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(54) Cladding support structure

(57) The present invention relates to a structure (1) for the support of a surface cladding (2), for example made from wood or stone, to a wall (4).

Such structure (1) comprises a heat-insulating coating (6), applicable to an outer surface (8) of the wall (4) and which defines a coating surface (10) opposite the wall (4), at least a first attachment pin (12), which crosses the thickness of the heat-insulating coating (6) to mechanically connect it to the wall (4), and an attachment assembly (14), which interferes with the first attachment pin (12) from the side of the coating surface (10).

At least one support element or guide (16) of the surface cladding (2) is provided, secured to the attachment assembly (14) by means of at least a second attachment pin (18) staggered in relation to the first attachment pin (12).

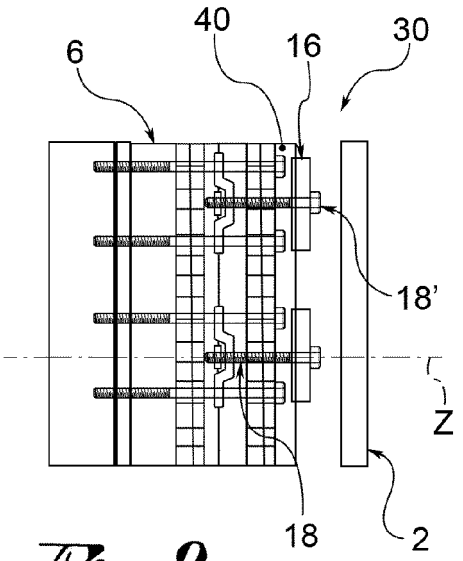

Fig.8

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Description

[0001] The present invention relates to a structure and assembly for the support of a surface cladding, and a method of making such structure and assembly.

[0002] The use of wood claddings to cover the outer surfaces of houses is widespread in the construction industry. The traditional laying method consists in anchoring an aluminium intersection structure, bearing the cladding, to the outside wall of the house.

[0003] The application of the legislation relative to energy saving has further developed the application of so-called "overcoat" claddings (EIFS; Exterior insulation and finishing systems), which consist of gluing an insulation material to the outer wall, and which is subsequently coated with a series of plaster coats reinforced with fibreglass.

[0004] In this structural situation the attachment of lightweight materials to the wall, in the order of just a few kilograms per square metre, is performed by inserting special plugs before plastering, measuring the millimetric position for the insertion of the attachment screws when the work is finished.

[0005] For heavier cladding materials, however, the position of the plugs must be defined already at the project stage so as to obligatorily couple them to the wall in various modes.

[0006] One specific method consists of attaching threaded bars or other elements which cross the insulation layer, which the structure of the cladding is subsequently anchored to.

[0007] Such technical solution is not however without drawbacks.

[0008] Specifically, the structure of the insulation layer is interrupted by a plurality of passages for the threaded bars to cross through. This way, the insulation material proves discontinuous, but above all is crossed by bars, usually metallic, which are heat conductors and which for such reason may form heat bridges through the insulation.

[0009] The present invention therefore sets out to provide a structure and a method able to overcome the drawbacks of the prior art, and in particular to avoid the creation of heat bridges which would otherwise favour the dissipation of heat through the outer wall.

[0010] Such objective is achieved by a structure according to claim 1, by an assembly according to claim 9 and by a method according to claim 11. The dependent claims describe embodiment variants.

[0011] The object of the present invention will now be described in detail with the help of the appended drawings, wherein:

[0012] - figures 1 to 8 show subsequent method steps according to the present invention, according to a possible embodiment; and

[0013] -figures 9 and 1 0 show, instead, opposite perspective views of an attachment assembly, according to an embodiment variant.

[0014] With reference to the aforementioned drawings, reference numeral 30 globally denotes an assembly comprising a structure 1, as described below, suitable for attaching to a wall 4 and at least one surface cladding 2 connected to such structure 1.

[0015] The structure which the present invention relates to is particularly suitable for the attachment of a surface cladding 2 to the walls of buildings. Such claddings may be in the form of a slab, a sheet, a plank or a beam.

[0016] Preferably, the surface cladding 2 is made of wood and/or stone, optionally reconstructed, even of metal and/or glass.

