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(54) **CLAMPING ELEMENT; FLOORS OR WALLS FORMED BY SUCH CLAMPING ELEMENTS, BOARDS AND BEAMS**

KLEMMTEIL; AUS SOLCHEN KLEMMTEILEN, PLATTEN UND BALKEN ZUSAMMENGEBAUTE FUSSBÖDEN ODER WÄNDE

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(56) References cited:
EP-A1- 1 600 579 **WO-A1-2010/071930**
WO-A1-2015/159136 **DE-U1-202007 002 282**
DE-U1-202007 002 282 **US-A1- 2004 045 244**

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EP 3 143 218 B1

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Description**Technical Field**

[0001] The invention relates to a product for forming a floor or surface covering composed of boards. The invention also concerns a floor or surface covering composed of boards.

Prior Art

[0002] American publication US2004/0045244A1 discloses a floor composed of floorboards, and a system for producing such a floor. A clamping element according to the preamble of claim 1 is known from said document.

[0003] The floor composed of floorboards comprises a number of boards, a number of wooden beams and a number of clamps.

[0004] The beams which carry the boards are laid out parallel to each other in their longitudinal direction with regular mutual spacing. The boards are arranged on the beams, wherein the longitudinal direction of the boards runs substantially perpendicular to the longitudinal direction of the laid out beams.

[0005] The boards have a groove on their narrow long sides.

[0006] Clamps are applied to the beams between the boards, and with a freestanding end engage in the grooves on the boards. The clamps are plate-like with a central screw hole and are provided with laterally positioned spring lips which hold the clamp on the beam.

[0007] The clamps are symmetrical in form, so that a clamp engages in the groove on each of the boards between which the clamp is positioned. The clamp is firmly screwed between two boards when the boards and intermediate clamp are correctly positioned. In this way a firm connection is created between each board and the beams, and between the boards.

[0008] US 2004/0045244 describes that the freestanding end on either side of the clamps is wider than the groove in the board, and should be formed relative to the groove in the board such that a minimum spacing is created between the boards, in order to ensure that after positioning of the boards and the intermediate clamps, it is possible to place a screw in the screw hole. The width between the edges of the freestanding ends of the clamp minus twice the groove depth is thus at least equal to the diameter of the screw head. This system and the associated method have the drawback that a space exists between the boards which has at least the width of a screw head.

[0009] From an aesthetic view point, it may be desirable to keep this intermediate space as small as possible but this is at the cost of the diameter of the screw head and possibly also the screw diameter. By using relatively thin screws, the permitted tensile force on the screw will diminish, with an increasing chance of breakage of the screw during assembly if too great a force is exerted on the screw. Also the chance of breakage during use, due

to excessive force as a result of a load on the floor, weather influences and/or temperature fluctuations, will increase due to the low permitted tensile force on the screws. Also, reducing the size of the screw head can lead to mechanical problems with the fixing.

[0010] A secondary disadvantage is that repair is only possible by fitting a new screw into the beam if there is sufficient space.

10 Summary of the Invention

[0011] It is an object of the invention to offer a solution to the problem of the prior art.

[0012] For this, the invention proposes a product for forming a floor composed of boards from a plurality of boards which are provided with a groove in their side faces running in the longitudinal direction, comprising at least:

a plurality of beams, and a plurality of clamping elements, wherein the clamping element is configured to cooperate with one of the beams and one or more of the boards, and comprises a substantially rectangular plate-like part with a plate width and a plate length, and provided with a central opening for receiving a screw which is provided with a screw head, wherein the plate-like part on a surface thereof is provided with a bar-like edge element which is perpendicular to the plate-like element and has a constant width up to an end face thereof which is smaller than the plate width, and extends on the surface over substantially the length of the plate-like part, wherein the central opening extends through the edge element, and the width of the edge element is at least equal to the dimension of the central opening in the width direction, and wherein a connecting structure of the beam comprises a guiding groove which is suitable for receiving a nut connected to the screw of the clamping element and having a greater diagonal dimension than a width of the groove, and wherein a freestanding part in the width direction of the plate-like part of the clamping element is received in the groove, and the height of the edge element from the plate-like part is less than the height of the groove from an underside of the board.

[0013] By attaching the edge element to the one surface with a width of the edge element at least equal to the dimension of the central opening in the width direction, a stop element is provided against which boards can lie against the clamp element. By selecting the groove of the boards deeper than or at least equal to the width over which the plate-like part extends outside the edge element, the spacing between boards adjacent to each other in their longitudinal direction is thus determined by the width of the edge element. Because the edge element has at least a width which is equal to the dimension of the central opening, the width of the edge element will be approximately equal to the diameter of the screw which can be inserted through the central opening, wherein the screw head will have a larger diameter than the width of the edge element. Thus it is ensured

that the space between boards adjacent to each other in their longitudinal direction may be smaller than in the above-mentioned prior art, for the same screw diameter. It is also achieved that the screw head is received in the mutually facing grooves of the boards adjacent to each other in their longitudinal direction.

[0014] The beam with this connecting structure has the advantage that the clamping element can be placed on the beam in a position which is fixed by the protrusions which are provided with thickening at their ends, without it being necessary to tighten the screw until a clamping is achieved on the groove edge. Because the screw is not yet tightened, the clamping element can still be moved over the beam in the direction of the groove, so the clamping element is freely moveable against an edge of a board. Also the height of the clamping element may still be adjusted as long as the screw is not tightened.

[0015] In addition, the fact that the height of the edge element from the plate-like part is less than the height of the groove from an underside of the board, allows boards of different groove height to be clamped with the clamping element, provided that the groove height is at least equal to or greater than the height of the edge element. Subject to this peripheral condition, the clamping element is universal, i.e. the clamping element can be used with boards with arbitrary height of the groove from the underside of the board. Because the height of the edge element from the underside of the board, when the screw is tightened the clamping element is pulled in the direction of the beam and the board is clamped onto a top surface of the beam to which the screw is connected via the nut.

