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(54) **METHOD FOR THE FINISHING OF A SUBSTRUCTURE OF A WALL OR A ROOF AND ACCESSORY APPLIED THEREBY**

(57) Method for the finishing of a substructure of a wall or a roof, whereby first thermal insulation panels (3) are adjoined against each other on the substructure (2) and then a cladding (23) is applied on a load-bearing frame (22) of slats, panels or the like which are attached on the substructure (2), **characterised in that** the slats, panels or the like of the load-bearing frame (22) are attached to the substructure (2) by means of one or more accessories (7) in the form of a base plate (8) which is applied against the side of the insulation panels (3) turned away (6) from the substructure (2) and which is fitted with a regulating rod or adjusting screw (9) with a head in the form of an attachment element (18) for the slats, panels or the like, whereby after installation of the accessories (7) the regulating rods or adjustment screws (9), in relation to the base plate (8), can be adjusted to align the slats, panels or the like of the load-bearing frame (2) with each other in a plane

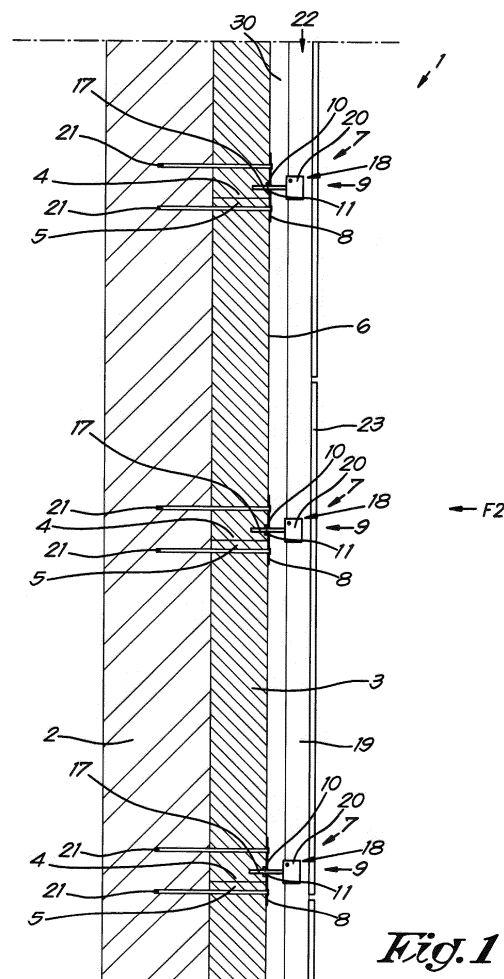


Fig. 1

Description

[0001] The present invention relates to a method for the finishing of a substructure of a wall or a roof.

[0002] It is known for the finishing of a substructure of a wall or a roof, e.g. in the form of the inner leaf of the wall or of a subroof, to first adjoin thermal insulation panels against each other on the substructure.

[0003] Afterwards a finish is provided with a cladding in the form of roof tiles, roof panels or the like in the event of a roof or in the form of decorative panels or panels against which bricks, plaster, or the like are applied in the event of a wall.

[0004] To apply the cladding first a load-bearing frame is installed on the substructure of the roof or wall with slats or panels against which the finish is provided.

[0005] According to a known technique, the insulation panels are placed between load-bearing wooden constructions. This technique is not recommended as the load-bearing frame shows considerable nodes. Moreover, this technique has a real and considerable risk of thermal bridges.

[0006] For this reason continuous, uninterrupted insulation techniques are becoming more common whereby the insulation panels are joined practically seamlessly against each other.

[0007] For ventilated, insulated walls today we distinguish two such continuous, uninterrupted techniques.

[0008] A first known continuous insulation technique uses a wooden frame whereby in a first phase the thermal insulation is applied against or on the substructure and the wooden frame using set screws.

[0009] The disadvantages of this first known technique are the following:

- ten different actions are needed which means there is a risk of incorrect execution;
- the technique is not handy as it is very difficult to regulate and also relatively labour-intensive and expensive;
- the technique has its limitations, e.g. because a glued sheet finish on the wooden frame is not recommended;
- the weight of the cladding is borne by the set screws, such that the weight of the cladding needs to be restricted, which limits the freedom of choice of this cladding.

[0010] A second known insulation technique with continuous uninterrupted insulation panels uses an aluminium frame with thermal break whereby the load-bearing frame, by means of special L-shaped brackets which are attached with one leg on the substructure and with the other leg stick through the insulation panels to attach the load-bearing frame with slats or panels.

[0011] The weak points of this technique are the following:

- it is an expensive system and therefore is less suited for the retail market;
- there is a real danger of thermal bridges as a piece needs to be cut out of the insulation every time;
- the system is not suited to a finish with slates, ceramic finish, etc.

[0012] The purpose of the present invention is to offer a solution for one or more of the aforementioned and other disadvantages and weak points.

[0013] To this end, the invention relates to a method for the finishing of a substructure of a wall or a roof, whereby first thermal insulation panels are adjoined against each other on the substructure and then a cladding is applied on a load-bearing frame in the form of slats, panels or the like which are attached on the substructure, characterised in that the slats, panels or the like of the load-bearing frame are attached on the substructure by means of one or more accessories in the form of a base plate which is attached {on the substructure against the side of the insulation panels turned away from the substructure and which is fitted with a regulating rod or adjusting screw with a top in the form of an attachment element for the slats, panels or the like, whereby after the placing of the accessories the regulating rods or adjustment screws in relation to the base plate can be adjusted to align the slats, panels or the like of the load-bearing frame with each other in a plane.

[0014] The method according to the invention is suitable both for new developments and for renovation to quickly, efficiently, continuously and sustainably insulate walls.

[0015] The unique adjusting system with the aforementioned accessories ensures that every wall can quickly and simply be aligned and is perfectly suited for all ventilated wall applications.

[0016] The method is extra handy to align the load-bearing frame by making the adjustment screws looser or tighter, e.g. using a drill with an adapted bit to be able to grip the attachment elements. With a ground laser the load-bearing frame can be aligned very accurately and in little time such that considerable time savings can be made and less working hours are required.

[0017] In view of the simplicity of the method there are also less chances of incorrect actions.

[0018] The wall can be finished in wood, synthetic material, composite, zinc, copper, aluminium, fibre cement and ceramic applications, slabs with plaster, and the like. The insulation panels form an uninterrupted insulation shield as it were without thermal bridges.

[0019] The accessories can be simply attached to the substructure using screws that are screwed through the provided holes in the base plate and through the insulation panels in the substructure.

