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(71) Applicant *(for all designated States except US)*: **ALUMINCO S.A.** [GR/GR]; GR-320 11 Inofyta, Viotia (GR).

(72) Inventor; and
(71) Applicant : **KARRAS, Anargyros** [GR/GR]; GR-320 11 Inofyta, Viotia (GR).

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(54) **Title**: SUPPORTING SYSTEM FOR PHOTOVOLTAIC MODULES ON TILE ROOFS OF ALUMINUM PROFILE

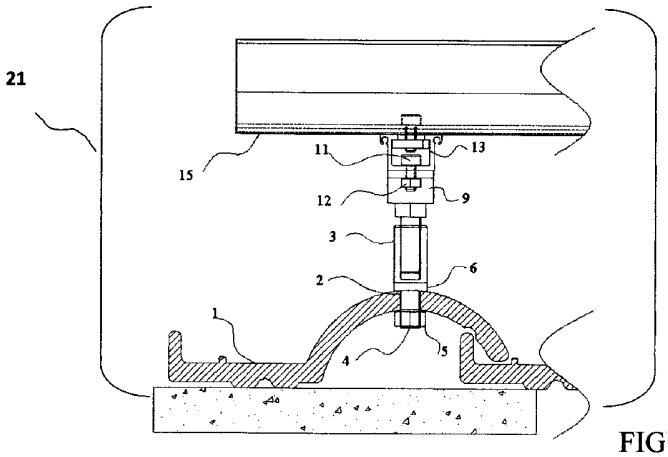

FIGURE 2

(57) **Abstract**: The invention relates to a supporting system for photovoltaic modules on tile roofs of aluminum profile, consisting of roman type tile (1) or another type made of cast aluminum including a device for adjusting the degree orientation of the modules (19). On the surface area of the tile roof we replace in selected locations, some natural tiles with tiles of identical shape, made of cast aluminum to mount the guides (13) firmly with the aluminum tiles (1) and the tiles (1) with the wooden beams of the roof (19) with a special component (18), screw (17) and a special nut (16).

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DESCRIPTION

SUPPORTING SYSTEM FOR PHOTOVOLTAIC MODULES ON TILE ROOFS OF ALUMINUM PROFILE

The invention refers to a supporting system for photovoltaic modules on tile roofs of aluminum profile.

Until now, manufacturing technology of supporting systems for photovoltaic modules on tile roofs, has not shown any similar structure. It's limited to conventional systems where the basic principle is based on the following technical rule: to mount the supporting guides over which the photovoltaic panels are placed, existing tiles are removed from selected areas, and on the wooden beams supporting the roof, metal components are mounted with screws, so their form follows the shape of the tile and creates an outlet for supporting the guides. This technical standard has significant disadvantages, where the most important thing is the precise break of part of the tile, not always achieved, in order to achieve the output of the component on which the guide is mounted and generally this method is time and money consuming .

The invention, as stated in the following, intends and succeeds in solving these basic disadvantages in a way that creates a brand new technical rule in manufacturing technology of supporting systems for photovoltaic modules on tile roofs by replacing selected natural tiles, with roof tiles of cast aluminum and the support of the photovoltaic modules on these with supporting media providing the following advantages:

1) Strong support of the photovoltaic modules onto the roof.

2) Ability for automatic adjustment of the required degree orientation of the photovoltaic modules.

3) Significant reduction in construction time.

4) Reduce manufacturing costs.

Below is figured and analyzed a detailed example of applying the invention, that must not be treated as a rule, regarding the supporting media of the photovoltaic modules on the tile:

Figure 1 shows in perspective a Roman style tile made of cast aluminum with a regulating bearing, on which the guide is mounted (13).

Figure 2 shows a view of the guide (13) mounting on the regulating bearing of the aluminum tile (1)

Figure 3 shows a view of the support of the photovoltaic modules on the edge and

middle of the underlying guides, as well as the profile distal strut (20) .

