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(54) Skylight structure.

(57) The invention relates to a skylight structure, comprising supporting profiles (1) attached to a building or alike (3), said profiles carrying glazing bars along their longitudinal edges for receiving the longitudinal edges of light transmittant panels (4), and further comprising tensioning means (5,6) for tensioning the panels with the glazing bars. In order to make the structure appropriate for receiving panels having different widths the glazing bars comprise an upper part (10) engaging the upper side of a panel and a lower part (11) hingedly connected thereto and engaging the lower side of said panel, wherein the tensioning means exert a force on the upper part which strives for moving closer said upper part and lower part.

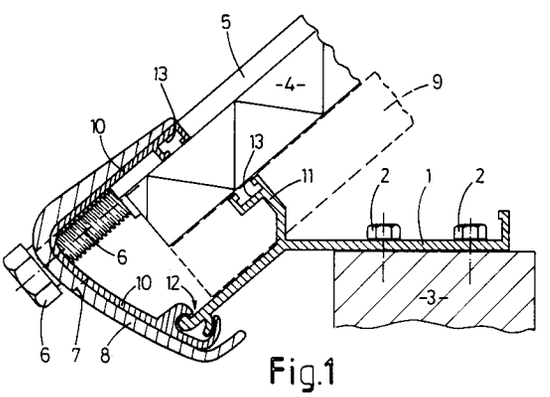

Fig.1

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The invention relates to a skylight structure, comprising supporting profiles attached to a building or alike, said profiles carrying glazing bars along their longitudinal edges for receiving the longitudinal edges of light transmittant panels, and further comprising tensioning means for tensioning the panels with the glazing bars.

A skylight structure of this type is already known in a number of embodiments. One example of such a skylight structure is shown by EP-A-0,129,357. The glazing bars provided in known skylight structures mostly consist of a U-profile, which encloses a respective longitudinal edge of a light transmittant panel with both its legs. Because the light transmittant panels, which generally are produced of glass or plastic, are applied in differing widths, said glazing bars too should have dimensions in correspondence with the panel width. In practice this means that many differing glazing bars have to be produced, kept in stock and applied. This will lead to an unwanted increase of cost.

It is true that it is possible to obtain a certain margin in respect of the width of the panels to be received if the legs of the glazing bars are somewhat deformable, or if between those legs and the glass panels flexible sealing strips are applied. However, these are emergency measures which can ameliorate the problem in a limited way only.

It is an object of the invention to provide a skylight structure of the type referred to above, using which the mentioned disadvantage can be removed in a simple, but nevertheless effective way.

Thus the skylight structure according to the invention is characterised in that the glazing bars comprise an upper part engaging the upper side of a panel and a lower part hingedly connected thereto and engaging the lower side of said panel, wherein the tensioning means exert a force on the upper part which strives for moving closer said upper part and lower part.

When, using the tensioning means, the glazing bars and the panels are tensioned (for example through a tensioning bolt, as described in EP-A-0,129,357), the upper part and lower part of the glazing bars each are hingeably relative to each other in such a way as to adapt themselves to the width of the panel therebetween. As a result one single glazing bar may be used for receiving panels having different widths. So, because one single glazing bar is universally applicable to skylight structures with different panels, the production of the glazing bars may be strongly simplified. As a direct consequence the amount of different glazing bar types to be kept in stock is strongly reduced. Further, during assembly of a skylight structure upto the last instance a modification of the panel width to be applied can be carried out without consequences in respect of the glazing bars to be applied. Thus the entire system becomes more flexible.

According to a preferred embodiment of the skylight structure according to the invention the hinged connection between the upper part and the lower part of the glazing bars is constituted by cooperating edges of both parts defining an axis of rotation. The cooperation between these edges of both parts may be realised in different ways. It is conceivable that, in the region of said edges, both parts are hingedly connected, however in a non-releasable way. It is possible too, that the hinged connection is constituted by edges of both parts shaped in such a way that indeed a hinged connection is constituted but that said parts may be disconnected from each other easily, if desired. In this aspect a construction is conceivable in which both parts may be joined at said edges in a defined relative position, whereafter in the operative positions (that means the positions in which they functionally enclose a panel therebetween) they are firmly interconnected constituting the hinged connection.