[0017] According to one embodiment, the surface cladding 2 has a maximum specific weight of about 70 kg/m^2, preferably of 60 kg/m^2, for example 50-60 kg/m^2.

[0018] The structure 1 for the support of such surface cladding 2 comprises a heat-insulating coating 6, applicable to an outer surface 8 of the wall 4 and which defines a coating surface 10 opposite the wall 4.

[0019] Consequently, according to one embodiment, the heat-insulating coating 6 abuts with the outer surface 8 through the interposition of a first adhesive layer 32, while the coating surface 10 faces the opposite side of the first adhesive layer.

[0020] The structure 1 comprises at least a first attachment pin 12, which crosses the thickness of the heat-insulating coating 6 to mechanically connect it to the wall 4. Advantageously, a plurality of pins 12 distributed with a predefined density over the heat-insulating coating 6, are provided. This way, even claddings 6 of considerable weight (and the relative accessories described below) are supported better by the structure.

[0021] As regards assessing the predefined distribution density of the pins 12, since it depends on the type of cladding, and on the weight which must be supported, reference is made to the expertise of a person skilled in the art.

[0022] The structure further comprises an attachment assembly 14, which interferes with the first attachment pin 12 on the side of the coating surface 10, preferably at a pin head 12', which extends radially outwards from the pin, that is to say from a stem 34 thereof.

[0023] Advantageously, at least a first reinforcement mesh 26 is provided, inserted between the heat-insulating coating 6 and the attachment assembly 14, preferably at least partially embedded in a gluing agent.

[0024] The function performed by such mesh (but the same function is also performed by the second mesh 36 described below) is mainly that of exercising a containing force on the heat-insulating coating 6; for example it has a greater resistance than said coating, preferably both a mechanical resistance and flame or fire resistance, so that, even in the event of a fire, the heat-insulating coating 6 does not run the risk of collapse inasmuch as constrained by the mesh (26 or 36).

[0025] Furthermore, according to a particularly advantageous embodiment, it is the reinforcement mesh itself which mainly or exclusively sustains the weight of the

surface cladding 2. In fact, since such mesh interacts in different points with a plurality of pins 12, the weight of such cladding - even if elevated - will be evenly distributed over the entire mesh by means of the support or guide element 16 described below, thereby ensuring a high level of mechanical resistance.

[0026] In other words, according to the previous variant, it is not just the wall 4 which has a load-bearing function, but such role is exerted by the reinforcement mesh, preferably in an essentially exclusive manner. According to such variant, the first pins 12 therefore perform a mainly safety function (in particular in the event of fire), in that they permit a programmed delay in the collapse of the structure, for example of at least 30 minutes, to prevent the escape routes of a building from being obstructed.

[0027] The structure further comprises at least one support element or guide 16 of the surface cladding 2, secured to the attachment assembly 14 by means of at least a second attachment pin 18 staggered in relation to the first attachment pin 12.

[0028] Consequently, the first 12 and the second 18 attachment pins both act on the attachment assembly 14, so as to hold the support element or guide 16 to the wall 4.

[0029] In other words, the first 12 and the second attachment pins 18 work at non-coinciding points with the attachment assembly 14, for example laterally displaced as shown in the drawings.

[0030] Within the present description, since the pins 12, 18 respectively present a longitudinal extension Y, Z, the term "laterally displaced" shall be understood to mean a radial direction in relation to at least one of the aforementioned extensions Y, Z.

[0031] In the variant shown, the longitudinal extensions Y, Z are substantially parallel, for example substantially orthogonal to the outer surface 8.

[0032] According to one embodiment, the first 12 and/or second attachment pin 18 are threaded; advantageously, such pin (12 and/or 18) has a pin head 12', 18' suitable for interacting with an implement for screwing or unscrewing it.

[0033] According to a preferred embodiment, the first attachment pin 12 is part of an expansion plug; according to a further variant, the second attachment pin 18 is of the self-tapping type. According to a further variant, the first 12 and/or second attachment pins 18 are heat cutting plugs.

[0034] According to a further preferred embodiment, the attachment assembly 14 comprises an outer component 20, which acts in conjunction with the first attachment pin 12 and which is suitable to house at least partially a separate inner component 22, engaged with the second attachment pin 18.

