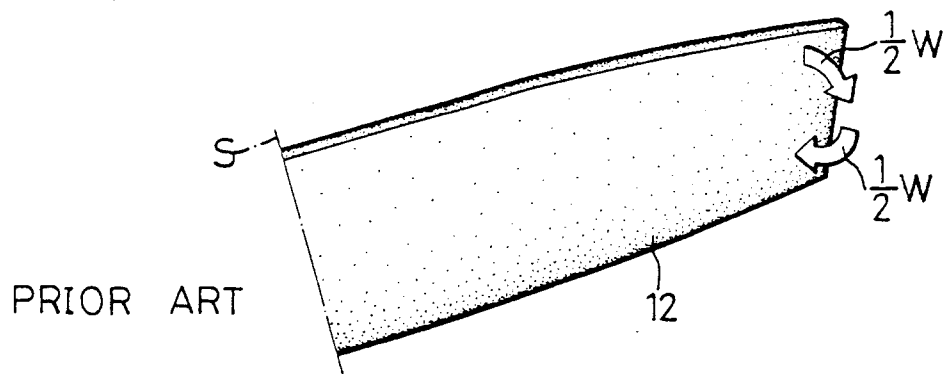


Fig 14