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(54) AN IMPROVED FRAME FOR DOORS, WINDOWS, PANELS, PARTITIONS AND THE LIKE

(71) I, CHIA KIN BOON, of 1048-9 Serangoon Road, Singapore, a Singapore Citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a frame for doors, windows, panels, partitions and the like, referred to hereinafter simply as doors, and has for its primary objects the provision of an improved form of frame and preformed strip material for making same which is immensely strong; neat and pleasing in appearance and which is slim and of streamlined cross-section so as to occupy the minimum of space so far as its cross sectional area is concerned thereby rendering it particularly applicable to construction in which the saving of space is of paramount importance.

Broadly, according to one aspect of the present invention there is provided a frame for doors, windows, panels, partitions and the like comprising flexible and resilient hollow frame members of substantially triangular cross section and in which one wall of the triangle constitutes a flat base and the other two walls concave side walls which converge towards one another from the sides of said base and which merge along their outer marginal parts into substantially semi-circular or angle-section portions with their outer free edges spaced apart so as to combine to define a slotted hollow bead-like edge portion of substantially circular or square or rectangular cross section through which said marginal edge portion of a panel or glass pane is inserted when engaged in the hollow interior of the frame member.

The frame members or preformed strip material are preferably made of metal such as mild steel or aluminium or metal alloy and can be fashioned from sheet material of a required gauge. Alternatively, the mem-

bers or preformed strip material may comprise extrusions of a suitable synthetic plastics material.

An important advantage of the frame provided by this invention is that it can be used in conjunction with an outer frame having any suitable shape in cross section. In this respect it is to be mentioned that according to a known construction of door the outer frame comprises hollow frame members of square cross section and the inwardly directed face of each member is slotted to receive a marginal edge portion of a panel and is formed at each side of said slot with a flange so that a pair of spaced apart flanges is provided forming between themselves a guide slot and a pair of bearing surfaces through and between which a marginal edge portion of a panel is passed into the hollow interior of the member. This known construction of frame is cumbersome, unsightly and not adaptable to variations in size and shape to satisfy different requirements.

To enable the invention to be clearly understood preferred embodiments thereof will now be described by way of example with reference to the accompanying drawings, wherein:—

Figure 1 illustrates an inner frame member constructed in accordance with this invention and fitted within an outer frame.

Figure 2 is a view similar to Figure 1 but showing a modification.

Figure 3 is a front view showing two panels of a folding door constructed in accordance with this invention, and

Figure 4 is a horizontal cross section taken through Figure 3.

Referring to said drawings, the frame provided by this invention is indicated generally at 1 and consists of a hollow frame member of substantially triangular cross section comprising one wall 2 which constitutes a base and two concave side walls 3 which terminate in parallel portions 3a short of one another to provide a space or neck 4

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through which a marginal edge portion 5a of a panel 5 of metal or glass pane can be inserted into the hollow interior of said frame member.

- 5 The portions 3a of said side walls 3 merge, as shown in Figure 1, into substantially semi-circular portions 6, or alternatively, as shown in Figure 2, in angle section portions 6 having their outer free edges 10 7 spaced apart so as to combine to define a slotted bead-like edge portion of substantially circular or square or rectangular cross section through which the said marginal edge portion 5a of a metal panel or glass 15 pane 5 may first be inserted when engaged in the hollow interior of the frame member.

- Preferably, the mouth of the slot 8 i.e. the gap between the outer edges 7 of the semi-circular or rectangular hollow portions 7 is substantially equal in size to the gap between the neck forming portions 3a of the side walls 3 so that said edges 7 and the portions 3a make two parallel line 25 contacts with the marginal edge portions 5a of a panel 5 thereby imparting stability to same.

- An inner frame made in accordance with this invention may be secured within an 30 outer frame 9 in any suitable manner e.g. the inner frame may be rivetted, welded, or otherwise fixedly secured within said outer frame 9, the latter being of square or any other shape in cross section.