[0016] The invention also concerns an assembled floor or wall constructed from a product as described above, wherein in their longitudinal direction, the beams are laid out in a first direction with a mutual space between adjacent beams; the boards are laid out on the plurality of beams with the longitudinal direction of the boards in a second direction which is substantially perpendicular to the first direction, wherein a clamping element is situated on at least one of the beams between every two adjacent boards, with the protrusions of the clamping element clamping against the opposing side faces of the beam; each of the adjacent boards is placed with its side face against the edge element of the clamping element; the clamping element is connected to boards placed on opposite sides of the clamping element in that the freestanding part of the plate-like part facing the board is received in the groove of the respective board, and wherein the depth of the groove or groove part is greater than or at least equal to the free width of the freestanding part of the plate-like part of the clamping element, wherein the head of the screw lies inside the groove, and wherein the clamping element in the groove of the respective boards is connected to the connecting structure of the beam by means of a nut on the end of the screw which is received in the central opening of the clamping element, wherein the height of the edge element from the plate-like part is

smaller than the height of the groove from an underside of the board.

[0017] The person skilled in the art will understand that the floor or wall thus defined is a surface covering which, without being limited, comprises both a floor, a terrace floor and a wall covering.

[0018] Further embodiments of the present invention are described in the subclaims.

[0019] Further features, areas of application and advantages of the invention appear from the description below of exemplary embodiments of the invention which are shown in the figures of the drawing.

Brief Description of the Figures

[0020] The invention will be described in more detail below with reference to some drawings which show some exemplary embodiments. The drawings are intended merely for illustrative purposes and should not be interpreted as a restriction of the inventive concept which is defined by the attached claims.

[0021] The drawings show:

Figure 1 a perspective view of a clamping element according to one embodiment of the invention;

Figure 2 a side view of the clamping element in Figure 1 in a width direction;

Figure 3 a side view of the clamping element in a longitudinal direction;

Figure 4 a view of the underside of the clamping element;

Figure 5 a perspective view of a beam on which a clamping element according to one embodiment of the invention may be attached;

Figure 6 a cross section of the beam in Figure 5;

Figure 7 a perspective view of an assembly according to one embodiment of the invention;

Figure 8 the cross section of the beam provided with a clamping element and a board; and

Figure 9 a detailed view of a cross section of the assembly at the site of the clamping element.

Description of Embodiments

[0022] In the description below, elements with the same reference numerals indicate similar or corresponding components on the attached figures.

[0023] Figure 1 shows a perspective view of a clamping element according to an embodiment of the invention.

[0024] The clamping element 1 according to an embodiment of the invention comprises a rectangular oblong plate 10 with width B and length L.

[0025] On the widths B, the plate 10 is provided with a bar-like or oblong protrusion 12 which extends perpendicularly to one side of the plate 10. The protrusion 12 serves as a protrusion for stabilisation on a beam, as will be explained below.

[0026] In the centre of the plate 10, a central opening

14 is provided for receiving a screw 50.

[0027] If the plate is relatively thick, the central opening may be provided with a recess such that a head of a screw 50 held in the central opening lies below the top surface 11 of the plate 10. If the plate consists of a thin metal (for example a thin steel), such a recess is usually unnecessary.

[0028] Figure 2 shows a side view of the clamping element in the longitudinal direction of the plate 10. In an embodiment, the top surface 11 of the plate is provided with a chamfer 26 along the plate periphery. This chamfer facilitates insertion of the clamping element in a groove of a board (not shown).

[0029] In the width direction B, the plate has freestanding ends 28 which extend outside the width of the protrusions 12 over a free width C.

[0030] Figure 3 shows a side view of the clamping element of Figure 1 in a width direction.

[0031] On the bottom surface 16 opposite the top surface 11 of the plate, the clamping element 1 comprises an edge element or ridge 18 which extends between the two protrusions 12. The edge element 18 has a height 20 which is less than the length 22 of the protrusions 12, so that the protrusions extend past the free end 24 of the edge element. The edge element has the function of a stop when the clamping element is placed between two boards which are provided with a groove in the narrow side face in the longitudinal direction. Each freestanding end 28 of the clamping element engages in the groove of the board. When the depth of the groove is at least equal to the free width C of the freestanding end 28, in the correctly inserted position of the clamping element, the side face of the board will lie against the edge element 18. This will be shown more clearly in Figure 4.

[0032] In an embodiment, the protrusions 12 may be provided with a thickening 13 at their ends on the mutually facing sides.

[0033] The thickening 13 is such that the space between the thickenings of opposing protrusions on the clamping element is smaller than the space between the thinner parts of the protrusions 12. In this way the protrusion serves as a clamping stabiliser on a beam when the clamping element is placed on the beam. The clamping element can thus still be moved over the length of the beam so that the clamping element is still freely moveable against an edge of a board. The height of the clamping element may still be set by the clamping protrusions as long as the screw is not tightened.

[0034] It is pointed out that the invention is restricted to the embodiment with these protrusions 12. Alternatively, out of scope of the invention, the protrusions 12 may be omitted so that the plate may be provided with the bar-like edge element 18, which extends over substantially the length of the plate 10, along the long centre line on one surface of the plate.

[0035] Figure 4 shows a side view of the underside of the clamping element. The edge element 18 which extends along the plate 10 has a width 30 which is substan-

tially equal to the diameter of the central opening 14. This ensures that the space between two boards is substantially equal to the diameter of the screw. Because the screw head is held in the groove of the board (and optionally in the recess of the centre opening 14 in the plate 10 of the clamping element 1), the space between the boards is thus not determined by the size of the screw head but exclusively by the width of the edge element or part of the screw carrying the thread, when the width of the edge element is virtually equal to the screw diameter.

[0036] In an embodiment, the edge element 18 is provided with a thickening 28 at the site of the central opening so that the wall 32 of the edge element is thin relative to the width 30 of the edge element at the site of the central opening 14. The person skilled in the art will understand that this thin wall is not essential and may be omitted by choosing the width 30 of the edge element equal to the diameter of the central opening (or its dimension in the width direction of the edge element 18).

[0037] In an embodiment, the thickness of the wall of the edge element at the site 28 of the central opening is less than 5% of the width 30 of the edge element.

[0038] In an example, the clamping element may be provided with a screw with a thread diameter of 5 mm. The thin wall then has a thickness of less than 0.25 mm. The space between two boards still remains sufficient for the tip of a screwdriver when the screw between two boards is to be tightened.

[0039] Figure 5 shows a perspective view of a beam 100 on which a clamping element 1 according to an embodiment may be attached.

[0040] In an embodiment, the beam 100 has a box profile 102 with a width E which is selected such that it substantially corresponds to the length of the edge element, or if protrusions are used, to the space between the protrusions 12 or between the inwardly directed thickenings of the protrusions 12 of the clamping element 1, whichever is the smaller.

