



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.11.2007 Bulletin 2007/45

(51) Int Cl.:
E04D 13/03 ^(2006.01) **E04D 3/28** ^(2006.01)
E04C 2/54 ^(2006.01)

(21) Application number: **07106686.4**

(22) Date of filing: **23.04.2007**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**
Designated Extension States:
AL BA HR MK YU

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(30) Priority: **27.04.2006 BE 200600252**

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(54) **Assembled roof element particularly intended for a skylight barrel vault**

(57) Assembled roof element, comprising at least one first light-transmitting profiled plate for the purpose of forming an element supporting the assembled roof el-

ement, this profiled plate being manufactured from a composite material; and at least one second plate of a plastic material, which plate is supported by the at least one first plate.

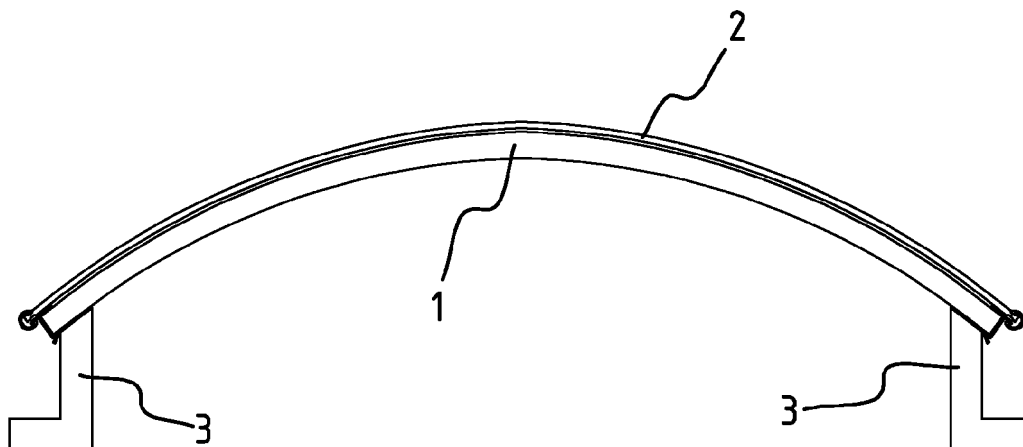


FIG. 1

Description

[0001] The present invention relates to an assembled roof element comprising at least one first profiled plate which is manufactured from a composite material and which serves as element supporting the assembled roof element.

[0002] In this paragraph a number of examples of known roof elements for skylight barrel vaults are described. A roof element which is common in Belgium is constructed from one or more profiled plates which are manufactured from a polyester resin reinforced with glass fibres. These are referred to as PRV (polyester renforcé de fibres de verre) skylight barrel vaults. In such skylight barrel vaults the U-value is relatively high. The U-value, or coefficient of heat transmission (W/m^2K), indicates how much heat is lost per second through $1 m^2$. Therefore, the lower the U-value, the better the roof element insulates.

[0003] Another known skylight barrel vault is constructed from a combination of aluminium curved profiles for supporting multi-walled polycarbonate plates. Such a construction has the drawback that expensive aluminium profiles are necessary.

[0004] The present invention has for its object to propose an assembled roof element for which the desired U-value and rigidity can be obtained in simple manner with an inexpensive construction in which expensive aluminium supporting profiles are not necessary.

[0005] The invention is distinguished for this purpose in that the assembled roof element comprises

- at least one first light-transmitting profiled plate for the purpose of forming an element supporting the assembled roof element, this profiled plate being manufactured from a composite material; and
- at least one second plate of a plastic material, which plate is supported by the at least one first plate.

[0006] The first plate of a composite material thus functions here as the supporting element, while the U-value can be brought to the desired value by a suitable choice of a multi-walled plate.

[0007] The second plate is preferably a flexible multi-walled plate.

[0008] The composite material is preferably a resin from the group of: polyester resin or other thermoset resins. Glass fibres can optionally be added to further strengthen the material.

[0009] The plastic material of the second plate is preferably a material from the group of: polycarbonate, acrylate, PET or other thermoplasts. These materials have the advantage that light-transmitting, flexible and light multi-walled plates can be manufactured, for instance by extrusion. The top side of the second plate must here preferably be given a UV-resistant form.

[0010] For an improved strength of the first profiled plate of composite resin, this plate can have a ribbed

profile in longitudinal section. The profiled supporting plate preferably describes an arcuate form in transverse direction.

[0011] The multi-walled plates are preferably provided on two transverse sides with a connecting profile, whereby the transverse sides of two adjacent second plates can be connected to each other. This can for instance be a protruding transverse part on a first transverse side and a transverse recess on the other transverse side, which can be mutually engaging.

[0012] According to a possible embodiment the multi-walled plate is bent close to the longitudinal side for mounting these longitudinal sides on an upstand. This can typically take place by means of a simple bending process.

