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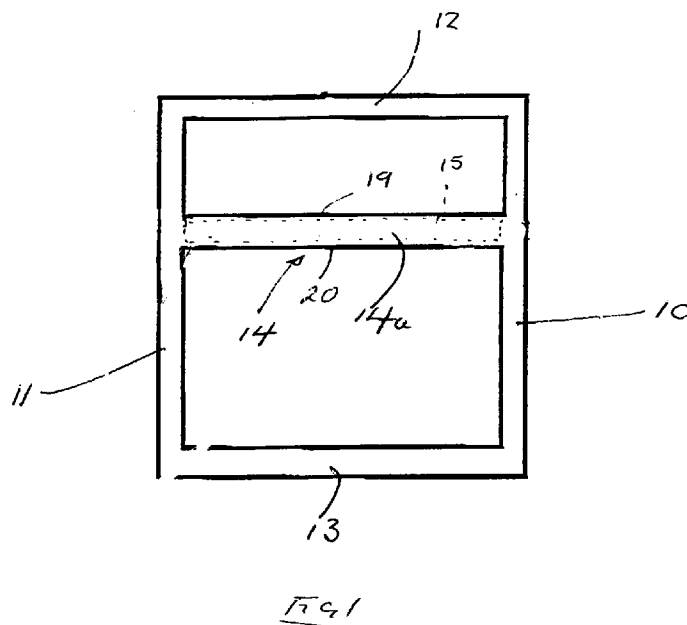
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(54) Windows

(57) A window is formed from hollow plastics members which incorporate an interior reinforcement (15) of generally rectangular cross-section. Two walls (16) of the reinforcement are generally planar but the other two walls (17) are provided with corrugations (18) that increase the strength of the reinforcement to bending

forces about axes generally normal to a plane intersecting the mid-points of the corrugated walls (17). This allows the reinforcement to be made of thinner gauge metal than would otherwise be the case.



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Description

This invention relates to windows.

A window usually comprises a fixed frame and a movable leaf. The frame and the leaf are formed from structural members which can be of a number of materials; for example plastics or wood. Where the members are of plastics, they are usually moulded in the form of tubes with a hollow interior. In the leaf, in particular, such plastics members may not be sufficiently strong to meet all possible loadings placed on the member. In particular, such plastics members can be insufficiently strong under bending forces applied, for example, by wind acting against the window.

In view of this, it is known to provide such plastics members with a reinforcement in the form of a metal tube which is inserted into the hollow interior of the member. The reinforcement may, for example, be a hollow rectangle formed of sheet steel with two pairs of opposed side walls and fit into a correspondingly shaped hole through the interior of the frame member.

Such reinforcements are expensive to construct since the steel needs to be comparatively thick in order to give the associated member the required strength.

According to the invention, there is provided a window comprising at least one frame member of plastics material having a hollow interior containing a reinforcement formed by a tube of generally rectangular cross section having two pairs of opposing walls, at least one pair of walls being configured to increase the strength of the reinforcement to bending forces about axes generally normal to a plane intersecting the mid-points of said walls.

By increasing the resistance of the walls to bending, the material from which the reinforcement is formed can be thinner and therefore save on manufacturing costs.

The following is a more detailed description of an embodiment of the invention, by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a schematic elevation of a window frame, and

Figure 2 is a cross-section of a reinforcing member for use with the window frame of Figure 1.

Referring first to Figure 1, the window frame is formed by five frame members; two outer side frame members 10, 11, upper and lower frame members 12, 13 and a transom 14. All the frame members are made from an extruded PVCu material with a hollow interior profile.

The reinforcement 15 shown in Figure 2 is used in, for example, the transom 14 to provide the transom 14 with increased strength in planes normal to the plane of the window (the planes in which wind loads act on the frame). The reinforcement is formed from a strip of steel. The strip is roll-formed to produce a tube of gen-

erally rectangular cross-section having wider side walls 16 interconnected by narrower side walls 17.

The wider side walls 16 are of planar configuration but the narrower side walls 17 are corrugated with the corrugations 18 being generally sinusoidal in shape. In fact, one narrower side wall 17 includes the join between the edges of the strip from which the tube is formed and so, at this narrower side wall, the corrugations are interrupted. As seen in Figure 2, the corrugations are comparatively shallow.

The effect of the corrugations 18 is to provide the tube with significant strength to resist bending forces about axes generally normal to a plane intersecting the mid-points of the shorter sides 17.

As a result of this, the reinforcement 15 can be formed of sheet steel which is thinner than would be required in the absence of the corrugations. For example, in one particular reinforcement it has been found that a reinforcement 15 formed as shown in Figure 2 and made from sheet steel of 2mm thickness is as resistant to bending as an uncorrugated reinforcement made from sheet steel of 3mm thickness.

In use, the reinforcement 15 is inserted into the transom 14 and held in position. The reinforcement is sized so that, while it fits closely within the transom, it does not have to be stressed or deformed in order to insert it into the transom and is not stressed or deformed when within the transom 14. Since the principal loads on a window frame are wind loads acting in directions normal to the plane of the frame, the reinforcement is normally arranged with the corrugated sides 17 adjacent the vertical side walls of the transom 14. It may, however, be arranged with the corrugated sides 17 adjacent upper and lower walls 19, 20 of the transom 14.