[0020] Alternatively, the accessories can be screwed on a support slat fitted against the side of the insulation panels turned away from the substructure and is connected with the substructure by means of screws that are

screwed through the provided holes in the support slat and through the insulation panels in the substructure.

[0021] Preferably the method uses insulation panels that across the length of one of their edges are provided with an aforementioned support slat which is attached in/on the insulation panel in question and sticks out with a certain width over the aforementioned edge of the insulation panel to form a protruding lip.

Preferably for the alignment of the slats, panels or the like of the load-bearing frame, a laser is used such that a quick and exact alignment are possible.

[0022] The invention also relates to an accessory for use in the method according to the invention, whereby the accessory is composed of a base plate and an adjusting screw which in relation to the base plate can be tightened or loosened in a direction perpendicular to the base plate and which is fitted with a top in the form of an attachment element for the attachment of the slats, panels or the like of the load-bearing frame.

[0023] This accessory can be manufactured very simply and cheaply.

[0024] It suffices to make a threaded hole in the base plate, e.g. in the form of a nut that is welded on the base plate, in which the adjusting screw can be screwed in.

[0025] The invention also relates to a combination of an accessory as aforementioned and of a support slat, whereby the support slat has a pattern with holes along two opposite edges located at a fixed distance from each other which is such that the base plate of an accessory can be positioned in such a way on the support slat that holes of the base plate correspond in position with a number of holes of the support slat.

[0026] In this way the support slat and the accessory, as the case may be, can be affixed to the substructure with the same screws.

[0027] Preferably the accessory and/or the support slat are made of metal.

[0028] Using the metal support slat, the insulation panels are attached to the wall. The support slats thus form a new fixed structure on which a non-ventilated finish (zinc and the like) can be directly installed without the use of accessories.

[0029] In combination with the rail profile a ventilated wooden or metal load-bearing frame can be easily mounted. This profile was designed in such a way that, depending on the weight of the wall cladding, it can be affixed with 2 or 4 self-tapping screws in the metal frame. For very heavy wall claddings (slab, stone strips, and the like) there is also the possibility to affix the rail profiles in the metal frame into the wall via the pre-drilled screw holes.

[0030] With the intention of better showing the characteristics of the invention, hereinafter, by way of an example without any limiting nature, a number of preferred applications are described of a method according to the invention for the finishing of a substructure of a wall or of a roof and of an accessory applied with this, possibly in combination with a support slat, with referral to the

enclosed drawings, wherein:

figure 1 schematically and in vertical cross-section shows a wall that is finished according to the method of the invention;

figure 2 shows a frontal view according to arrow F2 of the wall of figure 1;

figure 3 shows a frontal view according to arrow F2 of the wall of figure 1, but without finish;

figure 4 schematically shows a perspective view according to arrow F4 in figure 3;

figure 5 on a larger scale shows the accessory indicated in figure 4 with F5, but in a disassembled condition;

figure 6 shows an alternative embodiment of figure 3; figure 7 on a larger scale shows the support slat indicated in figure 6 with F7;

figure 8 shows a frontal view of part of the accessory of figure 5 next to the support slat of figure 7;

figure 9 on a larger scale shows a cross-section according to line IX-IX in figure 6;

figure 10 shows an alternative adjusting screw.

[0031] The finished wall 1 shown in figures 1 and 2 is built on a substructure 2 which in this case is formed by an inner leaf of a wall.

[0032] Against the substructure, insulation panels 3 are attached in the known way which with their edges 4 and 5, the bottom edge 4 and top edge 5 respectively, and with their side edges which are connected to each other to form an insulating skin that is as good as closed around the substructure 2 of the wall 1.

[0033] Against the side of the insulation panels turned away 6 from the substructure 2 an accessory 7 according to the invention is affixed as shown in figure 5 and in the way as shown in figures 1, 3 and 4 in case light finishing materials are used.

[0034] The accessory is composed of a base plate 8 and an adjusting screw 9, preferably metal.

[0035] In this case the base plate 8 is a square base plate with a central screw passage 10 which in this case is formed by a nut 11 that is welded on the base plate 8 opposite a passage 12 in the base plate 8.

[0036] The base plate 8 is also provided with a first series of holes 13 near the corners of the base plate 8 on a fixed radial distance A of the central screw passage 10 and situated on the corners of an imaginary square 14 that is shown in a dashed line in figure 8 with a side with length B.

[0037] A second series of holes 15 is provided in the base plate 8 at a fixed radial distance C of the central screw passage 10 that is smaller than the aforementioned distance A and which is located on the diagonals of the aforementioned imaginary square 14.

[0038] The base plate 8 is provided with radial protruding reinforcements 16 in relation to the screw passage 10, e.g. in the form of embossed sunken parts.

[0039] The adjusting screw 9 is formed by a threaded

rod 17 which is screwed in the screw passage 12 and which on one end is fitted with an attachment element 18 which in this case is to attach slats 19 and for this is made as a U-shaped folded element with legs 20 which extend parallel to the longitudinal direction X-X' of the threaded rod 17, such that a slat 19 can be attached between the legs 20.

[0040] The use of this kind of accessory is very simple and is illustrated based on the figures 1 to 4 in the case of light finishing materials for finishing a wall or roof.

[0041] When the insulation panels 3 are attached against the substructure 2, the accessories 7 with are affixed with their holes 13 vertically above each other against the insulation panels 3 and using screws 21 or the like attached through the holes 15 of the base plate 8 and through the insulation panels on the substructure 2 as shown in figure 1.

[0042] Then the adjustment screws of the placed accessories are tightened or loosened to align the attachment elements 18 in relation to each other in the same plane, in this case in a vertical plane, so that the slats 19 affixed in it, together with those already affixed in it, form a flat aligned load-bearing frame 22 of e.g. vertical or horizontal slats against which e.g. finishing panels or another cladding 23 can be attached in the known way.

[0043] The aligning is preferably done using a laser, although other known techniques also come into consideration for this.

[0044] Due to the fact that the load-bearing frame 22 is flat the finished wall will automatically also be flat without requiring any other adjustment and levelling. The cladding 23 can be attached directly to the load-bearing frame 22.

[0045] For the most current heavier finishing materials 23, the accessories 7, in the majority of cases using a support slat 24 of metal or the like, are attached to the substructure 2 as shown in the figures 6 and 9.

[0046] The support slat 24 forms a fixed structure as it were that will offset the forces exercised on the accessories 7 and distribute the forces of several accessories which are attached to support slat 24 better over the length of the support slat 24.