[0041] On a side 106 facing the boards, i.e. on the top side in the mounted state, the beam 100 has a connecting structure in the form of a guiding slot 108. This connecting structure serves to connect the beam to at least one clamping element by means of a screw 50 which is held in the central opening 14 of the clamping element, as shown for example in Figure 1, 2 or 3.

[0042] An oblong nut 52 is connected to the screw 50 and may be received in the slot 108.

[0043] As already explained here, the position of the clamping element 1 will be stable when the screw is inserted in the groove, without the need for a connection between the beam 100 and the clamping element 1 by the screw 50. The advantage here is that an assembly of two boards with a clamping element 1 in-between may be constructed without the clamping element needing to be connected immediately to the beam. This simplifies the positioning and locating of the boards and clamping elements.

[0044] The width F of the groove is greater than the

smallest width of the oblong nut but less than a diagonal of the oblong nut, or a diagonal dimension of the nut is greater than the width F of the groove. When the oblong nut is inserted in the groove and the screw is turned, the nut will turn initially until the nut reaches the limit of the groove. On further turning of the screw, the nut will be tightened so that the clamping element clamps via the groove in the board, clamping the board against the top of the beam, and a fixed connection results.

[0045] The connection between clamping element 1 and the beam 100 described above, by means of a slot 108 and oblong nut 52, in the use of a clamping element as described above, has the advantage that in contrast to the use of a wooden beam, the clamping element can be placed stably on the beam provided with the groove as described above and in addition can easily be moved without a connection needing to be created between the clamping element and the groove.

[0046] This connection method also has the advantage of bridging the height of the groove in the board relative to the side 106 on which the board rests due to the screw connection, whereby the clamping element 1 is "universal" i.e. can be used for different groove heights. Figure 6 shows a cross section of the beam 100 in Figure 5.

[0047] Figures 7 to 9 show details of a floor assembled from boards, which is constructed using the clamping element 1 and the beam 100 as described above. Without being limited to this, such an assembled floor may be used as a floor inside a building but also as a terrace floor or a wall covering.

[0048] The floor composed of boards comprises a plurality of beams 100, a plurality of clamping elements 1 and a plurality of boards 200. Embodiments of the beam 100 and clamping element 1 have been described above with reference to Figures 5 and 6 and Figures 1 to 4 respectively.

[0049] In the assembled floor, the plurality of beams 100 is laid out in the longitudinal direction in a first direction R1. Adjacent beams are placed with a mutual space. A side 106 of each beam on which the boards are to be placed is directed upwards.

[0050] The plurality of boards 200 are laid out on the upwardly directed side of the beams 100. The longitudinal direction of the boards runs in a second direction R2 which is substantially perpendicular to the first direction in which the beams extend longitudinally.

[0051] Figure 7 shows a perspective partial view of part of an assembly according to an embodiment of the invention. Clamping elements 1 are placed on a beam 100, wherein a screw 50 is received in the recess of the central opening 14 in the clamping element 1. The screw 50 is connected by means of an oblong nut 52 to the guiding slot 108 of the beam 100.

[0052] The freestanding end 28 of the clamping element 1 is received in the groove 202 in the board 200. The groove 202 is arranged in the narrow long sides of the board 200 in the second direction R2.

[0053] The groove may be continuous over the length

of the board but may also be arranged as groove parts at predefined points along the length with groove-free spaces in-between.

[0054] The boards 200 each lie with their long side against the edge element 18 of a clamping element 1. Because the edge element 18 has almost the same width as the diameter of the screw 50, and the groove 202 of the board is deeper than the free width C of the free-standing end 28 of the clamping element, a space D always remains between the boards 200 between which a clamping element 1 is placed, which space is approximately equal to the width of the edge element or the diameter of the screw, while the head of the screw, which has a larger diameter than the width of the edge element, lies partly in the grooves of two adjacent boards. In the embodiment in which the head of the screw 50 is held in the clamping element 1 and optionally in the recess of the clamping element 1, the positioning of the boards 200 and clamping element 1 is not hindered in this method. Secondly, if the groove is sufficiently high in the board, with a thin plate-like part 10 without recess therein, the screw head may also be held partly inside the board.

[0055] Optionally, the boards 200 are provided with a profile 204 on the surface.

[0056] Figure 8 shows a detailed view of a cross section of an assembly at the site of a clamping element according to an embodiment of the invention. The clamping element 1 is placed on the beam 100 with the protrusions 12 on either side clamped against the beam. The screw 50 is received in the central opening of the clamping element 1, wherein the nut on the screw is in the slot 108 of the beam. The freestanding end of the clamping element is held in the groove 202 of the board 20 so that the board is clamped against the top side 106 of the beam.

[0057] Figure 9 shows a detailed view of a cross section of a clamping element between two boards according to one embodiment of the invention.

[0058] Alternative and equivalent embodiments of the present invention are conceivable within the scope of the present invention, as will be clear to a person skilled in the art. The scope of the present invention is limited only by the attached claims.

Claims

1. A clamping element for use in a product for forming a floor or wall composed of boards from a plurality of boards or in an assembled floor or wall constructed from said product, wherein the clamping element comprises:

a substantially rectangular plate-like part (10) with a plate width (B) and a plate length (L) and provided with a central opening (14) for receiving a screw provided with a screw head, wherein the plate-like part (10) on a surface thereof is

provided with a bar-like edge element (18) which is perpendicular to the plate-like part and has a constant width (R) up to an end face thereof which is smaller than the plate width (B), and extends on the surface over substantially the length of the plate-like part, wherein the clamping element, on each of the head sides in the plate longitudinal direction, is provided with a bar-like protrusion (12) perpendicular to the plate-like part towards a first side of the plate-like part, wherein each protrusion lies in the middle of one of the respective head sides, wherein the edge element (18) extends between the protrusions (12) on the first side; the edge element having a height which is less than a length of the protrusions, so that the protrusions extend past a free end of the edge element, **characterised in that:**

- the central opening (14) extends through the edge element (18),
 - the width (R) of the edge element (18) is at least equal to the dimension of the central opening (14) in the width direction (B),
 - each protrusion (12) has a width which is smaller than the plate width, and that
 - the width of the edge element (18) is substantially equal to the width of the protrusion (12).
2. A product comprising a plurality of clamping elements (1) according to claim 1, for forming a floor or wall composed of boards from a plurality of boards, each provided with a groove (202) in their side faces running in the longitudinal direction, the product further comprising at least:
- a plurality of beams (100), wherein the clamping element (1) is configured to cooperate with one of the beams and one or more of the boards, wherein a connecting structure (108) of the beam comprises a guiding groove which is suitable for receiving a nut (52) connected to the screw (50) of the clamping element and having a greater diagonal dimension than a width of the groove, and wherein a freestanding part (28) in the width direction of the plate-like part (10) of the clamping element (1) is received in the groove (202), and wherein the height (K) of the edge element from the plate-like part is less than the height of the groove from an underside of the board.
3. The product according to claim 2, wherein the depth of the groove is greater than or at least equal to the free width (C) of the freestanding part of the plate-

like part of the clamping element.