Figure 4 shows a view of the regulating bearing mounting onto the aluminum tile (1)

The figures show a supporting system for photovoltaic modules on tile roofs of aluminum profile consisting of roman type tile (1) or another type, made of cast aluminum that has a hole (2), in which the support media for the photovoltaic cells are mounted (21). Further, in the hole of the tile (1), a special nut (3) is placed, as shown in Figure 1, which has on its bottom part a threaded extension (4) and is steadily mounted with a nut (5). Among tile (1) and special nut (3) there is a sealing gasket (6) . Within the special nut (3) an adjusting screw is bolted (7), and on its top a component supported of aluminum profile is mounted (9), with a nut (8). The component (9) has holes (10), on which are placed screws (11) who support the guide (13) with nuts (12). The guides (13) are placed parallel to the length of the tile, at least two, in proportional distances. Onto the guides (13) are placed and mounted guides (15) in similar positions who have cavities on which goes a special nut (16) with screw (17) and by means of the component (18) is achieved the support of the modules (19) as shown in Figure 3. On the surface area of the tile roof we replace in selected locations, some natural tiles with tiles of identical shape, made of cast aluminum to mount the guides (13) firmly with the aluminum tiles (1) and the tiles (1) with the wooden beams of the roof.

These key components are assembled as shown in the attached drawings in such a basic construction and operation of theirs. Features of detailed modifications are not discussed in this description and drawings. For any construction need, the shapes of tiles or components can be modified, without changes in the basic principle of the invention with the aforementioned in paragraph 1 benefits.

For the mass production of these components and aluminum profiles are required:

- Manufacturing of aluminum casting molds for each type of tile, which may subsequently be dyed in the color of the remaining natural tiles.
- Manufacturing of matrices for profile production.

CLAIMS

1: A supporting system for photovoltaic modules on tile roofs, characterized by tile (1) made of cast aluminum in identical shape as the current shape of the natural tile roof, which has a hole (2) as a socket for supporting media for photovoltaic modules (21).

2: A supporting system for photovoltaic modules on tile roofs in accordance with claim 1, characterized by the means of support media (21) consists of the following: special nut (3) mounted firmly on the tile (1) with nut (5). In the thread of the nut (3) an adjusting screw is bolted(7), which in the upper part has a profile (9) mounted firmly on the adjusting screw (7) with nut (8) and has holes (10) where with screws (11) and nuts (12), the guide (13) is firmly mounted ,on which is mounted theunderlying driver (15), on which the photovoltaic panel (19) is supported by the component (18) with screws (17) and the special nuts (16).