[0047] For this the support slat 24 is provided for example with holes 25 for the screws 21 with a pattern of holes that is such that the accessories 7 can be aligned with their holes 13 opposite the holes 25.

[0048] For this the support slat 24 shows two series of holes 25, respectively holes 25' and holes 25", that are located along two opposite edges of the support slat 24 according to two parallel lines at a distance D from each other which is the same as the aforementioned distance B between the holes 13 and for every series of holes 25' and 25" an intermediate centre distance E which amounts to half of the aforementioned distance B.

[0049] This means the accessories 7 can be moved every time over a half width of the pattern of holes 13 along the support slat 24 in aligned positions.

[0050] In these aligned positions possibly the support

slats 24 and the accessories 7 can be fixed together with the same screws 21, although not necessarily.

[0051] The support slats 24 can at the level of the holes 25 form a seat for the screw heads 21, such that the screws 21 with a sunken head fit under the base plate 8 of the accessory 7.

[0052] In this case alternatively only the support slat 24 with the screws 21 can be fixed in the substructure 2 and the accessories 7 in turn can be screwed tight using self-tapping screws 26 or the like through the holes 15 in the base plate 8 in the support slat 24 as illustrated in figure 9.

[0053] The support slats 24 can still be fitted with an additional series of holes 27, possibly to make room for the nuts 11 of the accessories 7.

[0054] According to another aspect of the invention the support slats 24 can also be integrated in the insulation panels 3, whereby the support slat 24 is attached on the aforementioned side 6 of the insulation panel 3 and sticks out over the length of the bottom edge 4 of the insulation panel 3.

[0055] In the shown example the support slat 24 sticks out with a certain width F over this edge 4 like a downward protruding lip 28 which can be affixed overlapping against an adjacent insulation panel 3 on this edge 4, whereby the holes 25" on the level of this lip 8 are provided above one insulation panel 3 and the other holes 25' on the level of the adjacent insulation panel 3.

[0056] The support slats 24 thus always support on two insulation panels 3.

[0057] The integrated support slats 24 can also be fitted, along one edge, with a perpendicular folded back lip 29 which is imbedded in the material of the insulation panel 3 and results in a greater stability.

[0058] If the insulation panels 3 with the pattern of holes of their support slats 24 are aligned in a vertical or horizontal direction, it is easier to align the accessories 7 correspondingly in a vertical or horizontal direction with each other by aligning them with their holes 13 on corresponding holes of the support slats 24 on a vertical or horizontal line.

[0059] The use of accessories 7 is applicable in ventilated applications whereby a ventilated air gap 30 between the insulation panels 3 and the cladding 23 is necessary.

[0060] Such insulation panels 3 with integrated support slats 24 can also be used according to another aspect of the invention for non-ventilated applications without accessories 7 if the cladding 23 is affixed against the insulation panels 3 without air gap between the insulation and the cladding. This is the case for instance for a finish with zinc. The holes 25 can then be used to attach zinc layers.

[0061] The invention is not only meant for the finishing of a wall, but is just as applicable to other substructures 2, such as a roof structure or the like.

[0062] It is clear that the adjustment screws 9 of the accessories 7 can be fitted with attachment elements of

various types, depending on whether the load-bearing frame is made with slats, panels or the like. Figure 10 shows an example of an adjusting screw 9 with a flat attachment element 18 that extends as it were in the extension of the threaded rod 17 and which is suitable, for example, for slats 19 made out of aluminium instead of wood.

[0063] The adjusting screw 9 is in this case provided with a round hole 31 and slip hole 32 for a screw passage for the attachment of the slats by means of screws. The round hole 31 can be used for a fixed connection, e.g. at one end of a slat 19, whereas the slip hole 32 can be used for a sliding connection in another point of the slat 19 at a distance from the fixed connection, and this to offset the contracting and shrinking of the aluminium following temperature fluctuations. In this way both attachments can be realised with one single type of adjusting screw 9.

[0064] It goes without saying that the invention is not restricted to the alignment of the load-bearing frame in a straight plane, but is also applicable for a curved plane.

[0065] It is clear that instead of an adjusting screw 9 a depth adjustable rod can also be used which can be held, e.g. with clamping means or the like in its set position.

[0066] The present invention is in no way whatsoever restricted to the embodiments shown by way of an example and in the figures, but a method according to the invention for the finishing of a substructure 2 of a wall or of a roof and of a thereby applied accessory possibly in combination with a support slat, which can be realised in all kinds of forms and dimensions, without departing from the scope of the invention.

Claims

1. Method for the finishing of a substructure of a wall or a roof, whereby first thermal insulation panels (3) are adjoined against each other on the substructure (2) and then a cladding (23) is applied on a load-bearing frame (22) in the form of slats, panels or the like which are attached on the substructure (2), **characterised in that** the slats, panels or the like of the load-bearing frame (22) are attached to the substructure (2) by means of one or more accessories (7) in the form of a base plate (8) which is applied against the side of the insulation panels (3) turned away (6) from the substructure (2) and which is fitted with a regulating rod or adjusting screw (9) with a head in the form of an attachment element (18) for the slats, panels or the like, whereby after installation of the accessories 7 the regulating rods or adjustment screws (9), in relation to the base plate (8), can be adjusted to align the slats, panels or the like of the load-bearing frame (2) with each other in a plane.
2. Method according to claim 1, **characterised in that** the accessories (7) are attached to the substructure

(2) by means of screws which are screwed through the provided holes (13) in the base plate (8) and through the insulation panels (3) in the substructure (2).

3. Method according to claim 1, **characterised in that** the accessories (7) are screwed on a support slat (24) which is fixed against the side of the insulation panels (3) turned away (6) from the substructure (2) and is fixed to the substructure (2) using screws (21) or the like which are attached through provided holes (25) in the support slat (24) and through the insulation panels (3) in the substructure (2).
4. Method according to claim 3, **characterised in that** a support slat (24) is used with a regular pattern of holes (25) and of an accessory (7) with holes (13) for the screws or the like that coincide with one or more holes (25) of the support slat (24) and that the support slat (24) and the base plate (8) of the accessories (7) are attached together using screws or the like that are attached through the coinciding holes (13-25) and through the insulation panels (3) in the substructure (2).
5. Method according to claim 3 or 4, **characterised in that** insulation panels (3) are used which over the length of one of their edges (4) are provided with an aforementioned support slat (24) which is attached to the insulation panel (3) in question and sticks out with a certain width (F) over this edge (4) of the insulation panel (3) to form a protruding lip (28).
6. Method according to claim 5, **characterised in that** the insulation panels (3) with an edge (4-5) are adjoined against each other in such a way that an edge (4) of an insulation panel with a support slat (24) touches an edge (5) without a support slat (24) of an adjacent insulation panel (3) and that the protruding lip (28) of the support slat (24) grips over the adjacent edges (4-5) of both adjoining insulation panels (3).
7. Method according to claim 5 or 6, **characterised in that** insulation panels (3) are used with an attached support slat (24), whereby the pattern of holes contains at least two series of holes (25), a first series of holes (25") that extends over the length of the protruding lip (28) of the support slat (24) and a second series of holes (25') that extends over the length of the part of the support slat (24) with which the support slat (24) is attached to the insulation panel (3) respectively.
8. Method according to any one of the claims 5 to 7, **characterised in that** insulation panels (3) are used with a support slat (24) attached to it, whereby the support slat (24) at the edge opposite the protruding lip (28) is folded back in a perpendicular way to form

