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(71) Applicant: **AV_New S.R.L.**
29122 Piacenza (IT)

(72) Inventor: **Tessadori, Andrea**
20124 Milano (IT)

(74) Representative: **Petraz, Gilberto Luigi et al**
GLP S.r.l.
Viale Europa Unita, 171
33100 Udine (IT)

(54) Thermal break bracket for a support frame of covering elements

(57) Thermal break bracket to attach a support frame (11) to an attachment wall (60), made of polymer material and comprising two parts, first (12) and second (13), in which the first part (12) performs the function of a transverse adjustment element, while the second part (13) performs the function of a vertical adjustment element with respect to the attachment wall (60).

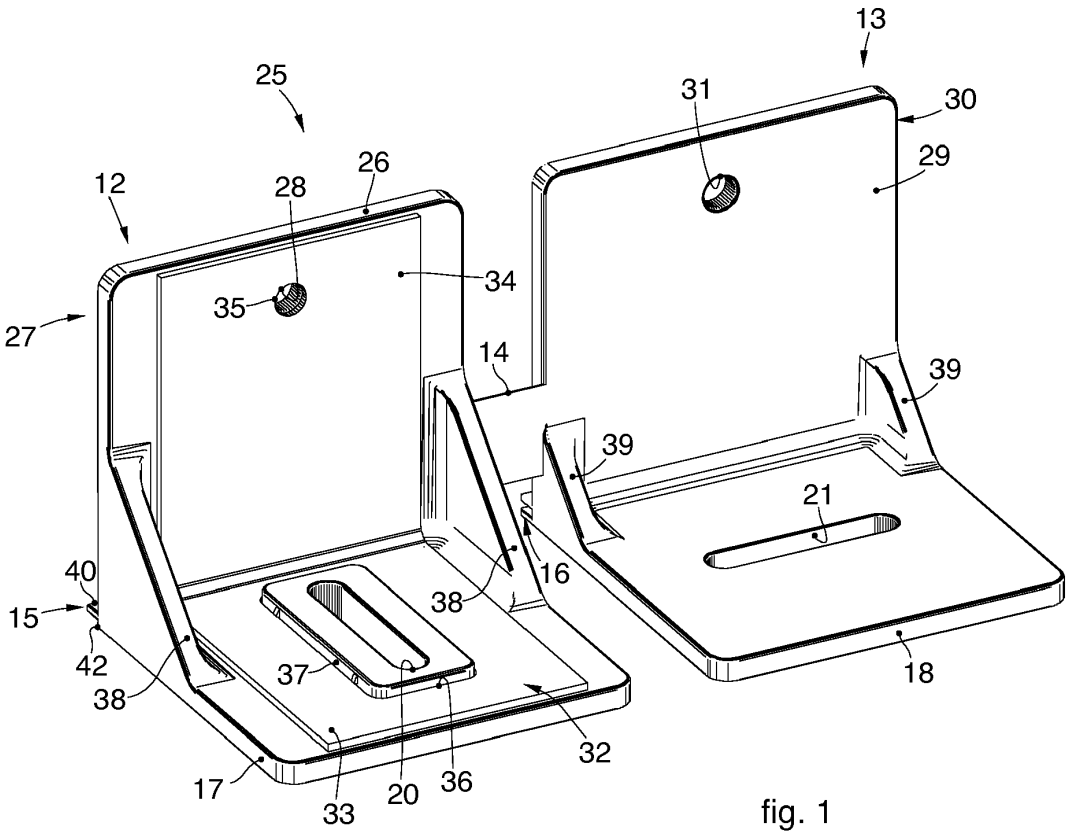

fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a thermal break bracket for a support frame of covering elements of the modular type, such as bricks, panels, plates, tiles or suchlike, substantially of any size and material, used mainly in the building sector, both public and private and street furniture.

BACKGROUND OF THE INVENTION

[0002] Support frames are known for external covering elements that are versatile, simple and practical to use, and are designed to create, quickly and at low cost, covering structures and facades of buildings to be applied to the walls.

[0003] The covering elements normally have the shape of tiles or slabs of a geometric shape, normally but not necessarily square, and can be made of various materials, including ceramic, marble, terracotta, wood, glass or other.

[0004] The support frames normally have a plurality of rapid clamping elements, provided with fins which cooperate by interference with corresponding grooves provided along the edges of the covering elements, in order to dispose the covering elements in a simple, rapid and guided way with respect to the wall to be covered.

[0005] Normally the support frames are constrained to the wall in advance by means of corresponding metal attachment apparatuses, which are generally adjustable on three axes to adjust the positioning of the support frame with respect to the wall in a desired way.

[0006] An example of this solution is described in the patent application ITUD2008A000172.

[0007] Another example of a bracket for covering structures is shown in DE 101 049 664 that shows a substantially L-shaped metal bracket equipped with adjustment eyelets on both sides of the L.

[0008] However, to guarantee these adjustments, in the range of positioning variability, it is necessary to use attachment apparatuses of a complex shape, that also require a high number of threaded elements to attach the whole structure.

[0009] Making attachment apparatuses entirely of metal has various disadvantages, including: a high thermal bridge between the surface of the building to be insulated and the metal structure of the support frame, and therefore between the inside and the outside of the building; low elasticity, so that it is diffcult to absorb the vibrations and adapt to the different working tolerances, as well as high production costs.

[0010] In particular, the thermal bridge is normally created due to the contact between the metal elements inserted and buried in the wall, which constitute its bearing structure, and the metal attachment elements inserted in the wall in order to anchor to it the support frame of the covering elements.

[0011] This contact between metal elements constitutes a passage way for the transmission of heat between the inside and the outside of the building, with negative effects on the thermal conditioning of the internal rooms of the building itself.

[0012] Other examples of metal brackets used to make covering structures for buildings, for example ventilated facades, are shown in US 4,442,642, WO 2008/101319 and DE 10 2004 025760.

[0013] One purpose of the present invention is to make a thermal break bracket for attachment apparatuses and support frames for covering structures of the type described above that simplifies production and assembly operations.

[0014] Another purpose of the present invention is to make a thermal break bracket for attachment apparatuses and support frames that guarantees a low thermal bridge between the surface of the building to be insulated and the metal structure of the support frame without entailing complexities in the manufacturing and high production costs. In particular, one purpose of the invention is to reduce as much as possible, if not to eliminate, the possibility of contact between metal elements of the metal structure of the support frame and structural metal elements inserted and buried in the wall of the building.

[0015] Another purpose of the present invention is to make a thermal break bracket for support frames that is extremely versatile and can adapt to different configurations required during the installation steps.

[0016] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0017] The present invention is set forth and characterized in the independent claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0018] In accordance with the above purposes, a thermal break bracket to attach a support frame to an attachment wall, according to the present invention, is at least partly made of polymer material and substantially consists of two components, first and second.

[0019] A first component, facing during use toward an attachment wall of the covering structure, is made of a polymer material and performs a thermal break function between the inside and outside of a building to which the covering structure is applied.