[0035] Preferably, both the first 12 and the second 18 attachment pin cross the thickness of the attachment assembly 14 or of the aforesaid components 20, 22.

[0036] As a result, the attachment pins 12, 18 according to this variant work on different components 20, 22 which are preferably thermally insulated from each other.

[0037] To such purpose, the components 20, 22 may advantageously be joined by means of a second adhesive layer 42, preferably with reduced heat-conducting properties.

[0038] For example, with reference to figure 9, in one variant the outer component 20 delimits a depression 24 for receiving the inner component 22; such depression 24 is advantageously peripherally delimited by a substantially planar component frame 28, which acts as an abutment with the heat-insulating coating 6 or, where provided, with the first reinforcement mesh 26.

[0039] The attachment assembly 14 may be optionally glued, by means of the second adhesive layer 42, to the heat-insulating coating 6 or to the first reinforcement mesh 26, advantageously by means of the component frame 28.

[0040] This way, by virtue of the specific conformation of the attachment assembly 14 described, the second adhesive layer binds outer component 20 and inner component 22 to each other, and both (optionally indirectly) to the heat-insulating coating.

[0041] In one embodiment, the outer component 20 is made in the form of a plate, for example with a plurality of through perforations 44 (for example suitable for the passage of the second adhesive layer into the depression 24 or in any case through such component), while a further variant envisages an inner component 22 in the form of a plate of much smaller dimensions than that constituting the outer component, but of greater thickness.

[0042] According to a particularly advantageous embodiment, each attachment assembly 14 is joined to a pair of first attachment pins 12 and to a single second attachment pin 18 positioned in an intermediate position between said first pins 12. For example, the second attachment pin 18 is substantially aligned along a line joining the first attachment pins 12.

[0043] According to a further embodiment, the support guide 16 extends in a main direction X so as to mechanically connect a plurality of attachment assemblies 14 alongside each other.

[0044] With reference for example to figure 7, the main direction X is represented as orthogonal to the illustration surface; preferably, the main direction X is, at least in projection, incident to the longitudinal extension Y, Z of at least one attachment pin 12, 18.

[0045] Alternatively or in addition, a plurality of distinct support elements (not shown) may be provided, distributed for example over a given path such as a line.

[0046] According to a further embodiment, between the support element or guide 16 and the attachment assembly 14 at least a second reinforcement mesh 36 may be provided, preferably at least partially embedded in a gluing agent.

[0047] Moreover, in addition to the mechanical resistance illustrated above, the first 26 and/or second 36 reinforcement mesh act independently as a substrate suitable for applying a coat of plaster 38, 40, if provided.

[0048] In fact, externally to the first 26 and/or second 36 reinforcement mesh at least one coat of plaster 38, 40 may independently be provided, for example having the function of levelling the surface of the respective meshes.

[0049] The present invention further relates to a method of making the structure 1 or assembly 30 described above.

[0050] Such method comprises a step of applying a heat-insulating coating 6 to the outer surface 8 of the wall 4. Advantageously, such step comprises a step of gluing the coating to the outer surface 8, for example by interposing a first adhesive layer 32.

[0051] A further step of inserting at least a first attachment pin 12 through the thickness of the heat-insulating coating 6 to mechanically connect it to the wall 4, and of making the first attachment pin 12 interfere with the attachment assembly 14, positioned on the side of the heat-insulating coating 6 opposite the wall 4 is envisaged.

[0052] According to one embodiment, the step of making them interfere comprises a step of making the first attachment pin 12 cross the thickness of the attachment assembly 14.

[0053] In further method steps, at least one support element or guide 16 of the surface cladding 2 and a second attachment pin 18 are provided, and the support guide 16 is secured by means of at least the second attachment pin 18 in such a way as to stagger it in relation to the first attachment pin 12.

[0054] Preferably, a step of mechanically attaching the surface cladding 2 to the support element or guide 16 is further envisaged. For example the step of mechanical attachment may comprise a step of hanging the surface cladding 2 to the support guide 16, of screwing and/or gluing such cladding to the aforesaid guide or element.