- a lip (29) that is imbedded in the insulation sheet.
9. Method according to any one of the previous claims, **characterised in that** for the alignment of the slats (19), panels or the like of the load-bearing frame (22), a laser is used. 5
 10. Accessory for use in a method according to any one of the previous claims, **characterised in that** the accessory (7) is composed of a base plate (8) and an adjusting screw (9) which can be tightened or loosed in the base plate (8) in a direction (X-X') perpendicular to the base plate (8) and which is fitted with a head in the form of an attachment element (18) to attach the slats (19), panels or the like of the load-bearing frame (22). 10
 11. Accessory according to claim 10, **characterised in that** the base plate (8) is provided with a screw passage (10) in which the adjusting screw (9) is screwed. 15
 12. Accessory according to claim 11, **characterised in that** the screw passage (10) is formed by a central nut (11) on the base plate (8). 20
 13. Accessory according to claim 11 or 12, **characterised in that** the base plate (8) is provided with a first series of holes at a fixed distance from the threaded hole (10) for the attachment of the base plate (8) on the substructure (2) by means of screws (21) or the like. 25
 14. Accessory according to claim 13, **characterised in that** the base plate is provided with a second series of holes (15) at a smaller fixed distance from the threaded hole (10) for the attachment of the base plate (8) on a supports slat (2) by means of screws (21) or the like. 30
 15. Accessory according to any one of the claims 11 to 14, **characterised in that** the base plate (8) is provided with reinforcements (16) which in relation to the threaded hole (10) extend in a radial direction. 35
 16. Accessory according to any one of the claims 10 to 15, **characterised in that** the attachment element (18) is a U-shaped element with two legs (20) which extend parallel to the longitudinal direction (X-X') of the adjusting screw (9) . 40
 17. Accessory according to any one of the claims 10 to 15, **characterised in that** the attachment element (18) is a plate which essentially extends in the extension of the adjusting screw (9). 45
 18. Accessory according to any one of the claims 10 to 17, **characterised in that** it is made of metal. 50
 19. Combination of an accessory according to any one of the claims 13 to 18 and of a support slat, **characterised in that** the support slat (24) is provided with a pattern of holes (25), whereby the support slat (24) along two opposite edges is provided with holes (25) at a fixed distance from each other which is such that the base plate (8) of an accessory (7) can be positioned on the support slat (24) in such a way that the first series of holes (13) of the base plate (8) corresponds with a number of holes (25) of the support slat (24). 55
 20. Combination according to claim 19, **characterised in that** holes (13) of the first series of holes of the base plate (8) are positioned according to the corners of an imaginary square (14) and that the centre distance between the holes (25') of the first series of holes (25) of the support slat (24) and the centre distance between the holes (25") of the second series of holes (25) of the support slat (14) is the same as half the length of a side of the aforementioned square (14).
 21. Combination according to claim 20, **characterised in that** the support slat (24) is made of metal.

