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(54) **SYSTEM FOR INTERNAL INSULATION OF BUILDINGS, IN PARTICULAR OF SLANTED ROOFS AND MOUNTING METHOD FOR THE INTERNAL INSULATION**

SYSTEM FÜR DIE INNENDÄMMUNG VON GEBÄUDEN, INSBESONDERE VON SCHRÄGDÄCHERN, SOWIE MONTAGEVERFAHREN FÜR EINE SOLCHE INNENDÄMMUNG

SYSTÈME D'ISOLATION INTERNE DE BÂTIMENTS, NOTAMMENT DE TOITS INCLINÉS ET PROCÉDÉ DE MONTAGE POUR L'ISOLATION INTERNE

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Description

[0001] The invention relates to a system for the internal insulation of buildings, in particular of slanted roofs according to the preamble of patent claim 1. The invention furthermore relates to a respective mounting method for applying an internal insulation, advantageously in the field of slanted roofs.

[0002] In the field of building insulation so called on rafter insulation is known for slanted roofs wherein the insulation material is applied to rafters extending perpendicular to a ridge beam of a roof, wherein the rafters are arranged at a distance from one another and extend according to the slant of the roof. Thereafter a lower cover web forming a water repellent outer layer is placed on the insulation material, thereafter there is counter and support lattice work forming a support structure for the roof tiles. Optionally a vapor barrier foil or a similar suitable climate membrane can be provided in particular in a remodeling situation.

[0003] Additionally, also the portion between the rafters arranged at a distance from one another can be filled with insulation material. So called clamping felts are typically used for this purpose. Clamping felts are typically delivered on rolls and are provided with evenly spaced marking lines. For insulation purposes, sections are cut off by a knife or similar on site from the unwound clamping felt roll, wherein a length of the clamping felt rolls corresponds to a clear width between the rafters and a predetermined oversize. These clamping felt sections are accordingly inserted between the rafters under pressure which builds up a reset spring force within the clamping felt so that the clamping felt is firmly supported between the rafters. Due to a considerable thickness of the rafters a large amount of damping material can be arranged between the rafters due to a considerable thickness of the rafters when providing between rafters insulation which naturally increases the insulation effect.

[0004] The subsequently described invention does not relate to external insulation of buildings but to an internal insulation of buildings wherein the insulation material is arranged from an inside under the inward oriented faces of the rafters (so called under rafter insulation). Also for under rafter insulation a support lattice structure is used which is formed by slats or metal profiles attached at the rafters at a distance from one another like in on rafter insulation. This support lattice structure/metal substructure is arranged from an inside on the respectively deployed insulation materials and attached at the rafters with attachment device elements, as an alternative thereto, the support lattice structure is applied first and the insulation materials are introduced thereafter. The support lattice structure is used for receiving the inner covering for which typically sheet rock is used which is attached at the support lattice structure with screws. Insofar a force introduced through the support lattice structure has to be received overall by the attachment device elements.

[0005] When there are walls made from a beam construction, either in the field of slanted roofs or when there are walls that extend over the entire height of a story and which have a wooden structure, the internal insulation is analogously applied to the rafter wherein also here an intermediary rafter insulation is typically, this means insulation material is arranged between the offset support rafters. Since this configuration differentiates on the one hand side between rafters for roof construction and on the other hand side beams for walls the term rafter element is subsequently uniformly used for beams and rafters like the term slat element typically includes slats made from wood and also optionally used profile strips made from plastic or sheet metal, in particular so called C or CD profile strips. Also the term under rafter insulation is uniformly used for the internal insulation placed in front of the rafter elements in a slanted roof and also in a vertical wall.

[0006] A system of this type for internal insulation of slanted roofs formed by rafters is known from WO 2009 / 103 911 A2. Thus insulation plates made from mineral wool for heat and/or sound insulation are placed onto the rafters from an inside and supported by anchor elements which are configured like bolts. These bolt type anchor elements are attached at the rafters by an integrally formed base portion and respectively include a head piece which is configured for receiving U-profile bars, wherein the head piece can be furthermore clipped onto an anchor element and which is furthermore also provided with clip in grooves for clipping on the profile bar. After arranging the insulation elements at the rafters the U-profile strips are clipped onto the head pieces of the anchor elements transversal to the longitudinal direction of the rafters, so that a support lattice structure is formed which is eventually used for receiving the cover elements, in particular sheet rock plates. These sheet rock plates are typically attached by self cutting bolts at the support lattice structure from an inside of the room wherein the support lattice structure is made from suitable profile strips.

[0007] The insulation material plates are thus arranged between the rafter and the head element of the anchoring elements, optionally with a vapor barrier or a similar climate membrane arranged there between. The anchoring elements are arranged at an inside of the rafters through the integrally formed base pieces through a bolted connection. An adaptation through thermal insulation plates with different thickness is either provided through a respective offset of the bolted connection of the anchor elements at the rafter through the base element or the base element is formed from plural sections arranged behind each other which are connected with one another through weak sections, so that respective sections are separable from the base element as a function of the thickness of the thermal insulation plate. This system however causes a certain assembly complexity, in particular with respect to adaptation to heat insulation plates with various thickness. Also during assembly the insula-

tion elements arranged at the rafters are not secured against falling off which makes insulating large surface roofs more difficult.

[0008] A system for internally insulating buildings is known from WO 2006 / 061 538 A1 for insulating walls formed from bricks or wall elements, wherein mineral wool insulation elements are arranged at an inside of the wall made from wall elements which is oriented towards the interior space of the building, wherein an inner covering is applied to the mineral wool insulation elements. Also here sheet rock plates are used in particular for the inner covering.

[0009] In this system horizontally extending profile strips are attached at the built up wall into which support elements are clipped at a uniform distance from one another wherein the support elements protrude from the profile bars to an interior of the room. Horizontally extending profile strips are also arranged at the upper and at the lower end of the built up wall. Eventually the insulation material elements are placed onto bolt shaped support elements. Thereafter respective locking elements are placed onto the protruding bolts of the support elements, wherein the locking elements are provided with head elements with clip in grooves into which in particular vertically oriented C profile strips are clipped. The bolt of the support element and also a respective inner borehole of each locking element are provided with opposite engagement profiles in the form of rib bands with free spaces in between in which a longitudinally extending rib shaped bar is configured. Depending on the rotational orientation of the locking elements, they can be moved together with the vertical C profile strips clipped thereto on the bolts of the support element in a direction towards the applied damper element. In the desired position the locking elements are then locked by rotating a lever arranged at the locking element, so that the vertical profile bars are fixated in the desired insertion position at a distance to the horizontal profile strip on the support elements. Thereafter the sheet rock plates are placed onto the vertical profile bars and threaded together with screws with self cutting thread with these profile strips in order to form the inner covering.

[0010] Various quick attachment elements are furthermore known from (EP 2 476 921 A1, EP 2 476 922 A1) through which profiles strips are connectable with each other with an adjustable distance, in particular for connecting thermal insulation and/or sound insulation elements for building walls. These quick connecting elements are provided with an anchor bolt provided with a head piece for connecting to a C-profile and an insertion bolt insert able therein, wherein both elements are provided with corresponding rib bands over a partial circumference. In one orientation the insertion bolt can be moved relative to the anchor bolt and can interlock in a desired plug in position or insertion position by a rotation by 90° similar to WO 2006 061 538 A1.

[0011] In particular in the field of slanted roofs increasingly an under rafter insulation is used, thus always in combination with a between rafter insulation. This type of insulation is used for new construction and also for renovating buildings. Thus, it is important that the support lattice structure is leveled as precisely as possible over the entire roof surface in order to receive the fairing elements so that the covering arranged on the support lattice structure is flat and level over the entire roof portion, in particular to provide an optically appealing surface configuration for the inner spaces provided under the roof portion. This leveling is very complex and time intensive, in particular due to the fact that the support lattice structure is attached at the rafters by a plurality of anchoring or attachment elements which overall have to be adjusted and set accordingly for leveling, e.g., by placing wood, veneer or plastic plates with different thickness behind the slats/profiles. Furthermore the inner insulation of slanted roofs is advantageously provided with insulation elements with different thickness which typically has the consequence that a plurality of different attachment elements has to be used for inner insulations of this type which are to be attached at the rafter in a suitable manner and respectively at a correct position for receiving the slats for the support lattice work and furthermore with a respective distance from the rafter in order to be able to receive the insulation elements arranged between support lattice work and rafters and vapor retarder foils or similar climate membranes. Thus, the assembly of insulation elements for this type becomes very complex for an internal insulation of this type and based on errors during assembly difficulties occur thereafter when cover plates are applied in a separate process step because sufficient leveling of the support lattice work is missing. This requires additional complex measures, wherein damping can become time consuming and also expensive. Practical applications have shown that errors during such internal insulations are quite frequently caused by a deficient execution of the so that there is a need for a suitable mounting system for an internal insulation of this type, in particular in the slanted roof field.

[0012] EP 0 924 365 A1 describes a system for internally insolating buildings according to the preamble of claim 1. The system comprises a sleeve-like attachment element which can be arranged on a tongue-like base element. The sleeve-like attachment element is largely encircling the tongue-like part of the base element, with the exception of a longitudinal or slot-like opening at one of the main faces of the sleeve. This is detrimental for a quick assembly.

[0013] GB 1 144 450 A discloses a system for internally insulating buildings, wherein slat elements are transversally arranged at rafter elements at a distance from the rafter elements and insulation elements arranged from an interior of a room between the rafter elements and the slat elements for thermal and/or sound insulation in the form of an under rafter insulation. Referring to the embodiment shown in figures 9 and 10 therein, the system comprises attachment devices formed from a base element attachable at the rafter element and an attachment

element which is adjustable relative to the base element and interlockable at the rafter element in a predetermined adjustment position, wherein the base element is configured as an overreaching element placeable on the attachment element in an overreaching arrangement, the base element being configured from two parallel longitudinal arms which define a receiving cavity between each other for a penetration by the upper section of the attachment element. The attachment element comprises a receiving element for receiving the slat element as an integral part of the attachment element. The system requires a finishing element to be inserted in recesses of the receiving element of the attachment element to provide a finish between edges and membranes.

[0014] US 3,857,216 A describes a ceiling suspension system for supporting panels in a horizontal plane, specifically insulation elements arranged from an interior of a room for thermal and/or sound insulation. The system comprises attachment devices formed from a base element that is attachable at a rafter element and an attachment element that is adjustable relative to the base element and interlockable at the rafter element in a predetermined adjustment position. The attachment element is configured as an overreaching element placeable on the base element and configured from two parallel longitudinal arms defining a receiving cavity for being penetrated by the upper section of the base element. The system described in US 3,857,216 A is not meant to bear the weight of slats.

[0015] Thus it is an object of the invention to provide a suitable system for an internal insulation of this type which can be used for mounting the insulation elements in a quick, simple and safe manner and in order to facilitate the execution of the insulation work and in order to prevent or avoid a deficient execution of the insulation caused by the mounting. It is another aspect of the invention to not only provide quick assembly but in particular also a precise assembly which in a simple manner facilitates an even leveling for subsequent layup of covering plates.

[0016] This object is achieved according to the invention by a system with the features of claim 1.

[0017] According to the invention, the receiving element is not integrally configured with the attachment element but forms a separate piece.

[0018] Subsequently advantageous embodiments of the invention are described to schematic drawing figures, wherein:

FIG. 1 illustrates a portion of a slanted roof with rafters from an interior;

FIG. 2 illustrates a detail view of the slanted roof of FIG. 1 with an assembly tool with a graphic marker;

FIG. 3 illustrates an embodiment of an attachment device in an exploded view;

FIG. 4 illustrates a detail view of the attachment device illustrated in FIG. 3;

FIG. 5 illustrates a view of the attachment device according to FIG. 4 with an applicable receiver element for a wooden bar;

FIG. 6 illustrates a lateral view of the embodiment illustrated in FIGs. 3 - 5;

FIG. 7 illustrates a front view of the embodiment with a sheet metal profile strip received therein;

FIG. 8 - 13 illustrates plural views of various sequential steps of a mounting method using a system which is not the system of the invention.

[0019] Subsequently the invention is described with reference to a slanted roof configuration with rafters, wherein this embodiment is also implementable for beam structures of vertical walls.

