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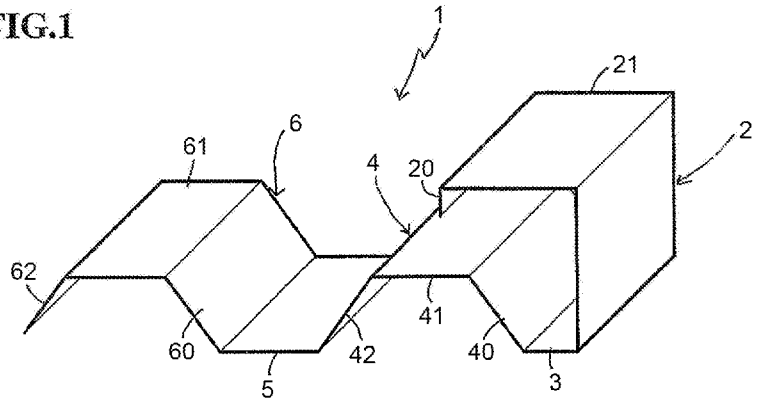
(54) Title: ANCHORING BRACKET FOR COVERS

FIG.1



(57) Abstract: An anchoring bracket for covers is described substantially composed of a shaped profile wherein an L- shaped element (2) having a free end is provided with an edge (20) folded orthogonally and the other end is provided with a modeled sector so as to couple with the shape of a cover slab and engage therewith. In particular, in the L-shaped element, the short arm (21) of the L constitutes a support and anchoring plate for any guide or fixing device for panels or installation structures such as walkways, air conditioners or any other plant that is to be installed on the cover.

DESCRIPTION

"Anchoring bracket for covers"

[0001] The present invention relates to an anchoring bracket particularly suitable for fixing structures on covers for the building industry.

[0002] As is well known, these days the installation of solar or photovoltaic plants for the generation of clean energy is becoming increasingly frequent. In addition, walkways or other installations such as machinery for air conditioning are required to be installed on industrial covers.

[0003] There are numerous fixing systems on the market for e.g. photovoltaic plants and various types of installations to be applied on industrial fretted covers.

[0004] At present, the fixing systems are made up of guides that are fixed to the cover by means of screws, and then, on the guides, supports of various configurations are fastened on which the anchoring elements of the photovoltaic panels are ultimately installed.

[0005] Other systems include the application of plates, which are always fixed to the cover by means of screws, on which are then applied guides that house supports and anchoring devices for the panel structures.

[0006] Other systems provide for fixing tubes to the cover to which are fixed bearings on which plates are

positioned to which are applied supports for the subsequent installation of the panels. In this case, the tubes are also engaged to the underlying structure by means of screws.

[0007] All of the previously illustrated systems, as well as many others in use, make use of a variety of guides, brackets, profiles, supports and the like, but the systems are all characterized by a single common denominator which is the perforation into metal slabs and other materials used for the cover.

[0008] The problem that renders the systems previously illustrated unreliable and ineffective over time is due to the many perforations that are made in the fretted slabs of the cover for fixing the various support and anchoring systems of the panels. The high number of perforations causes water infiltration phenomena that are difficult to resolve and, over time, damage the underlying structures when such phenomena are not discovered in time.

[0009] In order to avoid water infiltration, the above-mentioned systems include the presence of gaskets that may be rubber, foam, neoprene or silicone-based but which, over time, are subject to breakage, cracking, splitting, and drying due to harsh winter temperatures and high summer temperatures. An example is given: during

the summer with irradiation temperatures of 30-32°C, on a metal slab, the temperature can reach 65-75°C, with the result that elastomeric materials lose their sealing capacity as they soften greatly and, at the same time, dry out, thereby reducing their insulation function. In winter, however, with low temperatures the components harden to such an extent that they often crystallize, and with storms, winds or stresses they crack and crumble, leaving the fixing holes of the screws unprotected and not insulated. In addition, the changing of the seasons, the wind and rain lead to worn gaskets that begin to let moisture and water seep in that in a short time will cause considerable damage not only to the cover but also to the underlying structures.

[0010] In addition to what has been illustrated above, when a user decides to remove solar panels from the roof because they are not needed or because they need to be replaced because of damage, e.g., due to heavy hail, or because they have come to the end of their useful life, the roof cover must be completely rebuilt, given that it is full of perforations that cannot be used for a new plant or for new panels, as the screw that is inserted cannot clamp the structure adequately and thus cannot provide water tightness and stability to the structure and the plant.

[0011] These situations entail extremely expensive management and maintenance costs of a shed, as well as the fact that infiltrations are difficult to resolve without dismantling the plant that triggered them.