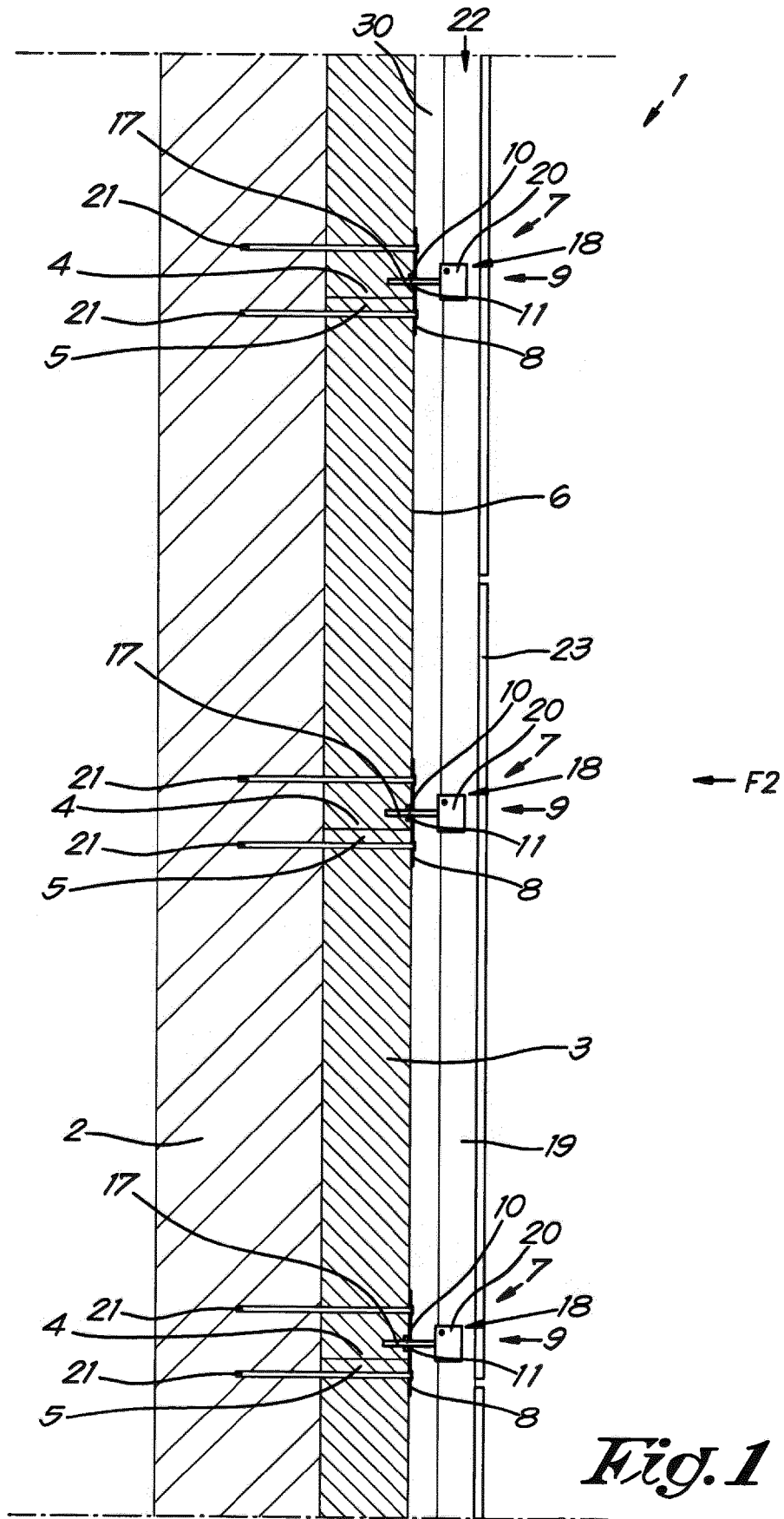


Fig. 1

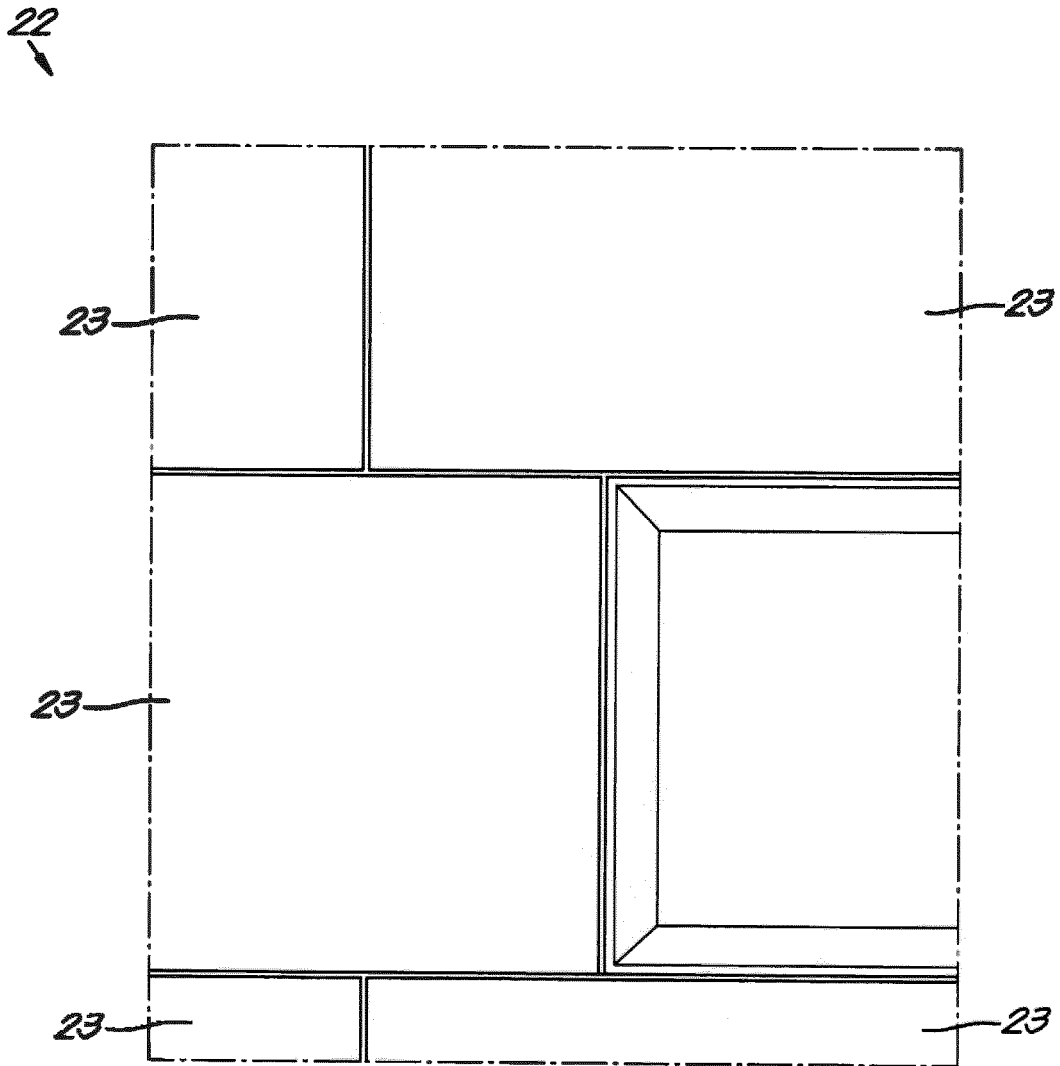


Fig. 2

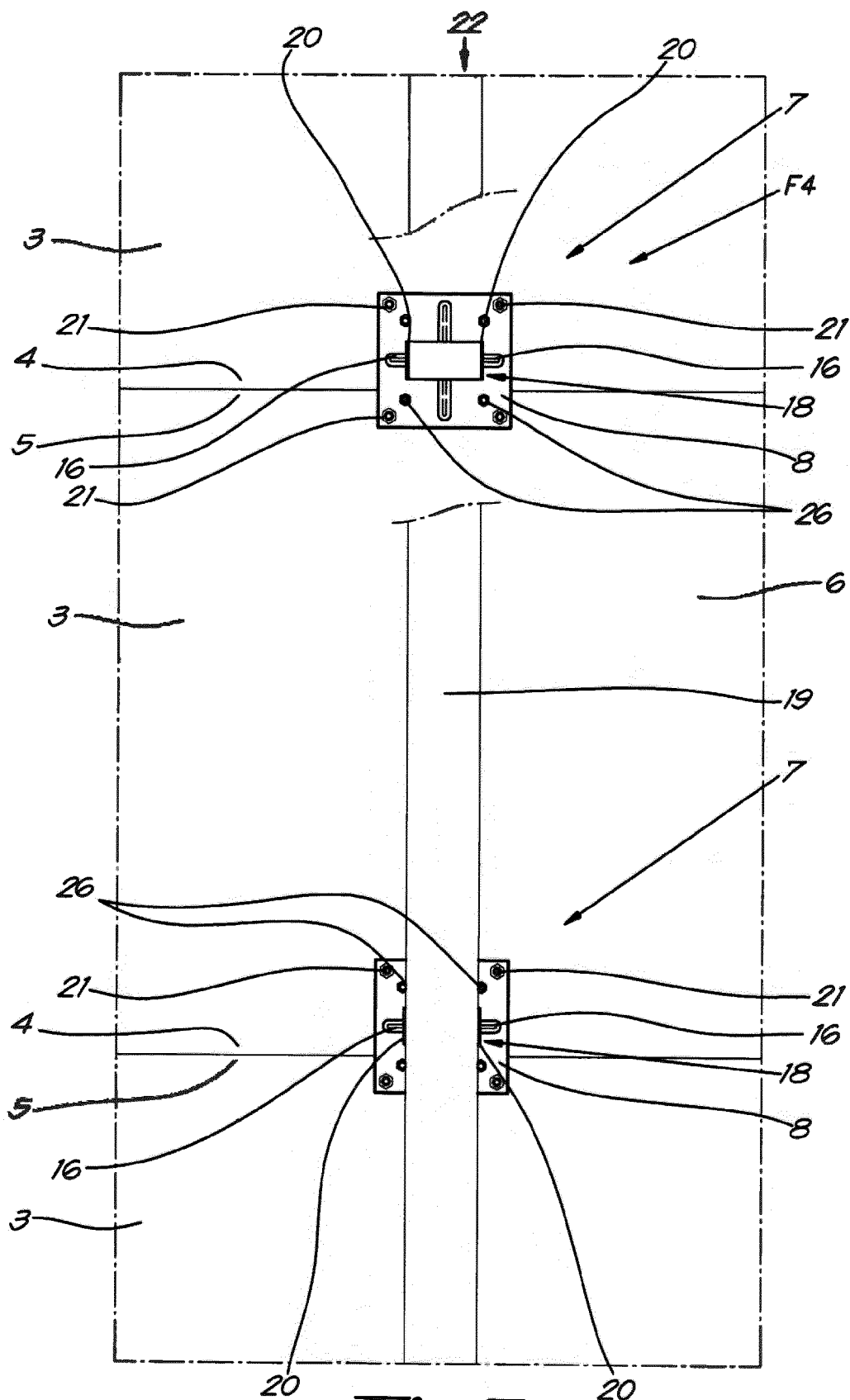


Fig. 3

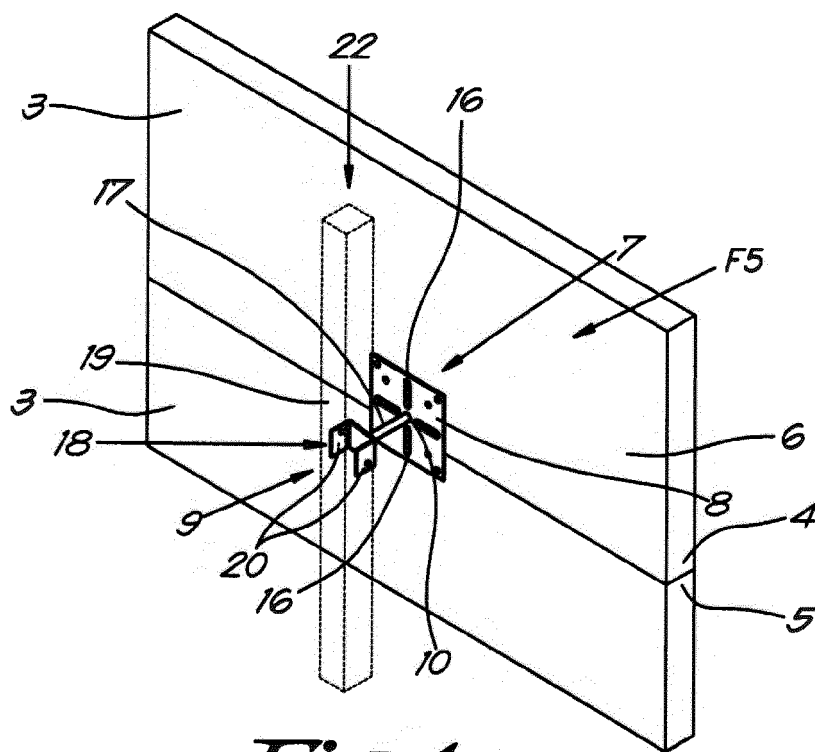