4. The product according to claim 2 or claim 3, wherein the central opening (14) has a recess (16) of greater dimension than the dimension of the central opening on a second side opposite the first side of the plate-like part, for receiving the head of the screw.
5. The product according to any of claims 2 to 4, wherein the head of the screw lies inside the groove, and wherein the head of the screw is received in the central opening in the plate-like part (10).
6. The product according to claim 2, wherein at the site of the central opening (14), the edge element (18) of the clamping element comprises wall elements (32) with a wall thickness which is thin relative to the width (R) of the edge element.
7. The product according to any of the preceding claims 2 - 6, wherein the beam has a box profile (102) with a width (E) which substantially corresponds to a length of the edge element (18) of the clamping element (1),
- and the beam on one side (106) thereof comprises a connecting structure (108) which serves for connecting the beam to at least one clamping element by means of the screw (50) which is held in the central opening of the clamping element, wherein the connecting structure of the beam comprises a guiding groove (108) which is suitable for receiving the nut (52) connected to the screw.
8. The product according to claim 6, wherein the width (F) of the groove of the beam is smaller than the diagonal of the nut but greater than a smallest width of the nut, and wherein the nut has an oblong form.
9. The product according to any of claims 6 to 8, wherein the beam has a width (E) which substantially corresponds to the length of the edge element (18) of the plate-like part or to a space between the protrusions (12) of the clamping element.
10. An assembled floor or wall constructed from a plurality of clamping elements according to claim 1, a product according to any of claims 2 to 9 and boards (200) provided from a plurality of boards, wherein
- in their longitudinal direction, the beams (100) are laid out in a first direction (R1) with a mutual space between adjacent beams, the boards (200) are laid out on the plurality of beams (100) with the longitudinal direction of the boards in a second direction (R2) which is

substantially perpendicular to the first direction, wherein a clamping element (1) is situated on at least one of the beams (100) between every two adjacent boards, with the protrusions of the clamping element clamping against the opposing side faces of the beam;

each of the adjacent boards is placed with its side face against the edge element (18) of the clamping element (1);

the clamping element is connected to boards (200) placed on opposite sides of the clamping element in that the freestanding part (28) of the plate-like part facing the board is received in the groove (202) of the respective board (200), and wherein the depth of the groove or groove part is greater than or at least equal to the free width (C) of the freestanding part of the plate-like part of the clamping element,

wherein the head of the screw lies inside the groove,

and wherein the clamping element in the groove of the respective boards is connected to the connecting structure (108) of the beam by means of the nut on the end of the screw (50) which is received in the central opening (14) of the clamping element, wherein the height (K) of the edge element from the plate-like part is smaller than the height of the groove from an underside of the board.

11. The assembled floor or wall according to claim 10, wherein the free width (C) of the freestanding part (28) of the plate-like part is equal to or smaller than a depth of the groove or groove part (202) in the board (200).
12. The assembled floor or wall according to claim 10, wherein the connecting structure of the beam comprises a guiding groove (108) which is suitable for receiving the nut (52) connected to the screw, wherein the nut (52) has a greater diagonal dimension than the width of the groove.
13. The assembled floor or wall according to any of claims 10 to 12, wherein the distal end face of the edge element of the clamping element does not make contact with the top face of the beam.

Patentansprüche

1. Klemmelement zur Verwendung in einem Produkt zum Ausbilden eines Bodens oder einer Wand, die aus Brettern aus einer Vielzahl von Brettern zusammengesetzt ist, oder in einem zusammengebauten Boden oder einer zusammengebauten Wand, der/die aus dem Produkt konstruiert ist, wobei das Klemmelement umfasst:

ein im Wesentlichen rechteckiges plattenförmiges Teil (10) mit einer Plattenbreite (B) und einer Plattenlänge (L), das mit einer zentralen Öffnung (14) zur Aufnahme einer mit einem Schraubenkopf versehenen Schraube versehen ist, wobei

das plattenartige Teil (10) auf einer Oberfläche desselben mit einem stabartigen Randelement (18) versehen ist, das senkrecht zu dem plattenartigen Teil verläuft und eine konstante Breite (R) bis zu einer Endfläche desselben aufweist, die kleiner als die Plattenbreite (B) ist, und sich auf der Oberfläche im Wesentlichen über die Länge des plattenartigen Teils erstreckt, wobei das Klemmelement an jeder der Kopfseiten in Plattenlängsrichtung mit einem stabförmigen Vorsprung (12) senkrecht zum plattenförmigen Teil zu einer ersten Seite des plattenförmigen Teils versehen ist,

wobei jeder Vorsprung in der Mitte einer der jeweiligen Kopfseiten liegt,

wobei sich das Randelement (18) zwischen den Vorsprüngen (12) auf der ersten Seite erstreckt; wobei das Randelement eine Höhe aufweist, die geringer ist als die Länge der Vorsprünge, so dass sich die Vorsprünge über ein freies Ende des Randelements hinaus erstrecken,

dadurch gekennzeichnet, dass:

- die zentrale Öffnung (14) sich durch das Randelement (18) erstreckt,
 - die Breite (R) des Randelements (18) mindestens gleich der Abmessung der zentralen Öffnung (14) in Richtung der Breite (B) ist,
 - jeder Vorsprung (12) eine Breite aufweist, die kleiner ist als die Plattenbreite, und dass
 - die Breite des Randelements (18) im Wesentlichen gleich der Breite des Vorsprungs (12) ist.
2. Produkt mit einer Vielzahl von Klemmelementen (1) nach Anspruch 1, zum Bilden eines Bodens oder einer Wand aus Brettern aus einer Vielzahl von Brettern, die jeweils mit einer in Längsrichtung verlaufenden Nut (202) in ihren Seitenflächen versehen sind, wobei das Produkt ferner mindestens umfasst:

eine Vielzahl von Trägern (100), wobei das Klemmelement (1) so konfiguriert ist, dass es mit einem der Träger und einem oder mehreren der Bretter zusammenwirkt, wobei eine Verbindungsstruktur (108) des Trägers eine Führungsnut aufweist, die zur Aufnahme einer mit der Schraube (50) des Klemmelements verbundenen Mutter (52) geeignet ist und eine größere diagonale Abmessung als ei-