[0012] Among the various panel fixing methods, gasket rivet systems are also used, which however have shown low reliability and low safety because the rivets tend to move with stresses due to rain and wind in addition to temperature variations that lead to wearing down the gaskets and, consequently, to triggering water infiltration phenomena.

[0013] The previously illustrated systems, while delivering results, do not provide a guaranteed seal over time apart due to the fact that each panel plant provides for its own fixing system and the perforations in the cover can never be reused.

[0014] As mentioned previously, ultimately, the need is highlighted for also installing other structures on the covers such as, for example, walkways or other installations, which may be temporary installations or installations used for short periods for maintenance, inspections or the like, for which the anchoring to the underlying structure must not puncture, and therefore damage, the cover slabs.

[0015] The object of the present invention is essentially

to resolve the problems of the prior art by overcoming the aforementioned difficulties by means of an anchoring bracket for covers that prevents the cover slabs from being perforated.

[0016] A second object of the present invention is to provide an anchoring bracket for covers that may be used on both new and existing covers.

[0017] Another object of the present invention is to provide an anchoring bracket for covers that is capable of adapting to any fretted or corrugated cover profile on the market.

[0018] Another object of the present invention is to provide an anchoring bracket for covers with a limited footprint and that is easy and convenient to assemble and disassemble even by unskilled personnel without losing its functionality and practicality.

[0019] A further object of the present invention is the fact that it may provide an anchor bracket for covers which allows for high operational precision and considerable security in sealing against infiltration.

[0020] Lastly, the object of the present invention is to provide an anchoring bracket for covers with a simple construction and good functionality.

[0021] These and still other objects, which will become more apparent in the present description, are

substantially achieved by an anchoring bracket for covers, as claimed below.

[0022] Further features and advantages will become more apparent from the detailed description of an anchoring bracket according to the present invention provided below with reference to the accompanying drawings provided for solely indicative, and therefore non-limiting, purposes, wherein:

[0023] - figure 1 is a schematic and perspective view of an anchoring bracket for covers of the present invention;

[0024] - figure 2 shows schematically and in a different perspective view the bracket of figure 1;

[0025] - figure 3 shows schematically a method for fixing to a cover;

[0026] - figure 4 shows schematically another method for fixing the bracket of figure 1 to a cover;

[0027] - figure 5 shows schematically a variant of the anchoring bracket in question;

[0028] - figure 6 shows schematically another method for fixing the bracket of figure 5 to a cover;

[0029] - figure 7 shows schematically another variant of the anchoring bracket according to the present invention and the relative method for fixing it to the cover;

[0030] - figure 8 shows schematically a further variant of the anchoring bracket according to the present

invention and the related method for fixing it to the cover;

[0031] - figure 9 shows schematically another method for fixing the bracket of figure 8 to a cover.

[0032] Referring to the figures cited above, and in particular to figure 1, an anchoring bracket for covers according to the present invention is indicated collectively at 1.

[0033] The anchoring bracket 1 is usable with any type of fretted or corrugated slab and is made with metallic profiles such as sheet metal or steel of different thicknesses according to the type of cover and the load that the bracket must support. Moreover, the bracket may be painted any color to adapt better aesthetically or to blend in with the cover or the installation that it must support.

[0034] The bracket 1 in question has a shaped profile wherein an L-shaped element 2 is provided which, in use, is an inverted L-shaped element having its free end with an orthogonally folded edge 20, as shown in figure 2, provided for making the bracket stiffer.

[0035] At the other end of the L, the bracket has a modeled sector so as to couple with the shape of the cover slab and engage with the same.

[0036] More specifically, in a first embodiment, the

modeled sector of the bracket is composed of a portion 3 orthogonal to the long arm of the L, which continues with a shaped element 4 suitable to fit the contour of the cover. For a fretted-type cover, the shaped element 4 has a trapezoidal profile with a first tilted portion 40, a second horizontal portion 41, perpendicular to the edge 20 and parallel to the portion 3, and a third tilted portion 42.

[0037] Moreover, in the present embodiment, the bracket 1 has a second portion 5 which leads away from the third portion 42 and is parallel to the portion 3 and from which a second shaped element 6 is detached, similar to the first element 4, which has a trapezoidal profile with a first tilted portion 60, a second horizontal portion 61 parallel to the second portion 41, and a third tilted portion 62, which is slightly shorter so that it does not touch the slab where it rests on the underlying structure.

[0038] As shown in figure 3, the first and second shaped elements 4 and 6 are intended to couple to a fretted slab configuration used as a cover for an industrial-type shed.

[0039] In particular, the engagement of the bracket to a pair of slabs 10 and 11 occurs in the joining zone of the two and the bracket is inserted between the two slabs

simply by inserting the bracket between the folds of the fretted slab. The weight of the upper slab 10 is sufficient to hold the bracket in place also because the two slabs are secured to each other by means of screws, and the bracket may be fastened to the fretted slab by means of at least one screw 12, which is none other than one of the screws that fastens the two slabs to each other, as shown in figure 3.

