

Description

[0001] The present invention relates to apparatus for fabricating a roof.

[0002] For several years, the present applicant has manufactured a glazing bar assembly for securing roofing panels (e.g. sheets of glass or plastics material) together for conservatories and the like. The known glazing bar assembly (10) is shown in Figure 1 and comprises a pair of complementary glazing bars (12,12') each having a pair of laterally extending flanges (14) for engaging one edge of a respective roofing panel. The glazing bars (12,12') are usually fitted to the panels off site to improve seal quality and facilitate construction on site. A first panel (16) edged with its glazing bar (12) is placed on a support structure comprising beam (18), with the glazing bar arranged transversely to the beam (18). A second panel (20) edged with its glazing bar (12') is registered along side the first panel (16) using the interfitting profiles (22) provided on each glazing bar. Screws (24) are then driven up into the glazing bar assembly (10) to secure the glazing bars (12,12') together. For this purpose, the glazing bar (12') has an inverted U-shaped member or section for anchoring screws driven up through the other glazing bar (12).

[0003] The present applicant has sought to improve their glazing bar assemblies for a number of reasons. First, the glazing bars may be difficult to secure together in high ceiling applications because access is only possible using ladders or tower platforms. Also, the glazing bars are not suitable for so-called cantilever canopies, since the glazing bars rest on cantilever brackets which makes it impossible to drive screws up into the assembly.

[0004] In accordance with the present invention, there is provided apparatus for fabricating a roof, comprising a pair of complementary glazing bars, each for engaging one edge of a respective roofing panel, the glazing bars having interfitting profiles for registering one glazing bar relative to the other during roof fabrication, with one glazing bar having a member for anchoring fasteners (e.g. screws) extending through the other glazing bar to secure the glazing bars together, characterised in that the member is configured to anchor fasteners introduced from above the roof during roof fabrication.

[0005] The present applicant has appreciated that by configuring the member to anchor fasteners introduced from above the roof, the apparatus is suitable for use with cantilever brackets which may extend - at least in part - parallel to the glazing bars. The resulting roof is therefore ideally suited for carports and walkways (e.g. for supermarket car parks). It will be appreciated that such buildings are not enclosed, so the fact that the fasteners may be accessible to persons on the roof does not necessarily matter from a security point of view. According to the invention, the glazing bars overlap in use, with the member being part of the glazing bar (hereinafter "first glazing bar") which is positioned beneath the

other glazing bar (hereinafter "second glazing bar") when the glazing bar profiles are in registration, i.e. the opposite way round to the known arrangement. The member may be configured to bear against an outer surface of the second glazing bar.

[0006] Each glazing bar may have its respective roofing panel attached thereto before the complementary glazing bars are registered together during roof fabrication. In this way, the glazing bars and roof panels may be assembled into pre-fabricated units off-site (e.g. in a factory environment) and delivered ready for installation.

[0007] The member may comprise an elongate body configured to receive fasteners (e.g. screws) anywhere along its length without the need to pre-drill holes. For example, the elongate body may include a groove whose side walls are readily tapped by a screw of an appropriate size. The member may be integrally formed with other parts of its glazing bar, e.g. as a single extrusion.

[0008] The member may be configured to anchor fasteners introduced from above the roof and to one side of the glazing bars (e.g. through the second glazing bar). For example, the elongate body may have a surface which in use opposes the second glazing bar, the surface being inclined at an acute angle (e.g. about 45°) to the plane of the roof being fabricated. In this way, a fabricator securing the glazing bars together may work not only from above the roof but also to one side of the glazing bars which may be more convenient than working vertically above the glazing bars. For example, the surface of the elongate body may be inclined to face away from the roof panel engaged by the glazing bar with the member. Thus, the fabricator may be able to secure the glazing bars together from a position in front of the surface of the elongate body, i.e. on an opposite side of the registered glazing bars to that of the roof panel engaged by the glazing bar with the member.

