



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.09.2023 Bulletin 2023/39

(51) International Patent Classification (IPC):
E04F 13/10 ^(2006.01) **E04B 9/36** ^(2006.01)
E04F 15/02 ^(2006.01)

(21) Application number: **23160322.6**

(52) Cooperative Patent Classification (CPC):
E04F 13/10; **E04B 9/36**; **E04B 9/363**;
E04F 13/0805; **E04F 13/0846**; **E04F 13/0862**;
E04F 15/02044; **E04F 15/02183**

(22) Date of filing: **07.03.2023**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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(30) Priority: **22.03.2022 NO 20220342**
21.11.2022 NO 20221248

(54) **A DEVICE, A SYSTEM, AND A METHOD FOR FACILITATING ASSEMBLING A SLATTED SURFACE ONTO A BUILDING STRUCTURE**

(57) A device (11), a system (1) and a method for facilitating assembling a slatted surface onto a building structure (2), wherein the device comprises a clip strip (11) having a plurality of slat clips (111) mutually spaced apart by clip spacers (112) flexibly connected to the slat clips (111), each slat clip (111) comprising a bottom clip

portion (111a) and spaced-apart side clip portions (111b) protruding from the bottom clip portion (111a), wherein the side clip portions (111b) of each slat clips (111) forming a gap (111d) and being provided with opposing gripping elements (111c) for, in an operating position, engaging a portion of a slat (12).

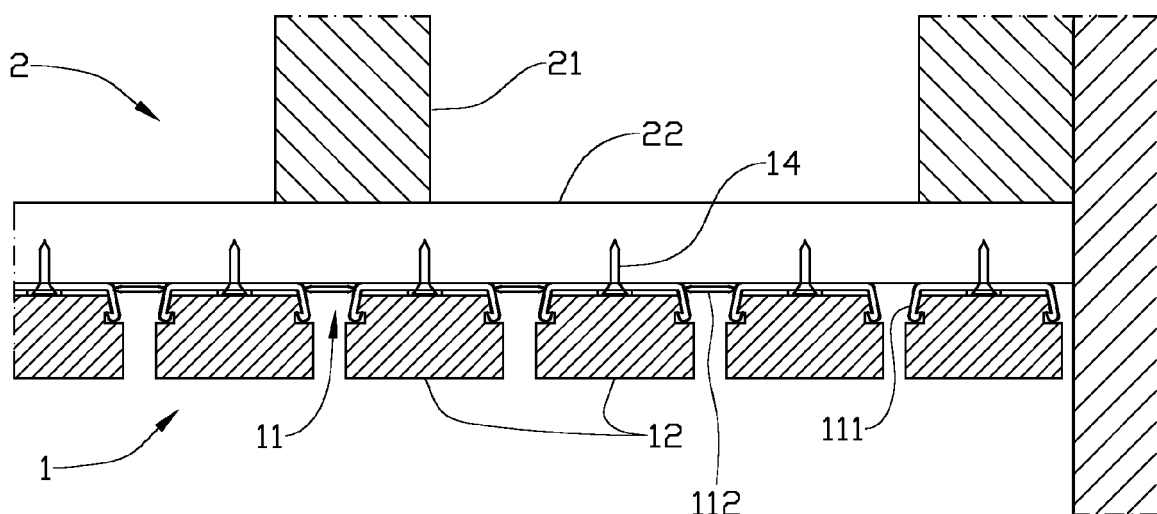


Fig. 6

Description

[0001] The present disclosure is related to a slatted surface. More specifically, the present invention concerns a device for facilitating assembling slats to provide a slatted surface onto a building structure to cover at least a portion of the building structure. The slatted surface may typically be assembled onto a wall, a ceiling, or a support structure of the building structure. A support structure may for example be a column or post forming part of an interior or exterior of a building structure. The building structure may be planar, or the building structure may comprise at least a portion being non-planar, for example curved.

[0002] The present disclosure also concerns a system for providing a slatted surface of a building structure. The system comprises slats to be secured to the building structure by means of the device.

[0003] The present disclosure further concerns a method for providing a slatted surface of a building structure by means of the system of the present invention.