[0020] It is well known that slanted roofs in a simple embodiment are made from an upper bridge beam at which rafters are attached on both sides in uniform intervals, thus on a left and on a right side of the bridge beam. At a lower end the rafters are attached at so called base beams. In case of an under beam insulation slats are arranged at an inside of the rafters, thus on an inward oriented side of the rafters transversal to the rafters wherein the slats are attached at the rafters which in turn are arranged along the rafters at a distance from one another and which form the horizontal support lattice work for receiving the inner fairing. The slats of the support lattice work do not only have to be able to carry the load but also have to be leveled precisely. Between this support lattice work the under spar insulation is advantageously attached with a thickness that corresponds to the slat depth wherein the so called inter slat insulation can be additionally arranged between the slats.

[0021] FIG. 1 schematically illustrates the configuration of one half of a slanted roof 1 with rafters 2 that are arranged at a distance to one another, a between rafters insulation 4 which is typically arranged flush with the rafters between the rafters 2, this means whose thickness corresponds to the height of the rafters and which completely fills the space between the rafters, a ridge beam 6 extending transversal to the rafters 2 and a bottom beam or threshold 8 and support lattice work arranged there between which is formed from slats 10 arranged at a distance from one another and extending transversal to the rafter.

[0022] In the embodiment illustrated in FIG. 1 eight slats 10 are provided in an exemplary manner between the ridge beam and the base beam 8 and wherein the slats 10 are attached at six rafters 2.

[0023] For a slanted roof half with a total of 6 rafters according to FIG. 1 this means that the slats have to be screwed down in a complex manner at 48 attachment points 12 and that they also have to be leveled. Thus FIG. 1 illustrates the slats 10 which extend horizontally and transversal to the rafters and which are not illustrated in a three dimensional manner but only has transversal

bands for simplification purposes.

[0024] In case of the under rafter insulation described in an exemplary manner for description purposes the slats 6 have to be arranged at a distance to the rafters 2 so that respective insulation elements can be arranged in the space between the rafters and the rear side of the slats 6. Thus according to the invention special attachment devices are attached which on the one hand side support the slat 6 respectively at a respective distance to the rafters 2 attach them at the rafters and furthermore are also configured so that they receive the slat 6 or can alternatively also receive C-profile bars and can be leveled in elevation which then forms the lattice work for the fairing that is eventually to be applied and which is mostly made from sheet rock plates. Attachment devices of this type are subsequently illustrated and described in different advantageous embodiments.

[0025] It is self-evident that this assembly work is complex, namely FIG. 1 only shows a roof half with 6 rafters in an exemplary manner. However typically many more rafters are provided per roof half of a roof thus also more attachment points for anchoring the support lattice work at the rafters.

[0026] In order to precisely attach these attachment devices at the provided attachment positions 12 which can be provided by a screw connection assembly aids are advantageously provided. For this purpose an adhesive tape is particularly suited wherein the adhesive tape can be wound from a roll and can be used for an adhesive attachment along each rafter 2 and wherein the adhesive tape is marked with markings 14 at a visible side that is oriented away from the adhesive joint with the rafters wherein the markings are arranged at even distances over the length of the adhesive tape 16 thus according to the nominal distance of the slats 10 of the support lattice work of the roof. A respective embodiment is illustrated based on FIG. 2 in which the respective adhesive tape 16 are already glued against the face of the rafters 2 oriented towards the interior of the room. The markings 14 which are provided on the visible side of the adhesive tape 16 and arranged at even distances from one another over the length of the adhesive tape are also clearly visible wherein the markers in this embodiment are formed in an exemplary manner by a cross marking. Other markings are also possible. For an even orientation of all attachment points along the rafters of a roof half a thread 18 can be advantageously run horizontally on the rafters under tension so that all tapes for a roof half can be attached exactly in a line guided by the first markings and glued on the rafters on in another manner for example by staples. Alternatively this horizontal orientation axis is visualized by a construction laser. This yields an even pattern for all attachment points so that the attachment devices can be fixated exactly at the provided attachment points at the rafters.

[0027] The embodiment according to FIG. 3 illustrates a base element 28 and an attachment element 30 which are both made from metal or plastic material in particular from extruded cast profiles by simply cutting off respective sections. In the illustrated embodiment the base element 28 and also the attachment element 30 have been cut off from an extruded cast aluminum profile as sections. As illustrated in FIG. 3 with the illustration of the attachment device in an exploded view also for this attachment device optionally a receiving shoe 50 for receiving a wooden slat 10 or a head 78 for receiving a profile bar can be used for receiving the inner fairing. The head 78 and also the receiving shoe 50 can thus the cut off from an extruded profile, in particular an aluminum extruded profile so that producing the attachment device is cost effective and simple. The variant is characterized by robust instruction.

[0028] In particular the base element illustrated in FIG. 3 is attached on a rafter 2 by attachment flanges protruding on both sides from the pedestal 34 and using an assembly aide including a band 16 with markings 14. Wherein the attachment is provided by two screws 30b.

[0029] The single wall pedestal 34 with the advantageous attachment flanges 36 on both sides is advantageously tapered at its upper edge for easier attachment of the attachment element 30 in particular the pedestal has a conical cross section in order to facilitate attachment of the attachment element 30. Furthermore the pedestal 34 is provided with an engagement profile for the attachment element 30 wherein the engagement profile extends over most of the elevation of the pedestal 34, in particular from an upper edge of the pedestal 34 until proximal to the attachment flanges. The height of length of the wave profile can certainly be configured suitable for the degree of elevation adjustment of the attachment element relative to the pedestal. In the illustrated embodiment the engagement profile 150 is configured as a fine wave profile, wherein the waves extend transversally and in particular perpendicular to the two vertical side edges of the pedestal 34.

[0030] The attachment element 30 is made from two offset longitudinal arms 152 and 154 which include two inward oriented inner flanges 156 which are arranged opposite to one another at a lower end of the attachment 30 which is oriented toward the pedestal 34 wherein the inner flanges 156 define a plug in pass through 158 between each other wherein the plug in pass through is in particular configured channel shaped and facilitates inserting the attachment element 30 onto the pedestal 34. In the portion of the plug in pass through 158 the inner flanges 156 are advantageously provided with a complementary engagement profile 160 towards the pedestal 34, thus with a respective wave profile.

[0031] Herein the width of the insertion pass through 158 is slightly less than the thickness of the pedestal 34 so that the attachment element 30 has to be placed onto the pedestal 34 in order to facilitate a penetration of the pedestal 34 into the profile cavity 160 defined between the two longitudinal arms 152 and 154.

[0032] Since the two inner flanges 156 are advantageously provided at a lower end portion of the attachment

end of the longitudinal arms 152, 154 a spring effect is advantageously generated when attaching the attachment element 30 on the pedestal 34. This means the two longitudinal arms 152, 154 are slightly pressed in outward direction away from one another in a lower end portion of the attachment element so that a spring loaded reset force is built up which then provides a very firm attachment of the attachment element 30 on the pedestal 34 when the attachment element 30 is arranged on the pedestal 34 at the desired elevation wherein the firm attachment is reached due to the engagement of both wave profiles and a respectively high load bearing capability of the attachment device is assured in its interlocking positions. The two longitudinal arms 152, 154 are connected with one another slightly above a center of the arms by a continuous transversal bar 162 so that the two longitudinal arms are kept at a distance from one another. This transversal bar 162 in this embodiment separates the upper profile cavity 160 from an upper receiving cavity 164.

[0033] In an upper portion of the receiving cavity 164 the two longitudinal arms 152, 154 are advantageously provided at their opposite insides with another substantially corresponding engagement profile thus in turn in wave shape.

[0034] Instead of a wave profile certainly any suitable engagement profile, thus a tooth or groove profile can be used which facilitates a respective interlocking between the two plug in components thus under a spring load. As required, in particular for stiffening but also for securing against a fall out of the insulation elements of the below rafter insulation to be inserted support flanges 168 protruding on both sides from the arm are provided in the upper portion of the attachment element 30 and at the upper end wherein the support flanges 170 protrude on both sides. The support flanges 168 secure the insulation elements of the below rafter insulation against falling down during assembly and the support flanges 170 can be used as a support for a vapor retarder to be introduced or for the same climate membrane. Thus for support respective adhesive pads (not illustrated) can be provided on the support flanges 170 or alternatively also hook and loop tapes wherein respective hook and loop structures can be arranged at the climate membrane.

[0035] After applying the attachment element 30 on the pedestal 34 optionally a receiving shoe 50 (FIG. 5) can be applied to the support flanges 170 which is then attached in a suitable manner at the attachment element 30 thus respectively with a sheet metal screw 172 or similar which comes into engagement with the respective engagement profile 166 at the upper end of the two longitudinal arms 152, 154 so that the receiving shoe 50 can be respectively fixated on the attachment element 30. Advantageously two offset support ribs 174 are provided at the bottom side of the receiving shoe 50 wherein the support ribs 174 can provide a preload relative to the support flanges 170 for increasing the fixation when the screw 172 is turned in.

[0036] The engagement position of the sheet metal screw 172 into the engagement profile 166 comes from the sectional view in FIG. 6 which illustrates a receiving head 78 for receiving the profile strip 32 instead of the receiving shoe 50 illustrated in FIG. 5 wherein the profile strip is clipped on through its inward protruding arm into respective grooves 80 of the receiving head 78.

[0037] As an alternative to an optional clamping over the support ribs 174 described in conjunction with FIG. 5 the support ribs 174 as illustrated in FIG. 6 can be moved apart far enough so that they reach over the upper support flanges 170 on both sides when attaching the receiving head 78 or the receiving shoe 50 so that they chamber the upper portion of the attachment element 30 between each other.

[0038] FIG. 7 illustrates the attachment device in mounted position wherein initially the base elements 28 are attached on the rafters 2 with respective assembly aides that are described supra and the attachment elements 30 are applied. Thereafter the insulation elements of the under rafter insulation are applied, in particular using clamping felts, eventually a suitable climate membrane or vapor retarder foil 44 is applied to the support flanges 170 and eventually the receiving shoe 50 or the receiving head 78 are applied with a fixation by a suitable screw 172, thus a sheet metal screw which tightens against the interlocking of the engagement profile that is provided in an upper portion of the attachment element 30. The suitable adjustment in elevation is simply provided by respective sliding of the attachment element onto the pedestal, wherein the spring elastic aluminum profile interlocks on the pedestal 34 in the desired position so that a simple leveling can be provided without tools.

[0039] FIG. 7 eventually illustrates clipping on the support lattice work formed herein by sheet metal profile bars 32 which can eventually be provided with the covering thus in the form of sheet rock plates by respective attachment devices like e.g. sheet metal screws.

[0040] Subsequently the complete assembly of a below rafter insulation using an alternative attachment device comprising an insertion sleeve 140 with a circumferentially protruding flange 40, and therefore not illustrating a method of mounting of the claimed system, is described. Thus, starting from a roof half corresponding to FIG. 1 with 6 rafters and a between rafter insulation 4 introduced between the rafters 2 initially according to FIG. 8 a guide thread 18 is pulled taunt over the rafters wherein optionally already a vapor retarder foil or a respective climate membrane was already mounted on the between rafter insulation as required.

[0041] In a second step using the taunt guide thread 18 accordingly the adhesive tapes are glued perpendicular to the taunt guide threads 18 onto the rafters 2 after pulling a release foil from the adhesive tape, in case of an optionally mounted vapor retarder foil the tapes are glued onto the foil. An adhesive tape with a cross marking 14 is used for this purpose.

[0042] Multiple assembly tests have shown that only a

few minutes are required for pulling the guide thread 18 and for gluing the adhesive tapes onto the rafters or the vapor retarder foil.

[0043] Subsequently the assembly of the base elements which are configured as sheet metal angles with an insertion sleeve 140 and thus using a screw connection at the rafters, wherein time requirements for a total of 48 attachment points are low. The attachment devices mounted on the roof in this step are evident from FIG. 10 where they are illustrated as rectangular insertion sleeves 140.

[0044] Thereafter the under rafter insulation is introduced thus by clamping felts or similar with a width of for example 400 mm as illustrated in FIG. 11. In this assembly condition the clamping felts 190 used as insulations elements are secured by circumferentially protruding flanges 40 of the insertion sleeves 140 against falling down. Also this step is performed rather quickly. Thereafter also a vapor retarder foil or a suitable climate membrane can be applied to the under rafter insulation. For this purpose the circumferentially protruding flanges 40 of the insertion sleeves 140 are used for support.

[0045] Starting from the assembly condition in FIG. 11, thus applying the clamping felts between the base elements the attachment elements 30 are then applied according to FIG. 12 with the receiving shoes or optionally respective receiving heads 78. The of the attachment element per attachment point is performed quickly: little time is required for the assembly process.