[0040] A variant of the bracket according to the present invention is shown in figure 5, wherein the bracket has an L-shaped element 2 with an orthogonally folded edge 20, a portion 3 orthogonal to the long arm of the L which continues with a shaped element 4 having a trapezoidal profile with a first tilted portion 40, a second horizontal portion 41 perpendicular to the edge 20 and parallel to the portion 3 and a third tilted portion 42. In particular, the bracket has a second portion 50 that leads away from the third portion 42 and is perpendicular to the portion 3 and from which is detached an end edge 7 orthogonal to the second portion 50.

[0041] The present variant is intended to be used in those covers that have a greater pitch between one fret and another as shown in figure 6. Also in this case, the bracket may simply be interposed between the two slabs in their overlapping area and held in place by means of the

fixing screw 12 of the slabs themselves.

[0042] Another variant of the bracket in question provides only one shaped element, as shown in figure 7, whereby the bracket is substantially composed of a L-shaped element 2 including the folded edge 20, a portion 3, and a shaped element 4 with the portions 40, 41 and 42 and a second end portion 5. Also in this case, the bracket is placed in the overlapping area of the two fretted slabs and is fixed by means of the screw 12 for fastening the two slabs together.

[0043] As previously illustrated, it is contemplated that the cover slab is fretted, but the bracket according to the present invention may also be used when the cover has a corrugated configuration, as shown in figure 8. In this case, the bracket always has the L-shaped element 2 with the folded edge 20 and the curvilinear portion 3 so that it may follow the corrugated profile of the cover slab. Moreover, the shaped element 400 is also curvilinear with a profile that resembles that of slabs 10 and 11. In this case, the shaped element 400 continues with a second portion 50 which is parallel to the long arm of the L ending with an end edge 7 orthogonal to the second portion 50.

[0044] Similar to the bracket versions illustrated above, the assembly takes place by interposition between two

corrugated slabs and then may be secured by means of a screw 12 which is the same one which fastens the cover slabs together.

[0045] In addition to the foregoing, the end edge 7 has the task of abutting against the lower surface of the slab, so as to attach itself firmly to the structure of the slab itself and keep the two cover slabs and the interposed bracket engaged with each other.

[0046] According to the present invention, the short arm 21 of the L-shaped element constitutes a support and anchoring plate for any guide or fixing device of the panels or installation structures such as walkways, air conditioners or any other plant that must be installed on the cover.

[0047] The invention in question having been described in a predominantly structural sense, the operation thereof is as follows.

[0048] When installing e.g. solar panels on an industrial cover, one needs to simply insert the brackets at regular intervals between the slabs. The brackets will then be fastened by means of screws, and the anchoring devices of the panels fixed on the short arm 21 of the L of the bracket.

[0049] In this way, if the fixing screws of the panels lose their seal over time as the gaskets wear out, dry or

crumble, infiltrating water will not pass under the cover, but remains on the outside ending up on the outer surface of the cover.

[0050] The present invention thus achieves the intended objects.

[0051] In fact, the anchoring bracket for covers in question allows the cover slabs not to be perforated in addition to the holes provided for the joining and the fastening of the slabs, thereby avoiding all the problems to the underlying structure resulting from water infiltration and the deterioration of the slabs due to the perforation necessary for anchoring the panel support systems or other installations, as is the case with the operating procedures of the prior art.

[0052] Advantageously, the anchoring bracket may be used on both new and existing covers and is able to adapt to any fretted or corrugated cover profile on the market.

[0053] Another advantage of the bracket according to the present invention is that it has a limited footprint to be easily and conveniently assembled and disassembled even by unskilled personnel without losing its features of functionality and practicality and is able to be absolutely effective in function from the time of its installation.

[0054] In addition to that which is illustrated, the

anchoring bracket offers high operational precision and considerable security for that which is anchored above it.

[0055] In particular, the structure of the bracket allows it to be shaped to conform to all types of fretted profiles on the market as well as all corrugated ones.

[0056] A further advantage provided by the bracket in question is that it does not require periodic inspections and maintenance with considerable savings in the construction of covers, photovoltaic systems and other temporary and permanent installations that may be present on a cover.

[0057] Moreover, the bracket is extremely flexible and is easily movable to be able to modify the installations on the cover.

[0058] In addition to what has been said so far, the bracket in question is able to offer high positioning precision for an accurate and precise anchoring of the installations to be installed, and furthermore allows it to accommodate any kind of support condition unthinkable with the anchoring modes used in the prior art.

[0059] An additional advantage of the present bracket comes from the simple structure that avoids the use of all the complicated anchoring systems currently used.