[0009] The second glazing bar may comprise an auxiliary member for anchoring fasteners extending through the first glazing bar, the auxiliary member being configured to anchor fasteners (e.g. screws) introduced from below the roof during fabrication. The auxiliary member may provide additional security and may be engaged along the length of the glazing bars, either in regions not obscured by an underlying support (e.g. cantilever bracket) or elsewhere possibly even through the underlying support.

[0010] The interfitting profiles may comprise a protuberant "tongue" part and a mating recessed "groove" part, with the former being a snug sliding fit in the latter when the profiles are fitted (pushed linearly) together. The interfitting profiles may comprise two set or groups of mating tongue and groove parts. The two groups of mating parts may be spaced apart, for example on opposite lateral sides of the registered glazing bars, adjacent the roofing panels attached thereto. At least one of the groove parts may have a flared opening to guide

mating engagement with its respective tongue part. The or each tongue part may project in a direction above and to one lateral side of its glazing bar (the one lateral side furthest from the roof panel attached to that glazing bar). The direction may be at approximately 45° to the plane of the roof panel attached to that glazing bar. In this way, the interfitting profiles may only be brought together into mating engagement along the direction in which the or each tongue projects. Once the tongue and groove parts are fitted together, any twisting of one roof panel relative to its adjacent roof panel may be reduced to a maximum of about 1 to 1.5 degrees. This may be important when a bending load is applied to the edge of one of the roof panels.

[0011] The member for anchoring fasteners for securing glazing bars together may form one part of the interfitting profiles, for example, a tongue part. In this way, the member performs two roles simultaneously.

[0012] Embodiments of the invention will now be described by way of example and with reference to the accompanying drawings in which:

Figure 1 is a sectional view of a roof fabricated using known glazing bars;

Figure 2 is a sectional view of a roof fabricated using apparatus according to the present invention;

Figure 3 shows cross sectional detail of glazing bars used in the apparatus of Figure 2;

Figure 4 shows a sectional view of glazing bars according to a second embodiment of the present invention; and

Figures 5a and 5b show sectional views of glazing bars according to a third embodiment of the present invention.

[0013] Figure 2 shows a cantilevered canopy (100) supported on cantilever bracket (102). The canopy (100) comprises a pair of complementary glazing bars (112, 112'), each having a pair of laterally extending flanges (114) for engaging one edge of a respective roof panel (115). The glazing bars (112, 112') have a pair of spaced apart sets of interfitting profiles (limbs 122) for registering one relative to the other. The glazing bar (112) on the left hand side of bracket (102) (hereinafter referred to as "left hand glazing bar") includes a member or section (130) for anchoring screws (140) driven through the other glazing bar (112') (hereinafter referred to as "right hand glazing bar"). The member (130) is configured to receive screws (140) through the right hand glazing bar (112') from above the roof. In this way, the glazing bars (112, 112) sit flush on bracket (102) and without the latter interfering with securing the two glazing bars together.

[0014] As shown in Figure 3, the member (130) of the left hand glazing bar (112) is integrally formed with other parts (flanges 114 and limbs 122) of the glazing bar (112). The member (130) includes an elongate body (132) having a surface (150) which includes a groove

(152) for receiving screws anywhere along its length without the need to pre-drill holes in the member. The surface (150) faces away from flanges (114) of the left hand glazing bar (112), and towards a complementary part (160) of right hand glazing bar (112'). The side walls of groove (152) are substantially perpendicular to the surface of the complementary part (160), with both inclined at an angle of about 45° to the flanges (114) of their respective parts. In use, screws (140) may be driven from above and to the right of the glazing bars (112, 112'), through the complementary part (160) of the right hand glazing bar (112') into the groove (152) of the member (130) of the left hand glazing bar (112).