[0004] Attaching slats forming the visible surface of a building structure, such as for example a wall or a ceiling, is a time-consuming and laborious operation involving numerous elements to be secured to a supporting structure (posts, beams, laths, etc) in a very accurate way using screws or nails. A slatted surface, such as a slatted wall, slatted ceiling, or other slatted supporting structures, may be assembled or installed for decorative purposes only. Despite performing the installation with great accuracy, the visible heads of the screws or nails may represent a negative visual appearance of the slatted wall or -ceiling. It may also be cumbersome to arrange the slats in parallel, and to provide substantially equally spaced slats. Furthermore, joining slats in a longitudinal direction of the slats, should be positioned on the supporting structure to maintain stability and smoothness over time, causing additional consumption of slat materials due to excess lengths to be cut off when adapting the slats to suit the supporting structure.

[0005] There are known slatted wall and ceiling systems comprising prefabricated sections or panels provided with spaced-apart slats typically interconnected by laths (backers) or dowels, or mounted onto a plate material. Such prefabricated panels may be useful for providing for example ceiling having particular acoustic property, or if it is desired to provide a ceiling having a portion being lower than the rest of the ceiling, for example hanging from a grid system.

[0006] However, prefabricated slatted wall- or ceiling elements are typically in the form of rectangular sections. If the building structure to be covered by the elements has a dimension exceeding a length of the slats of the prefabricated element, all joints will appear on a "common line" and may represent a negative visual appearance.

[0007] Publication EP3138976A1 discloses a strip ceiling system for providing a slatted surface. The strip ceiling

is made from sections wherein a sheet has opposed first and second sheet surface sides, and at least three sheet side edges. The system further comprises a plurality of elongate strips having a side face, and first and second spaced ends. A plurality of parallel longitudinal grooves are formed in the first sheet surface side of the sheet. The second sheet surface side of the sheet is configured for facing an existing wall and/or ceiling of a room. A part of the side face of an individual strip is sized and configured to fit and fasten into an individual longitudinal groove in the first sheet surface side of the sheet.

[0008] Publication DK 180612 B1 discloses a strip covering for providing a planar slatted wall or ceiling. The strip covering comprises at least two U-formed bracket profiles with a surface through which openings are provided. The openings are arranged in pairs in a longitudinal direction of the bracket profiles, where each pair of openings are arranged with a mutual distance in the longitudinal direction. The strip covering further comprises a number of steel spring fittings, each comprising two essentially parallel arms having a mutual distance suitable to be able to be mounted in one of the pairs of openings in the bracket profiles.

[0009] Publication AU 5637594A discloses a panelling system comprising: a plurality of elongated mounting strips for fixedly mounting to a substrate at parallel spaced apart locations; and a plurality of elongated boards for locking connection to said mounting strips at closely spaced predetermined locations, substantially orthogonal to said mounting strips. Each said mounting strip being formed with a plurality of outwardly projecting tongues disposed along the connecting side of said mounting strip so that at least one tongue is disposed at each said predetermined location. Each said board being formed with at least one groove corresponding to a set of aligned tongues for biased connection therewith such that a said board is able to be pressed into juxtaposition for retained and locked connection to and across a plurality of said mounting strips.

[0010] Publication WO 01/38667 A1 discloses carrier rails that are screwed into the wall and/or ceiling for fixing wainscots/panels to the wall and/or ceiling. The rail is provided with a slightly springy hook system. The wainscots/panels are provided with special clamps that are provided with a hook system. The hook system of the rail and the hook system of the clamps fit into each other by means of one movement only and using slight pressure.

[0011] The invention has for its object to remedy or to reduce at least one of the drawbacks of the prior art, or at least provide a useful alternative to prior art.

[0012] The object is achieved through features, which are specified in the description below and in the claims that follow.

[0013] The invention is defined by the independent patent claims. The dependent claims define advantageous embodiments of the invention.