[0055] According to a particularly advantageous embodiment, the step of securing the support guide 16 comprises a step of thermally insulating the second attachment pin 18 from the first attachment pin 12. This way, the possibility of creating heat bridges through the heat-insulating coating is drastically reduced.

[0056] The method advantageously comprises other processing steps, not described in greater detail, which lead to the structure and assembly variants described in the previous paragraphs.

[0057] According to a further embodiment, a further step is envisaged of inserting at least a first reinforcement mesh 26 between the heat-insulating coating 6 and the attachment assembly 14, such mesh being configured to support mainly or exclusively the weight of the surface cladding 2. Optionally, a plurality of first attachment pins 12 may be provided, distributed with a predefined density over the heat-insulating coating surface 6, so that they interact with the first reinforcement mesh 26 for the support of said cladding 2.

[0058] Innovatively, the structure and assembly which the present invention relates to are suitable for interrupting the thermic path which leads from the surface cladding to the wall, so that on the one hand discontinuities of the heat-insulation coating extending as far as the outer surface of the cladding are not needed, and on the other so as to drastically reduce the heat conduction through the required pins.

[0059] Advantageously, the structure which the present invention relates to is suitable to withstand the load of surface claddings of considerable weight/thickness, above all by virtue of the fact that for the first time the heat-insulating coating is transformed into a load-bearing structural element; in fact such coating performs the dual function of thermal insulation and also of support for the surface cladding.

[0060] Advantageously, the attachment assembly which the present invention relates to is suitable for adhering in an optimal manner to the surfaces with which it is destined to interact.

[0061] Advantageously, the structure and assembly which the present invention relates to are simple to construct and therefore suitable for being produced at an extremely limited cost.

[0062] A person skilled in the art may make variations to the embodiments of the assembly, of the structure and of the method described above so as to satisfy specific requirements, replacing elements with others functionally equivalent.

[0063] Such variants are also contained within the scope of protection defined by the following claims.

[0064] In addition, each of the features described as belonging to a possible embodiment may be performed independently of the other embodiments described.

Claims

1. Structure (1) for the support of a surface cladding (2), for example made from wood or stone, to a wall (4), wherein said structure (1) comprises:

   - a heat-insulating coating (6), suitable for being applied to an outer surface (8) of said wall (4) and which defines a coating surface (10) opposite the wall (4);
   - at least a first attachment pin (12), which crosses the thickness of the heat-insulating coating (6) to mechanically connect it to the wall (4);
   - an attachment assembly (14), which interferes with the first attachment pin (12) from the side of the coating surface (10); and
   - at least one support element or guide (16) of the surface cladding (2), secured to the attachment assembly (14) by means of at least a second attachment pin (18) staggered in relation to the first attachment pin (12).

2. Structure according to claim 1, wherein the first (12) and the second attachment pins (18) work at non-coinciding points with the attachment assembly (14),

for example laterally displaced.

3. Structure according to claim 1 or 2, wherein the attachment assembly (14) comprises an outer component (20), which acts in conjunction with the first attachment pin (12) and which is suitable to house at least partially a separate inner component (22), engaged with the second attachment pin (18).

4. Structure according to claim 3, wherein the outer component (20) comprises a depression (24) for the housing of the inner component (22), said depression (24) being peripherally delimited by a substantially planar component frame (28).

5. Structure according to claim 3 or 4, wherein said components (20, 22) are thermally insulated from each other.

6. Structure according to any of the previous claims, comprising at least a first reinforcement mesh (26) inserted between the heat-insulating coating (6) and the attachment assembly (14), configured to support mainly or exclusively the weight of the surface cladding (2).

7. Structure according to claim 6, comprising a plurality of first attachment pins (12), distributed with a predefined density along the heat-insulating coating surface (6), which interact with the first reinforcement mesh (26) for the support of said cladding (2).

8. Structure according to any of the previous claims, wherein each attachment assembly (14) is joined to a pair of first attachment pins (12) and to a single second attachment pin (18) positioned in an intermediate position between said first pins (12).

9. Structure according to any of the previous claims, wherein the support guide (16) extends in a main direction (X) so as to mechanically connect a plurality of attachment assemblies (14) alongside each other.