Further, it is preferred in a constructive sense that the lower part of the glazing bars is an integral part of the supporting profile. Thus, in such a construction the upper part is hingeable relative to the supporting profile.

However, it is conceivable too that the lower part of the glazing bars is constituted by a part attachable to the supporting profile in one defined position. This means that the lower part basically is not an integral part of the supporting profile, but, dependent upon the skylight structure to be constructed, is attached to the supporting profile in a defined position. Next the upper part is hingedly provided relative to said lower part or relative to said supporting profile.

It is noted, that EP-A-0,415,667 already shows a skylight structure comprising a glazing bar hingedly connected to a supporting profile. However this only allows an amendment of the position of the glazing bar in its entirety relative to the supporting profile. The hinged connection does not allow a modification of the shape of the glazing bar for an adaptation to different panel widths.

Hereinafter the invention will be elucidated referring to the drawing, in which an embodiment of the skylight structure according the invention is illustrated.

Fig. 1 shows partially a cross section of an embodiment of the skylight structure according to the invention comprising a panel having a first width, and

Fig. 2 shows a cross section in correspondence with fig. 1, however comprising a panel having a

smaller width.

The skylight structure to be described belongs to a type of skylight structures which, among others, is already described in EP-A-0,129,357 and 0,415,667 as well as NL-C-145,630. In such a type of skylight structure supporting profiles 1 are applied attached to a part of a building 3 using appropriate attachment means 2 (bolts or alike). The respective part of the building could for example be a wall of a shopping arcade, which has to be closed at its top by such a skylight structure.

Generally two supporting profiles 1 are applied in a skylight structure, said profiles extending in parallel at some distance and receiving the longitudinal edges of the light transmittant panels to be applied, such as plastic panels or glass panels. For this the supporting profiles carry along their longitudinal edges glazing bars or glazing bar sections, in which the longitudinal edges of the panels 4 are received.

Further generally tensioning profiles 5 engaging the outer surface of the panels (preferably at the connection seam between two adjoining panels) are applied which can be tensioned using appropriate tensioning means, such as tensioning bolts 6. The tensioning bolts 6 generally extend through appropriate openings 7 in the glazing bars or in tensioning hooks 8 enclosing the glazing bars. Finally supporting beams 9 may be applied extending below the supporting profiles 1 which support the panels 4 and offer thereto the desired shape.

For a detailed description of such skylight structure reference is made to the patent documents mentioned before.

In correspondence with the invention the glazing bars comprise an upper part 10 engaging the upper side of panel 4 and a lower part 11 hingedly connected thereto and engaging the lower side of the panel 4. In the embodiment shown in the figures the lower part 11 is an integral part of the supporting profile 1. However, this is not necessary; there are also different ways to connect the lower part 11 to the supporting profile 1 other than integrally.

The edge of the lower part 11 not engaging the panel 4 together with the corresponding edge of the upper part 10 forms a hinged connection 12, such that the upper part 10 and lower part 11 are hingeably relative to each other. In the illustrated embodiment the shape of the cooperating edges of the upper part 10 and the lower part 11 is such that the hinged connection 12 is disconnectable if the panel 4 has been taken out between both parts and next both parts are entirely pivoted towards each other. However, disconnecting the hinged connection 12 is impossible if the panel 4 is present.

The shape of the tensioning hook 8 depends upon the shape of the upper part 10. The tensioning bolt 6 extending through the opening 7 in the tensioning hook 8 engages the tensioning profile 5, such that at one hand this tensioning profile 5 is tensioned for fixating the panel 4, and at the other hand a force is exerted on the upper part 10 striving to rotate it clockwise, as seen in the figure. As a result the upper part 10 is in positive way pressed against the outer surface of the panel 4.

The ends of the upper part 10 and lower part 11 comprise recesses 13 into which, if desired, flexible sealing profiles may be provided (such as the sealing profile 14 in fig. 2).

In the illustrated embodiment the lower part 11 has a fixed position, whereas the upper part 10 may rotate relative to the lower part 11. However, it is conceivable too that the upper part 10 has a fixed position whereas the lower part 11 may rotate for a compensation of the width of a panel 4 received therebetween.