[0013] According to another possible embodiment the first and second plate can be mounted on an upstand by means of a mounting profile, optionally with additional clamping profile.

[0014] The invention will be further elucidated on the basis of a number of non-limitative exemplary embodiments of the assembled roof element according to the invention, with reference to the accompanying figures, wherein:

figure 1 is a schematic cross-section of an assembled roof element according to the invention arranged on upstands;

figures 2 (A), (B), (C), (D) show four possible variants for mounting of the roof element on the upstand;

figures 3 (A), (B), (C) show three possible longitudinal sections of the ends of a multi-walled plate of an assembled roof element according to the invention; figures 4 (A), (B) show two possible longitudinal sections of the first plate of composite resin of an assembled roof element according to the invention.

[0015] The same components are designated in the figures with the same reference numerals.

[0016] The assembled roof element shown in cross-section in figure 1 comprises one first curved plate 1 manufactured from a composite resin and one second multi-walled flexible plate 2 of a plastic material. The second multi-walled flexible plate is supported by the first rigid plate 1. This embodiment is typically used in so-called skylight barrel vaults, wherein a number of such assembled roof elements can be arranged adjacently of each other in longitudinal direction on upstands 3.

[0017] Figure 2(A) shows a first method of mounting the roof element on upstand 3. The supporting first plate 1 is pushed into a profile 4. Second plate 2 is fixed by means of a clamping profile 5. In the shown embodiment this clamping profile 5 engages behind a protruding rib 17 of profile 4 and in a recess 18 which is provided on the top side of plate 2, close to the longitudinal side thereof.

[0018] Figure 2(B) illustrates a second method of connecting the roof element to the upstand. First and second

plates 1, 2 are herein mounted on upstand 3 by means of a mounting profile 4 fixed to the upstand and having two longitudinal channels for the respective longitudinal sides of plates 1, 2.

[0019] Figure 2(C) shows a third variant in which the second plate is bent along a longitudinal seam 5 and connected to the upstand by means of a screw 6.

[0020] Figure 2(D) shows a fourth variant in which plate 1 is connected by means of a screw 8 to an upstand with an oblique top side and plate 2 is connected by means of a screw 7 to the first plate.

[0021] Note that these are only a number of examples and that any method known in the art suitable for the roof element can be employed.

[0022] Figures 3(A)-(C) show three examples of a second plate in longitudinal section.

[0023] According to a first variant, which is shown in figure 3(A), two adjacent second plates are mutually connected in longitudinal direction by an overlapping and snapping connection. In the shown embodiment a first transverse side of a second plate is provided for this purpose with a substantially gutter-like part 20 with a downward directed opening, and the other transverse side is provided with two flexible, upward directed ribs 21, 22. This gutter-like part 20 and ribs 21, 22 co-acting therewith are formed such that the ribs can be snapped into the gutter-like part. This gutter-like part 20 and ribs 21, 22 can be manufactured integrally with second plate 2.

[0024] A second variant, shown in figure 3(B), has a protruding transverse part 10 on a first transverse side thereof, and a transverse recess 9 on a second transverse side. In this manner adjacent second plates can be mutually connected in simple manner. According to a second variant, shown in figure 3(C), a transverse side is provided with a vertical flange 12, which can be arranged in a transverse gutter 11 on the other transverse side of an adjacent plate 2. Once again it is possible to envisage many other variants which are known to the skilled person.

[0025] Finally, figure 4 shows two examples of a first plate 1 in longitudinal section. According to a possible embodiment, strengthening ribs 13 are provided in transverse direction, wherein one transverse rib 13 overlaps in each case with a transverse rib 13' of an adjacent plate. According to another possibility shown in figure 4(B), the first curved plate is plane and a gutter-flange 15, 14 connection is used to mutually connect adjacent plates.

[0026] The invention is not limited to the above illustrated examples, and the scope of protection is defined solely by the appended claims.

Claims

1. Assembled roof element, comprising
 - at least one first light-transmitting profiled plate for the purpose of forming an element supporting

the assembled roof element, this profiled plate being manufactured from a composite material; and

- at least one second plate of a plastic material, which plate is supported by the at least one first plate.