[0020] A second component, or connection component, that can be made of metal, connects the first component made of polymer material of the bracket to the support frame.

[0021] According to one form of embodiment of the present invention, the first component of the bracket, made of polymer material, has both transverse adjust-

ment elements of the assembly position in a parallel direction with respect to the attachment wall, and also vertical adjustment elements.

[0022] In one form of embodiment, the adjustment elements, both transverse and vertical, are the eyelet type, made separately on one or more surfaces of the first component made of polymer material of the bracket and possibly in mating surfaces of the second metal component.

[0023] In another form of embodiment, the first component of the bracket, made of polymer material, consists in its turn of two parts, which are able to be selectively coupled with respect to each other in the assembly and joining step to the second metal connection component of the bracket.

[0024] In this form of embodiment, each part of the first component of the bracket is substantially L-shaped, wherein a first wall of the L is disposed, during use, substantially parallel to the attachment wall, while the second wall of the L is disposed during use substantially orthogonal to the attachment wall.

[0025] In this form of embodiment, in at least one of the parts of the first component made of polymer material of the bracket, at least one first transverse adjustment eyelet is made in the first wall of the L, disposed parallel to the attachment wall, while a second vertical adjustment eyelet is made in the second wall of the L.

[0026] According to a variant, in one of the parts of the first component made of polymer material of the bracket, at least one first transverse adjustment eyelet is made in the first wall of the L while in the other part of the first component made of polymer material of the bracket at least a second vertical transverse adjustment eyelet is made.

[0027] In one form of embodiment, in the first component made of polymer material of the bracket, which performs the thermal break function, the two parts are obtained in the form of a mono block and are connected to each other by a connection tongue.

[0028] In an alternative form of embodiment, the two parts of the component made of polymer material are obtained separately as distinct elements and are assembled with respect to each other and to the second metal component in the assembly step of the covering structure.

[0029] In one form of embodiment, the first component made of polymer material of the bracket, in the assembled condition, can have, during use, at least a T-shaped configuration deriving from the reciprocal connection of the two L-shaped parts. In the assembled condition, the respective first walls of the two L-shaped parts are disposed aligned with each other and resting on the attachment wall, and the respective second walls of the two L-shaped parts are disposed adjacent to each other and orthogonal to the attachment wall, so as to define an interspace between them suitable for the insertion and installation of the second metal component of the attachment frame.

[0030] Thanks to the T-shaped configuration, the second walls of the polymer component of the bracket define an assembly position of the second metal component distanced from the wall of the building, so as to eliminate any point of contact between the wall of the building, in particular between structural metal elements inserted in the wall, and metal parts of the frame that supports the covering structure. In this way the heat transmission points that can create thermal bridges between the inside and outside of the building are eliminated.

[0031] The bracket according to the invention can have, during use, at least an S-shaped configuration in which the first wall of one of the two parts is disposed resting on the attachment wall, while the other of the two parts is positioned so that its first wall is adjacent to the second wall of the part and the second wall is resting on the support frame.

[0032] In accordance with one form of embodiment, the thermal break bracket comprises at least one fireproof element disposed overlapping at least one wall of one of the two parts.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033] These and other characteristics of the present invention will become apparent from the following description of forms of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a perspective view of the first component of the thermal break bracket according to the invention in one form of embodiment;
- fig. 2 is a perspective view of the thermal break bracket comprising the component of fig. 1 in a possible configuration of use;
- fig. 3 is a variant form of embodiment of the bracket in fig. 2;
- fig. 4 is a perspective view of the thermal break bracket in fig. 1 in another possible configuration of use;
- fig. 5 is a perspective view of the thermal break bracket in fig. 1 in another configuration of use;
- fig. 6 is a perspective rear view of a form of embodiment of the thermal break bracket;
- fig. 7 concerns another form of embodiment of a component of the thermal break bracket.

[0034] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one form of embodiment can conveniently be incorporated into other forms of embodiment without further clarifications.

DETAILED DESCRIPTION OF SOME FORMS OF EMBODIMENT

[0035] We shall now refer in detail to the various forms of embodiment of the present invention, of which one or

more examples are shown in the attached drawing. Each example is supplied by way of illustration of the invention and shall not be understood as a limitation thereof. For example, the characteristics shown or described insomuch as they are part of one form of embodiment can be adopted on, or in association with, other forms of embodiment to produce another form of embodiment. It is understood that the present invention shall include all such modifications and variants.

[0036] Figs. 1-7 are used to describe forms of embodiment of a thermal break bracket 10 used to attach a support frame 11 to an attachment wall 60, shown schematically in figs. 2 and 3.

[0037] The thermal break bracket 10 has a first component 25 (figs. 1, 7) made at least partly, advantageously wholly, of polymer material, such as polyamide for example, obtainable by molding or other suitable working process.

[0038] In accordance with the present description, with reference to fig. 1, the first component 25 in polymer material consists substantially of two parts, respectively first 12 and second 13, connected to each other by a connection tongue 14. In the form of embodiment in fig. 7 each part 12, 13 is made singly, for example by molding, and is advantageously, even if not necessarily, coupled, during the assembly step, to another of said parts 12, 13, in order to define the coupling condition shown in figs. 2 and 3 for example.

[0039] The solution shown in fig. 1 concerns the case, not binding, in which the first component 25 in polymer material is obtained as a monoblock in a single piece from molding.

[0040] In the solution of fig. 1, the two parts 12 and 13 have a mating geometric configuration for the functions they must perform in their operative application, as will be discussed in detail hereafter.

[0041] In particular, each of the two parts 12 and 13 comprises a first surface or wall, lying on a first plane, in this case horizontal, respectively 17 and 18, and a second surface, or wall, lying on a second plane, angled in this case substantially at 90°, with respect to the first plane, in this case vertical, respectively 26 and 29. The terms vertical and horizontal are intended with reference to the positioning shown in fig. 1 and must not be considered restrictive in the context of the present description.

[0042] As will be seen hereafter, and with regard to their conformation, in the solution shown in fig. 2, the first part 12 performs the function of transverse adjustment element, while the second part 13 performs the function of vertical adjustment element with respect to the attachment wall 60.

[0043] In the solution in figs. 3 and 7, as will be seen better hereafter, each part 12, 13 can perform both the function of vertical adjustment and also that of transverse adjustment.

[0044] In this case too, the terms transverse and vertical are intended as a preferential function in condition of use, and refer to the position that the two elements that constitute the bracket 10 will assume when installed with respect to the attachment wall 60. Any reference to position is not to be considered as restrictive for the invention, but used only for greater descriptive clarity.

[0045] In some forms of embodiment, the first component 25 of the thermal break bracket 10 is made of composite material, such as for example resins reinforced with a fibrous material, like glass fibers for example. In this way, the first component 25 can have the function of insulating material so as to have a thermal transmission coefficient much lower than that of the metal materials used in the state of the art.

[0046] In some forms of embodiment, each part 12 and 13 can have a shape to allow interfacing and connection with the other part 13 and 12 and, at the same time, attachment to the wall as well as connection with a second metal component 23 of the bracket 10, described hereafter.