[0060] The last advantage of the present invention is that

it is remarkably easy to use, with its simple construction and good functionality.

[0061] Naturally, numerous modifications and variations may be made to the present invention, all within the scope of the inventive concept that characterizes it.

Claims

1. Anchoring bracket for covers characterized in that it substantially consists of a shaped profile in which there is an L-shaped element (2) having at the free end an edge (20) folded orthogonally and at the other end a sector modeled in such a manner as to couple with the shape of a cover slab and engage with the cover slab, said L-shaped element provides for the short arm (21) of the L constituting a resting and anchoring plate for any guide or fixing device of panels or installation structures such as walkways, air conditioners or any other plant that has to be installed on the cover.

2. Anchoring bracket for covers according to claim 1, characterized in that, when the cover slab has a fret configuration, it has said modeled sector consisting of a portion (3) that is orthogonal to the long arm of the L that continues with a shaped element (4) that has a trapezoidal profile with a tilted first portion (40), a second horizontal portion (41), that is perpendicular to the edge (20) and parallel to the portion (3) and a third tilted portion (42) which is followed by a second portion (5) that leads away from the third portion (42) and is parallel to the portion (3) and from which a second shaped element (6) is detached that provides a trapezoidal profile with a first tilted portion (60), a

second horizontal portion (61) parallel to the second portion (41) and a third portion (62) that is tilted, but slightly shorter in order not to touch the slab where it rests on the underlying structure.

3. Anchoring bracket for covers according to claim 2, characterized in that the first and the second shaped element (4 and 6) are provided for being able to couple with the configuration of a fretted slab used as a cover in an industrial shed and engaging the bracket with a pair of slabs (10 and 11) occurs in the joining zone of the two and the bracket is inserted between the two slabs simply by inserting the bracket between the folds of the fretted slab and the weight of the upper slab (10) keeps the bracket stationary that is connected to the fretted slabs by at least one fixing screw (12) fixing the two slabs together.

4. Anchoring bracket for covers according to claim 1, characterized in that it has said modeled sector consisting of a portion (3) that is orthogonal to the long arm of the L that continues with a shaped element (4) having a trapezoidal profile with a tilted first portion (40), a second horizontal portion (41) that is perpendicular to the edge (20) and parallel to the portion (3) and a third tilted portion (42), of a second portion (50) that leads away from the third portion (42)

and is perpendicular to the portion (3) and from which an end edge (7) detaches that is orthogonal to the second portion (50), said modeled sector being suitable for being used in those cover slabs that have a greater pitch between one fret and the other.

5. Anchoring bracket for covers according to claim 2, characterized in that it features said modeled sector having only one shaped element and said bracket substantially consists of an L-shaped element (2) with the edge (20) folded, of a portion (3) and of a shaped element (4) with the portions (40, 41 and 42) and of a second end portion (5).

6. Anchoring bracket for covers according to claim 1, characterized in that, when the cover slab has a corrugated configuration, it has said modeled sector that comprises a curvilinear portion (3) so as to be able to follow the corrugated profile of the cover slab, a shaped element (400) that is also curvilinear with a profile that continues that of the cover slab (10 or 11) that is followed by a second portion (50) that is parallel to the long arm of the L and ends with an end edge (7) orthogonal to the second portion (50) and provided for abutting against the lower surface of the slab so as to be firmly connected to the structure of the slab, keeping the two cover slabs and the interposed bracket engaged

together.

7. Anchoring bracket for covers according to claim 6, characterized in that it is interposed between two slabs that are corrugated and connected by a screw (12) that connects the cover slabs together.

8. Anchoring bracket for covers according to claim 1, characterized in that it is usable with any configuration of fretted or corrugated slabs and is made with profiles made of metal material such as sheet metal or steel with different thicknesses depending on the type of cover and the load that the bracket has to support

9. Anchoring bracket for covers according to claim 1, characterized in that is can be painted any color to adapt better aesthetically or to blend in with the cover or the installation that it has to support.

10. Anchoring method for anchoring a structure to a cover comprising fretted or corrugated slabs partially superimposed each other, comprising the steps of:

- providing an anchoring bracket according to any of the previous claims;