[0014] In a first aspect of the invention there is provided a device for facilitating assembling a slatted surface onto

a building structure. The device comprises a clip strip having a plurality of interconnected slat clips mutually spaced apart by clip spacers. The spacers are flexibly connected to the slat clips. Each slat clip comprises a bottom clip portion and spaced-apart side clip portions protruding from the bottom clip portion. The side clip portions of each slat clips form a gap and being provided with opposing gripping elements for, in an operating position, engaging a portion of a slat. Thereby, when urging a slat that has been adapted to the slat clip, towards the bottom clip portion, the slat and the clip is interlocked, and no further fastening means for securing the slat to the clip is needed.

[0015] One effect of flexibly connecting the slat clips to the clip spacers, is that the clip strip may be secured to a planar building structure, or the clip strip may be secured to building structure having at least a portion being non-planar, for example curved.

[0016] The clip spacer arranged between two slat clips may be a single element, or the clip spacer may comprise more than one element, for example two elements. Such two or more elements may, but does not have to, be arranged in parallel to each other.

[0017] Each slat clip has a length and a width, wherein the length is the extension of the slat clip in a direction being perpendicular to a longitudinal direction of the clip strip. A width of the slat clip is the extension of the slat clip in a longitudinal direction of the clip strip.

[0018] Each clip spacer is formed by an elongated member having a length, a breath, and a thickness, wherein the breath of the clip spacer may be less than a length of the slat clip. A clip having a breath being smaller than a length of the slat clip, may be advantageous inter alia with respect to reducing a visibility of the clip spacers between neighbouring slats secured to the clip strip.

[0019] The side clip portions may diverge in a direction from the bottom clip portion towards the gripping elements. An effect of this is that the insertion of a slat in the clip is facilitated.

[0020] The bottom clip portion may be provided with at least one reinforcement rib extending across a width of the slat clip along or parallel to a centre axis of the bottom clip portion. Preferably, the at least one rib protrudes from the bottom clip portion towards the gap of the clip. An effect of this is that good clip stability and slat positioning is provided.

[0021] The bottom clip portion may be provided with a through opening or bore configured to receive a fixing means. Thus, one function of the bore is to provide a template for a mechanical fastening means. An effect of this is that precise positioning and accurate fastening of the clip to the building structure is facilitated.

[0022] The reinforcement rib may encircle the through opening, providing a countersunk opening top. An effect of this is the fixing means is well hidden, not influencing the levelling of the slats to be attached.

[0023] A strip spacer may extend from the bottom clip portion of a slat clip provided at an end of the clip strip.

Thus, the strip spacer may facilitate exact positioning of a consecutive clip strip, such that an even space between the clips along a building structure is achieved.

[0024] A connection between each slat clip and the adjacent spacer(s) in the clip strip may be configured as a weak link. An effect of this is that adaption of the length of a clip strip or the separation of individual slat clips may be performed quickly and without the use of a tool, both for a clip strip made from a metal, or from a plastic material.

[0025] In a second aspect of the invention there is provided a system for providing a slatted surface onto a building structure, wherein the system comprises

a plurality of clip strips according to the first aspect of the invention, and

a plurality of slats provided with opposing lateral surfaces, wherein a first lateral portion of each of said opposing lateral surfaces extends from a slat base surface to an attachment portion arranged to receive the gripping element of each slat clip.

[0026] The system may further comprise a plurality of supplementary, separate slat clips. The separate slat clip may be provided by separation from one or more clip strips. Thus, such a system may be particularly useful when adapting a spacing between the clips towards an end portion of the slatted wall or ceiling to avoid either a longitudinal cutting of a final slat, or an excessive spacing between a final slat and an abutting building structure.

[0027] The first lateral portions of the lateral, opposing slat surfaces may be slanted, diverging from the slat base surface to said attachment portions. An effect of this is that the insertion of a slat in a clip is further facilitated, and the positioning precision is improved.

[0028] A width of the slat base surface may be sized to allow the slat to enter the slat clip when the slat base surface is facing the bottom portion of the slat clip. An effect of this is facilitating guiding of the slat base into engagement with the clip.

[0029] The attachment portions of the opposing lateral surfaces may be configured as slots extending along the opposing lateral surfaces of each slat. An effect of this is that the clips can engage the slat at any position along the slat, thus saving material, and allowing the clip strips to be arranged at any distance in the longitudinal direction of the slats. Thus, a standard spacing between rows of clips strips, is not required.