Fig. 4

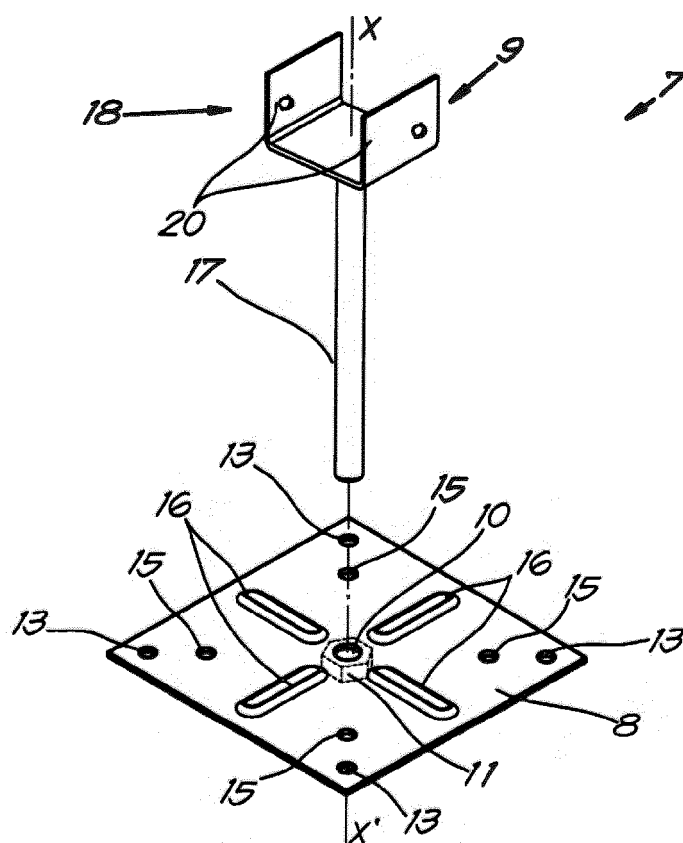


Fig. 5

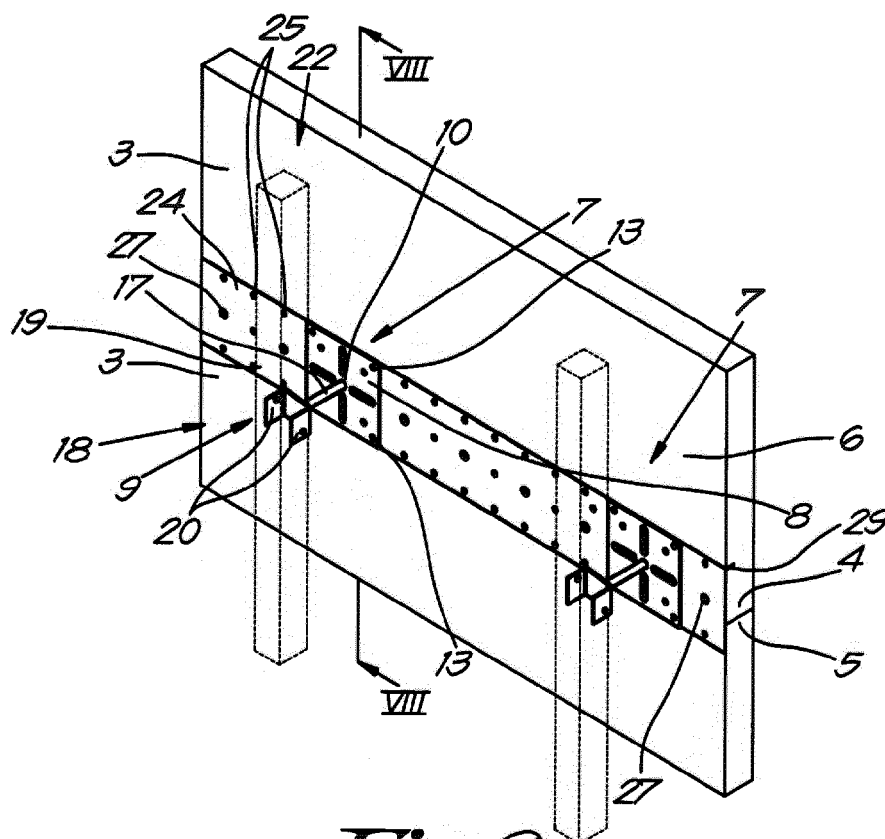


Fig. 6

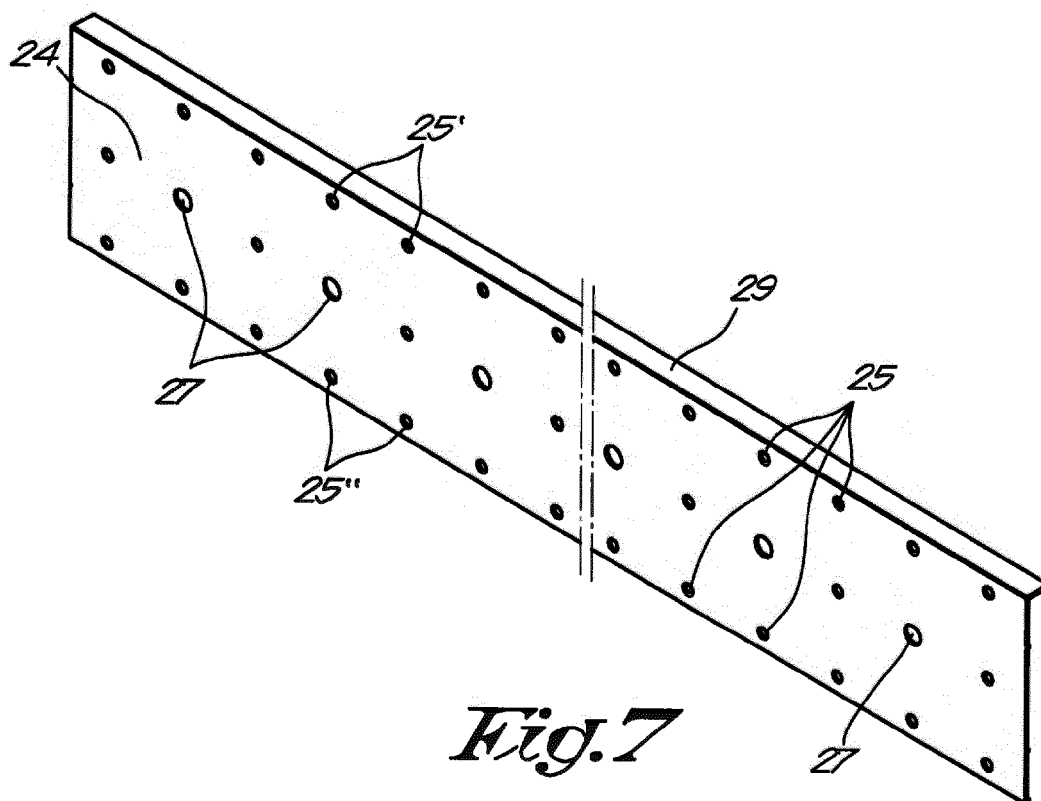


Fig. 7