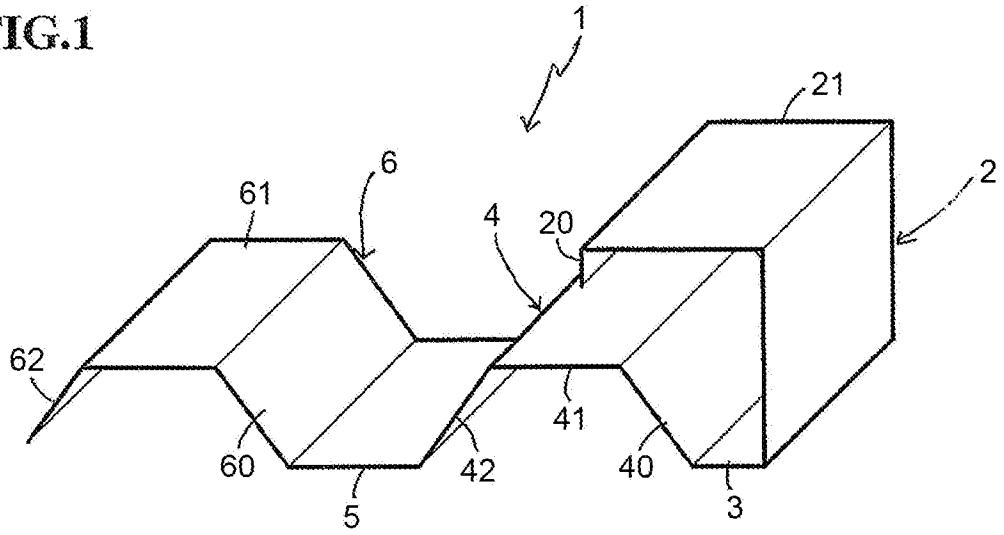
- inserting the anchoring bracket between the slabs' portions which are superimposed each other;

- anchoring the structure to the horizontal short arm of the "L-shaped" element of the anchoring bracket.

11. Anchoring method according to the previous claim,

wherein the anchoring bracket is fixed to the partially superimposed slabs by means of a screw and of the holes already provided for the reciprocal joining of the slabs.