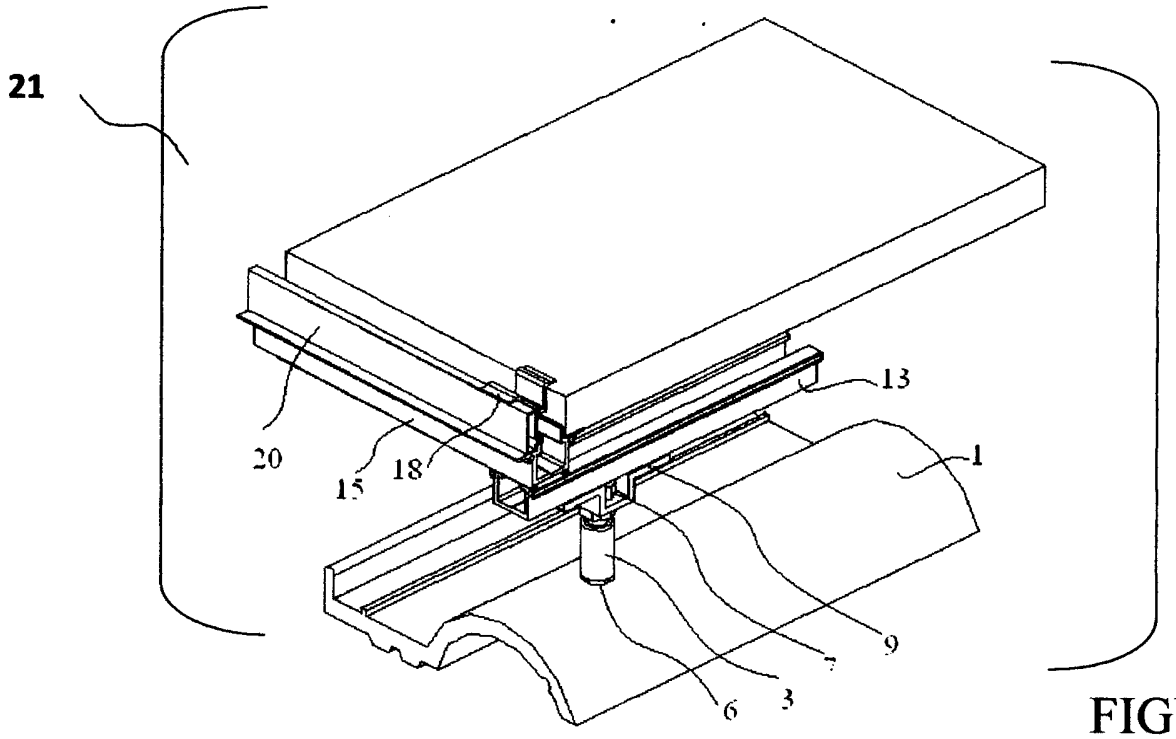

FIGURE 1

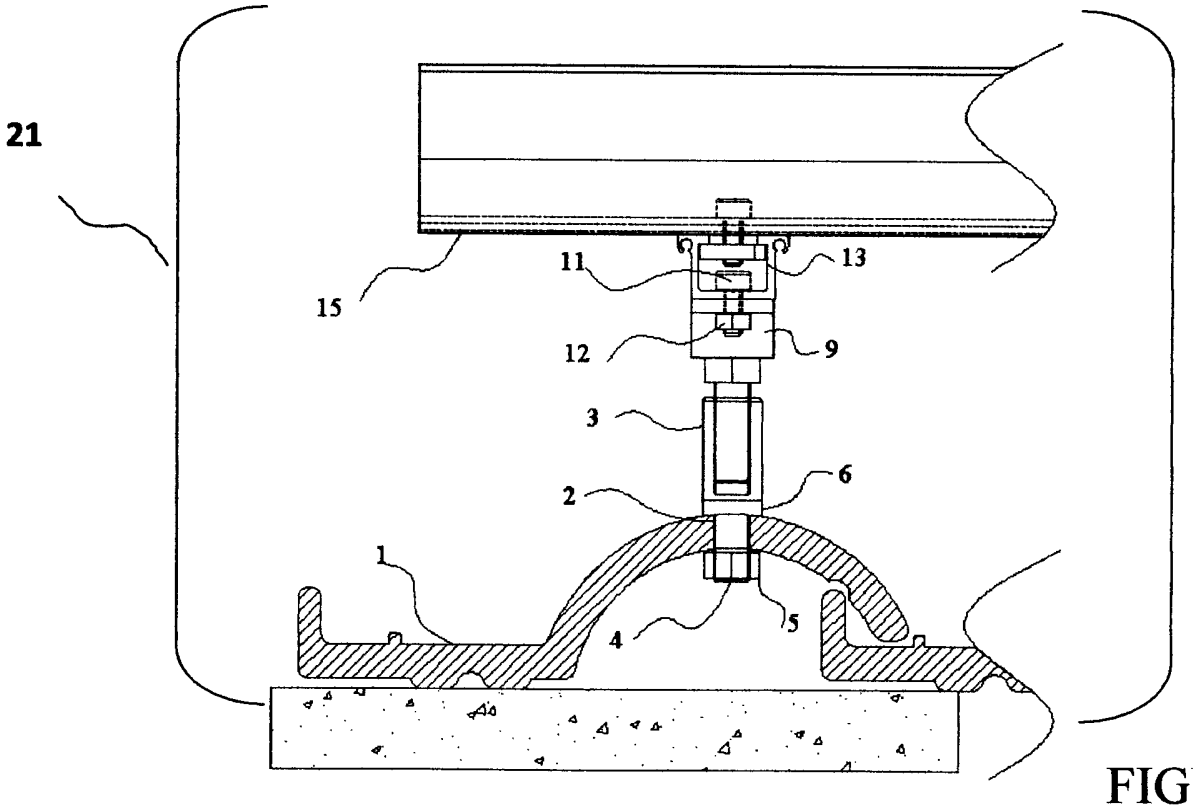

FIGURE 2

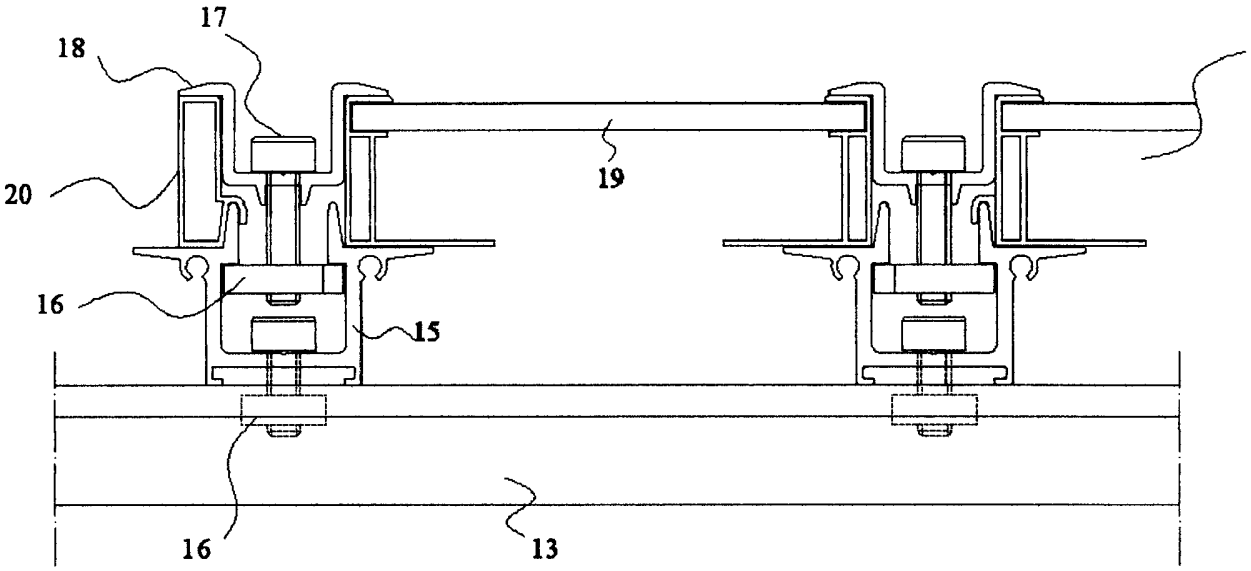

FIGURE 3

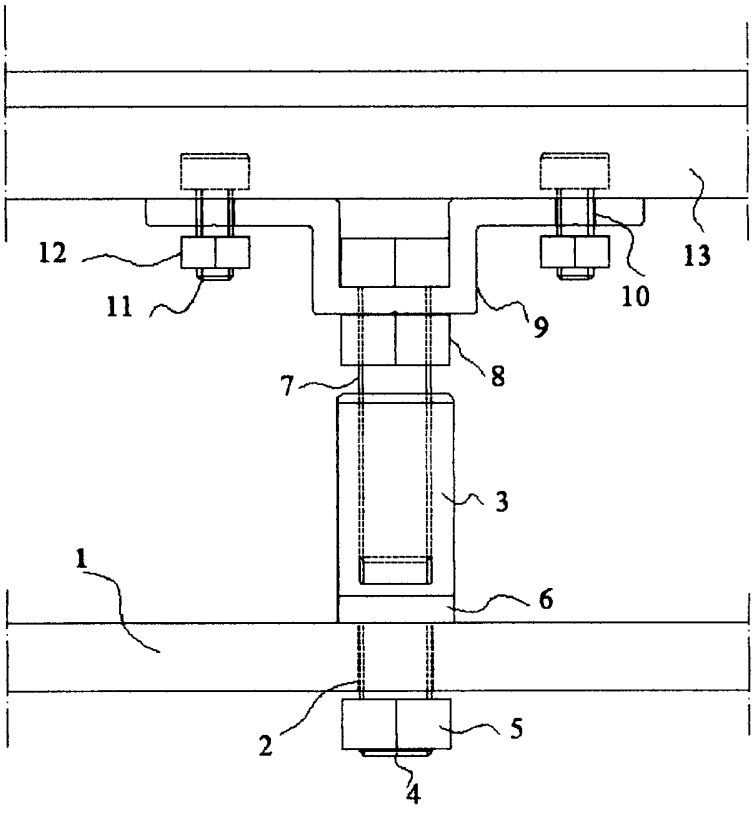

FIGURE 4

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. H01L31/048 F24J2/52
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01L F24J E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2008 127866 A (YAMADE KK) 5 June 2008 (2008-06-05) figures	1,2
Y	GB 1 389 025 A (POWEL AUTOMATION LTD) 3 April 1975 (1975-04-03) column 3, line 15 - column 3, line 22; figures	1
Y	US 2006/118163 A1 (PLAISTED JOSHUA R [US] ET AL PLAISTED JOSHUA REED [US] ET AL) 8 June 2006 (2006-06-08) figures 3b,4a,4b,5b	2
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 July 2012	20/07/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ferro Pozo, José

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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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