10. Assembly (30) comprising:

- a structure (1) according to any of the previous claims attachable to a wall (4); and
- at least one surface cladding (2), for example made from wood or stone, connected to said structure (1).

11. Assembly according to claim 10, wherein the surface cladding (2) has a maximum specific weight of about 70 kg/m^2, preferably of 60 kg/m^2.

12. Method for making a structure (1) for the support of a surface cladding (2), for example made from wood or stone, to a wall (4), said method comprising the steps of:

- applying a heat-insulating coating (6) to an outer surface (8) of said wall (4);
- inserting at least a first attachment pin (12) which crosses the thickness of the heat-insulating coating (6) to mechanically connect it to the wall (4);
- making the first attachment pin (12) interfere with an attachment assembly (14), positioned on the side of the heat-insulating coating (6) opposite the wall (4);
- supplying at least one support element or guide (16) of the surface cladding (2) and a second attachment pin (18);
- securing the support guide (16) to the attachment assembly (14) at least by means of the second attachment pin (18) in such a way as to stagger it in relation to the first attachment pin (12).

13. Method according to claim 12, wherein the step of applying the heat-insulating coating (6) comprises a step of gluing said coating to the outer surface (8).

14. Method according to claim 12 or 13, further comprising a step of inserting at least a first reinforcement mesh (26) between the heat-insulting coating (6) and the attachment assembly (14), configured to support mainly or exclusively the weight of the surface cladding (2), a plurality of first attachment pins (12) being distributed with a predefined density along the heat-insulating coating surface (6), which interact with the first reinforcement mesh (26) for the support of said cladding (2).

15. Method according to any of the claims from 12 to 14, wherein the step of securing the support guide (16) comprises a step of thermally insulating the second attachment pin (18) from the first attachment pin (12).