- ne Breite der Nut aufweist, und
wobei ein freistehender Teil (28) in der Breitenrichtung des plattenförmigen Teils (10) des Klemmelementes (1) in der Nut (202) aufgenommen ist, und
wobei die Höhe (K) des Randelements von dem plattenartigen Teil kleiner ist als die Höhe der Nut von einer Unterseite der Platte.
3. Produkt nach Anspruch 2, wobei die Tiefe der Nut größer als oder mindestens gleich der freien Breite (C) des freistehenden Teils des plattenartigen Teils des Klemmelements ist.
4. Produkt nach Anspruch 2 oder 3, wobei die zentrale Öffnung (14) auf einer zweiten, der ersten Seite des plattenförmigen Teils gegenüberliegenden Seite eine Aussparung (16) aufweist, deren Abmessung größer ist als die Abmessung der zentralen Öffnung, um den Schraubenkopf aufzunehmen.
5. Produkt nach einem der Ansprüche 2 bis 4, wobei der Schraubenkopf innerhalb der Nut liegt und der Schraubenkopf in der zentralen Öffnung im plattenförmigen Teil (10) aufgenommen ist.
6. Produkt nach Anspruch 2, wobei das Randelement (18) des Klemmelementes an der Stelle der zentralen Öffnung (14) Wandelemente (32) mit einer im Verhältnis zur Breite (R) des Randelementes geringen Wandstärke aufweist.
7. Produkt nach einem der vorhergehenden Ansprüche 2 - 6, wobei der Träger ein Kastenprofil (102) mit einer Breite (E) aufweist, die im Wesentlichen einer Länge des Randelements (18) des Klemmelementes (1) entspricht, und der Träger auf einer Seite (106) davon eine Verbindungsstruktur (108) aufweist, die zum Verbinden des Trägers mit mindestens einem Klemmelement mittels der Schraube (50) dient, die in der zentralen Öffnung des Klemmelementes gehalten ist,
wobei die Verbindungsstruktur des Trägers eine Führungsnut (108) aufweist, die zur Aufnahme der mit der Schraube verbundenen Mutter (52) geeignet ist.
8. Produkt nach Anspruch 6, wobei die Breite (F) der Nut des Trägers kleiner ist als die Diagonale der Mutter, aber größer als eine kleinste Breite der Mutter, und wobei die Mutter eine längliche Form aufweist.
9. Produkt nach einem der Ansprüche 6 bis 8, wobei der Träger eine Breite (E) aufweist, die im Wesentlichen der Länge des Randelements (18) des plattenförmigen Teils oder einem Zwischenraum zwischen den Vorsprüngen (12) des Klemmelements entspricht.
10. Zusammengesetzter Boden oder Wand aus einer Vielzahl von Klemmelementen nach Anspruch 1, einem Produkt nach einem der Ansprüche 2 bis 9 und aus einer Vielzahl von Brettern (200), wobei
die Träger (100) in ihrer Längsrichtung in einer ersten Richtung (R1) mit einem gegenseitigen Abstand zwischen benachbarten Trägern angeordnet sind,
die Bretter (200) auf der Vielzahl von Trägern (100) mit einer Längsrichtung der Bretter in einer zweiten Richtung (R2) ausgelegt sind, die im Wesentlichen senkrecht zu der ersten Richtung ist,
wobei ein Klemmelement (1) auf mindestens einem der Träger (100) zwischen jeweils zwei benachbarten Brettern angeordnet ist, wobei die Vorsprünge des Klemmelements gegen die gegenüberliegenden Seitenflächen des Trägers klemmen;
jedes der benachbarten Bretter mit seiner Seitenfläche gegen das Randelement (18) des Klemmelements (1) gelegt ist;
das Klemmelement mit Brettern (200) verbunden ist, die auf gegenüberliegenden Seiten des Klemmelements angeordnet sind, indem der freistehende Teil (28) des plattenartigen Teils, der dem Brett gegenüberliegt, in der Nut (202) des jeweiligen Bretts (200) aufgenommen ist, und wobei die Tiefe der Nut oder des Nutteils größer oder zumindest gleich der freien Breite (C) des freistehenden Teils des plattenartigen Teils des Klemmelements ist,
wobei der Kopf der Schraube innerhalb der Nut liegt,
und wobei das Klemmelement in der Nut der jeweiligen Bretter mittels der Mutter am Ende der Schraube (50), die in der zentralen Öffnung (14) des Klemmelementes aufgenommen ist, mit der Verbindungsstruktur (108) des Trägers verbunden ist, wobei die Höhe (K) des Randelementes von dem plattenartigen Teil kleiner ist als die Höhe der Nut von einer Unterseite des Brettes.
11. Zusammengesetzter Boden oder Wand nach Anspruch 10, wobei die freie Breite (C) des freistehenden Teils (28) des plattenartigen Teils gleich oder kleiner als eine Tiefe der Nut oder des Nutteils (202) in dem Brett (200) ist.
12. Zusammengesetzter Boden oder Wand nach Anspruch 10, wobei die Verbindungsstruktur des Trägers eine Führungsnut (108) aufweist, die zur Aufnahme der mit der Schraube verbundenen Mutter (52) geeignet ist, wobei die Mutter (52) eine größere diagonale Abmessung als die Breite der Nut aufweist.

13. Zusammengesetzter Boden oder Wand nach einem der Ansprüche 10 bis 12, wobei die distale Endfläche des Randlelements des Klemmelements nicht mit der Oberseite des Trägers in Kontakt kommt.