[0046] The final assembly condition with C,D profiles clicked into the supports. is illustrated in FIG. 13.

[0047] Thus, this is an integrated mounting system which facilitates exact positioning of the attachment elements in a quick and simple manner, a secure mounting of the below rafter insulation between the attachment elements and which provides a flat mounting surface for the subsequent covering for a simple and quick leveling by attaching the lattice work on the receiving shoes or receiving heads.

[0048] Through the attachment elements with integrated support elements arranged with uniform row spacing and used as mounting aides for temporary fixation of the insulation elements or by the previously attached support lattice work. The insulation material can be advantageously mounted in roll off direction for a predetermined width without the insulation material falling out of the intermediary space during assembly. This installation is not possible with known types of below rafter insulation due to the lacking clamping effect transversal to the direction of production. It is appreciated that this generates substantial time savings when installing insulation material.

Claims

1. A system for internally insulating buildings in particular slanted roofs, the system comprising:

a particularly wooden base structure including rafters (2) or beams, the rafters (2) and beams being subsequently referred to as rafter elements (2),

slats (10) and/or profile strips (32), the slats (10) and the profile strips (32) being subsequently referred to as slat elements (10, 32),

which slat elements (10, 32) are transversally arranged at the rafter elements (2) and at a distance from the rafter elements (2) and at a distance from each other,

insulation elements (42) arranged from an interior of a room at the rafter elements (2) and between the rafter elements (2) and the slat elements (10, 32) for thermal and/or sound insulation, in particular made from mineral wool forming an inner insulation placed in front of the rafter elements (2), which is subsequently referred to as an under rafter insulation, and

attachment devices for supporting the insulation elements (42) and for attaching the slat elements (10, 32) at the rafter elements (2) offset therefrom for forming a support lattice structure at which a covering towards an interior of the room that is in particular made from sheet rock plates is attachable,

wherein each attachment device is formed from a base element (28) that is attachable at the rafter element (2) and an attachment element (30) that is adjustable relative to the base element (28) and interlockable at the rafter element (2) in a predetermined adjustment position, and

wherein a receiving element (50, 78) for receiving the slat element (10, 32) is arranged at the end of the attachment element (30) that is remote from the rafter element (2),

characterized in that

the attachment element (30) is configured as an overreaching element placeable on the base element (28) in an overreaching arrangement, and that

the attachment element (30) is configured as a section of an extruded profile which is configured from two parallel longitudinal arms (152, 154) which define a receiving cavity between each other for a penetration by the upper section of the base element (28),

wherein in a portion of the two parallel longitudinal arms (152, 154) which define the receiving cavity between each other, an engagement profile is provided at the longitudinal arms (152, 154)

and a complementary engagement profile is provided at the base element (28),

such that by placing the attachment element (30) onto the base element (28) under respective pressure a relative elevational adjustment between the attachment element (30) and the base

element (28) is performed such that the attachment element (30) and the base element (28) are anchored to each other due to the spring force of both longitudinal arms (152, 154) when both engagement profiles mesh.

2. The system according to claim 1,
characterized in that
a band shaped mounting aide is provided for attaching the base element (28) at the rafter element (2), wherein the mounting aid is provided along the rafter element (2) attachable thereto and with positioning elements (14, 22) for a predetermined positioned arrangement of the base elements (28) at the rafter element (2), wherein the base elements (28) are respectively provided at a distance from one another at the mounting aide, wherein the distance corresponds to a distance between the slat elements (10, 32) of the support lattice structure, wherein the positioning elements (14, 22) are advantageously respectively formed by a graphic marking (14) on a mounting aide that is formed as an adhesive tape (16) for a glue connection along the rafter element (2) and/or which are respectively formed by a pedestal element (22) which are arranged at a band that is attachable at a rafter element (2), by screws, nails and similar and which are respectively configured for a quick coupling connection with a base element (28), which are in particular configured as a bayonet closure or clip element.

3. The system according to one of the preceding claims,
characterized in that
the base element (28) includes a pedestal (34) which is provided at one end with at least one attachment flange (36) angled away from the pedestal (34), advantageously two opposite attachment flanges (36) for attachment at the rafter element (2).

4. The system according to claim 3,
characterized in that
the attachment element (30) is configured as a component that is insertable onto the pedestal (34), wherein the attachment element (30) at its end portion remote from the rafter element (2) includes a flange (170) protruding in outward direction at least at two opposite sides from the attachment element (30) for securing the insulation elements (42), wherein the flange (170) includes a flat contact surface for arranging a vapor retarder foil or a similar climate membrane (44).

5. The system according to one of the preceding claims,
characterized in that
the attachment element (30) is configured as a section of an extruded profile, with the two offset longitudinal arms (152, 154) connected with one another by at least one transversal bar (162), wherein inward protruding flanges (156) are provided at an end of the attachment element (30) at both longitudinal arms (152, 154) which end is remote from the rafter elements (2), wherein the two inward protruding flanges (156) define an insertion pass through (158) for a penetration of the pedestal (34) between each other, wherein a width of the insertion pass through (158) is less than a width of the penetrating pedestal (34) and wherein the two inward protruding flanges (156) are respectively provided with the engagement profile, and **in that** the pedestal (34) is provided with the complementary engagement profile (150) at least in the penetration portion opposite to the attachment element (30) so that the attachment element (30) is applicable under pressure on the pedestal (34) and fixable in the desired elevation position of the receiving element (50, 78) relative to the pedestal (34) under a spring preload through the longitudinal arms (152, 154) relative to the pedestal (34), wherein the two longitudinal arms (152, 154) are pressed apart.

6. The system according to claim 5,
characterized in that
a wave or a tooth or a groove profile is used as engagement profile (150).

7. The system according to one of the preceding claims,
characterized in that
the upper edge of the pedestal (34) is provided with an insertion tip with conical cross section and **in that** at the end of the attachment element (30) remote from the rafter elements (2), the two longitudinal arms (152, 154) are provided with an engagement profile (160)for an interconnection element for fixating the receiving element (50, 78) that is applicable on the attachment element (30).

8. The system according to one of the preceding claims,
characterized in that
the receiving element (50, 78) arranged at the end of the attachment element (30) remote from the rafter elements (2) is configured as a U-shaped receiving shoe (50) for receiving a slat element (10, 32) or configured as a head (78) with lateral grooves (80) for clipping in a profile strip (32), wherein in particular the receiving element (50, 78) is insertable onto the end of the attachment element (30) that is remote from the rafter element (2) and interlockable, in particular through a clip connection.

9. The system according to one of the preceding claims,
characterized in that

a flange (170) of the attachment device is configured so that it is suitable as a contact for flat mounting of a foil and is used as an assembly aide which prevents a drop out of the insulation elements (42) arranged between the attachment devices during assembly, wherein the flange (170) laterally protrudes from the pedestal (34) at least over part of its circumference, and forms a flat contact surface for a contact of a vapor retarder foil or a similar climate membrane (44) and for supporting the insulation elements (42) arranged between the attachment devices.

10. Method for mounting an interior insulation of building of using a system according to one of the preceding claims 1 to 9,
characterized in that
bands that are provided with positioning elements (14, 22) are attached at the rafters (2) in a longitudinal direction of the rafters (2), base elements (28) are placed onto the positioning elements (14, 22) and fixated with the rafters (2), subsequently attachment elements (30) are placed onto the base elements (28) and eventually slat elements (10, 32) are attached at the attachment elements (30) in order to form the support slatting of the roof, wherein the insulation elements (42) for under rafter insulation are placed accordingly and that a guide thread (18) is horizontally pulled against the rafters (2), at which guide thread (18) the bands including the positioning elements (14, 22) are aligned for an even arrangement of the positioning elements (14, 22) along the rafters (2) and thereafter the bands are attached at the rafters (2).

11. Method according to claim 10,
characterized in that
a vapor retarder foil or a climate membrane (44) is applied and fixated relative to the attachment elements (30) after attaching the base elements (28) at the rafters (2) and after arranging the insulation elements (42) between the base elements (28).

12. Method according to claim 10 or 11,
characterized in that
a levelling is performed by relative adjustment of the attachment element (30) relative to the base element (28) and subsequent arresting of the attachment element (30) after applying the slat elements (10, 32) onto the attachment elements (30).

Patentansprüche

1. System zur Innendämmung von Gebäuden, insbesondere von Schrägdächern, wobei das System Folgendes umfasst:

eine insbesondere hölzerne Grundkonstruktion mit Sparren (2) oder Balken, wobei die Sparren (2) und Balken nachfolgend als Sparrenelemente (2) bezeichnet werden,
Latten (10) und/oder Profilleisten (32), wobei die Latten (10) und die Profilleisten (32) im Folgenden als Lattenelemente (10, 32) bezeichnet werden,
welche Lattenelemente (10, 32) quer an den Sparrenelementen (2) und in einem Abstand zu den Sparrenelementen (2) und in einem Abstand zueinander angeordnet sind,
von einem Rauminneren aus an den Sparrenelementen (2) und zwischen den Sparrenelementen (2) und den Lattenelementen (10, 32) angeordnete Dämmelemente (42) zur Wärme- und/oder Schalldämmung, insbesondere aus Mineralwolle, die eine vor den Sparrenelementen (2) angeordnete Innendämmung bilden, die nachfolgend als Untersparrendämmung bezeichnet wird, und
Befestigungsvorrichtungen zum Abstützen der Dämmelemente (42) und zum Befestigen der Lattenelemente (10, 32) an den von diesen abgesetzten Sparrenelementen (2) zur Bildung einer Traggitterstruktur, an der eine insbesondere aus Rigipsplatten bestehende Abdeckung zum Rauminneren hin befestigbar ist,
wobei jede Befestigungsvorrichtung aus einem am Sparrenelement (2) befestigbaren Basiselement (28) und einem relativ zum Basiselement (28) verstellbaren und am Sparrenelement (2) in einer vorgegebenen Verstellposition verriegelbaren Befestigungselement (30) gebildet ist, und
wobei an dem dem Sparrenelement (2) abgewandten Ende des Befestigungselements (30) ein Aufnahmeelement (50, 78) zur Aufnahme des Lattenelemente (10, 32) angeordnet ist,
dadurch gekennzeichnet, dass
das Befestigungselement (30) als übergreifendes Element ausgebildet ist, das auf dem Basiselement (28) in einer übergreifenden Anordnung platzierbar ist, und dass
das Befestigungselement (30) als Abschnitt eines Strangpressprofils ausgebildet ist, das aus zwei parallelen Längsschenkeln (152, 154) gebildet ist, die zwischen sich einen Aufnahmehohlraum für eine Durchdringung durch den oberen Abschnitt des Basiselements (28) definieren,
wobei in einem Abschnitt der beiden parallelen Längsschenkel (152, 154), die den Aufnahmehohlraum zwischen sich begrenzen, ein Eingriffsprofil an den Längsschenkeln (152, 154) vorgesehen ist
und am Basiselement (28) ein komplementäres Eingriffsprofil vorgesehen ist,
so dass durch Aufsetzen des Befestigungsele-

mentes (30) auf das Basiselement (28) unter entsprechendem Druck eine relative Höhenverstellung zwischen dem Befestigungselement (30) und dem Basiselement (28) erfolgt, so dass das Befestigungselement (30) und das Basiselement (28) durch die Federkraft der beiden Längsarme (152, 154) miteinander verankert werden, wenn beide Eingriffsprofile ineinander greifen.

2. System nach Anspruch 1,
dadurch gekennzeichnet, dass
eine bandförmige Montagehilfe zur Befestigung des Basiselements (28) am Sparrenelement (2) vorgesehen ist, wobei die Montagehilfe entlang des daran befestigbaren Sparrenelements (2) mit Positionierungselementen (14, 22) für eine vorgegebene positionierte Anordnung der Basiselemente (28) am Sparrenelement (2) versehen ist, wobei die Basiselemente (28) jeweils in einem Abstand voneinander an der Montagehilfe vorgesehen sind, wobei der Abstand einem Abstand zwischen den Lattenelementen (10, 32) der Tragwerkskonstruktion entspricht, wobei die Positionierungselemente (14, 22) vorteilhaft jeweils durch eine grafische Markierung (14) auf einer Montagehilfe gebildet sind, die als Klebeband (16) für eine Klebeverbindung entlang des Sparrenelements (2) ausgebildet ist und/oder die jeweils durch ein Sockelelement (22) gebildet sind, die an einem an einem Sparrenelement (2) befestigbaren Band, durch Schrauben, Nägel und dergleichen angeordnet sind und die jeweils für eine Schnellkupplungsverbindung mit einem Sockelelement (28) ausgebildet sind, die insbesondere als Bajonettverschluss oder Clipelement ausgebildet sind.