[0015] Figure 4 shows complementary glazing bars (212, 212') according to a second embodiment of the present invention. Features in common between the complementary glazing bars (112, 112') of Figures 2 and 3 and the complementary glazing bars (212, 212') of Figure 4 share the same reference number for ease of understanding. In the arrangement of Figure 4, the right hand glazing bar (212') includes an auxiliary member (250) depending from roof-like structure (260). The auxiliary member (250) is configured to align with anchor point (170) when the interfitting profiles are in registration. Once registered, a screw may be introduced from beneath the assembly through the left hand glazing bar (212) and into a groove-like recess (252) in an opposing end of the auxiliary member (250).

[0016] Figures 5a and 5b show complementary glazing bars (312, 312') according to a third embodiment of the present invention, in two different stages of assembly. As before, features of the third embodiment in common with the embodiment of Figures 2 and 3 share the same reference number. The glazing bars (312, 312') comprise modified interfitting profiles for registering one relative to the other. The modified interfitting profiles are formed in two groups, with the first group comprising a tongue part (320) on left hand glazing bar (312) and corresponding groove part (325) on right hand glazing bar (312'). The other group of interfitting profiles comprises the member (130) configured as a tongue part (330) to fit corresponding groove part (335) on the right hand glazing bar (312'). The groove parts (325, 335) have flared ends (326, 336) respectively to guide their respective tongue parts (320, 330) into mating engagement therewith. The tongue parts (320, 330) extend in a direction (D) above and to one lateral side of the left hand glazing bar (312), at an angle (α) of about 45° to the plane of flanges (114). Accordingly, the glazing bars (312, 312') must be brought together linearly at such an angle if the tongue parts (320, 330) are to slidably engage corresponding groove parts (325, 335).

Claims

1. Apparatus for fabricating a roof, comprising a pair of complementary glazing bars, each for engaging

one edge of a respective roofing panel, the glazing bars having interfitting profiles for registering one glazing bar relative to the other during roof fabrication, with one glazing bar having a member for anchoring fasteners extending through the other glazing bar to secure the glazing bars together, **characterised in that** the member is configured to anchor fasteners introduced from above the roof during roof fabrication.

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2. Apparatus according to claim 1, in which each glazing bar has its respective roofing panel attached thereto before the complementary glazing bars are registered together during roof fabrication.

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3. Apparatus according to claim 1 or claim 2, in which the member has an elongate body configured to receive fasteners anywhere along its length without the need to pre-drill holes.

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4. Apparatus according to claim 3, in which the elongate body comprises a groove whose side walls are readily tapped by a screw fastener of appropriate size.

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5. Apparatus according to any one of the preceding claims, in which the member is configured to anchor fasteners introduced from above the roof and to one lateral side of the glazing bars when assembled together.

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6. Apparatus according to any one of the preceding claims, in which the interfitting profiles comprise a tongue part and a mating groove part, with the tongue part being a snug sliding fit in the groove part.

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7. Apparatus according to claim 6, in which the interfitting profiles comprise two sets of mating tongue and groove parts, the two sets being spaced apart laterally relative to the glazing bars.

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8. Apparatus according to claim 6 or claim 7, in which the or each groove part has a flared opening to guide mating engagement with its respective tongue part.

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9. Apparatus according to any one of claims 6, 7 or 8, in which the member for anchoring fasteners together forms one part of the interfitting profiles.