Revendications

1. Élément de fixation à utiliser dans un produit pour former un plancher ou une paroi composé(e) de plaques à partir d'une pluralité de plaques ou dans un plancher ou une paroi assemblé(e) construit(e) à partir dudit produit, dans lequel l'élément de fixation comprend :

une partie analogue à une plaque sensiblement rectangulaire (10) avec une largeur de plaque (B) et une longueur de plaque (L) et qui est pourvue d'une ouverture centrale (14) destinée à recevoir une vis pourvue d'une tête de vis, dans lequel

la partie analogue à une plaque (10), sur une surface de celle-ci, est pourvue d'un élément de bordure analogue à une barre (18) qui est perpendiculaire à la partie analogue à une plaque et a une largeur constante (R) jusqu'à une face d'extrémité de celle-ci qui est inférieure à la largeur de plaque (B), et s'étend sur la surface sur sensiblement la longueur de la partie analogue à une plaque, dans lequel

l'élément de fixation, sur chacun des côtés de tête dans la direction longitudinale de plaque, est pourvu d'une saillie analogue à une barre (12) perpendiculaire à la partie analogue à une plaque vers un premier côté de la partie analogue à une plaque, dans lequel chaque saillie se trouve au milieu de l'un des côtés de tête respectifs,

dans lequel l'élément de bordure (18) s'étend entre les saillies (12) sur le premier côté ;

l'élément de bordure ayant une hauteur qui est inférieure à une longueur des saillies, de sorte que les saillies s'étendent au-delà d'une extrémité libre de l'élément de bordure,

caractérisé en ce que :

- l'ouverture centrale (14) s'étend à travers l'élément de bordure (18),

- la largeur (R) de l'élément de bordure (18) est au moins égale à la dimension de l'ouverture centrale (14) dans la direction de largeur (B),

- chaque saillie (12) a une largeur qui est inférieure à la largeur de plaque, et **en ce que**

- la largeur de l'élément de bordure (18) est sensiblement égale à la largeur de la saillie (12).

2. Produit comprenant une pluralité d'éléments de fixation (1) selon la revendication 1, pour former un plancher ou une paroi composé(e) de plaques à partir d'une pluralité de plaques, chacun étant pourvu d'une rainure (202) dans leurs faces latérales s'étendant dans la direction longitudinale, le produit comprenant en outre au moins :

une pluralité de poutres (100), dans lequel l'élément de fixation (1) est configuré pour coopérer avec une des poutres et une ou plusieurs des plaques,

dans lequel une structure de liaison (108) de la poutre comprend une rainure de guidage qui est appropriée pour recevoir un écrou (52) relié à la vis (50) de l'élément de fixation et ayant une dimension diagonale plus grande qu'une largeur de la rainure, et

dans lequel une partie autonome (28) dans la direction de largeur de la partie analogue à une plaque (10) de l'élément de fixation (1) est reçue dans la rainure (202), et

dans lequel la hauteur (K) de l'élément de bordure à partir de la partie analogue à une plaque est inférieure à la hauteur de la rainure à partir d'un côté inférieur de la plaque.

3. Produit selon la revendication 2, dans lequel la profondeur de la rainure est supérieure ou au moins égale à la largeur libre (C) de la partie autonome de la partie analogue à une plaque de l'élément de fixation.

4. Produit selon la revendication 2 ou la revendication 3, dans lequel l'ouverture centrale (14) a un évidement (16) d'une dimension supérieure à la dimension de l'ouverture centrale sur un second côté opposé au premier côté de la partie analogue à une plaque, pour recevoir la tête de la vis.

5. Produit selon l'une quelconque des revendications 2 à 4, dans lequel la tête de la vis se trouve à l'intérieur de la rainure, et dans lequel la tête de la vis est reçue dans l'ouverture centrale dans la partie analogue à une plaque (10).

6. Produit selon la revendication 2, dans lequel au niveau du site de l'ouverture centrale (14), l'élément de bordure (18) de l'élément de fixation comprend des éléments de paroi (32) avec une épaisseur de paroi qui est mince par rapport à la largeur (R) de l'élément de bordure.

7. Produit selon l'une quelconque des revendications précédentes 2 à 6, dans lequel la poutre a un profil de boîte (102) avec une largeur (E) qui correspond sensiblement à une longueur de l'élément de bordure (18) de l'élément de fixation (1), et la poutre, sur

- un côté (106) de celle-ci, comprend une structure de liaison (108) qui sert à relier la poutre à au moins un élément de fixation au moyen de la vis (50) qui est maintenue dans l'ouverture centrale de l'élément de fixation,
- dans lequel la structure de liaison de la poutre comprend une rainure de guidage (108) qui est appropriée pour recevoir l'écrou (52) relié à la vis.
- 5
8. Produit selon la revendication 6, dans lequel la largeur (F) de la rainure de la poutre est inférieure à la diagonale de l'écrou, mais supérieure à la plus petite largeur de l'écrou, et dans lequel l'écrou a une forme oblongue.
- 10
9. Produit selon l'une quelconque des revendications 6 à 8, dans lequel la poutre a une largeur (E) qui correspond sensiblement à la longueur de l'élément de bordure (18) de la partie analogue à une plaque ou à un espace entre les saillies (12) de l'élément de fixation.
- 15
- 20
10. Plancher ou paroi assemblé(e) construit(e) à partir d'une pluralité d'éléments de fixation selon la revendication 1, d'un produit selon l'une quelconque des revendications 2 à 9 et de plaques (200) fournies à partir d'une pluralité de plaques, où
- 25
- dans leur direction longitudinale, les poutres (100) sont disposées dans une première direction (R1) avec un espace mutuel entre des poutres adjacentes,
- 30
- les plaques (200) sont disposées sur la pluralité de poutres (100) avec la direction longitudinale des plaques dans une seconde direction (R2) qui est sensiblement perpendiculaire à la première direction,
- 35
- où un élément de fixation (1) est situé sur au moins une des poutres (100) entre deux plaques adjacentes, les saillies de l'élément de fixation étant fixées contre les faces latérales opposées de la poutre ;
- 40
- chacune des plaques adjacentes est placée avec sa face latérale contre l'élément de bordure (18) de l'élément de fixation (1) ;
- 45
- l'élément de fixation est relié à des plaques (200) placées sur des côtés opposés de l'élément de fixation en ce sens que la partie autonome (28) de la partie analogue à une plaque faisant face à la plaque est reçue dans la rainure (202) de la plaque respective (200), et dans lequel la profondeur de la rainure ou de la partie de rainure est supérieure ou au moins égale à la largeur libre (C) de la partie autonome de la partie analogue à une plaque de l'élément de fixation,
- 50
- où la tête de la vis se trouve à l'intérieur de la rainure,
- 55
- et où l'élément de fixation dans la rainure des
- plaques respectives est relié à la structure de liaison (108) de la poutre au moyen de l'écrou sur l'extrémité de la vis (50) qui est reçue dans l'ouverture centrale (14) de l'élément de fixation, où la hauteur (K) de l'élément de bordure à partir de la partie analogue à une plaque est inférieure à la hauteur de la rainure à partir d'un côté inférieure de la plaque.
11. Plancher ou paroi assemblé(e) selon la revendication 10, où la largeur libre (C) de la partie autonome (28) de la partie analogue à une plaque est égale ou inférieure à une profondeur de la rainure ou de la partie de rainure (202) dans la plaque (200).
12. Plancher ou paroi assemblé(e) selon la revendication 10, où la structure de liaison de la poutre comprend une rainure de guidage (108) qui est appropriée pour recevoir l'écrou (52) relié à la vis, dans lequel l'écrou (52) a une dimension diagonale supérieure à la largeur de la rainure.
13. Plancher ou paroi assemblé(e) selon l'une quelconque des revendications 10 à 12, dans lequel la face d'extrémité distale de l'élément de bordure de l'élément de fixation ne vient pas en contact avec la face supérieure de la poutre.