3. System nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
das Basiselement (28) einen Sockel (34) aufweist, der an einem Ende mit mindestens einem vom Sockel (34) abgewinkelten Befestigungsflansch (36) versehen ist, vorteilhafterweise zwei gegenüberliegende Befestigungsflansche (36) zur Befestigung am Sparrenelement (2).

4. System nach Anspruch 3,
dadurch gekennzeichnet, dass
das Befestigungselement (30) als ein auf den Sockel (34) aufsteckbares Bauteil ausgebildet ist, wobei das Befestigungselement (30) an seinem dem Sparrenelement (2) abgewandten Endabschnitt einen zumindest an zwei gegenüberliegenden Seiten des Befestigungselements (30) nach außen vorstehenden Flansch (170) zur Befestigung der Dämmelemente (42) aufweist, wobei der Flansch (170) eine ebene Anlagefläche zur Anordnung einer Dampfbremsfolie oder einer ähnlichen Klimamembran (44) aufweist.

5. System nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
das Befestigungselement (30) als Abschnitt eines Strangpressprofils ausgebildet ist, wobei die beiden versetzten Längsschenkel (152, 154) durch mindestens einen Quersteg (162) miteinander verbunden sind, wobei an einem von den Sparrenelementen (2) abgewandten Ende des Befestigungselements (30) an beiden Längsschenkeln (152, 154) nach innen vorspringende Flansche (156) vorgesehen sind, wobei die beiden nach innen vorstehenden Flansche (156) einen Einschubdurchgang (158) für eine Durchdringung des Sockels (34) untereinander definieren, wobei eine Breite des Einschubdurchgangs (158) geringer ist als eine Breite des durchdringenden Sockels (34) und wobei die beiden nach innen vorstehenden Flansche (156) jeweils mit dem Eingriffsprofil versehen sind, und dass der Sockel (34) zumindest in dem dem Befestigungselement (30) gegenüberliegenden Durchdringungsabschnitt mit dem komplementären Eingriffsprofil (150) versehen ist, so dass das Befestigungselement (30) unter Druck auf den Sockel (34) aufbringbar und in der gewünschten Höhenposition des Aufnahmeelements (50, 78) relativ zum Sockel (34) unter einer Federvorspannung durch die Längsarme (152, 154) relativ zum Sockel (34) fixierbar ist, wobei die beiden Längsarme (152, 154) auseinandergedrückt werden.

6. System nach Anspruch 5,
dadurch gekennzeichnet, dass
eine Welle, ein Zahn oder ein Rillenprofil als Eingriffsprofil (150) verwendet wird.

7. System nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
der obere Rand des Sockels (34) mit einer Einführspitze mit konischem Querschnitt versehen ist und dass an dem den Sparrenelementen (2) abgewandten Ende des Befestigungselements (30) die beiden Längsarme (152, 154) mit einem Eingriffsprofil (160) für ein Verbindungselement zur Fixierung des am Befestigungselement (30) einsetzbaren Aufnahmeelements (50, 78) versehen sind.

8. System nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
das an dem den Sparrenelementen (2) abgewandten Ende des Befestigungselements (30) angeordnete Aufnahmeelement (50, 78) als U-förmiger Aufnahmeschuh (50) zur Aufnahme eines Lattenelements (10, 32) oder als Kopf (78) mit seitlichen Nuten

(80) zum Einklipsen einer Profilleiste (32) ausgebildet ist, wobei insbesondere das Aufnahmeelement (50, 78) auf das dem Sparrenelement (2) abgewandte Ende des Befestigungselements (30) aufsteckbar und verriegelbar ist, insbesondere durch eine Klippverbindung.

9. System nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet, dass
ein Flansch (170) der Befestigungsvorrichtung so ausgebildet ist, dass er als Kontakt für eine flächige Montage einer Folie geeignet ist und als Montagehilfe dient, die ein Herausfallen der zwischen den Befestigungsvorrichtungen angeordneten Dämmelemente (42) bei der Montage verhindert, wobei der Flansch (170) zumindest über einen Teil seines Umfangs seitlich aus dem Sockel (34) herausragt und eine flächige Kontaktfläche für einen Kontakt einer Dampfbremsfolie oder einer ähnlichen Klimamembran (44) und zur Abstützung der zwischen den Befestigungsvorrichtungen angeordneten Dämmelemente (42) bildet.

10. Verfahren zur Montage einer Innenisolierung eines Gebäudes unter Verwendung eines Systems nach einem der vorhergehenden Ansprüche 1 bis 9,
dadurch gekennzeichnet, dass
dass an den Sparren (2) in Längsrichtung der Sparren (2) Bänder befestigt werden, die mit Positionierungselementen (14, 22) versehen sind, dass auf die Positionierungselemente (14, 22) Basiselemente (28) aufgesetzt und mit den Sparren (2) fixiert werden, dass anschließend Befestigungselemente (30) auf die Basiselemente (28) aufgesetzt werden und dass schließlich an den Befestigungselementen (30) Lattenelemente (10, 32) befestigt werden, um die Traglattung des Daches zu bilden, wobei die Dämmelemente (42) zur Untersparrendämmung entsprechend platziert werden und dass ein Führungsfaden (18) horizontal gegen die Sparren (2) gezogen wird, an welchem Führungsfaden (18) die Bänder mit den Positionierungselementen (14, 22) zur gleichmäßigen Anordnung der Positionierungselemente (14, 22) entlang der Sparren (2) ausgerichtet werden und danach die Bänder an den Sparren (2) befestigt werden.

11. Verfahren nach Anspruch 10,
dadurch gekennzeichnet, dass
nach der Befestigung der Basiselemente (28) an den Sparren (2) und nach der Anordnung der Dämmelemente (42) zwischen den Basiselementen (28) eine Dampfbremsfolie oder eine Klimamembran (44) aufgebracht und gegenüber den Befestigungselementen (30) fixiert wird.

12. Verfahren nach Anspruch 10 oder 11,
dadurch gekennzeichnet, dass
eine Nivellierung durch Relativverstellung des Befestigungselementes (30) gegenüber dem Basiselement (28) und anschließende Arretierung des Befestigungselementes (30) nach Aufbringen der Lattenelemente (10, 32) auf die Befestigungselemente (30) erfolgt.

Revendications

1. Un système d'isolation intérieure des bâtiments, en particulier des toits en pente, comprenant

une structure de base particulièrement en bois comprenant des chevrons (2) ou des poutres, les chevrons (2) et les poutres étant dénommés par la suite éléments de chevrons (2),
des lamelles (10) et/ou des bandes profilées (32), les lamelles (10) et les bandes profilées (32) étant ci-après dénommées éléments de lattes (10, 32),
ces éléments de lattes (10, 32) sont disposés transversalement aux éléments de chevrons (2) et à une certaine distance des éléments de chevrons (2) et à une certaine distance l'un de l'autre,
des éléments d'isolation (42) disposés depuis l'intérieur d'une pièce au niveau des éléments de chevrons (2) et entre les éléments de chevrons (2) et les éléments de lattes (10, 32) pour l'isolation thermique et/ou phonique, notamment en laine minérale formant une isolation intérieure placée devant les éléments de chevrons (2), appelée par la suite isolation sous chevrons, et
des dispositifs de fixation pour supporter les éléments d'isolation (42) et pour fixer les éléments de lattes (10, 32) aux éléments de chevrons (2) décalés de ceux-ci pour former une structure de support en treillis à laquelle peut être fixée une couverture vers l'intérieur de la pièce qui est en particulier faite de plaques de tôle,
dans lequel chaque dispositif de fixation est formé d'un élément de base (28) qui peut être fixé à l'élément de chevron (2) et d'un élément de fixation (30) qui est réglable par rapport à l'élément de base (28) et qui peut être verrouillé à l'élément de chevron (2) dans une position de réglage prédéterminée, et
dans lequel un élément de réception (50, 78) destiné à recevoir l'élément de latte (10, 32) est disposé à l'extrémité de l'élément de fixation (30) qui est éloignée de l'élément de chevron (2),
caractérisé par le fait que
l'élément de fixation (30) est configuré comme un élément de rattrapage pouvant être placé sur l'élément de base (28) dans une disposition de

rattrapage, et que
l'élément de fixation (30) est configuré comme une section d'un profilé extrudé qui est configuré à partir de deux bras longitudinaux parallèles (152, 154) qui définissent une cavité de réception entre eux pour une pénétration par la section supérieure de l'élément de base (28),
dans lequel, dans une partie des deux bras longitudinaux parallèles (152, 154) qui définissent la cavité de réception l'un par rapport à l'autre, un profil d'engagement est prévu au niveau des bras longitudinaux (152, 154)
et un profil d'engagement complémentaire est fourni à l'élément de base (28),
Ainsi, en plaçant l'élément de fixation (30) sur l'élément de base (28) sous une pression respective, un ajustement relatif de l'élévation entre l'élément de fixation (30) et l'élément de base (28) est effectué de telle sorte que l'élément de fixation (30) et l'élément de base (28) sont ancrés l'un à l'autre en raison de la force du ressort des deux bras longitudinaux (152, 154) lorsque les deux profils d'engagement s'engrènent.

2. Le système selon la revendication 1,
caractérisé par le fait que
une aide de montage en forme de bande est prévue pour fixer l'élément de base (28) à l'élément de chevron (2), dans laquelle l'aide de montage est prévue le long de l'élément de chevron (2) qui peut y être fixé et avec des éléments de positionnement (14, 22) pour une disposition positionnée prédéterminée des éléments de base (28) à l'élément de chevron (2), dans laquelle les éléments de base (28) sont respectivement prévus à une distance l'un de l'autre à l'aide de montage, dans laquelle la distance correspond à une distance entre les éléments de lattes (10, 32) de la structure de support en treillis, dans lequel les éléments de positionnement (14, 22) sont avantageusement formés respectivement par un marquage graphique (14) sur une aide de montage qui est formé comme une bande adhésive (16) pour une liaison par collage le long de l'élément de chevron (2) et/ou qui sont formés respectivement par un élément de socle (22) qui sont disposés sur une bande qui peut être fixée à un élément de chevron (2), par des vis, des clous et similaires et qui sont configurés respectivement pour une liaison par couplage rapide avec un élément de base (28), qui sont en particulier configurés comme une fermeture à baïonnette ou un élément d'agrafe.

3. Le système selon l'une des revendications précédentes,
caractérisé par le fait que
l'élément de base (28) comprend un socle (34) pourvu à une extrémité d'au moins une bride de fixation (36) inclinée par rapport au socle (34), avantageusement deux brides de fixation opposées (36) pour la fixation à l'élément de chevron (2).

4. Le système selon la revendication 3,
caractérisé par le fait que
l'élément de fixation (30) est configuré comme un composant pouvant être inséré sur le socle (34), dans lequel l'élément de fixation (30), dans sa partie terminale éloignée de l'élément de chevron (2), comprend une bride (170) faisant saillie vers l'extérieur au moins sur deux côtés opposés de l'élément de fixation (30) pour fixer les éléments d'isolation (42), dans lequel la bride (170) comprend une surface de contact plate pour disposer une feuille de retardateur de vapeur ou une membrane climatique similaire (44).

5. Le système selon l'une des revendications précédentes,
caractérisé par le fait que
l'élément de fixation (30) est configuré comme une section d'un profilé extrudé, avec les deux bras longitudinaux décalés (152, 154) reliés l'un à l'autre par au moins une barre transversale (162), dans lequel des brides saillantes vers l'intérieur (156) sont fournies à une extrémité de l'élément de fixation (30) au niveau des deux bras longitudinaux (152, 154) dont l'extrémité est éloignée des éléments de chevron (2), dans lequel les deux brides saillantes vers l'intérieur (156) définissent un passage d'insertion (158) pour une pénétration du socle (34) l'un entre l'autre, dans lequel une largeur du passage d'insertion (158) est inférieure à une largeur du socle pénétrant (34) et dans lequel les deux brides saillantes vers l'intérieur (156) sont respectivement pourvues d'un profil d'engagement, et en ce que le socle (34) est pourvu du profil d'engagement complémentaire (150) au moins dans la partie de pénétration opposée à l'élément de fixation (30) de sorte que l'élément de fixation (30) est applicable sous pression sur le socle (34) et peut être fixé dans la position d'élévation souhaitée de l'élément de réception (50, 78) par rapport au socle (34) sous une précharge de ressort par les bras longitudinaux (152, 154) par rapport au socle (34), dans lequel les deux bras longitudinaux (152, 154) sont pressés l'un contre l'autre.