2. Assembled roof element as claimed in claim 1, **characterized in that** the or each second plate is a multi-walled plate.
3. Assembled roof element as claimed in claim 1, **characterized in that** the second plate is flexible.
4. Assembled roof element as claimed in claim 1, **characterized in that** the first plate is curved.
5. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the composite material is a resin from the group of: polyester resin, thermoset resins.
6. Assembled roof element as claimed in any of the claims 1-5, **characterized in that** the plastic material of the second plate is a material from the group of: polycarbonate, acrylate and other thermoplasts.
7. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the or each profiled plate is bent.
8. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the multi-walled plate is provided on both transverse sides with a connecting profile, whereby transverse sides of two adjacent second plates can be connected to each other.
9. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the second plate is bent close to each longitudinal side for mounting of this longitudinal side on an upstand.
10. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the first and second plate can be mounted on an upstand by means of a mounting profile.
11. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the first plate can be mounted on an upstand by means of a mounting profile and that the second plate can be connected to the first plate by means of a clamping profile.
12. Assembled roof element as claimed in any of the foregoing claims, **characterized in that** the top side of the second plate is UV-resistant.

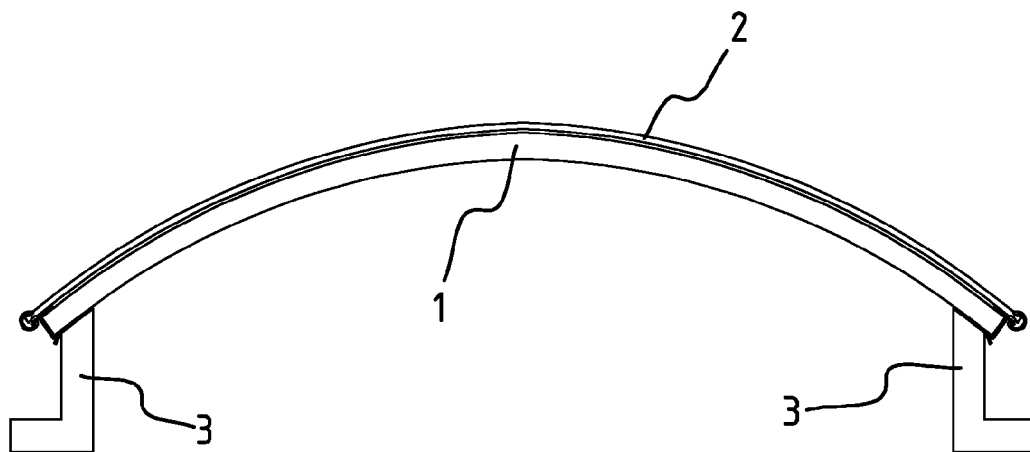


FIG. 1

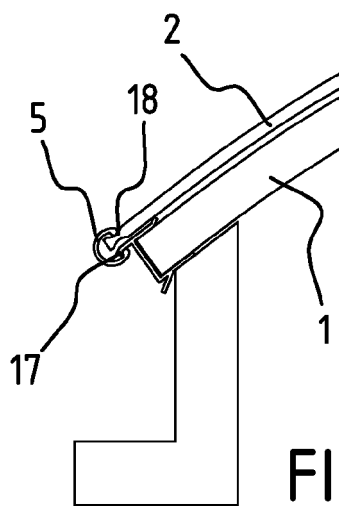


FIG. 2A

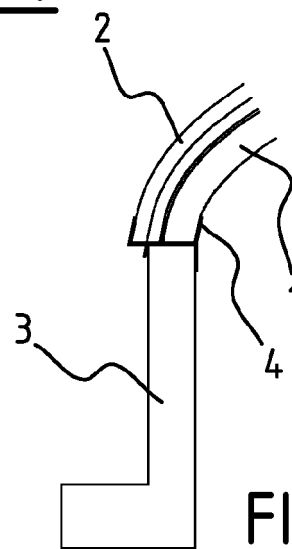


FIG. 2B

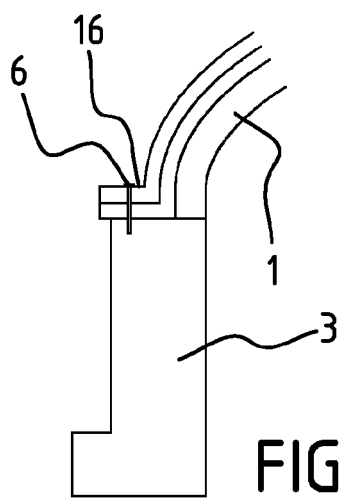


FIG. 2C

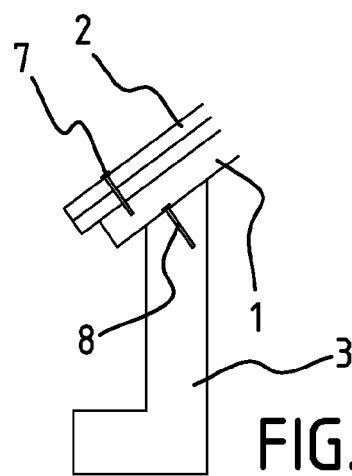


FIG. 2D

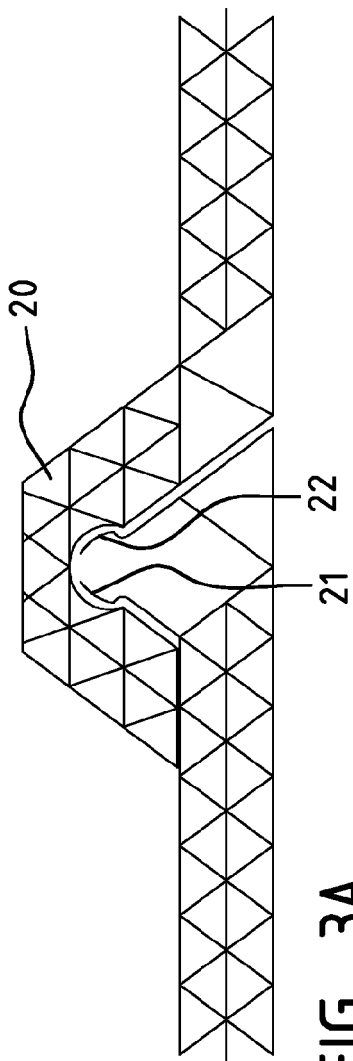


FIG. 3A

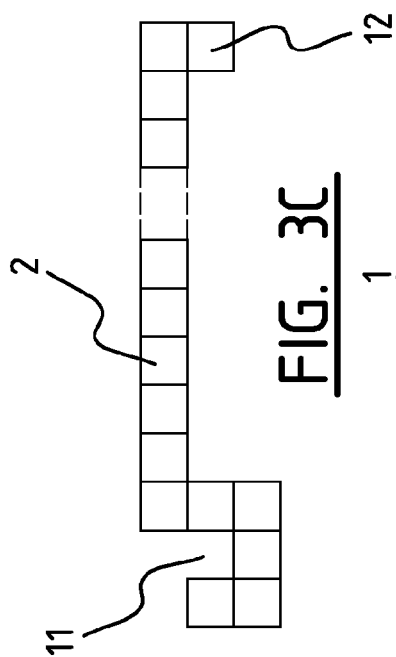


FIG. 3C

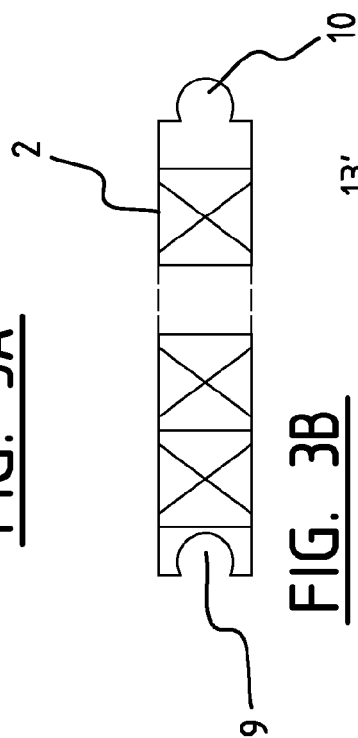


FIG. 3B

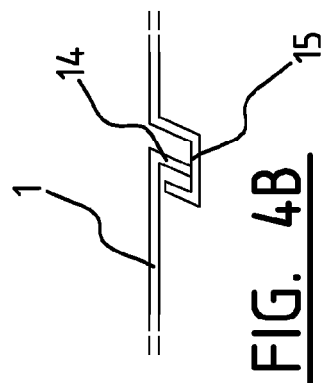


FIG. 4B

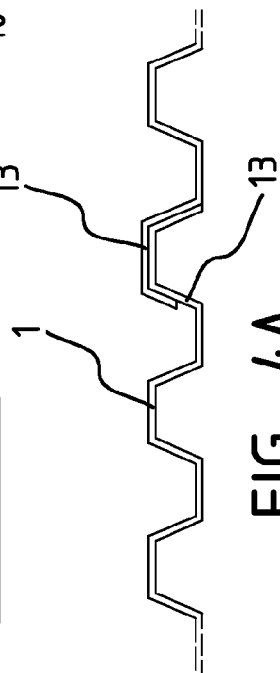


FIG. 4A



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 6686

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	BE 1 011 338 A6 (METAALKONSTRUKTIE EN HANGARBOU [BE]) 6 July 1999 (1999-07-06)	1,3-7, 9-12	INV. E04D13/03 E04D3/28 E04C2/54
Y	* page 2, last paragraph - page 4, paragraph 2; figures *	2	
Y	DE 86 01 903 U1 (COLT INTERNATIONAL GMBH, 4190 KLEVE, DE) 5 June 1986 (1986-06-05)	2	
A	* page 5, last paragraph; figures 1-3 *	1,3-7, 9-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E04C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 2 August 2007	Examiner Demeester, Jan
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 03.82 (P04C01)

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

EP 07 10 6686

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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02-08-2007

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