FIG.1



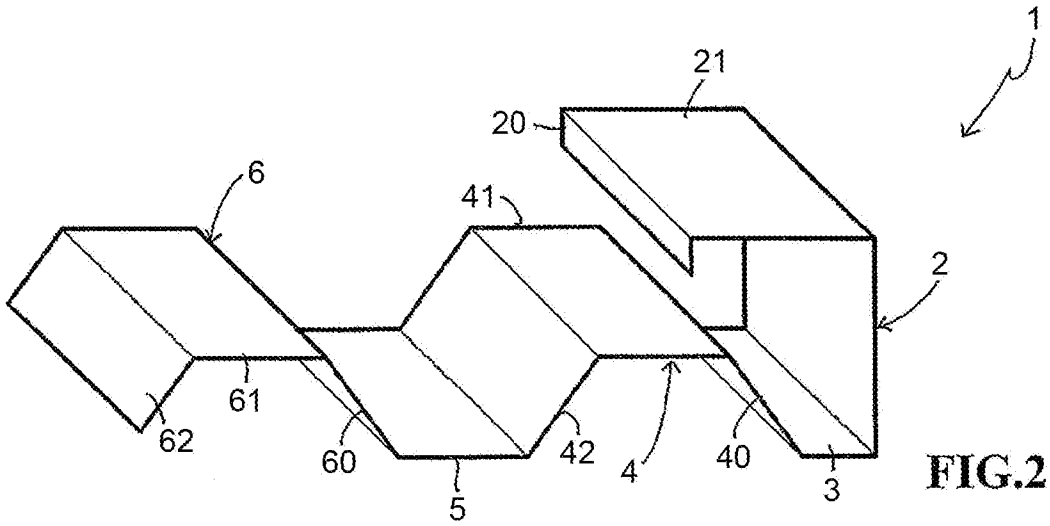


FIG.2

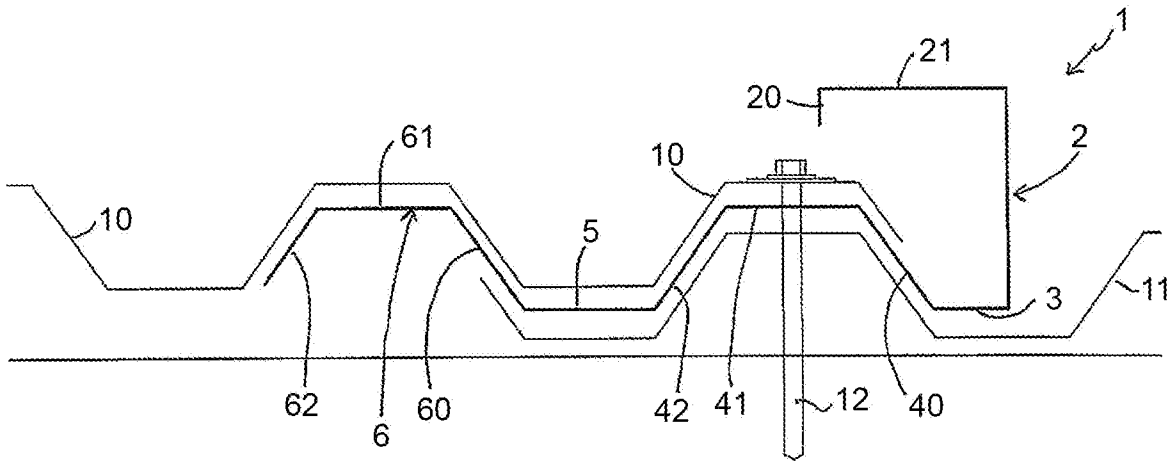
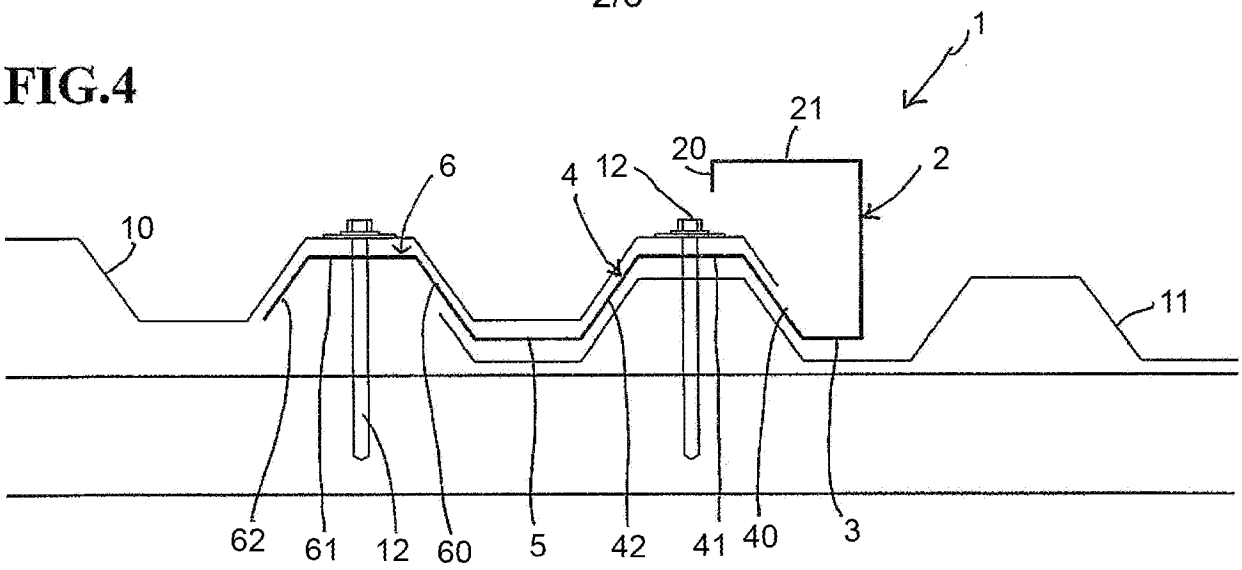