Fig.1

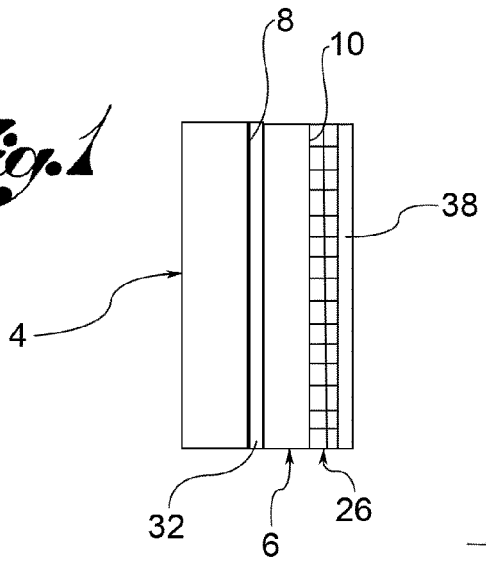


Fig.2

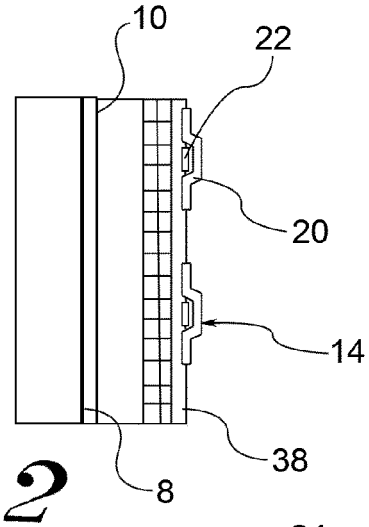


Fig.3

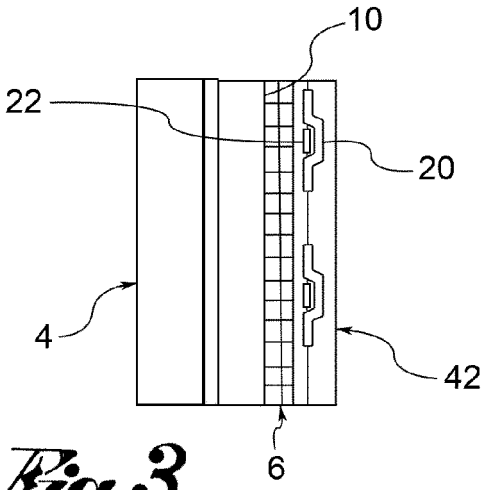


Fig.4

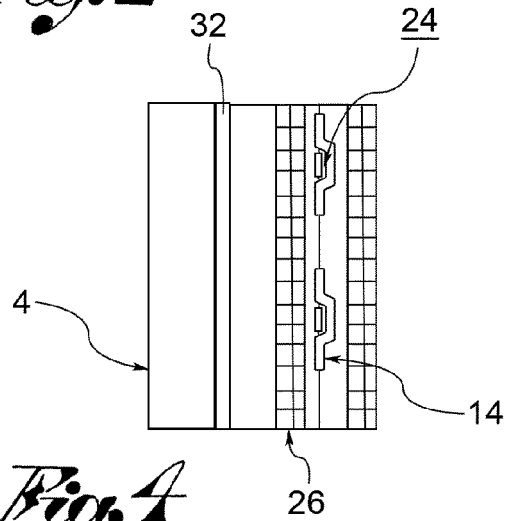


Fig.5

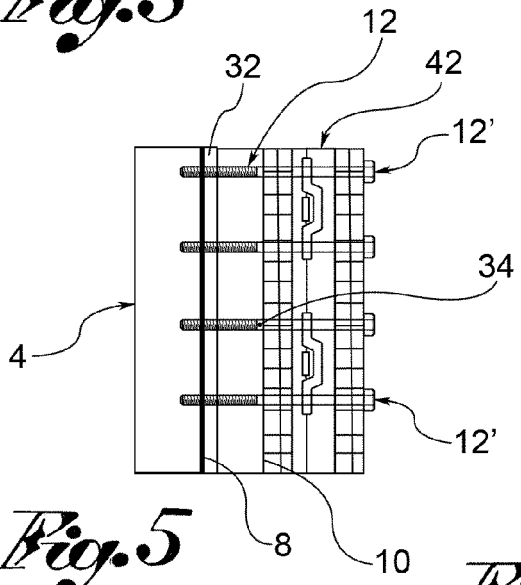
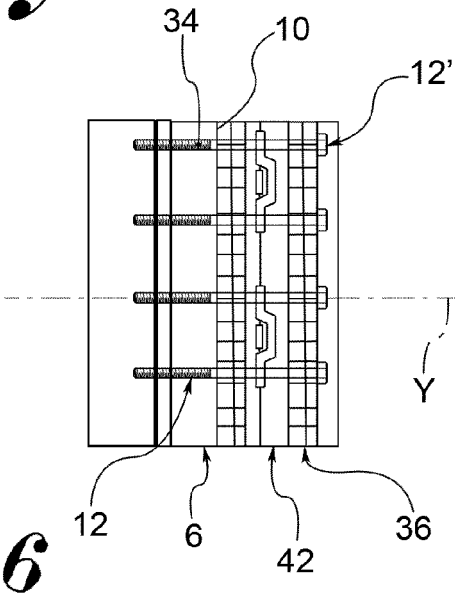