[0047] For example, a shape that respects these requirements can be an L-shape, as shown in figs. 1-7 for example.

[0048] The L-shape of each part 12, 13 of the first component in polymer material 25 allows, in the assembled condition, to keep the second metal component 23 at a distance from the attachment wall 60, reducing to a minimum the possibility of any contact between metal components inserted and buried in the attachment wall 60 and metal elements of the support frame 11, thus preventing the creation of thermal bridges between inside and outside the building.

[0049] In some forms of embodiment, by breaking the connection tongue 14, the two parts 12 and 13 can be separated completely from each other, so they can be used autonomously and independently.

[0050] In other forms of embodiment, the two parts 12 and 13, obtained separate, or subsequently separated, as shown in fig. 7, can then be coupled and connected in a different disposition from that shown in fig. 1.

[0051] In order to obtain a thermal break bracket 10 that can interface both with the attachment wall 60 and with the support frame 11, each of the parts 12 and 13 can have connection seatings and possible joint coupling seatings.

[0052] In particular, in this case, a transverse joint seating 15 and a vertical joint seating 16 are respectively made, substantially in the connection zone between vertical wall and horizontal wall of each of the two parts 12 and 13 (figs. 1, 6).

[0053] The joint seatings 15 and 16 allow to couple and connect again the two parts 12 and 13 with respect to each other, after the separation through breaking of the connection tongue 14, in order to obtain a thermal break bracket 10 in a single body (see fig. 2 for example) but with a configuration suitable for the specific operative function to be performed.

[0054] In particular, the connection between the two parts 12 and 13 can produce a T-shaped configuration (see figs. 2, 3 and 4 for example), that can be used, for

example, to support the load associated with the support frame 11, or an S-shaped configuration (see fig. 5 for example), that can be used to increase the resistance to wind stresses that act on the external covering wall and consequently can cause the covering itself to vibrate excessively.

[0055] In accordance with figs. 2 and 3, concerning a T-shaped configuration, the parts 12 and 13, and in particular the respective walls 17 and 18, connected to each other by means of the respective joint seatings 15 and 16, define an attachment surface 19 which, during use, can be located in contact with any flat surface, such as an attachment wall 60 for example.

[0056] In accordance with fig. 2, the wall 17 of the first part 12 performs, during use, a transverse adjustment function while the wall 18 of the second part 13 performs, during use, a vertical adjustment function.

[0057] In particular, the transverse adjustment wall 17 and the vertical adjustment wall 18 comprise, respectively, a transverse adjustment eyelet 20 and a vertical adjustment eyelet 21 which allow, respectively, the transverse and vertical adjustment of the thermal break bracket 10, giving the first two degrees of adjustment of the support frame 11. As seen in the drawings, in particular fig. 1, in the monoblock production conformation, the eyelets 20 and 21 have a reciprocally substantially perpendicular development.

[0058] In the solution shown in fig. 3, instead, both walls 17 and 18, disposed in contact with the attachment wall 60, of the parts 12 and 13 perform a transverse adjustment function, having respective transverse adjustment eyelets 20, while the walls 26, 29 orthogonal to them, described in greater detail hereafter, perform a vertical adjustment function, having respective vertical adjustment eyelets 21.

[0059] In some forms of embodiment, the T-shaped configuration of the polymeric component 25 of the thermal break bracket 10 defines an element 22 orthogonal to the attachment surface 19, therefore orthogonal to the attachment wall 60, defined by the parallel and adjacent positioning of the two walls 26, 29. The orthogonal element 22 defines, in the space between the walls 26, 29, a sliding fissure or interspace 24 that can house at least part of said second metal component 23, used for the coupling and connection of the first polymeric component 25 and the support frame 11.

[0060] The second metal component 23 can translate orthogonally with respect to the plane on which the wall lies, allowing both a vertical adjustment and an adjustment of the amplitude of the space between the attachment wall 60 of the building to be insulated and the covering of the building.

[0061] In this way, in addition to the transverse and vertical adjustments, a third degree of adjustment is obtained, defined by the distance between support frame 11 and attachment wall 60.

[0062] In accordance with fig. 1, the wall 26 can have, in correspondence to one of its upper transverse ends 27, a transverse aperture 28, such as a hole for example, through in the thickness of the transverse assembly wall 26.

[0063] Moreover, still in accordance with fig. 1, the wall 29 in correspondence with an upper vertical end 30, has a vertical aperture 31, such as a hole for example, through in the thickness of the vertical assembly wall 29.

[0064] In some forms of embodiment, the two apertures 28 and 31 can be provided on the axis of symmetry of the respective assembly walls 26 and 29; according to a variant, they can be disposed in different positions from those shown, provided that the two apertures 28 and 31 are disposed aligned with respect to each other when the two parts 12 and 13 are disposed in the T-shaped configuration.

[0065] In the T-shaped configuration (figs. 2 and 3), in order to clamp the metal component 23 in the interspace 24, attachment elements can be used, such as for example threaded screws, passing through the apertures 28 and 31 to determine a stable position of the metal component 23. The diameter of the apertures 28 and 31 can therefore be variable, as a function of the type of attachment element used.

[0066] In some forms of embodiment, in order to facilitate the insertion of the attachment elements, it is possible to provide a lead-in in the apertures 28 and 31 as above.

[0067] According to the present description and with reference for example to fig. 1, the transverse adjustment eyelets 20 and the vertical adjustment eyelets 21 are like through apertures in the thickness of the respectively transverse and vertical adjustment walls 17, 18, 26, 29. The eyelets 20 and 21 can both have an oblong extension in the direction, respectively, transverse and vertical with respect to the attachment wall 60, in order to allow to adjust the position of the thermal break bracket 10. In particular, the eyelets 20 and 21 are designed to house the attachment elements, such as threaded screws, which can allow connection of the thermal break bracket 10 to the attachment wall 60 (see for example figs. 2-4). In particular, the adjustment of the position of the thermal break bracket 10 can be made by sliding the attachment elements inside the eyelets 20 and 21 until the optimum position is determined.

[0068] As can be seen from the solution in fig. 3, the transverse adjustment eyelets 20 allow to correctly position the polymer component 25 with respect to the attachment wall 60. The vertical adjustment eyelets 21 allow to correctly position, in a vertical direction, the second metal component 23 with respect to the polymer component 25.

[0069] The clamping of the first polymer component 25 and the second metal component 23 is obtained also with the assistance of anchoring screws 66, insertable through insertion holes 65 aligned between parts 12, 13 of the first polymer component 25 and corresponding holes present in the second metal component 23.

[0070] In some forms of embodiment, the wall 26,

which during use is disposed orthogonally to the attachment wall 60, can house a fireproof element 32 (fig. 2), which also has a bracket or L shape and can be made of metal material. The main purpose of the fireproof element 32 is to statically support the support frame 11 of the covering if the polymer component 25 starts to melt due to fire. If the polymer material melts, the attachment plugs can rest against the fireproof element 32, transmitting the loads and thus allowing to at least temporarily support the structure.