[0030] Preferably, a width of a front slat surface extends the maximum width of the slat clip. An effect of this is that the clips may be well hidden behind a wider front portion of the slats, and thus an attractive visual appearance.

[0031] The system may comprise slat splicing clips configured for interconnecting slat end portions of mating slats in need of being spliced. The slat splicing clips may be provided by means of a slat clip detached from a clip strip according to the first aspect of the invention. How-

ever, to provide an improved stability between abutting end portions of two slats, a length of the slat splicing clip may exceed a length of the slat clip. By the term length is meant an extension in a direction parallel with a longitudinal axis of the slat. By providing a slat splicing clip having a length exceeding a length of the slat clip a stability of a slat splice may be improved.

[0032] By providing a slat splicing clip having a cross-sectional shape being equivalent to that of the slat clip, the slat splice can be established anywhere along the extent of the slatted section, reducing the amount of waste slat material.

[0033] At least two reinforcement ribs may elevate from the bottom splicing clip portion, extending in parallel offset a centre axis of across the width of the slat splicing clip. An effect of this is that good splicing clip stability and slats positioning is provided.

[0034] In a third aspect the invention relates more particularly to a method for providing a slatted surface onto a building structure, wherein the method comprising the steps of:

- providing the system according to the second aspect of the invention;
- attaching clip strips along exterior faces of the building structure to be slatted;
- if required, attaching separate clips at individual spacings to balance final gaps not coinciding with a partition of the clip strips; and
- bringing slats into engagement with the clips.

[0035] The method may further comprise joining ends of mating slats using a slat splicing clip.

[0036] In the following is described an example of a preferred embodiment illustrated in the accompanying drawings, wherein:

- Fig. 1 shows a perspective drawing of a clip strip according to the invention;
- Fig. 2 shows in larger scale a perspective view of a slat clip of the clip strip;
- Fig. 3 shows a top view of a slat clip and a spacer separated from a clip strip;
- Fig. 4 shows a side view of the slat clip shown in figure 3;
- Fig. 5 shows a bottom view of the slat clip shown in figure 3;
- Fig. 6 shows in smaller scale a cross sectional view of a slatted ceiling structure;
- Fig. 7 shows in larger scale a detail of the ceiling structure, wherein a slat is in a position to engage with a slat clip;
- Fig. 8 shows in a scale similar to that of figures 3-5 a top view of a slat joint provided with a splicing clip; and
- Fig. 9 shows a cross sectional view of a slatted, curved wall section provided with vertical slats.

[0037] Any positional indications refer to the position shown in the figures.

[0038] In the figures, same or corresponding elements are indicated by same reference numerals. For clarity reasons, some elements may in some of the figures be without reference numerals.

[0039] A person skilled in the art will understand that the figures are just principal drawings. The relative proportions of individual elements may also be distorted.

[0040] Figure 1 shows a clip strip 11 according to the invention, wherein the clip strip 11 is formed from a plurality of evenly spaced apart slat clips 111. The clip strip 11 shown in figure 1 comprises six slat clips 111 interconnected by clip spacers 112. An additional strip spacer 112a extends from the slat clip 111 located at one end (the right end in figure 1) of the clip strip 11 defining a spacer to a first slat clip 111 of a consecutive clip strip (not shown) to be arranged in-line with the shown clip strip 11. The additional strip spacer 112a has a length along its longitudinal axis being identical to a length of the spacers 112 between the slat clips 111.

[0041] The connections of spacers 112, 112a to the respective slat clips 111 are configured as weak links 112b facilitating the adaption of the length of the clip strip 11, separation of a clip strip into individual slat clips 111, and possibly removing the spacer 112, 112a from the end of a clip strip 11 or from a slat clip 111.

[0042] Figure 2 shows in larger scale a slat clip 111 that has been separated from a clip strip 11 shown in fig. 1. That slat clip 111 comprises a bottom clip portion 111a and two side clip portions 111b protruding from the bottom clip portion 111a. The side clip portions 111b divert towards an open clip end 111d. Thus the bottom clip portion 111a and the side clip portions 111b form a "U-like" gap. Hook formed gripping elements 111c form free ends of the side clip portions 111b, one gripping element 111c extending towards the other. The side clip portions 111b are diverting in the direction from the bottom clip portion 111a towards the open clip end 111d.