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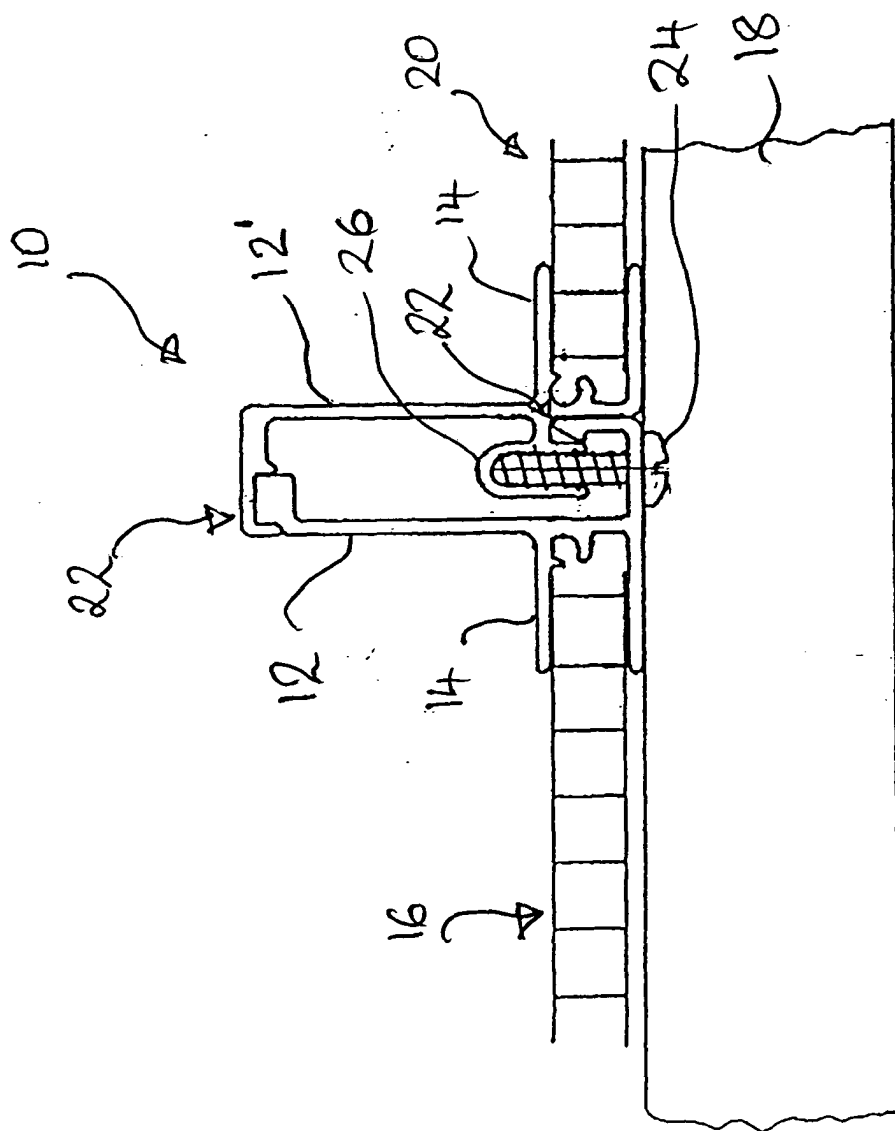


FIGURE 1
(Prior Art)