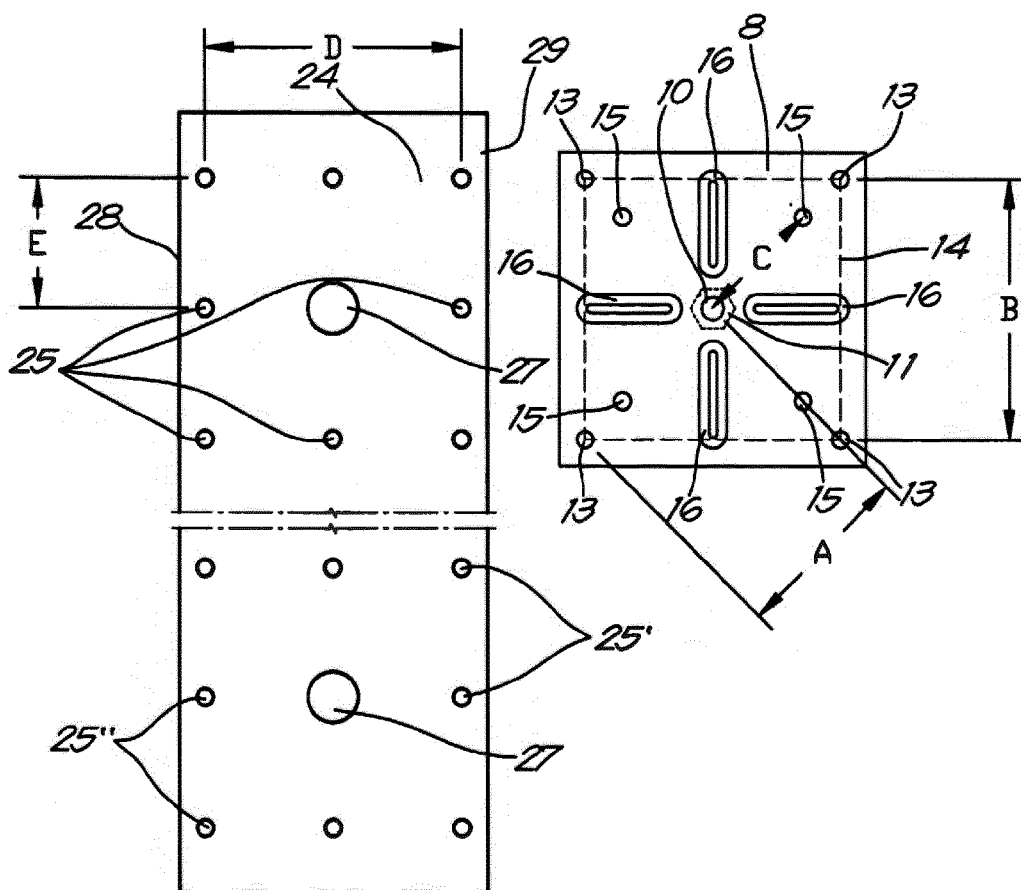


Fig. 8

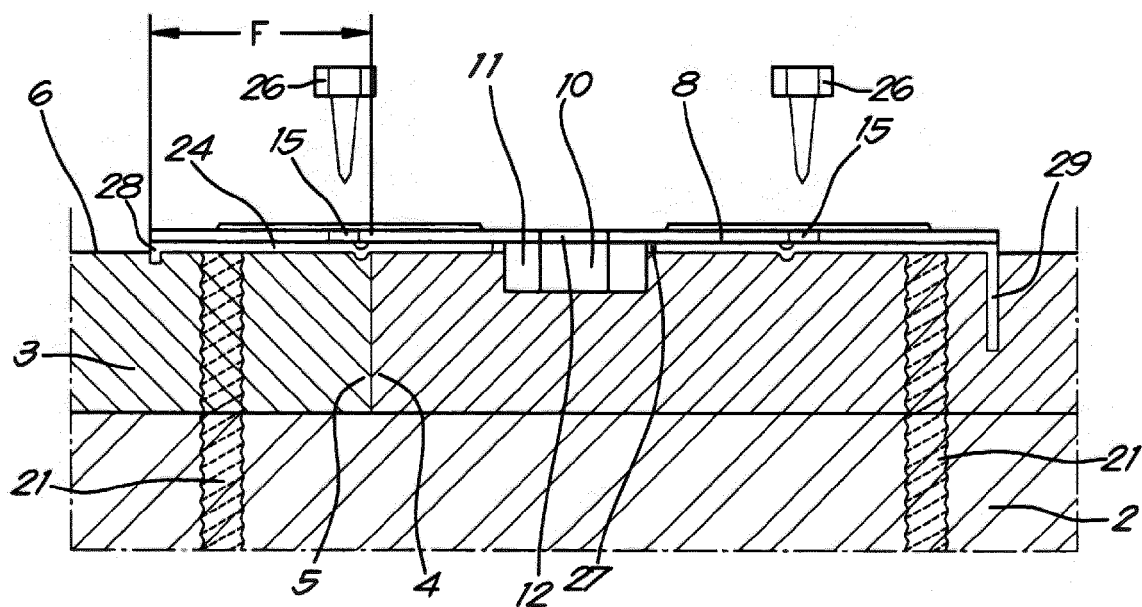


Fig. 9

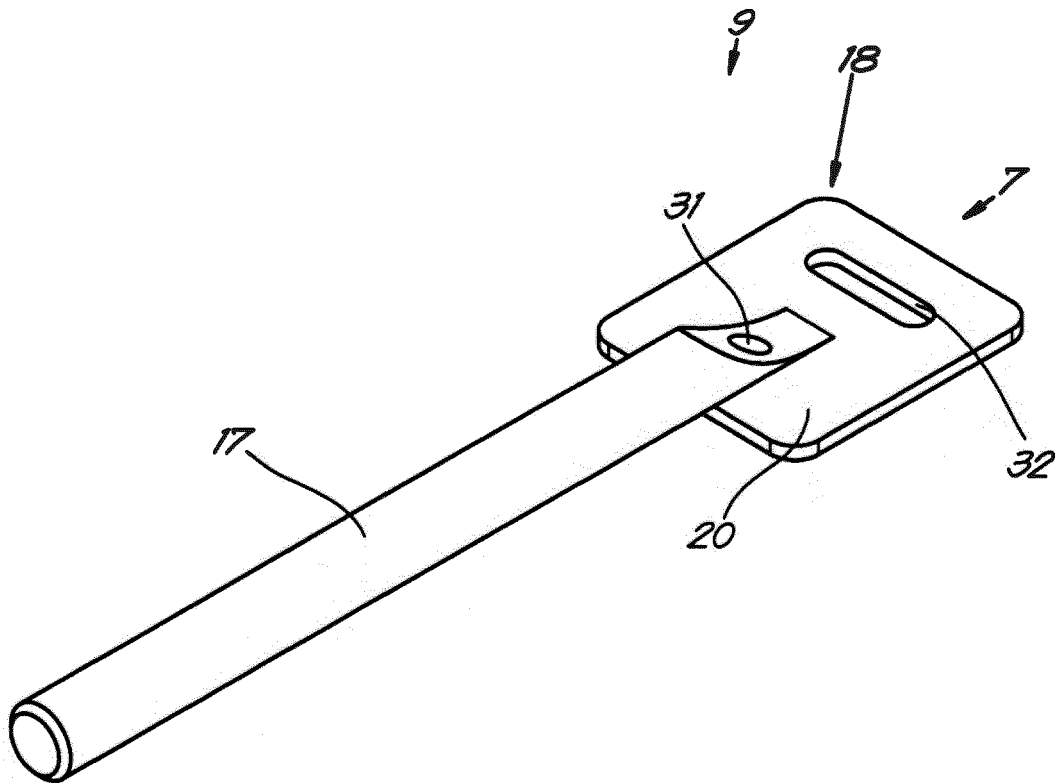


Fig.10



EUROPEAN SEARCH REPORT

Application Number
EP 18 15 0943

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 24 May 2018	Examiner Arsac England, Sally
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