[0071] This causes an increase in the fireproof properties of the bracket 10 in terms of safety times.

[0072] Another function of the fireproof element 32 is to prevent the fall of drops of melted composite material as a consequence of overheating in correspondence with the polymer component 25 of the thermal break bracket 10.

[0073] The fireproof element 32 comprises a transverse fireproof wall 33 and an orthogonal fireproof wall 34.

[0074] The fireproof element 32 can be mounted overlapping with the first part 12 of the polymer component 25. To do this, compatibly with the shape of the first part 12, the fireproof element 32 comprises, at the end of the orthogonal fireproof wall 34, an aperture 35, such as for example a hole which, in the T-shaped configuration of the thermal break bracket 10, can be aligned and interacting in size and position with the apertures 28 and 31 as above.

[0075] With this configuration, a coupling element, such as a threaded element, can pass through the apertures 28, 31 and 35, attaching both the fireproof element 32 and the second metal component 23.

[0076] The transverse fireproof wall 33 also comprises an eyelet 36 with a size at least equal to that of the transverse adjustment eyelet 20 of the first part 12.

[0077] In some forms of embodiment, the transverse adjustment wall 17 can have a greater thickness around the transverse adjustment eyelet 20, thus generating a raised area 37 that can have a peripheral shape such as to generate interaction with the eyelet 36, in particular joint or similar forms of attachment and insertion.

[0078] In other forms of embodiment, the raised area 37 can have a thickness compatible with the thickness of the fireproof element 32, or different.

[0079] In other forms of embodiment, the raised area 37 can have a surface area with a rectangular or oblong shape, or shapes compatible with the transverse adjustment eyelet 20.

[0080] According to the present description, and purely for the purpose of clarifying fig. 2, the first part 12 and the second part 13 of the polymer component 25 of the thermal break bracket 10 comprise support elements, respectively transverse 38 and vertical 39.

[0081] In particular the support elements 38 and 39 can have a shape such as to increase the robustness of the individual parts 12 and 13 and their capacity for supporting loads.

[0082] A shape compatible with these requirements can be a triangle, such as an isosceles or right triangle, disposed so as to make the other sides adhere to the surfaces of the walls affected by said advantageous effect, and the hypotenuse exposed toward the external environment.

[0083] The support elements 38 and 39 can have a variable thickness, which can also be the same as that of the walls that make up the elements 12 and 13 of the polymer component 25 of the thermal break bracket 10.

[0084] In some forms of embodiment, and with reference for example to fig. 1, the support elements 38 and 39 can be in contact respectively with the front surface of the orthogonal wall 26 and the upper surface of the transverse adjustment wall 17, and with the front surface of the orthogonal wall 29 and upper surface of the transverse or vertical adjustment wall 18.

[0085] In some forms of embodiment, the transverse assembly wall 26, the transverse adjustment wall 17 and the support elements 38 can constitute a single body of the first part 12 and are connected to each other by connections with a radius suitable to prevent the formation of dead angles. In the same way, the vertical assembly wall 29, the transverse or vertical adjustment wall 18 and the support elements 39 can constitute a single body of the second part 13 and are connected to each other by connections with a radius suitable to prevent the formation of dead angles.

[0086] In some forms of embodiment, the size in surface terms of the vertical support elements 39 can be less than the size of the transverse support elements 38: this is for reasons of industrial requirements for the production of the vertical adjustment eyelet 21.

[0087] In some forms of embodiment, and with reference to fig. 1 for example, in the rear part of the transverse assembly wall 26, the first part 12 has the transverse joint seating 15 described above.

[0088] The transverse joint seating 15 has a transverse tongue 40, parallel to the transverse adjustment wall 17, which extends with a length that can correspond to that of the transverse assembly wall 26 in the vertical direction. In some forms of embodiment, the thickness of the tongue can vary from a few millimeters to a few centimeters and the amplitude can be a few millimeters, preferably 5-6 millimeters.

[0089] The transverse tongue 40 is connected to the transverse assembly wall 26 in correspondence with a lower transverse end 41 and located at a distance from the transverse rear edge 42, in the direction orthogonal to the attachment wall, equal to the thickness of the mating vertical joint seating provided on the second part 13.

[0090] In some forms of embodiment, in correspondence with the connection with the transverse assembly wall 26, the tongue 40 can have at least a joint aperture 43, in this case two apertures 43. In some forms of embodiment, the joint apertures 43 can be made through or blind in the thickness of the tongue 40 and can have a rectangular or oblong shape for example.

[0091] In some forms of embodiment, and with reference to fig. 1, in the rear part of the vertical assembly wall 29 the second part 13 has the vertical joint seating 16, with a shape such that it can mate with the transverse joint seating 15 (see fig. 6 for example).

[0092] The vertical joint seating 16, in this case, has a rear tongue 44 and a joint tongue 45, parallel to the vertical adjustment wall 18, which extend with a length that can correspond to that of the transverse assembly wall 26 in the vertical direction.

[0093] The rear tongue 44 is connected to the vertical assembly wall 29 in correspondence with a vertical lower end 46 and is located on the transverse rear edge 42, configured as an extension in the transverse direction of the vertical adjustment wall 18.

[0094] The joint tongue 45 is connected to the transverse assembly wall 26 in correspondence with a vertical lower end 46 and located at a distance from the transverse rear edge 42, in a direction orthogonal to the attachment wall, equal to the sum of the thickness of the transverse tongue 40 and the rear tongue 44.

[0095] In some forms of embodiment, the joint tongue 45 can be discontinuous, since it can have at least one joint element 48, in this case two, compatible with the joint apertures 43.

[0096] In some forms of embodiment, the two tongues 44 and 45 define between them an interspace 47, such as for example a fissure, that extends for the entire length of the tongues 44 and 45. The interspace 47 has a shape and size such as to house the transverse tongue 40 inside it and the apertures 43 of the transverse tongue 40 are such as to be able to house the joint elements 48, so as to obtain a stable connection between the first part 12 and the second part 13.

[0097] In some forms of embodiment, the interspace 24 has a thickness corresponding to the amplitude of the tongues 40, 44 and 45 with respect to the respective transverse and vertical assembly walls 26 and 29.

[0098] In some forms of embodiment, it may be convenient to use two polymer components 25, operating on the same metal component 23 with the purpose of increasing the structure's resistance to stresses.

[0099] In other forms of embodiment, it can be advantageous to use the thermal break bracket 10 both to attach the vertical profile (see figs. 1-4), and also the horizontal profile of the support frame 11 (see fig. 5 for example).

[0100] In some forms of embodiment, and in particular in the S-shaped configuration, the second part 13 can be positioned in the same way as in the T-shaped configuration, in particular so that the vertical adjustment wall 18 rests against the attachment wall 60, giving the possibility of making the vertical adjustment of the apparatus in this configuration.