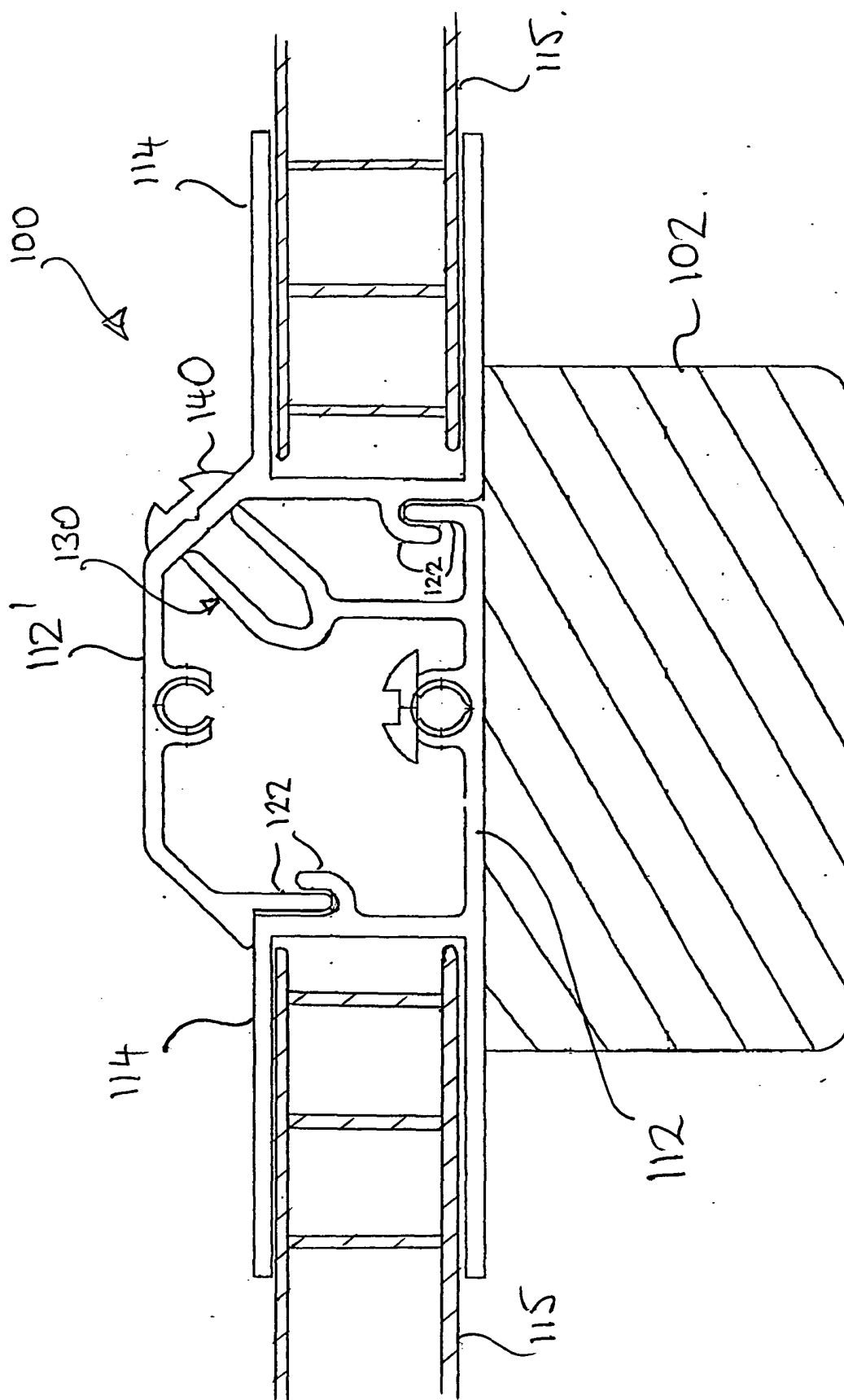


FIGURE 2.