6. Le système selon la revendication 5,
caractérisé par le fait que
un profil de vague, de dent ou de rainure est utilisé comme profil d'engagement (150).

7. Le système selon l'une des revendications précédentes,
caractérisé par le fait que
le bord supérieur du socle (34) est pourvu d'une pointe d'insertion à section conique et, à l'extrémité de l'élément de fixation (30) éloignée des éléments de

chevron (2), les deux bras longitudinaux (152, 154) sont pourvus d'un profil d'engagement (160) pour un élément d'interconnexion destiné à fixer l'élément récepteur (50, 78) applicable sur l'élément de fixation (30).

8. le système selon l'une des revendications précédentes,
caractérisé par le fait que
l'élément de réception (50, 78) disposé à l'extrémité de l'élément de fixation (30) éloignée des éléments de chevron (2) est configuré comme un sabot de réception en forme de U (50) pour recevoir un élément de latte (10, 32) ou configuré comme une tête (78) avec des rainures latérales (80) pour le clipsage d'une bande de profilé (32), où en particulier l'élément de réception (50, 78) est insérable sur l'extrémité de l'élément de fixation (30) qui est éloignée de l'élément de chevron (2) et interverrouillable, en particulier par une connexion de clip.

9. Le système selon l'une des revendications précédentes,
caractérisé par le fait que
une bride (170) du dispositif de fixation est configurée de manière à pouvoir servir de contact pour le montage à plat d'une feuille et est utilisée comme aide au montage pour empêcher la chute des éléments d'isolation (42) disposés entre les dispositifs de fixation pendant le montage, la bride (170) dépassant latéralement du socle (34) au moins sur une partie de sa circonférence et formant une surface de contact plane pour le contact d'une feuille pare-vapeur ou d'une membrane climatique similaire (44) et pour soutenir les éléments d'isolation (42) disposés entre les dispositifs de fixation.

10. Procédé de montage d'une isolation intérieure de bâtiment utilisant un système selon l'une des revendications précédentes 1 à 9,
caractérisé par le fait que
des bandes munies d'éléments de positionnement (14, 22) sont fixées aux chevrons (2) dans le sens longitudinal des chevrons (2), des éléments de base (28) sont placés sur les éléments de positionnement (14, 22) et fixés aux chevrons (2), ensuite des éléments de fixation (30) sont placés sur les éléments de base (28) et enfin des éléments de lattes (10, 32) sont fixés aux éléments de fixation (30) afin de former la latte de support du toit, où les éléments d'isolation (42) pour l'isolation sous les chevrons sont placés en conséquence et où un fil de guidage (18) est tiré horizontalement contre les chevrons (2), sur lequel le fil de guidage (18) les bandes comprenant les éléments de positionnement (14, 22) sont alignées pour une disposition régulière des éléments de positionnement (14, 22) le long des chevrons (2) et ensuite les bandes sont attachées aux chevrons (2).

11. Méthode selon la revendication 10,
caractérisé par le fait que
une feuille pare-vapeur ou une membrane climatique (44) est appliquée et fixée par rapport aux éléments de fixation (30) après avoir fixé les éléments de base (28) aux chevrons (2) et après avoir disposé les éléments d'isolation (42) entre les éléments de base (28).

12. Méthode selon la revendication 10 ou 11,
caractérisé par le fait que
un nivellement est effectué par l'ajustement relatif de l'élément de fixation (30) par rapport à l'élément de base (28) et l'arrêt ultérieur de l'élément de fixation (30) après avoir appliqué les éléments de lattes (10, 32) sur les éléments de fixation (30).