Instead of a tensioning bolt 6 also other tensioning means, known per se, may be applied which can take care of exerting a force striving to rotate the upper part 10 relative to the lower part 11 for adapting their relative distance in correspondence with the width of a panel 4 received therebetween.

Instead of the illustrated disconnectable hinged connection 12 also other hinged connections are conceivable being or not being disconnectable. It is even conceivable that a so-called living hinge is applied, comprising a material weakening.

Fig. 2 shows a view in correspondence with fig. 1, however having applied a panel 4' with reduced width. Moreover a sealing profile 14 is provided now in the recess 13 of the upper part.

The force exerted by the tensioning bolt 6 on the tensioning hook 8 and therefore on the upper part 10 has caused a clockwise rotation of the upper part 10 relative to the lower part 11, starting from a position according to fig. 1. As a result the ends of the upper part 10 and lower part 11 comprising the recesses 13 have moved closer such that the panel 4' is correctly received between these parts 10 and 11 forming the glazing bar.

The skylight structure according to the invention is applicable to panels having a flat shape and having a curved shape. Further it is possible to apply the structure to systems in which the tensioning bolt 6 has been replaced by other tensioning means, such as screws extending from the upper side through the upper part 10 and the panel 4 and being attached to the structure below (the supporting profile 1 or even the building 3).

The invention may be varied widely within the scope as defined by the claims.

Claims

1. Skylight structure, comprising supporting profiles attached to a building or alike, said profiles carrying glazing bars along their longitudinal edges for receiving the longitudinal edges of light transmittal panels, and further comprising tensioning means for tensioning the panels with the glazing bars, **characterised** in that the glazing bars comprise an upper part engaging the upper side of a panel and a lower part hingedly connected thereto and engaging the lower side of said panel, wherein the tensioning means exert a force on the upper part which strives for moving closer said upper part and lower part.

2. Skylight structure according to claim 1, **characterised** in that the hinged connection between the upper part and the lower part of the glazing bars is constituted by cooperating edges of both parts defining an axis of rotation.

3. Skylight structure according to claim 1 or 2, **characterised** in that the upper part and lower part are disconnectable from each other.

4. Skylight structure according to one of the claims 1-3, **characterised** in that the lower part of the glazing bars is an integral part of the supporting profile.

5. Skylight structure according to one of the claims 1-3, **characterised** in that the lower part of the glazing bars is constituted by a part attachable to the supporting profile in one defined position.