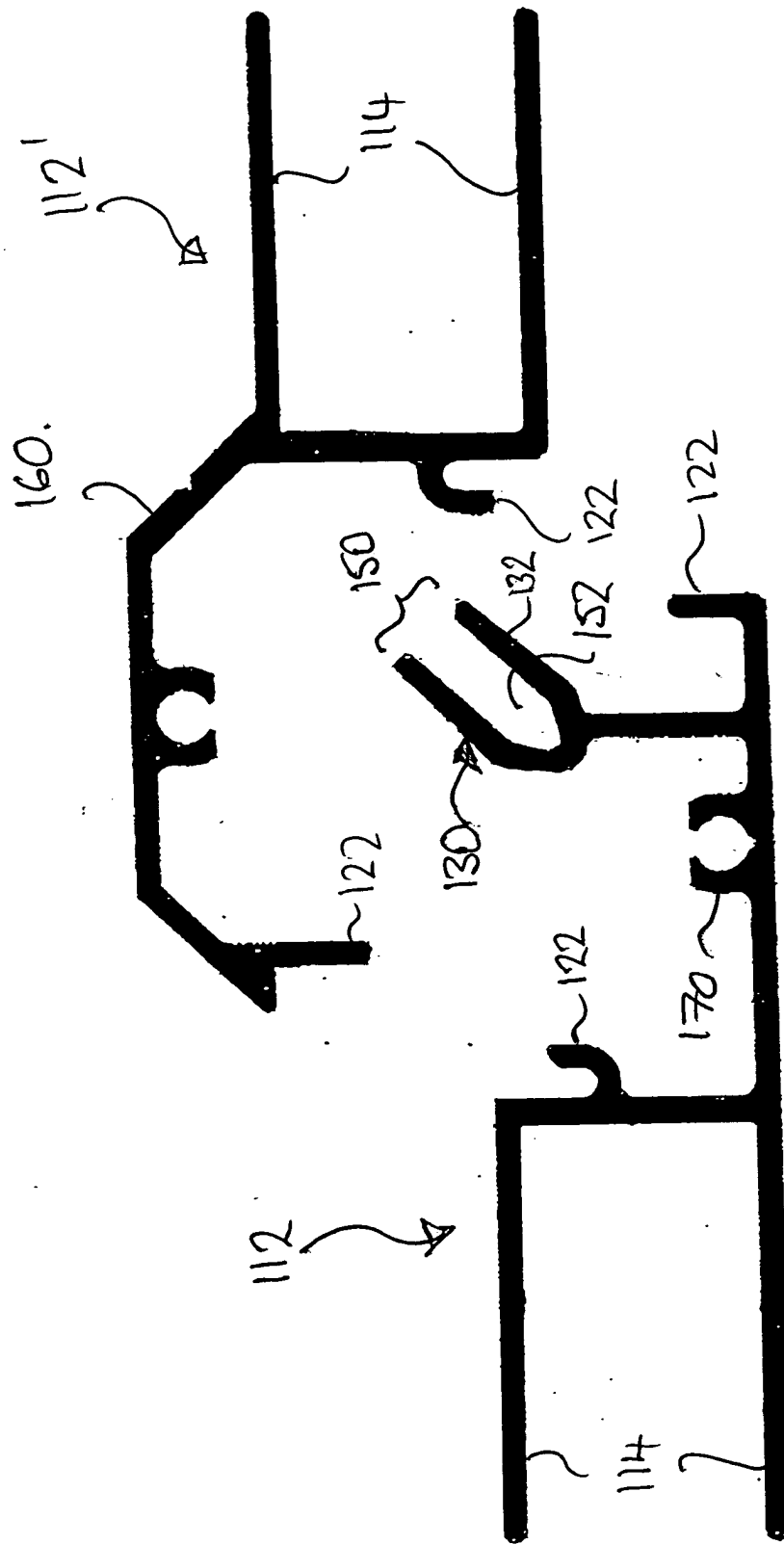


Figure 3.