Fig. 1

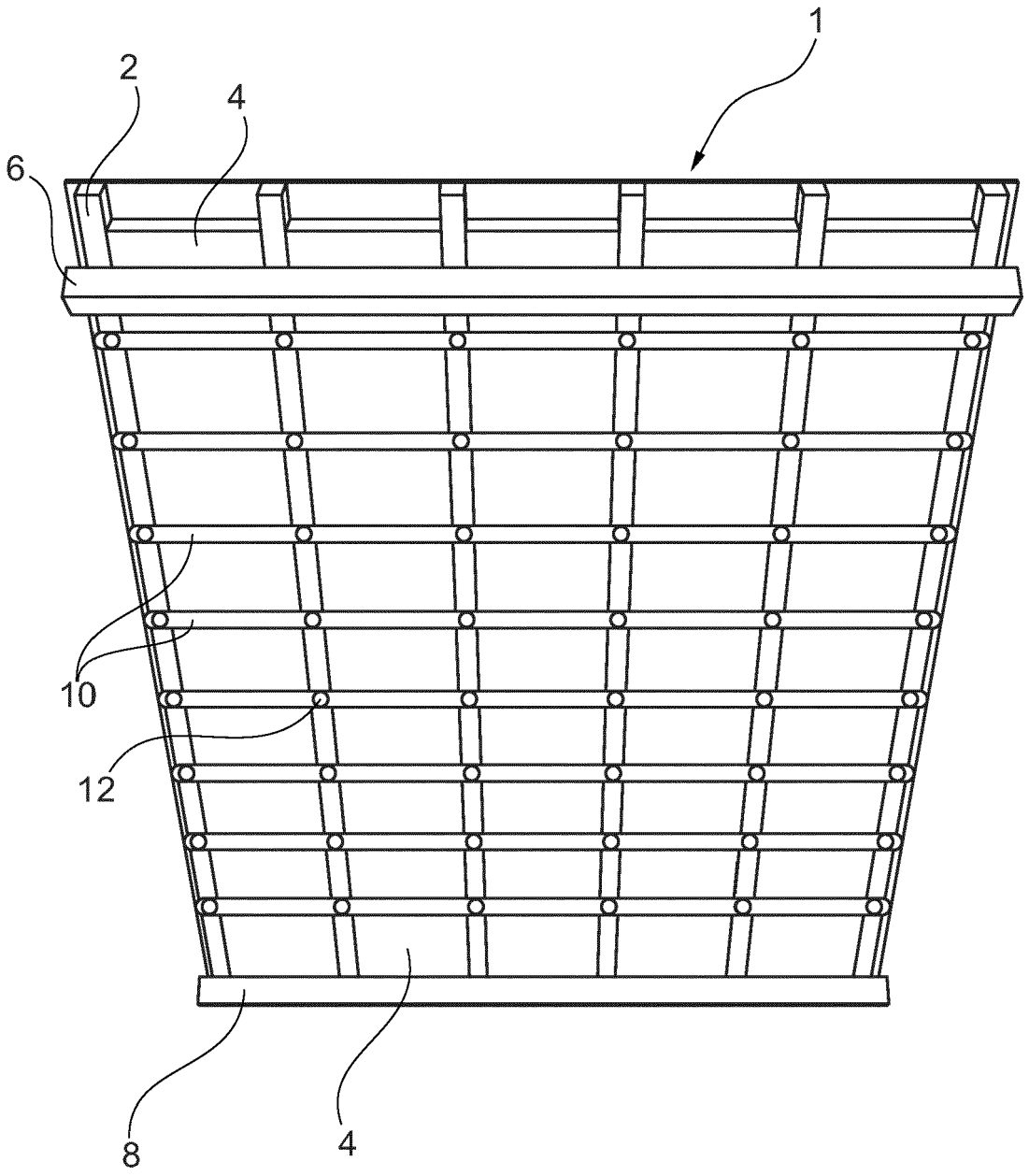


Fig. 2

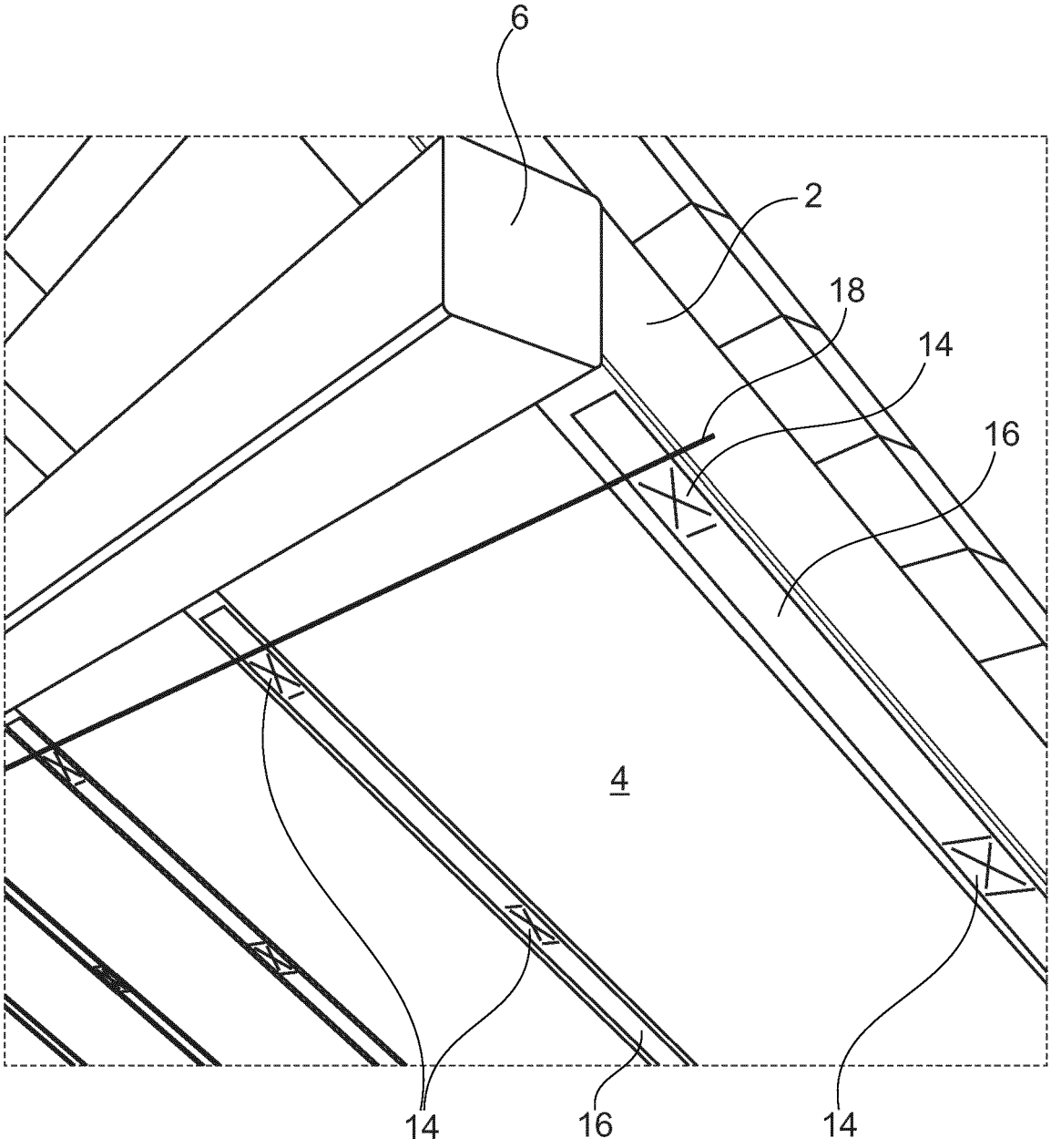


Fig. 3

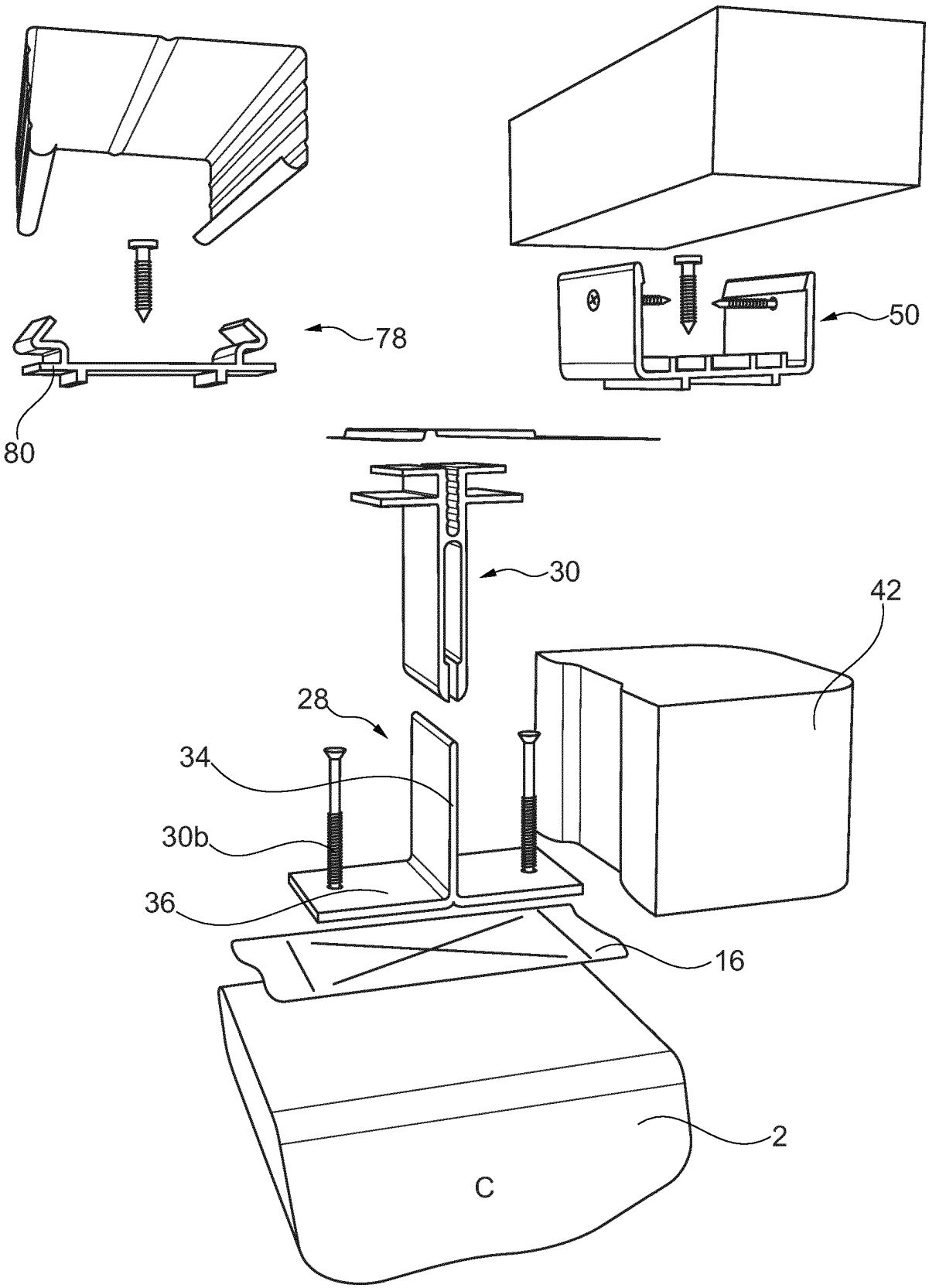


Fig. 4

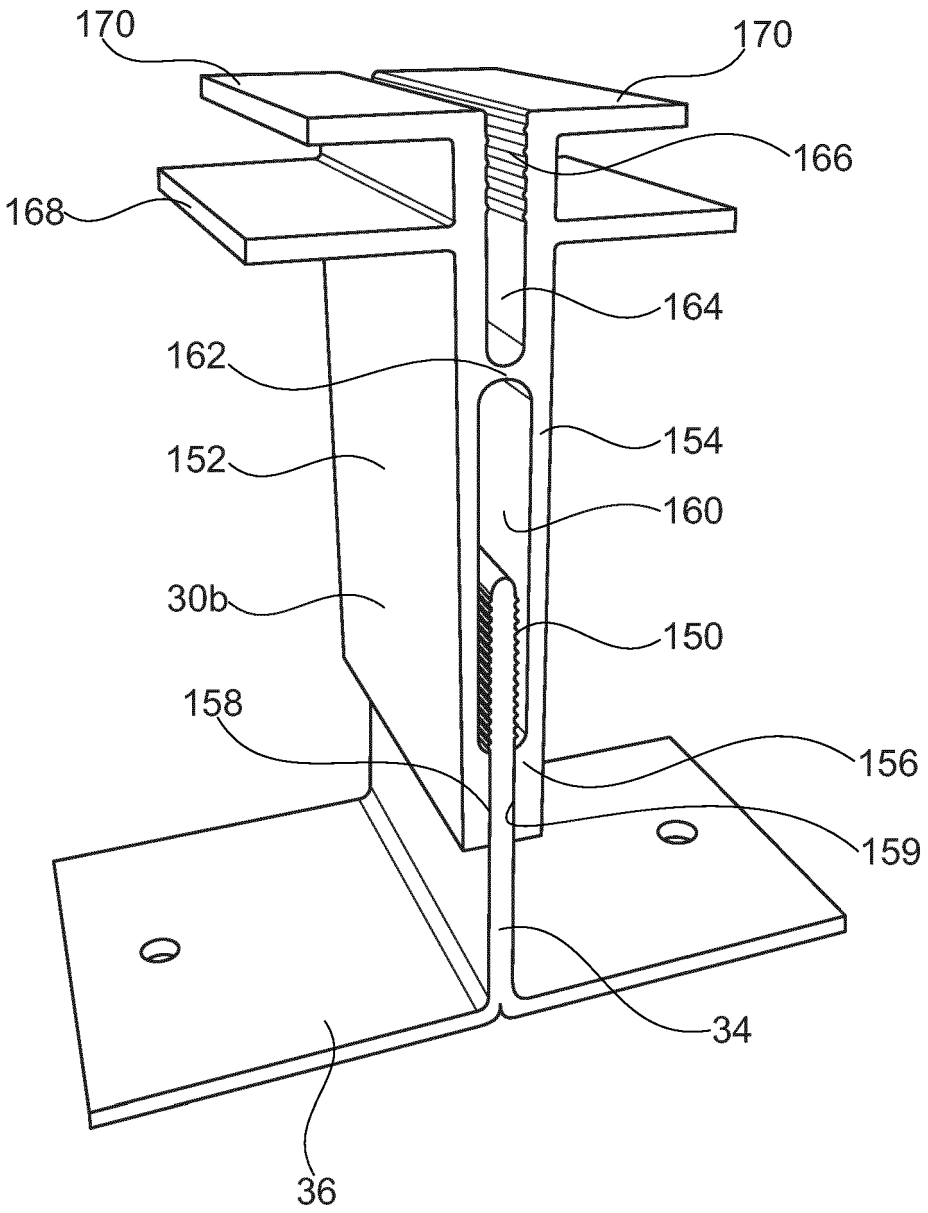


Fig. 5

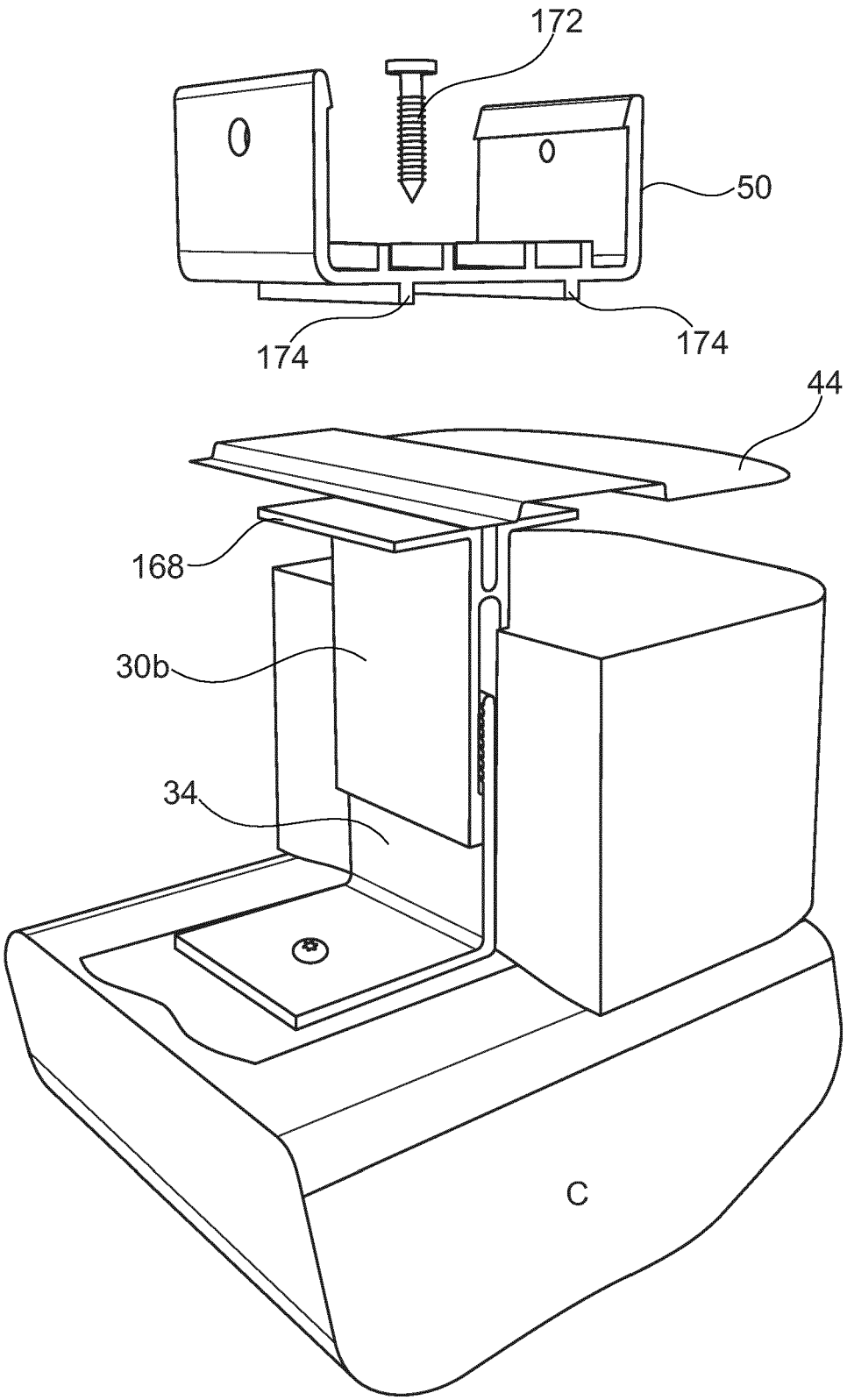