Fig.6



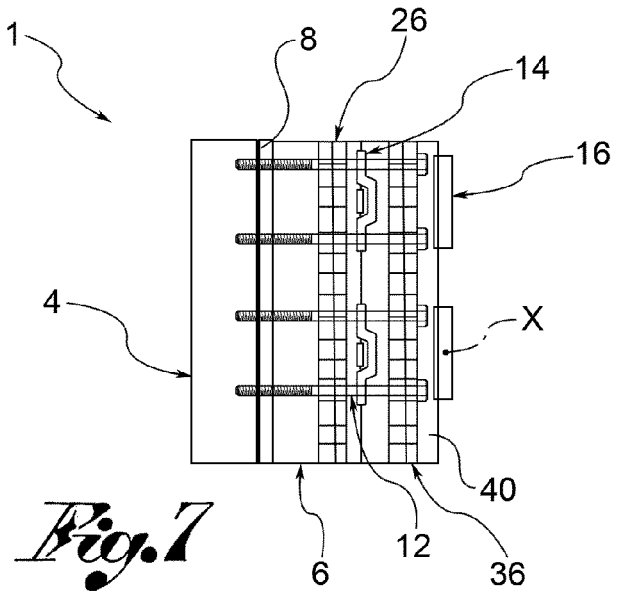


Fig.7

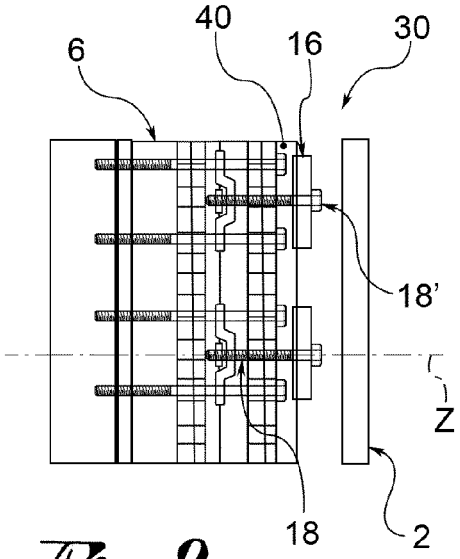


Fig.8

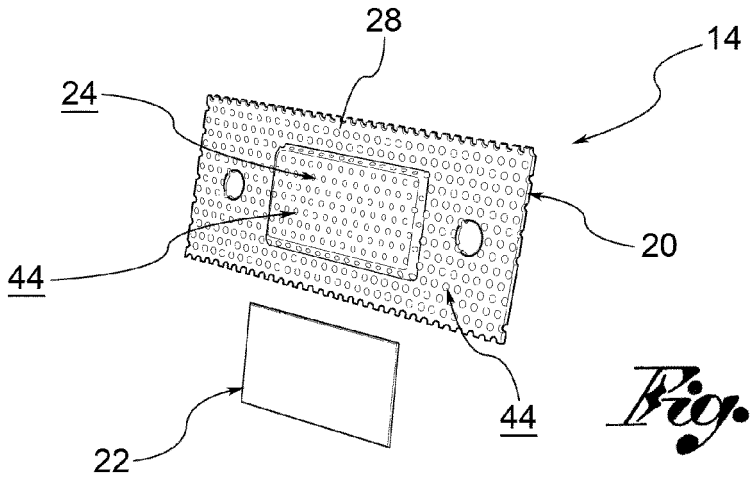


Fig.9

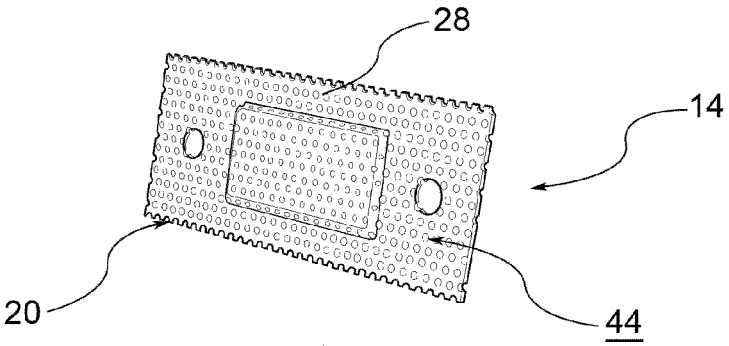


Fig.10

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EUROPEAN SEARCH REPORT

Application Number
EP 13 15 5907

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 Y	DE 197 04 112 A1 (KELLNER PETER [DE]; RIMBACH FRANK [DE]; OBERHAUS HERIBERT DR [DE] KELL) 18 June 1998 (1998-06-18) * column 3, line 30 - column 4, line 4; figures 3,4 * -----	1-5, 8-13,15 6,7,14	INV. E04B1/76
X Y	DE 10 2009 044352 A1 (SFS INTEC HOLDING AG [CH]) 5 May 2011 (2011-05-05) * abstract; figure 1 * * paragraph [0037] - paragraph [0044] * -----	1,2,12 6,7,14	
A	DE 20 2010 002347 U1 (SEXTL KURT [DE]) 26 August 2011 (2011-08-26) * paragraph [0017] - paragraph [0025]; figures 1,2 * -----	1,6,7,14	

TECHNICAL FIELDS SEARCHED (IPC)
E04B E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 May 2013	Galanti, Flavio

CATEGORY OF CITED DOCUMENTS

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07-05-2013

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