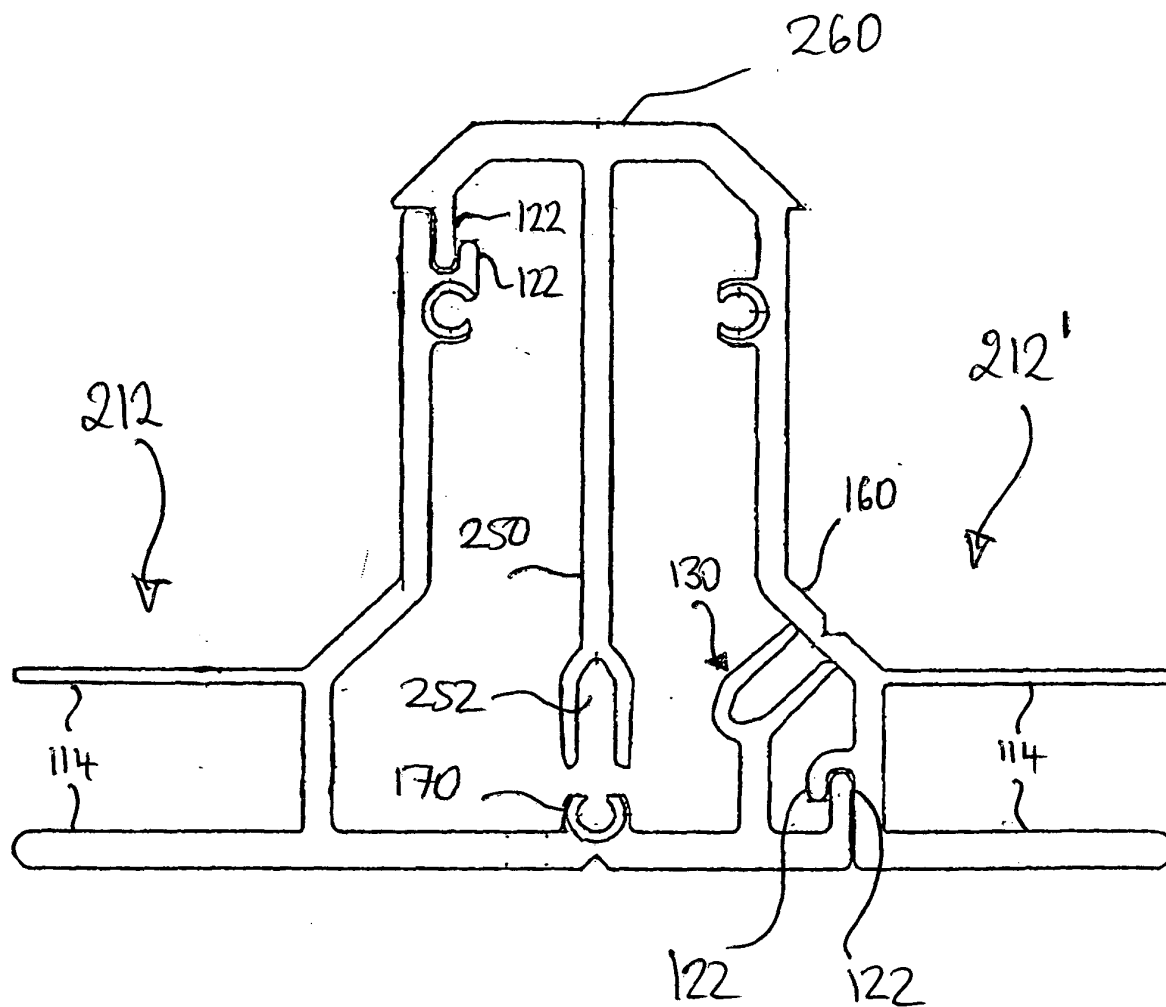


FIGURE 4.