Fig. 6

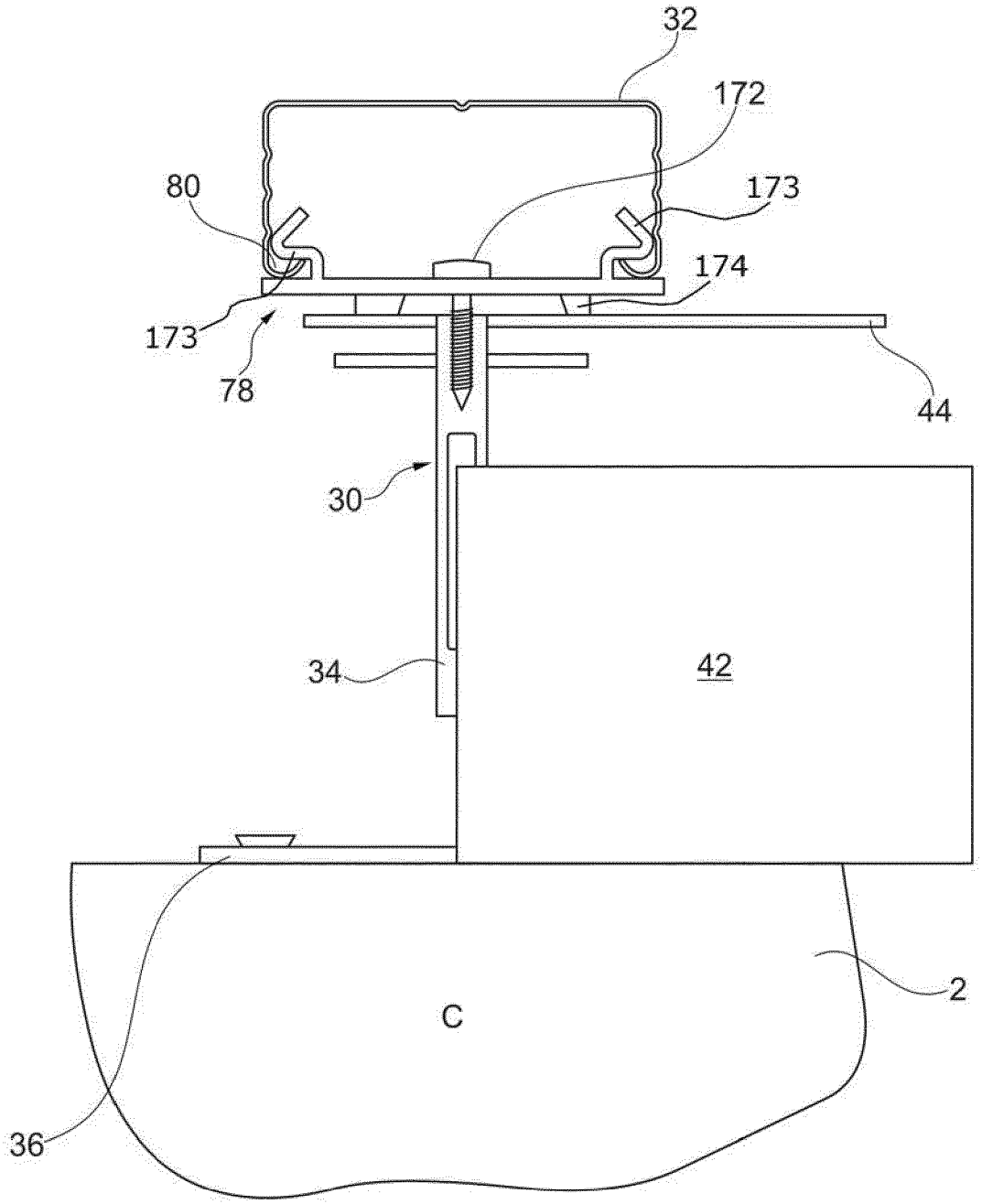


Fig. 7

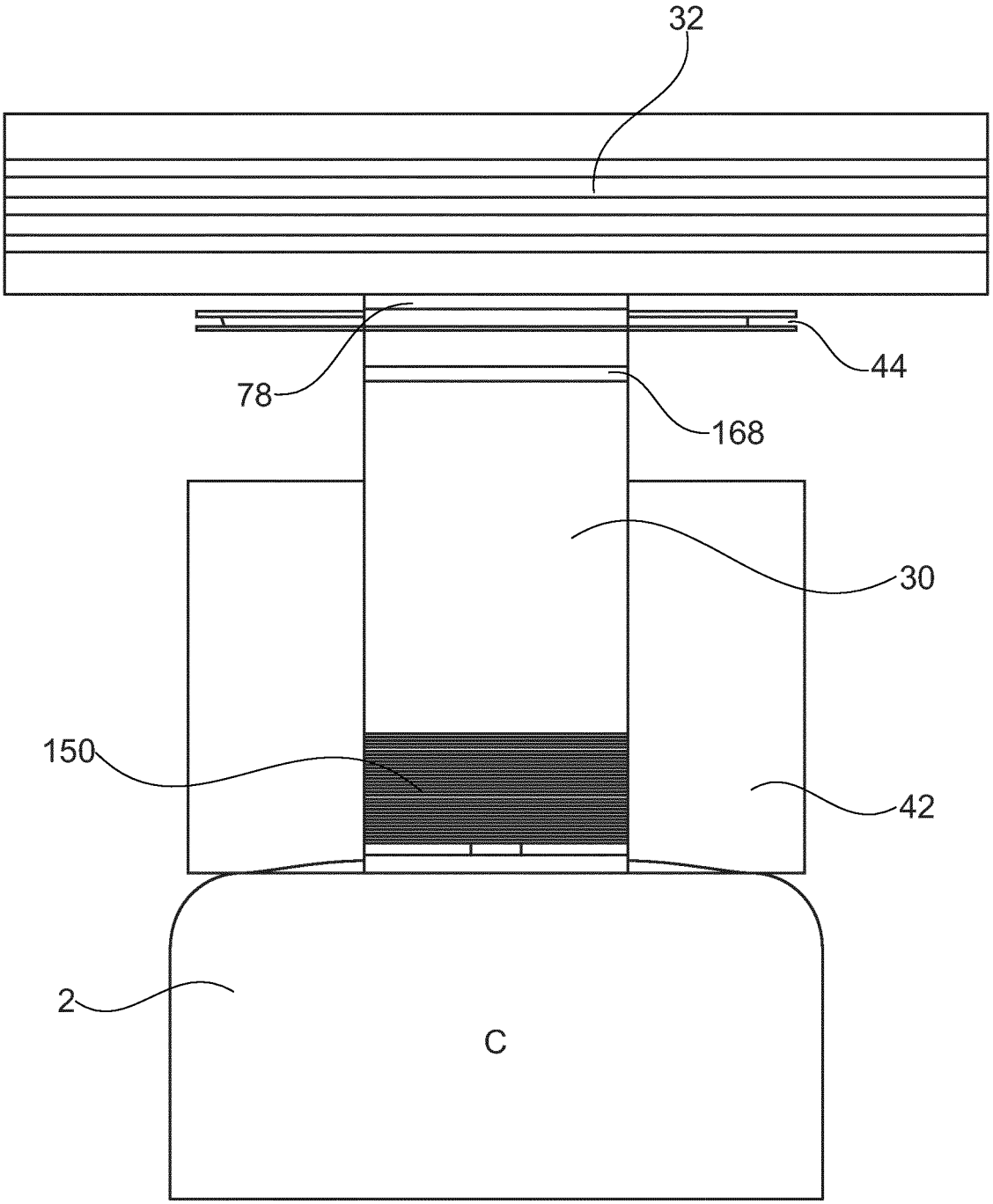


Fig. 8

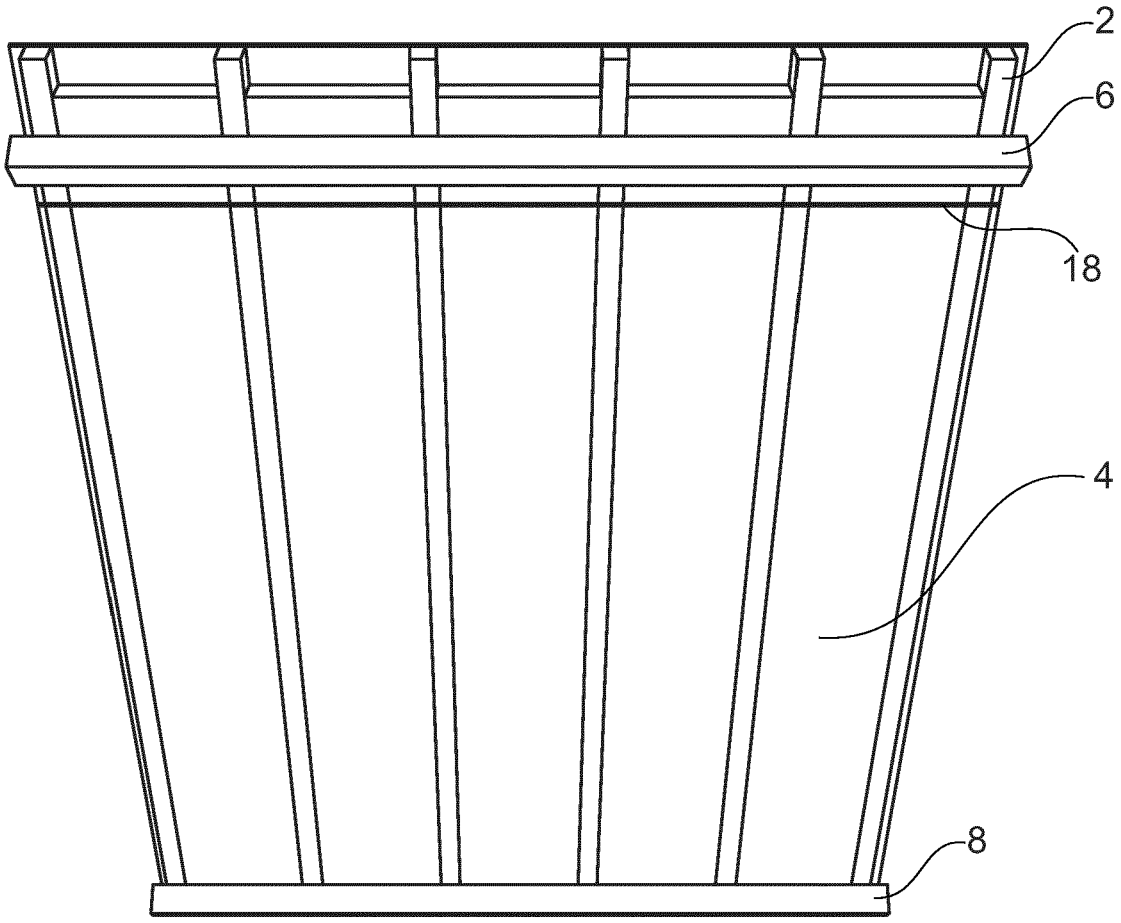


Fig. 9

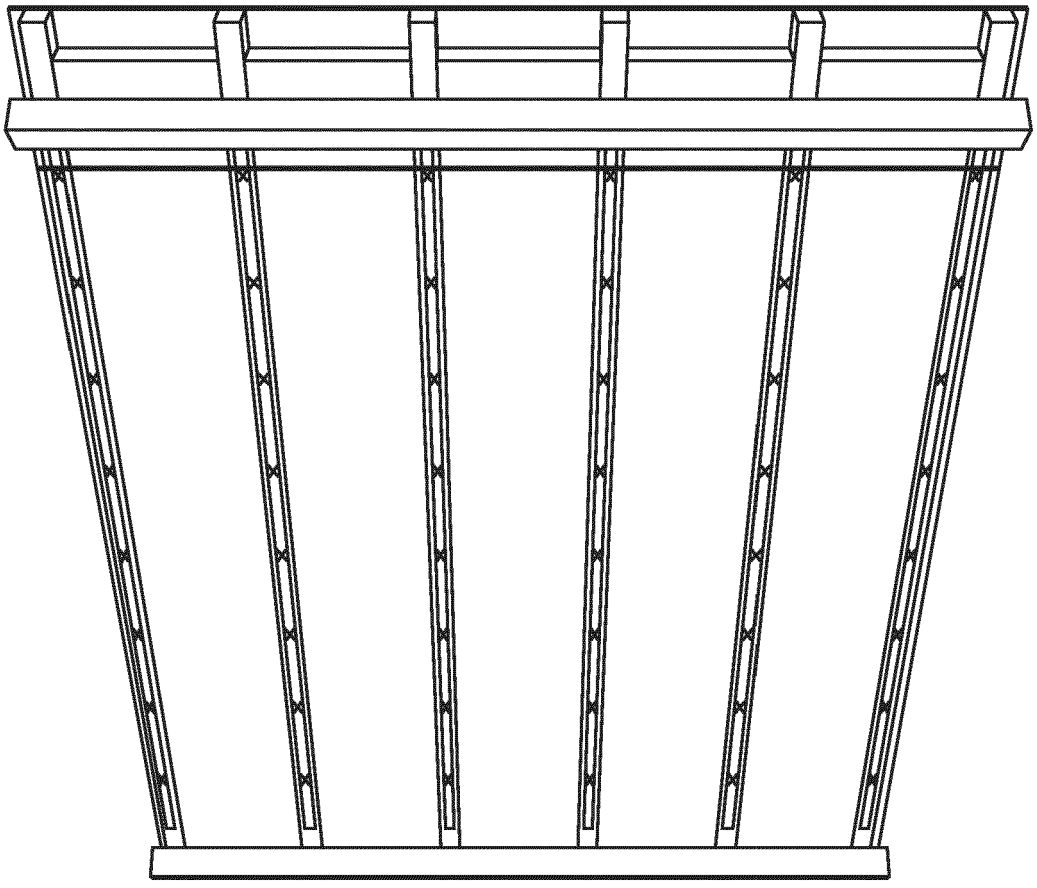


Fig. 10

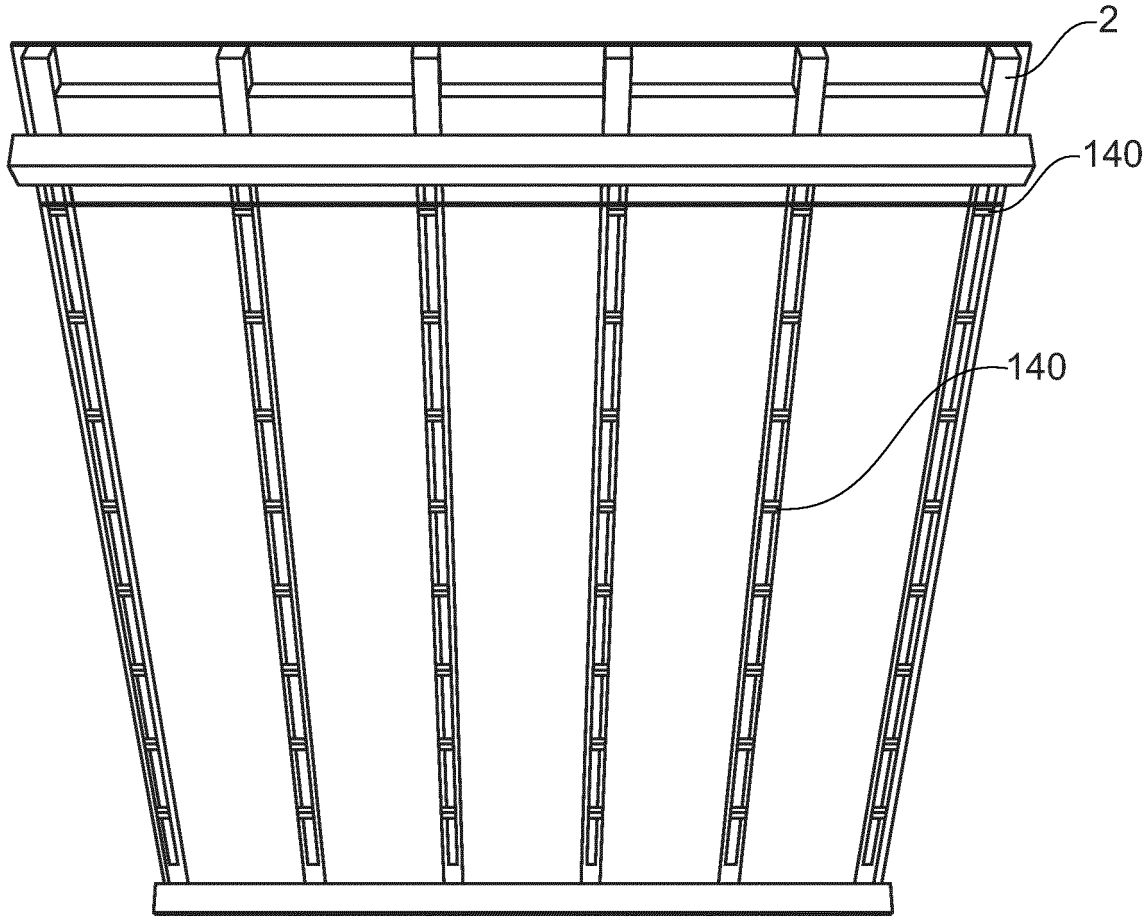