[0101] The first part 12 is disposed instead so that the transverse adjustment wall 17 is adjacent to the vertical assembly wall 29 of the second part 13, and such that the transverse adjustment eyelet 20 is aligned with the vertical aperture 31, so as to allow connection of the two parts 12 and 13 by coupling elements, such as for example threaded elements (see fig. 2 for example).

[0102] The transverse assembly wall 26 is instead put resting on the support frame 11 and is connected to it by coupling elements such as threaded screws.

[0103] According to the present description, and with reference to figs. 2 and 3 for example, the second metal component 23 comprises a first flap 49 and a second flap 50.

[0104] The insertion in this case of one flap or the other 49, 50 inside the interspace 24 allows to produce another two configurations (see figs. 2 and 4 for example). The first of them is such that the first flap 49 is inserted into the interspace 24 (fig. 2) while the second is such that the second flap 50 is inserted into the interspace 24 (fig. 3). The two configurations differ by a distance D (fig. 5), which can be created between the attachment wall 60 of the building to be insulated and the metal structure of the support frame 11 according to the asymmetrical configuration of the metal component 23.

[0105] In particular, in the configuration in fig. 2, like that in fig. 3, a greater distance D can be generated that is compatible with big thicknesses of the insulating material; this solution can be used to create external coverings associated with the insulation of spaces that require a high quality insulation, such as bedrooms for example.

[0106] In the configuration in fig. 4, instead, a reduced distance D can be generated, compatible with using smaller thicknesses of the insulating material; this solution can be used for example to create external coverings associated with the insulation of stairwells.

[0107] The first flap 49 can have a quadrangular shape, for example square or rectangular; it comprises at least one hole 51 to attach it to the frame 11, in this case four holes, and an orthogonal sliding eyelet 52, through in the thickness of the wall of the flap 49 and having an oblong shape in a direction orthogonal with respect to the attachment wall.

[0108] The eyelet 52 can have a shape and size such that it can interact with the interspace 24 and in particular with the apertures 28 and 31, respectively, of the two parts 12 and 13 of the first polymer component 25, to allow the insertion of coupling elements, such as for example threaded elements, to couple the metal component 23 to the polymer component 25 of the thermal break bracket 10.

[0109] The second flap 50 comprises a quadrangular segment 53, which is beveled on one side in fig. 3, in this case on the left, for example having a square or rectangular shape, and a rectangular segment 55. The segment 53 comprises at least one hole 51, in this case four holes, and a transverse sliding eyelet 54 through in the thickness of the walls and having an oblong shape in a transverse direction with respect to the attachment wall 60; on the contrary, the rectangular segment 55 can have a surface without apertures.

[0110] The second metal component 23 is made in a

single body and the presence of the two flaps 49 and 50 is obtained by a bending and incision process. In particular, the rectangular segment 55 is connected by the short side to the quadrangular segment 53, forming a surface belonging to the same plane, whereas in the direction of the long side the rectangular segment 55 is connected to the first flap 49. The first flap 49 and the second flap 50 are orthogonal with respect to each other so as to form a double L-shaped and P-shaped configuration as described above.

[0111] A possible application of the present invention can provide to reciprocally connect two thermal break brackets 10 so that the transverse adjustment wall 17 and the vertical adjustment wall 18 of the first and second bracket both rest against the wall 60 and that the transverse 15 and vertical 16 joint seatings of the first bracket are respectively connected to the vertical 16 and transverse 15 joint seatings of the second bracket. This solution allows to support higher loads.

[0112] It is clear that modifications and/or additions of parts may be made to the thermal break bracket for a support frame for covering elements as described heretofore, without departing from the field and scope of the present invention.

Claims

1. Thermal break bracket to attach a support frame (11) to an attachment wall (60) of a building, **characterized in that** it comprises a first component (25), facing during use toward said attachment wall (60), made of polymer material and with a thermal break function between the inside and the outside of the building, and a second component (23) made of metal, that connects said first component made of polymer material (25) to said support frame (11), wherein at least said first component (25) made of polymer material has at least one transverse adjustment element and at least one vertical adjustment element to adjust the assembly position on the attachment wall (60).

2. Thermal break bracket as in claim 1, **characterized in that** said at least one transverse adjustment element and said at least one vertical adjustment element to adjust the assembly position are the eyelet type (20, 21), made separately on one or more surfaces (17, 18; 26, 29) of the first component (25) made of polymer material.

3. Thermal break bracket as in claim 1 or 2, **characterized in that** said transverse adjustment element and said vertical adjustment element are made in surfaces (49, 50) of the second metal component (23) in a position mating with a corresponding transverse adjustment element or a corresponding vertical adjustment element present on walls of the first component (25) of polymer material.

4. Thermal break bracket as in any claim hereinbefore, **characterized in that** the first component (25) of the bracket, made of polymer material, consists of two parts (12, 13), able to be selectively coupled with respect to each other in the assembly and joining step to the second metal component (23) of the bracket.

5. Thermal break bracket as in claim 4, **characterized in that** each part (12, 13) of the first component (25) is substantially L-shaped, in which a first wall of the L is configured to be disposed, during use, substantially parallel to the attachment wall (60), while the second wall of the L is configured to be disposed, during use, substantially orthogonal to said attachment wall (60).

6. Thermal break bracket as in claim 4 or 5, **characterized in that** the two parts (12, 13) are obtained in the form of a monoblock and are connected to each other by a connection tongue (14).

7. Thermal break bracket as in claim 4, 5 or 6, **characterized in that** each of said two parts (12, 13) comprises a respective joint seating (15, 16), wherein said joint seatings (15, 16) are mating and complementary with each other for reciprocal coupling and connection,

8. Thermal break bracket as in any claim from 4 to 7, **characterized in that** each of said two parts (12, 13) comprises a first surface or wall (17, 18), lying on a first plane, and a second surface or wall (26, 29), lying on a second plane, angled with respect to the first plane.

9. Thermal break bracket as in any of the claims from 4 to 8, **characterized in that**, during use, it has at least a T-shaped configuration in which the respective first walls (17, 18) of the two parts (12, 13) are disposed aligned with each other and resting on the attachment wall (60), and the respective second walls (26, 29) of the two parts (12, 13) are disposed adjacent to each other and orthogonal to said attachment wall (60), so as to define an interspace (24) between them suitable for the insertion and the attachment of said second metal component element (23) of the attachment frame (11) in a position distanced from said attachment wall (60).

10. Thermal break bracket as in any of the claims from 4 to 8, **characterized in that**, during use, it has at least an S-shaped configuration in which the first wall (18) of one (13) of the two parts is disposed resting on the attachment wall (60), while the other (12) of the two parts is positioned so that its first wall (17)

is adjacent to the second wall (29) of the part (13) and the second wall (26) is resting on the support frame (11).

11. Thermal break bracket as in claim 1, **characterized in that** it comprises at least a fireproof element (32) disposed positioned at least above one wall (17) of one of the two parts (12, 13).