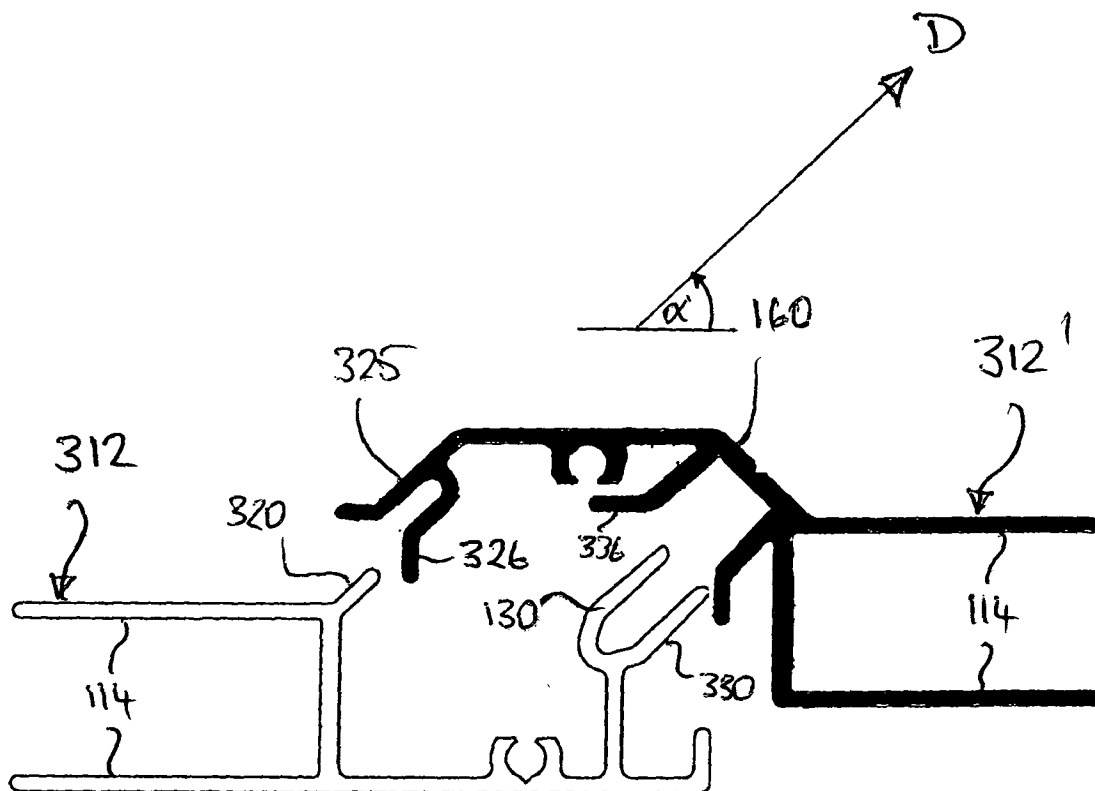


FIGURE 5a

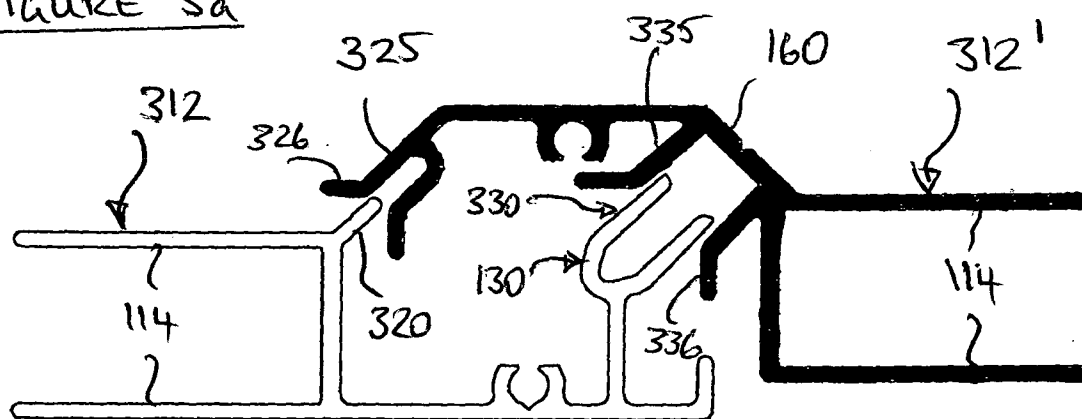


FIGURE 5b



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 3265

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.7)
X	US 5 546 713 A (VOEGELE, JR. ET AL.) 20 August 1996 (1996-08-20)	1,2	E04D3/28
A	* column 3, last paragraph - column 4, paragraph 3; figures 2,5 *	3-9	E04D3/14
A	EP 1 111 152 A (XTRALITE IND. ROOFLIGHTS) 27 June 2001 (2001-06-27) * abstract; figures 1,3,4,7 *	1,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 September 2004	Examiner Righetti, R
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 25 3265

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-09-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5546713	A	20-08-1996	NONE	

EP 1111152	A	27-06-2001	EP 1111152 A2	27-06-2001
			GB 2357783 A ,B	04-07-2001