Fig. 11

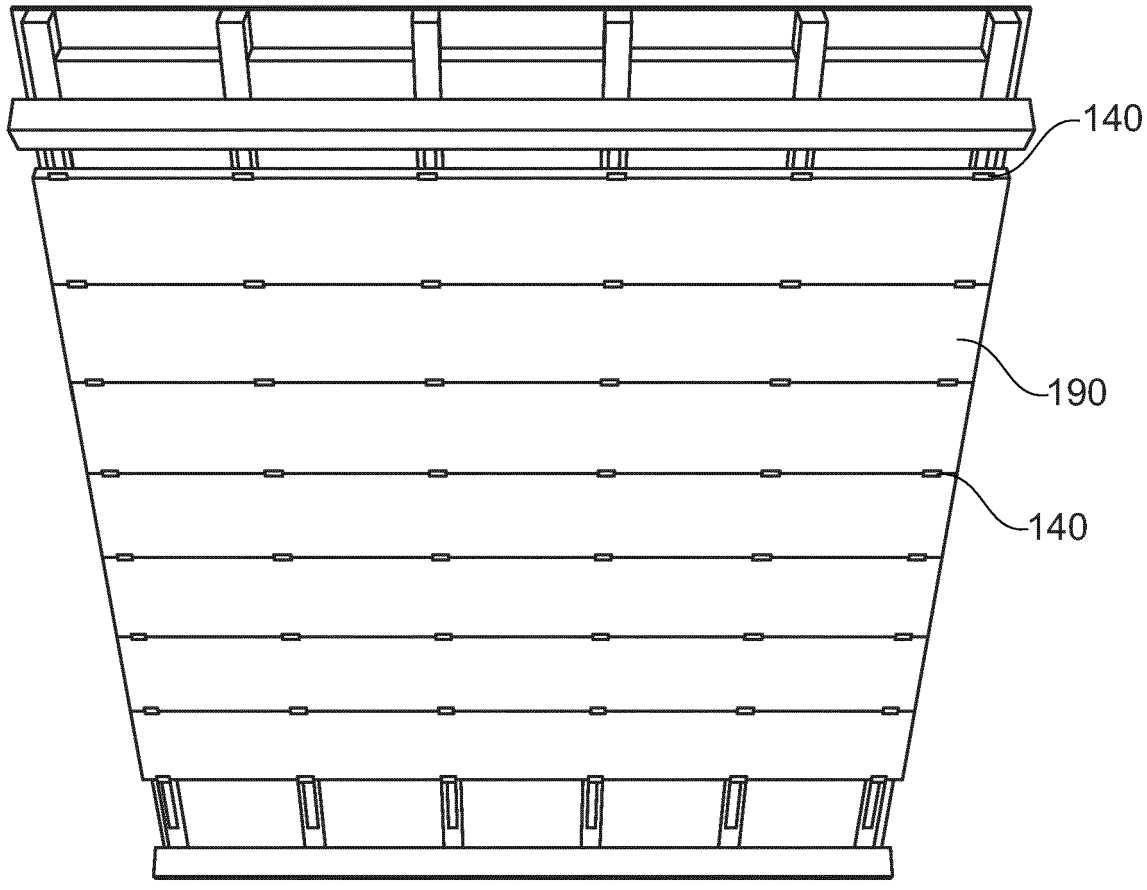


Fig. 12

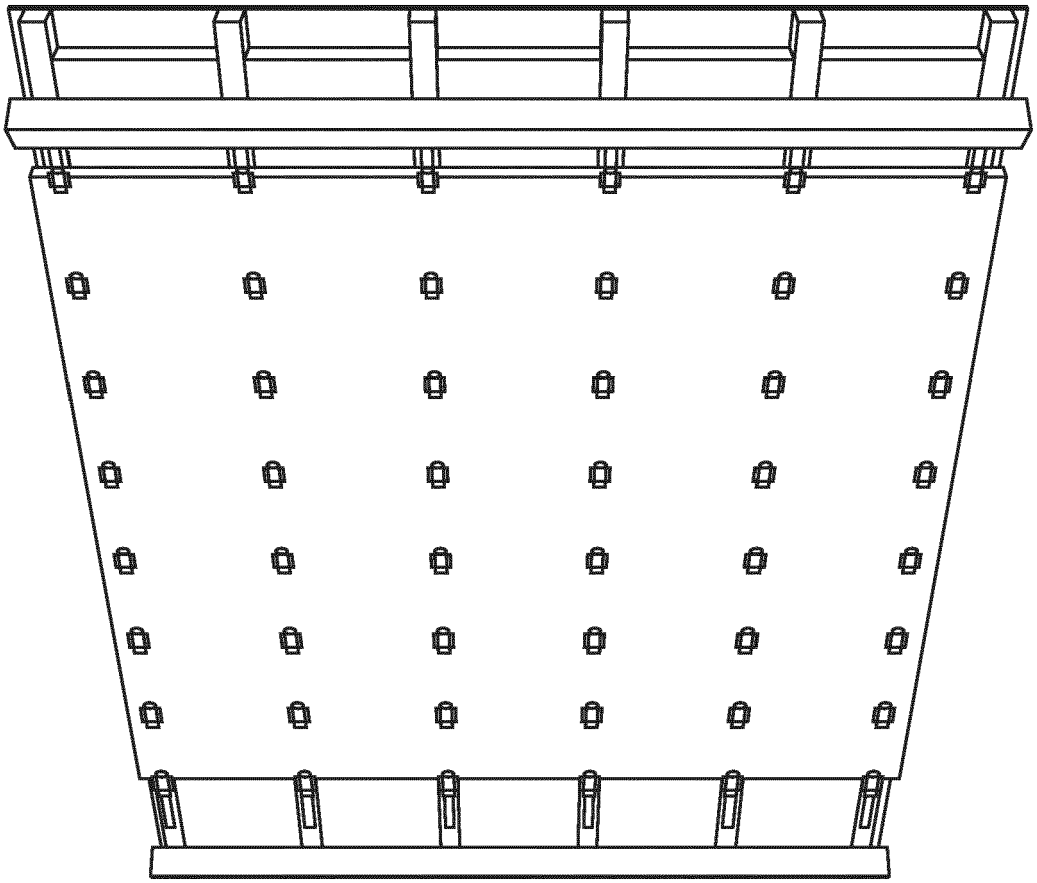
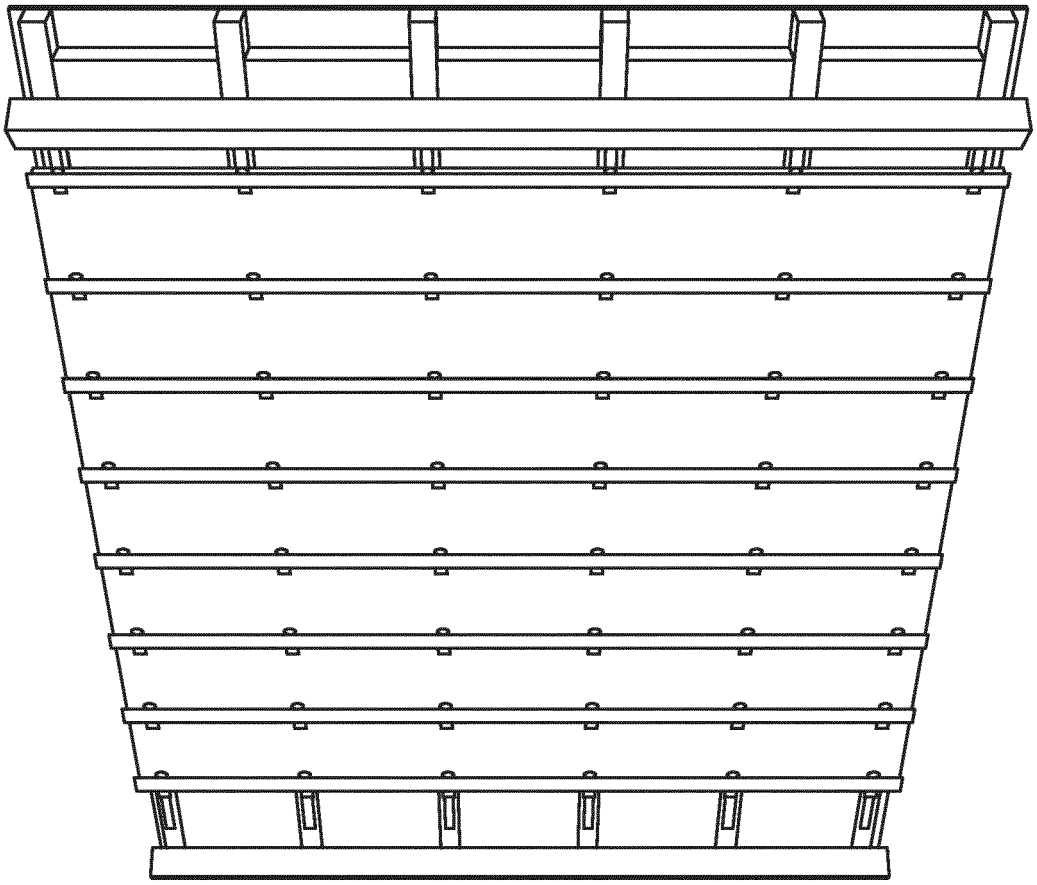


Fig. 13



REFERENCES CITED IN THE DESCRIPTION

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