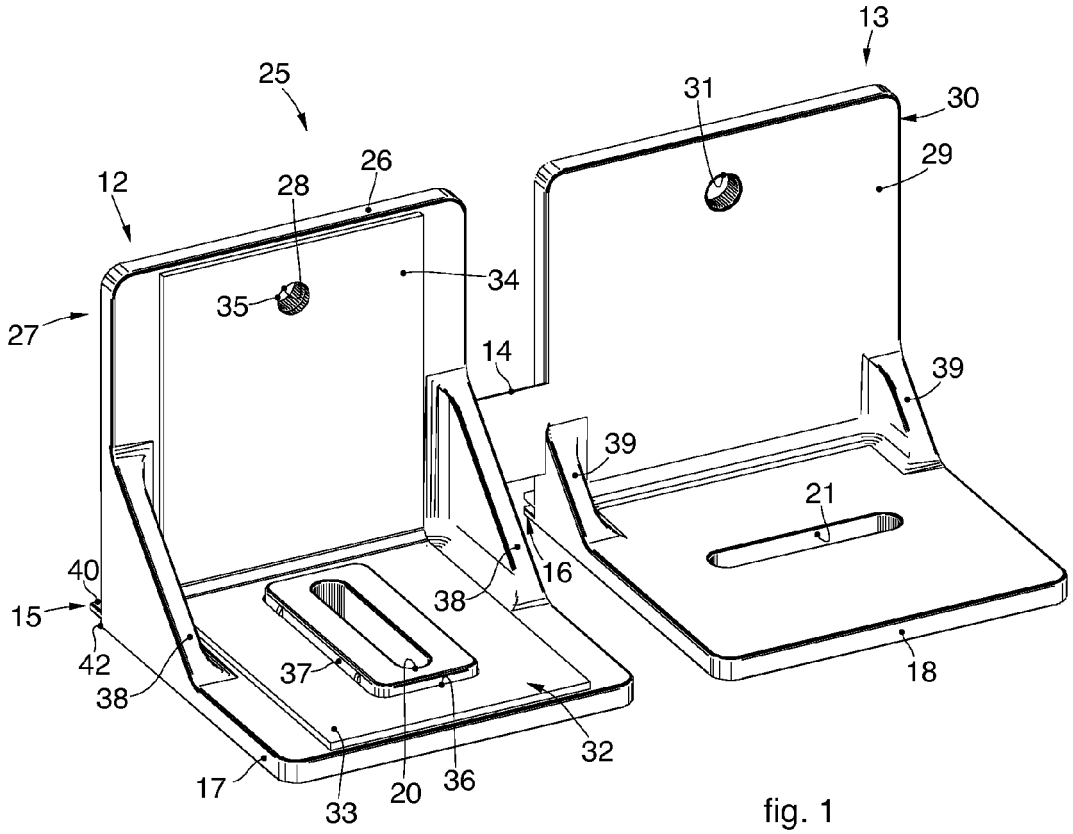
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fig. 1

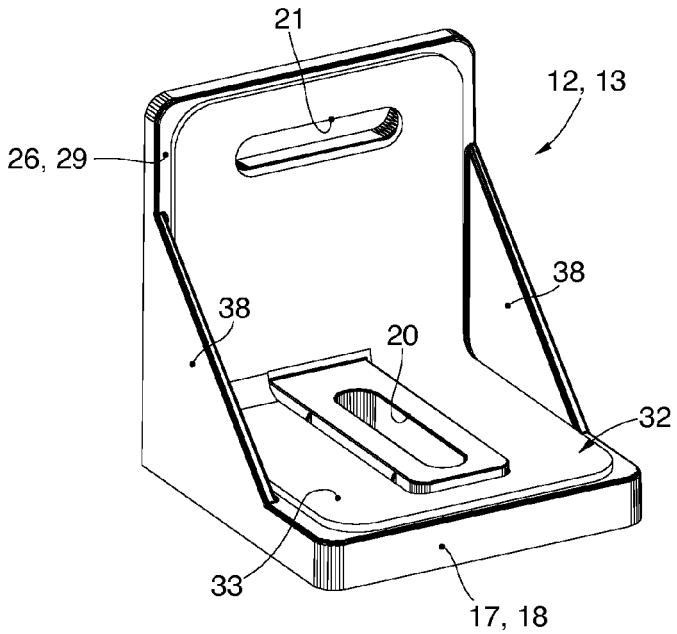
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fig. 7

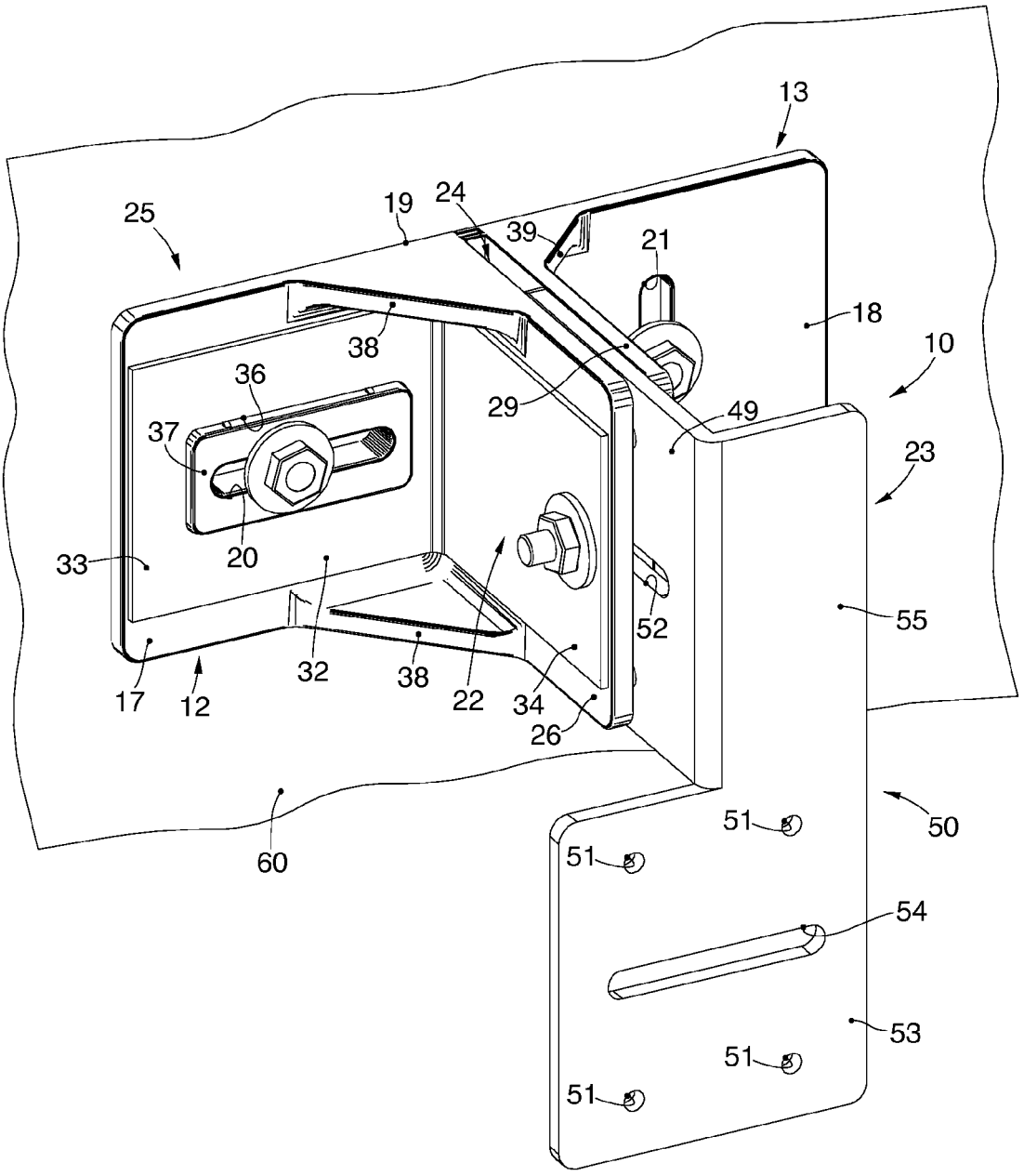
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fig. 2