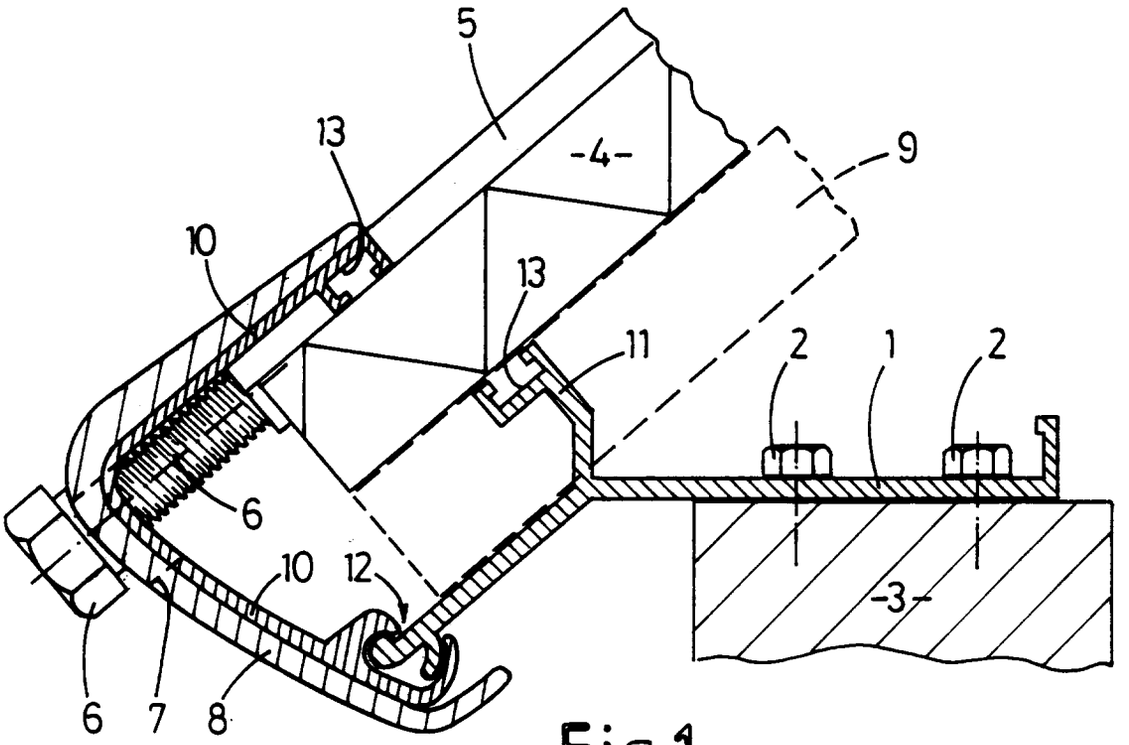

Fig.1

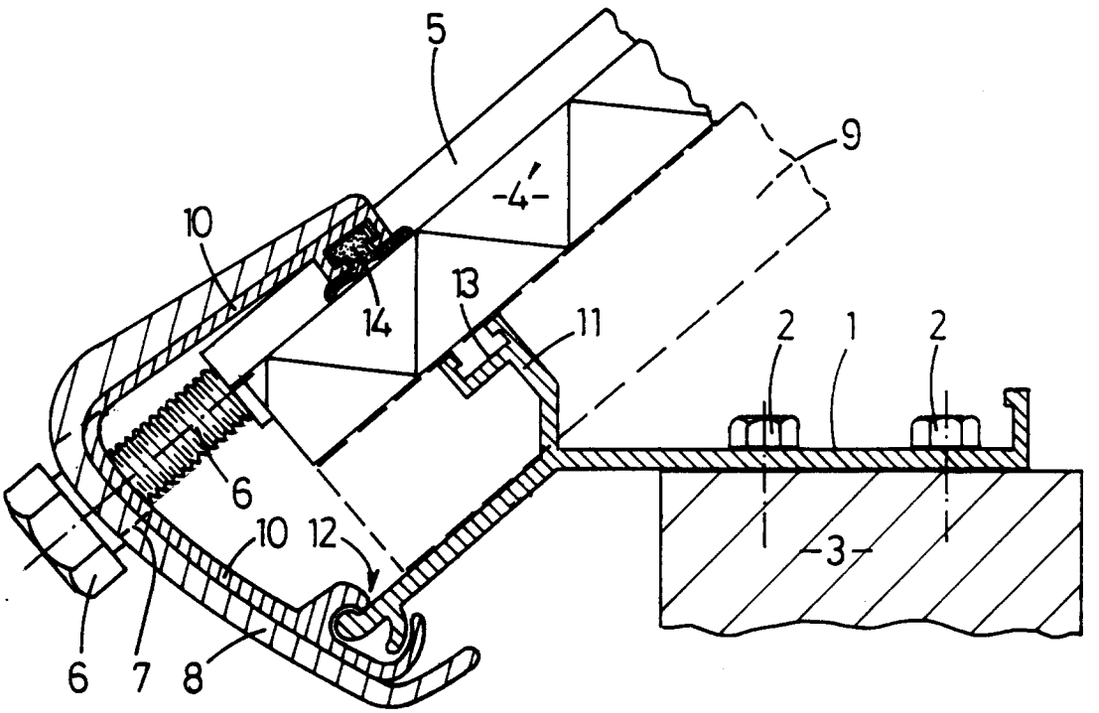

Fig.2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 20 0510

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	DE-A-23 36 747 (E. THUM) * page 6 - page 8; figures * ---	1-5	E04D3/08 E04D13/03
X	GB-A-258 008 (H. BARTLETT) * page 2, line 20 - line 103; figures * ---	1-5	
A	DE-A-42 27 756 (E. THUM ET AL.) * the whole document * ---	1-5	
A	EP-A-0 191 274 (LANTER SRL) * page 3, line 11 - page 4; figures * ---	1	
A	GB-A-600 173 (W. F. HOWARD) * figure 2 * -----	1-4	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23 June 1995	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
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