- 35 The thickness and nature of the material from which the frame members 1 provided by this invention are made, is such that the members are readily flexible and resilient and will adapt themselves to any 40 irregularity in the outer frames 9 or the surface of any other structure within which they are fitted. The frame members 1 may be made of any suitable metal such as mild steel, aluminium or an alloy and can be 45 fashioned from sheet material of a required gauge or alternatively they can be made as an extrusion and if necessary of a synthetic plastics material.

- 50 Figures 3 and 4 illustrate the invention as applied to two sections of a sliding door having outer frame members 9 hinged together as indicated at 10 and inner frame members 1 made in accordance with this invention, the panels 5 being of sheet metal.

Although only two door sections are shown 55 in the drawings, it will be appreciated that a multiplicity of sections may be provided. By means of this invention the cross sectional size of the outer frames 9 may be kept at a minimum and in this respect it 60 will be appreciated that when a plurality of door sections are folded together into parallel planes when the door is opened, that the total thickness of the folded together doors will be considerably less than 65 would be the case if panels of known construction comprising frame members of larger section were used thus providing a door space which is larger than usual.

The frame members can be made from 70 preformed strip material cut to a required length.

It is to be appreciated that a frame constructed in accordance with this invention may be incorporated in any structure in 75 which a frame forms a part.

WHAT I CLAIM IS:—

1. A frame for doors, windows, panels, partitions and the like comprising flexible and resilient hollow frame members of 80 substantially triangular cross section and in which one wall of the triangle constitutes a flat base and the other two walls concave side walls which converge towards one another from the sides of said base and which 85 merge along their outer marginal parts into substantially semi-circular or angle-section portions with their outer free edges spaced apart so as to combine to define a slotted hollow bead-like edge portion of substantially 90 circular or square or rectangular cross section through which said marginal edge portion of a panel or glass pane is inserted when engaged in the hollow interior of the frame member. 95

2. Preformed strip material having a cross section substantially as shown in Figures 1 and 2 for constructing a frame as claimed in Claim 1.

3. A door, window, panel, partition or 100 the like comprising a frame as claimed in Claim 1.

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An inner frame made in accordance with this invention may be secured within an outer frame 9 in any suitable manner e.g. the inner frame may be rivetted, welded, or otherwise fixedly secured within said outer frame 9, the latter being of square or any other shape in cross section.

35 The thickness and nature of the material from which the frame members 1 provided by this invention are made, is such that the members are readily flexible and resilient and will adapt themselves to any irregularity in the outer frames 9 or the surface of any other structure within which they are fitted. The frame members 1 may be made of any suitable metal such as mild steel, aluminium or an alloy and can be fashioned from sheet material of a required gauge or alternatively they can be made as an extrusion and if necessary of a synthetic plastics material.

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Although only two door sections are shown in the drawings, it will be appreciated that a multiplicity of sections may be provided. By means of this invention the cross sectional size of the outer frames 9 may be kept at a minimum and in this respect it will be appreciated that when a plurality of door sections are folded together into parallel planes when the door is opened, that the total thickness of the folded together doors will be considerably less than would be the case if panels of known construction comprising frame members of larger section were used thus providing a door space which is larger than usual.

The frame members can be made from preformed strip material cut to a required length.

It is to be appreciated that a frame constructed in accordance with this invention may be incorporated in any structure in which a frame forms a part.

WHAT I CLAIM IS:—

1. A frame for doors, windows, panels, partitions and the like comprising flexible and resilient hollow frame members of substantially triangular cross section and in which one wall of the triangle constitutes a flat base and the other two walls concave side walls which converge towards one another from the sides of said base and which merge along their outer marginal parts into substantially semi-circular or angle-section portions with their outer free edges spaced apart so as to combine to define a slotted hollow bead-like edge portion of substantially circular or square or rectangular cross section through which said marginal edge portion of a panel or glass pane is inserted when engaged in the hollow interior of the frame member.

2. Preformed strip material having a cross section substantially as shown in Figures 1 and 2 for constructing a frame as claimed in Claim 1.

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