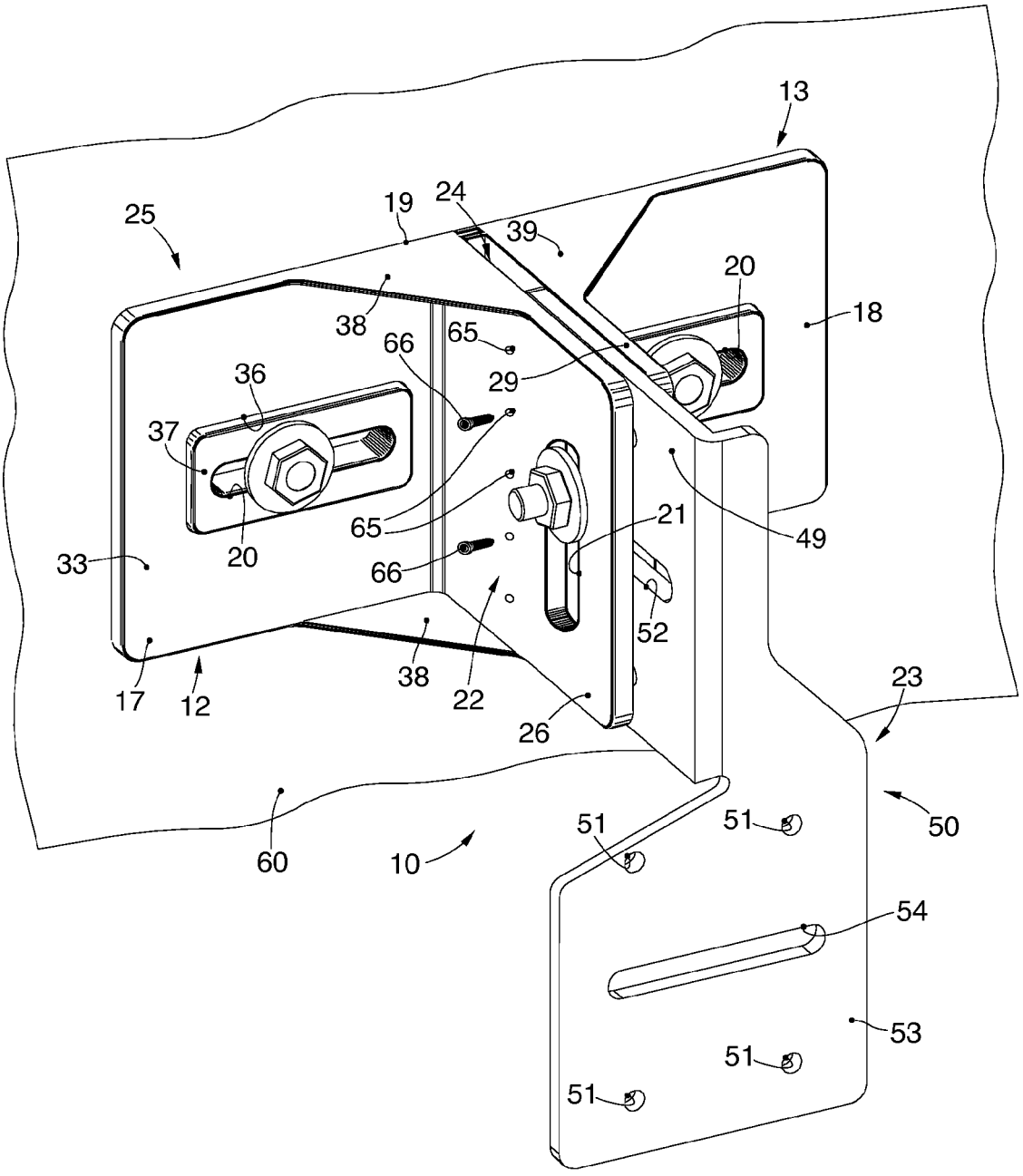
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fig. 3