[0043] A countersunk through opening 111e is provided in the bottom clip portion 111a, arranged to receive a fixing means 14 like a nail or a screw (see figures 6 and 7).

[0044] A reinforcement rib 111f protrudes from the bottom clip portion 111a, extending along a centre axis of the bottom clip portion 111a and encircling said through opening 111e, thus improving the rigidity of the slat clip 111, assuring that the fixing means 14 is fully sunk, and providing an accurate and even support for a slat.

[0045] Figures 3-5 shows a slat clip 111 and a spacer 112, 112a in more details.

[0046] It is now referred to figure 6, wherein a section of a slatted building structure system 1 is depicted. A building structure 2, here shown as beams 21 and laths 22 forming a ceiling structure, is prepared to be covered by evenly spaced apart slats 12. Several rows of clip strips 11 are attached along front surfaces of the building structure 2, in the depicted embodiment along laths 22 being supported by beams 21. The clip strip row pitch

may vary according to the modular system of the building structure and the stiffness of the slats. When attached to posts/beams 21 or laths 22 of the building structure 2, a row of clip strips 11 is normally attached to each post/beam 21 or lath 22. In the example shown, one separate slat clip 111 (the right slat clip) is attached to the lath 22 at an edge of the ceiling at a distance to the final slat clip of the clip strip 11 than the clip gap internally in the clip strip 11 to balance the remaining distance to the edge of the ceiling structure 2.

[0047] Now it is particularly referred to figure 7. The slats 12 are prepared to engage with the slat clips 111. Lateral surfaces 122 of the slats 12 are stepped, wherein first lateral surface portions 122a are diverting in a direction away from a slat base surface 121 to attachment portions 122c, here shown as engagement slots extending along the slats 12. Second lateral surface portions 122b are extending from the attachment portions 122c to a front slat surface 123. By giving the front slat surface 123 a width larger than the overall width of the slat clips 111 and extending the second lateral surface portions 122b in parallel, the cross-sectional shape and dimension of the slats 12 causes the slat clips 111 of a completed slatted building structure to become substantially invisible.

[0048] The slat 12 is pushed into a row of corresponding slat clips 111. To facilitate the assembly of the slats 12, the width of the slat base surface 121 is set slightly smaller than the open clip end gap 111d to allow the slat 12 to enter the slat clip 111 at least partly before pushing the slat 12 into engagement with the slat clip 111, thus forcing the side clip portions 111a sidewise till the gripping elements 111c are entering the attachment portions 122c of the slat 12.

[0049] It is now referred to figure 8. A slat splicing clip 13 is provided. The overall cross-sectional shape of the slat splicing clip 13 is substantially identical to that of the slat clip 111 but lacks the through opening arranged to receive a fixing means, though. The length of the slat splicing clip 13, i.e. the extension in the length direction of slats 12, 12a to be spliced, exceeds the length of the slat clip 111, here shown with double the length of the slat clip 111, thus providing sufficient stability of a slat joint. Two reinforcement ribs 135 are elevating from the bottom splicing clip portion 131, extending in parallel and off-set a centre axis of the bottom splicing clip portion 131, thus improving the rigidity of the slat splicing clip 13 and providing an accurate and even support for the slats 12, 12a to be spliced.

[0050] When forming a slat splicing, the length of a first slat 12 is adjusted to allow a second end section 125 of the first slat 12 extending at least about half the length of the slat splicing clip 13 from the adjacent slat clip 111. A second slat 12a is prepared with a first end section 124 facing the end of the first slat 12. The slat splicing clip 13 is forced into engagement with the end sections 124, 125 from the rear side of the slats 12, 12a, allowing the gripping elements 133 of the slat splicing clip 13 engage with

the attachment portion 122c of the slats 12, 12a, thus securing the end sections 124, 125 in line.