FIG.3

FIG.4



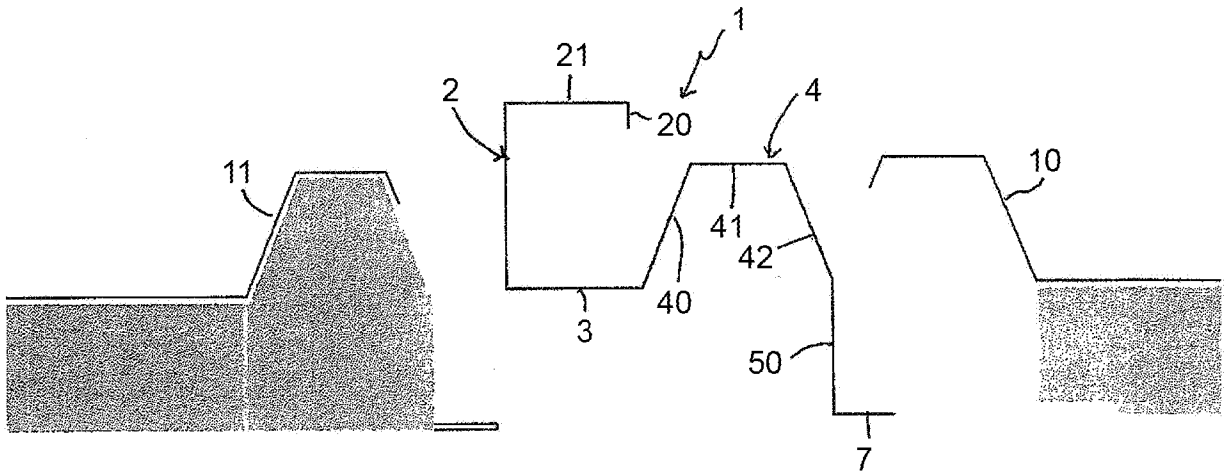


FIG.5

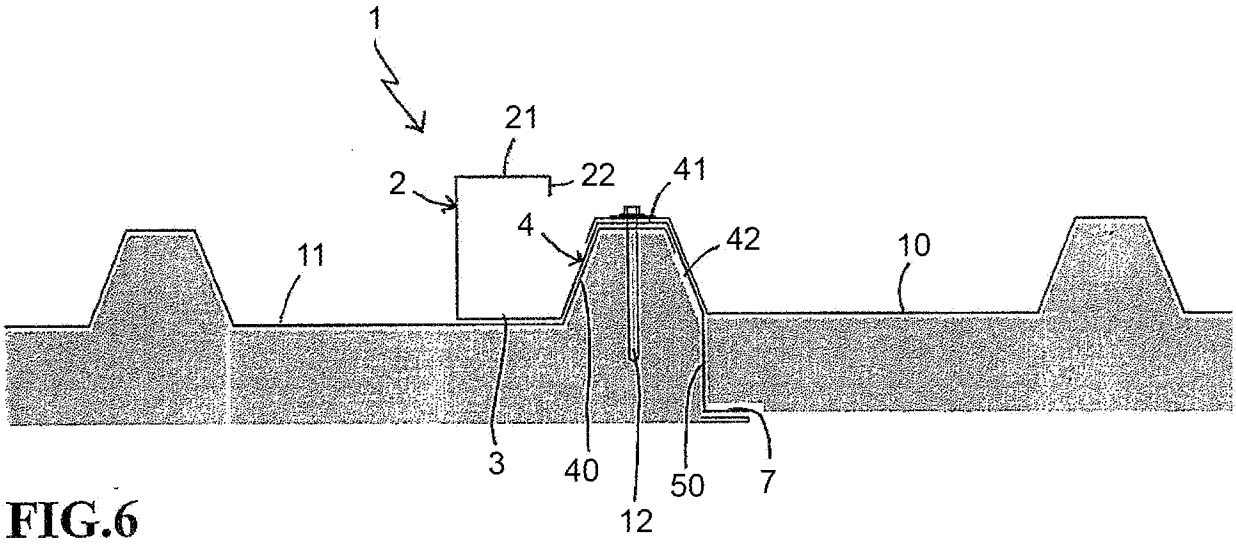


FIG.6

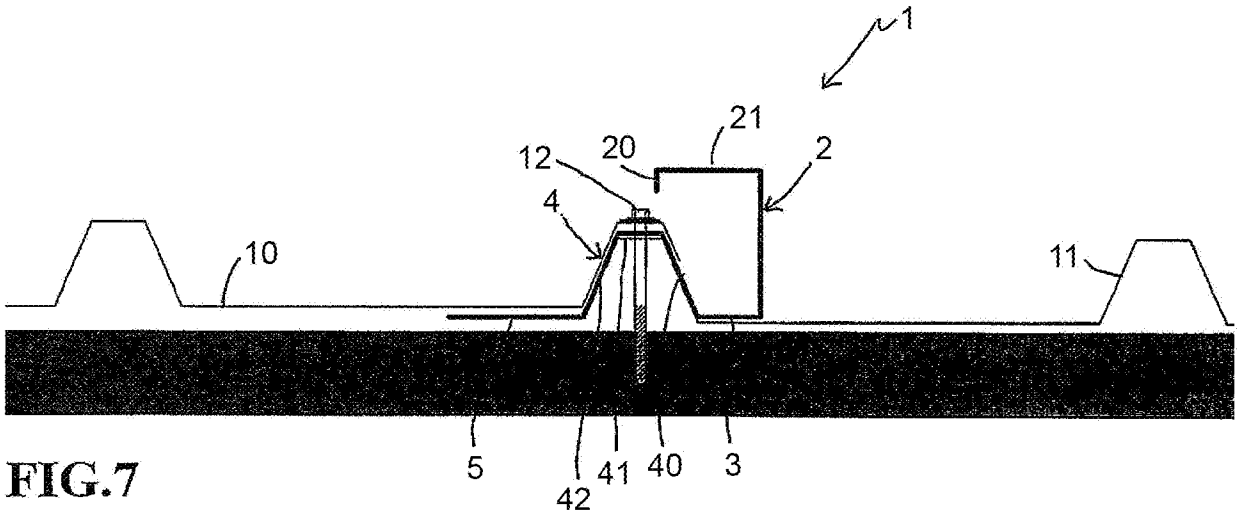


FIG.7

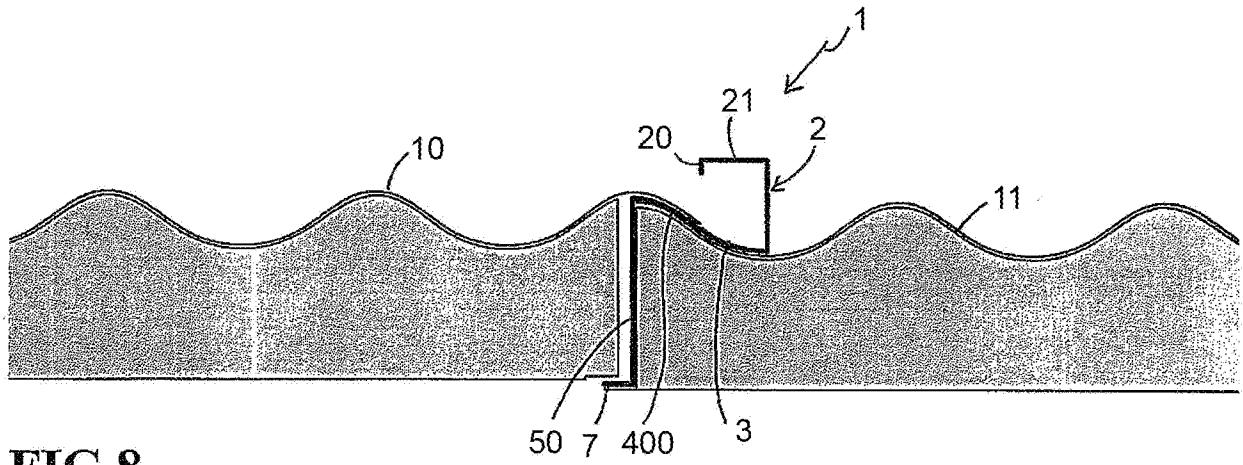


FIG.8

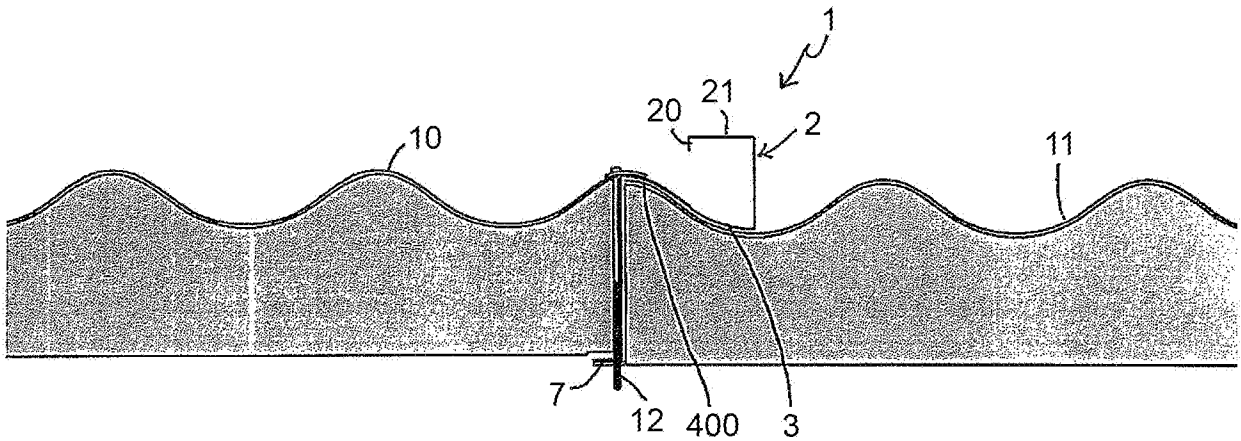


FIG.9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/054248

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24J2/52 H02S20/23 E04D13/12
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)
E04G F24J H02S 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.
X	DE 20 2008 007662 U1 (ARCELORMITTAL CONSTRUCTION DEU [DE]) 14 August 2008 (2008-08-14) figure *	1-11
X	US 2011/272545 A1 (LIU JUN [US]) 10 November 2011 (2011-11-10) figures 5,6	1-4,6,8, 9
X	CA 2 751 963 A1 (OPSUN TECHNOLOGIES INC [CA]) 8 March 2013 (2013-03-08) figure 4	1-4,6,8, 9
A	GB 2 462 490 A (MORELLO SERVICES LTD [GB]) 17 February 2010 (2010-02-17) figures 2,6,8,9	10,11

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
29 August 2017	06/09/2017

Name and mailing address of the ISA/	Authorized officer
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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.
A	EP 2 103 755 A2 (IMECO SRL [IT]) 23 September 2009 (2009-09-23) figure 2 -----	1-11
A	DE 10 2010 041161 A1 (OPITZ MARTIN [DE]) 22 March 2012 (2012-03-22) figure 4 -----	1-11

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2017/054248

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