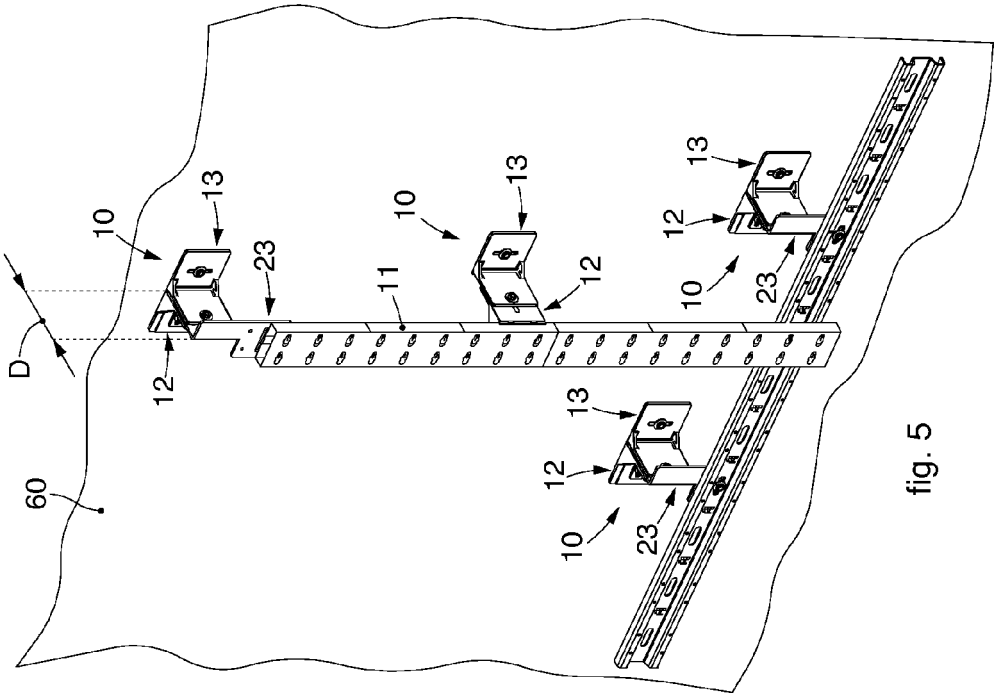

fig. 5

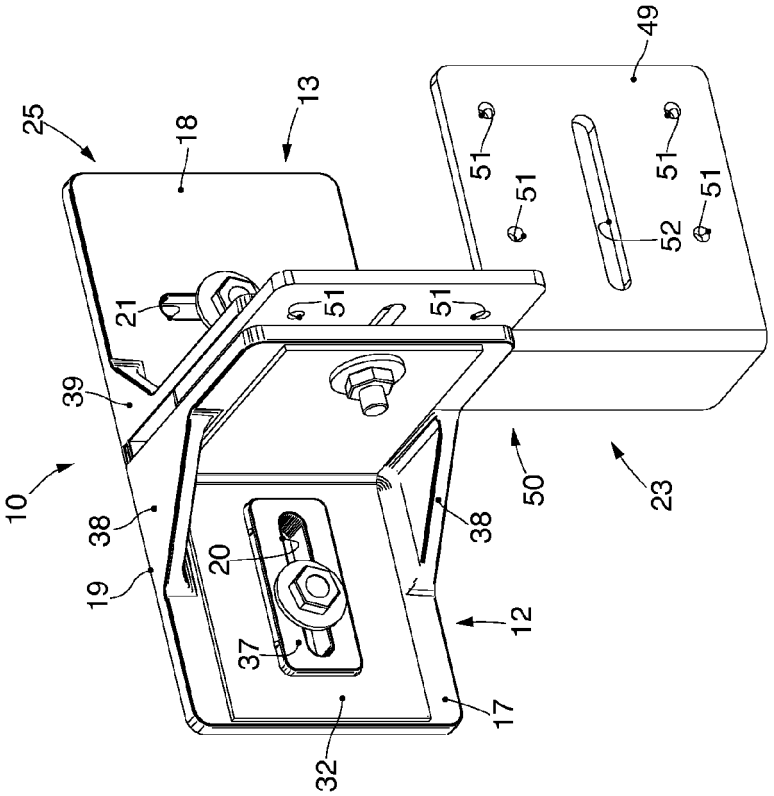

fig. 4

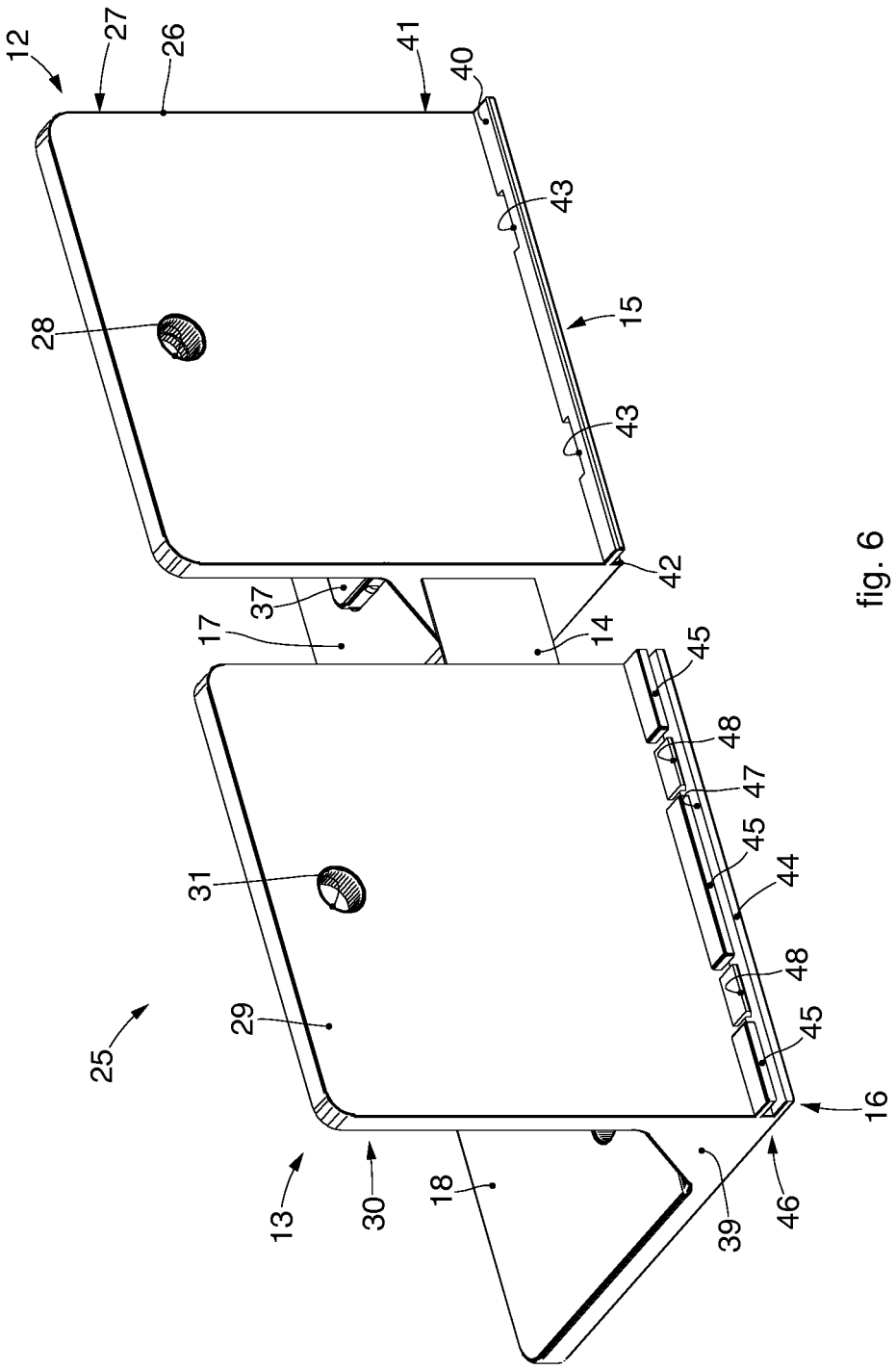
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fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 6390

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,D Y	DE 10 19 664 B (LINDE EISMASCH AG) 21 November 1957 (1957-11-21) * paragraphs [0002], [0018]; figures 1-4 * -----	1-3,10, 11 4-9	INV. E04F13/08 E04B2/74
Y	FR 2 972 746 A1 (INTERNAT FIXING SYSTEMS [FR]) 21 September 2012 (2012-09-21) * figures 1-4 * -----	4-9	

TECHNICAL FIELDS SEARCHED (IPC)
E04F
E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 July 2015	Topcuoglu, Sadik Cem

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29-07-2015

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DE 1019664 B	21-11-1957	NONE	
FR 2972746 A1	21-09-2012	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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