Fig. 1

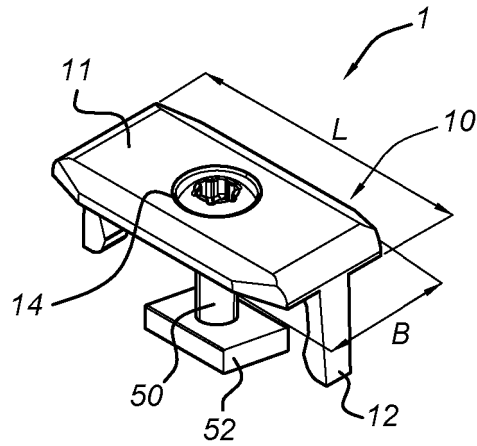


Fig. 2

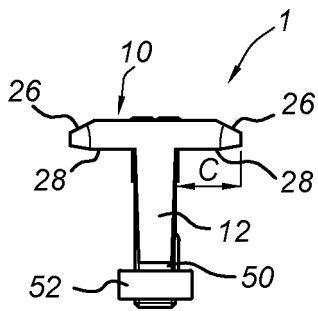


Fig. 3

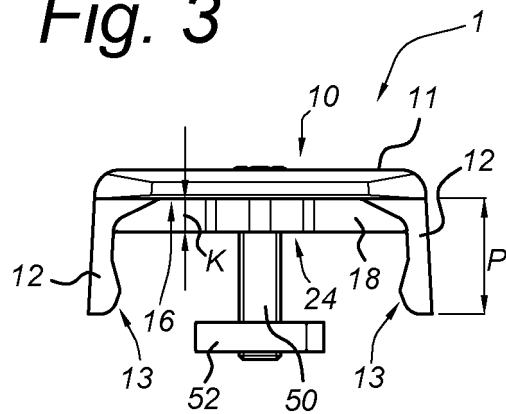
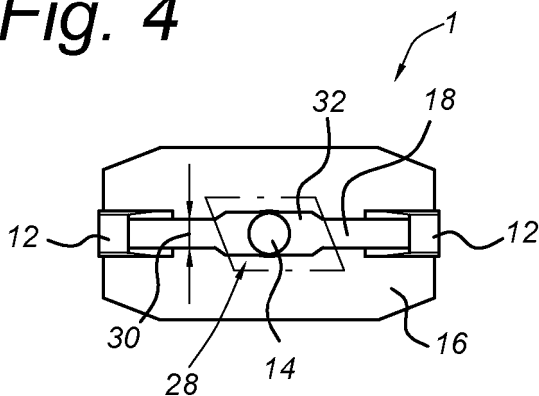