It will be appreciated that the narrower sides 17 need not be provided with sinusoidal corrugations. They could be provided with corrugations of a different cross-sectional shape or they could be provided with any other form of configuration which increases the strength of the reinforcement to bending forces about axes generally normal to a plane intersecting the mid-points of the walls 17.

Claims

1. A window comprising at least one frame member (14) of plastics material having a hollow interior containing a reinforcement (15) formed by a tube of generally rectangular cross-section having two pairs of opposing walls (16, 17), at least one pair of walls (17) being configured to increase the strength of the reinforcement to bending forces about axes generally normal to a plane intersecting the mid-points of said walls (17).
2. A window according to claim 1 wherein at least one of said walls (17) are provided with corrugations (18).

3. A window according to claim 2 wherein both walls (17) are provided with corrugations (18).
4. A window according to any one of claims 1 to 3 wherein the reinforcement (15) is formed from sheet metal.
5. A window according to claim 4 wherein the thickness of the sheet (15) is 1.5mm or less.

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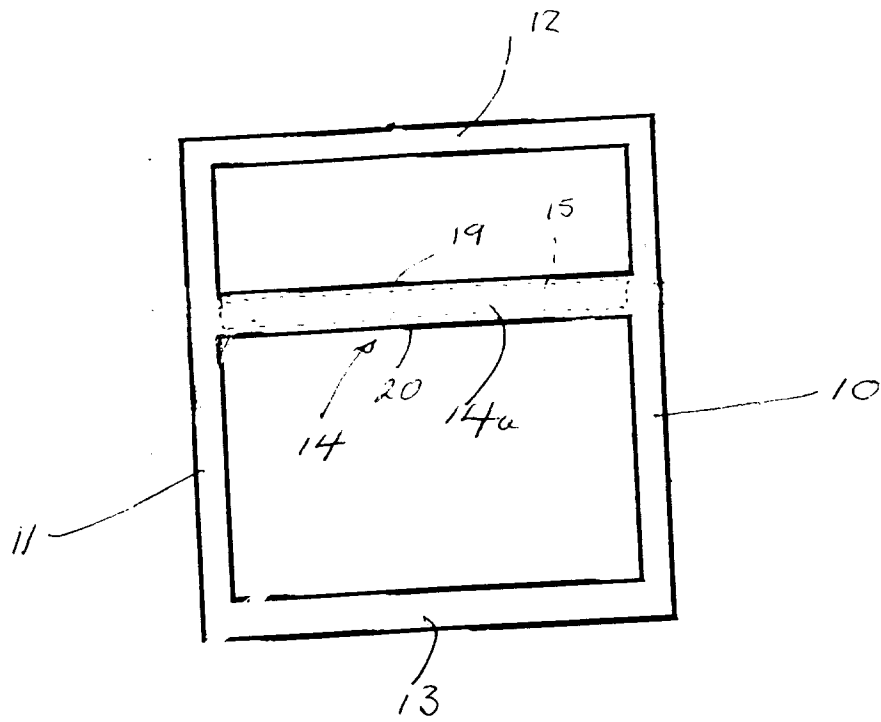


Fig 1

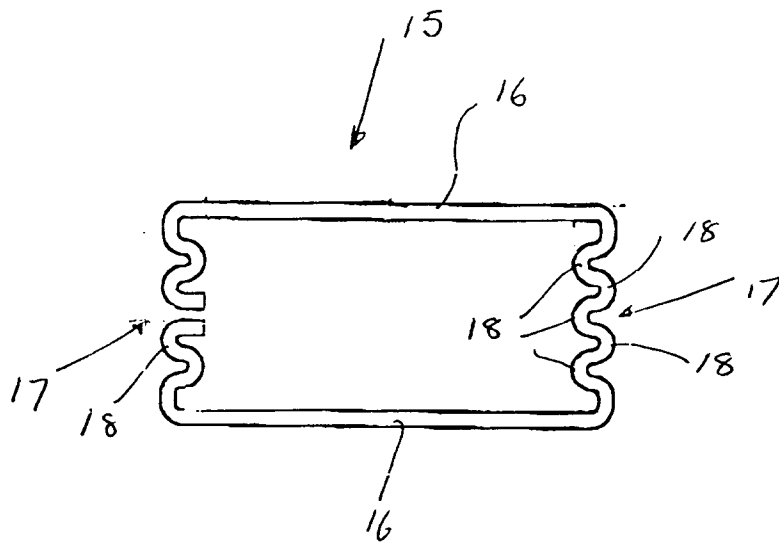


Fig 2



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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 3293

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP-A-0 077 412 (KARLSTADTER FENSTER- U. ELEMENTENBAU) * the whole document *	1-5	E06B3/26
X	FR-A-2 494 334 (FORMING) * the whole document *	1-5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 August 1996	Examiner Depoorter, F
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