Fig. 4



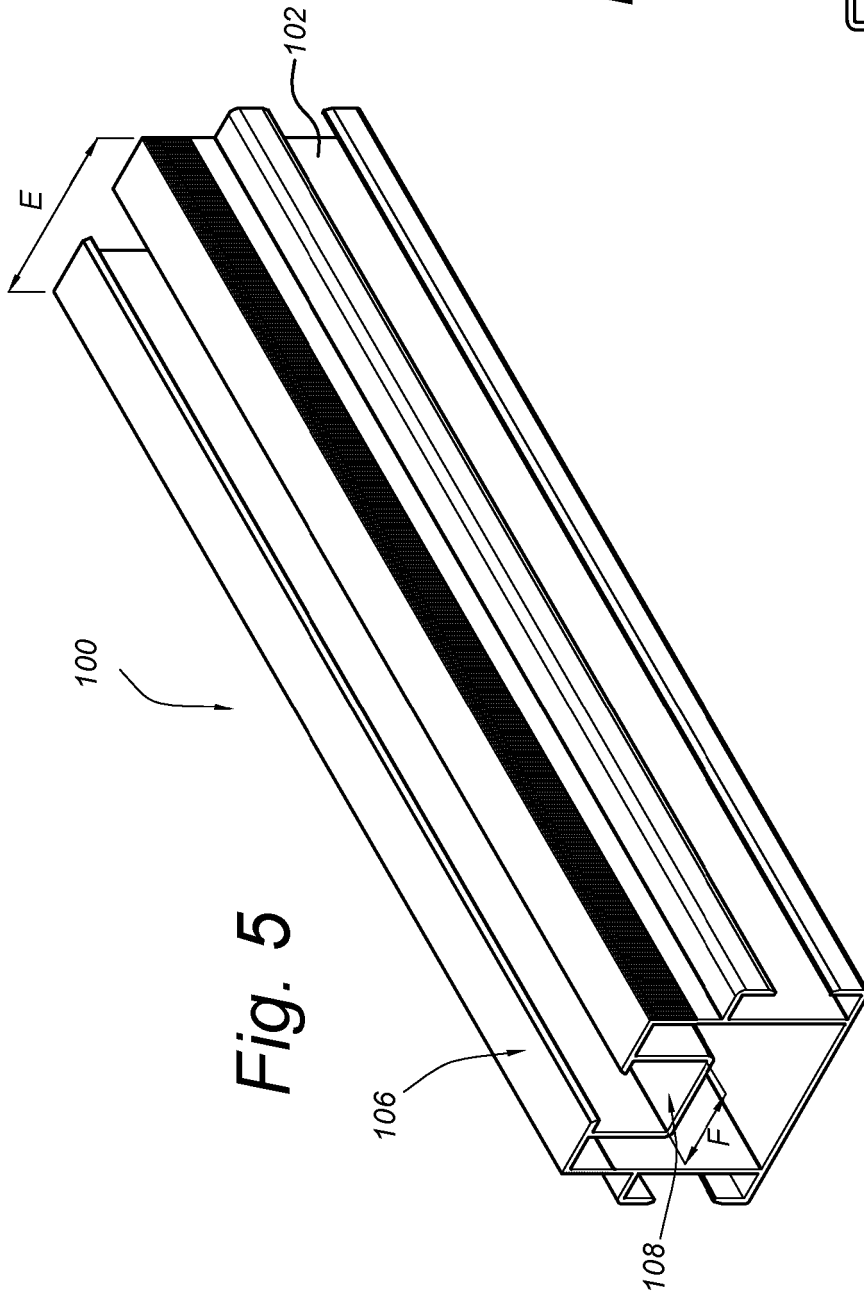


Fig. 6

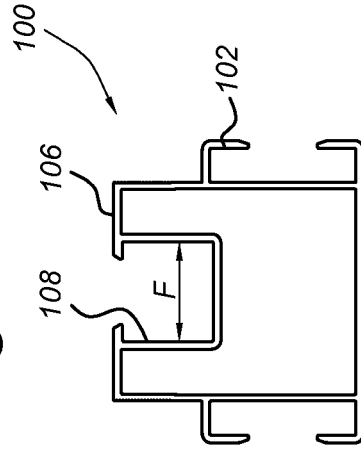


Fig. 7

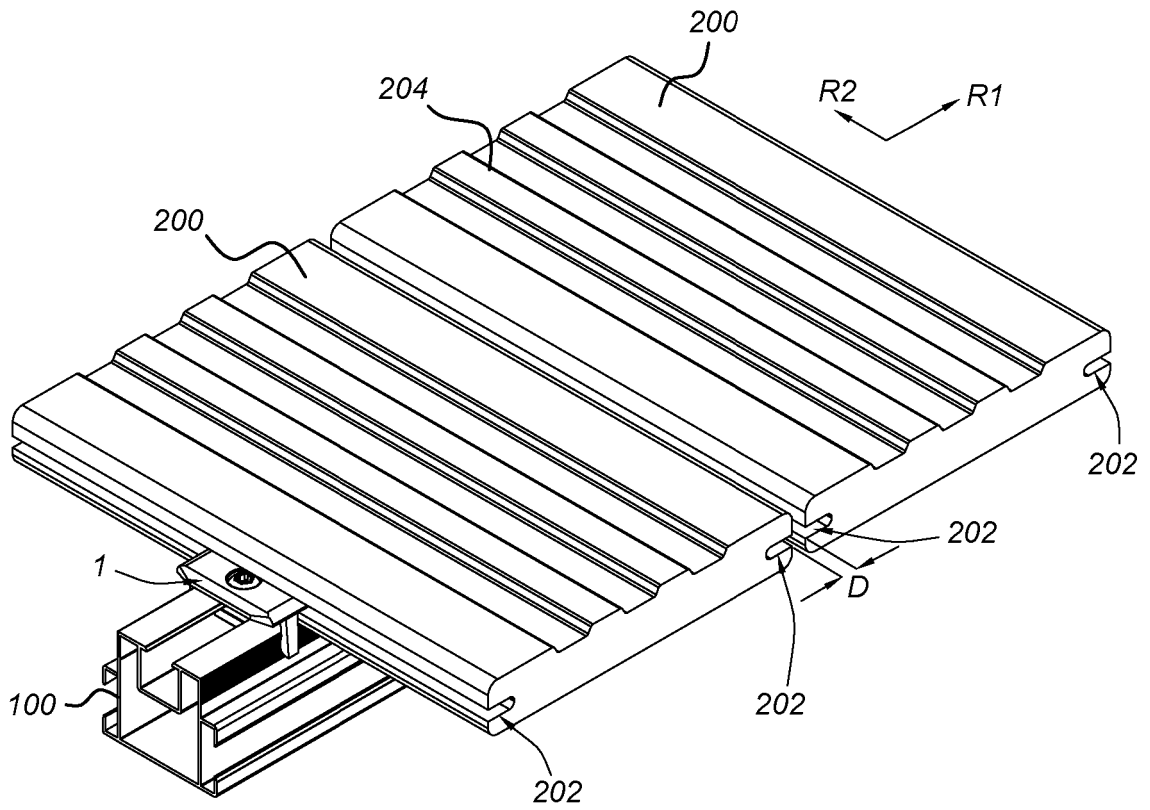
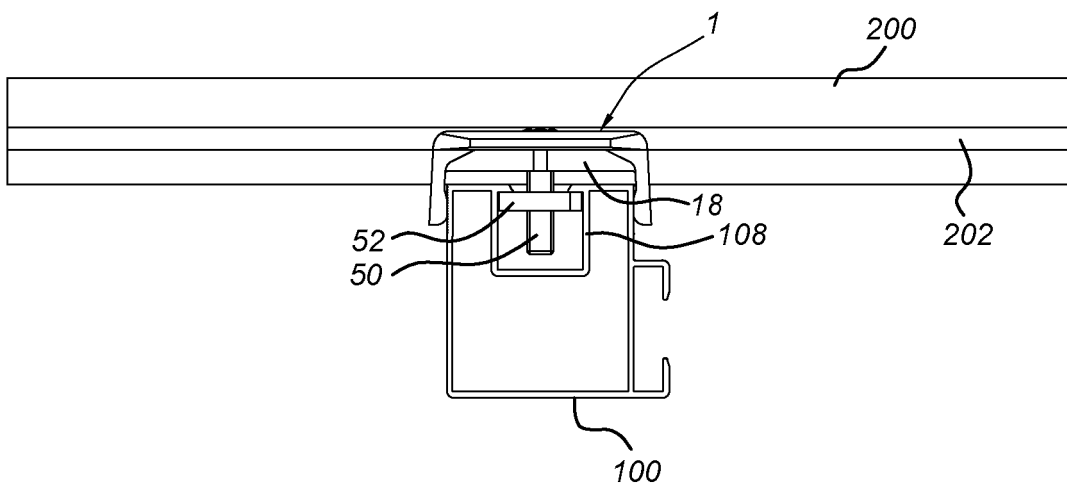


Fig. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20040045244 A1 [0002]
- US 20040045244 A [0008]