[0051] Fig. 9 is a cross-sectional view of section of a slatted building structure system 1 seen from above. A plurality of slats 12 (six shown in fig. 9) has been secured to a building structure 2 via at least two (one shown) mutually spaced clip strips 11 according to the invention.

[0052] In the embodiment shown in fig. 9, the building structure 2 is in the form of a curved concrete wall. Due to the clip spacers 112 being flexibly connected to the slat clips 111 while at the same time providing equidistant spacing of the slat clips 111, the clip strip 11 of the invention provides a great flexibility for assembling a slatted surface, independently of the building structure 2 being planar, concave (as shown in fig. 9), or convex.

[0053] The clip strip 11 may be made in one piece with no separate parts. The clip strip is therefore easy to install even for a person without any special skills.

[0054] It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

Claims

1. A device (11) for facilitating assembling a slatted surface onto a building structure (2), **characterised in that** the device comprises a clip strip (11) having a plurality of slat clips (111) mutually spaced apart by clip spacers (112) flexibly connected to the slat clips (111), each slat clip (111) comprising a bottom clip portion (111a) and spaced-apart side clip portions (111b) protruding from the bottom clip portion (111a), wherein the side clip portions (111b) of each slat clips (111) forming a gap (111d) and being provided with opposing gripping elements (111c) for, in an operating position, engaging a portion of a slat (12).
2. The device (11) according to claim 1, wherein the side clip portions (111b) are diverging in a direction from the bottom clip portion (111a) towards the gripping elements (111c).
3. The device (11) according to claim 1 or 2, wherein the bottom clip portion (111a) is provided with at least one reinforcement rib (111f) extending across a width of the slat clip (111) along or parallel to a centre axis of the bottom clip portion (111a).
4. The device (11) according to any one of the preced-

ing claims, wherein the bottom clip portion (111a) is provided with a through opening (111e) for a fixing means (14).

5. The device (11) according to claims 3 and 4, wherein the reinforcement rib (111f) is encircling the through opening (111e), providing a countersunk opening top.

6. The device (11) according to claim any of the preceding claims, further provided with a strip spacer (112a) extending from the bottom clip portion (111a) of a slat clip (111) provided at an end of the clip strip (11).

7. The device (11) according to any of the preceding claims, wherein a connection between each slat clip (111) and the adjacent spacer(s) (112, 112a) in the clip strip (11) is configured as a weak link (112b).

8. A system (1) for providing a slatted surface onto a building structure,
characterised in that the system comprises

a plurality of clip strips (11) according to any one of claims 1-7, and
a plurality of slats (12) provided with opposing lateral surfaces (122),

wherein a first lateral portion (122a) of each of said opposing lateral surfaces (122) extends from a slat base surface (121) to an attachment portion (122c) arranged to receive the gripping element (111c) of each slat clip (111).

9. The system (1) according to claim 8, wherein the first lateral portions (122a) of the lateral, opposing slat surfaces (122) are slanted, diverging from the slat base surface (121) to said attachment portions (122c).

10. The system (1) according to claims 8 or 9, wherein a width of the slat base surface (121) is sized to allow the slat (12) to enter the slat clip (111) when the slat base surface (121) is facing the bottom portion (111a) of the slat clip (111).

11. The system (1) according to any one of claims 8-10, wherein the attachment portions (122c) of the opposing lateral surfaces (122) are configured as slots extending along the opposing lateral surfaces (122) of each slat (12).

12. The system (1) according to claim any one of claims 8-11, wherein a width of a front slat surface (123) extends a maximum width of the slat clip (111).

13. The system according to any of claim 8 to 12, further

comprising slat splicing clips (13) configured for interconnecting slat end portions (124, 125) of mating slats (12, 12a) in need of being spliced.

14. The system (1) according to claim 13, wherein a length of the slat splicing clip (13) exceeds a length of the slat clip (111).

15. A method for providing a slatted surface onto a building structure (2),
characterised in that the method comprising the steps of:

- providing the system (1) according to any one of claims 8-14;
- attaching clip strips (11) along exterior faces of the building structure (2) to be slatted;
- if required, attaching separate clips (111) at individual spacings to balance final gaps not coinciding with a partition of the clip strips (11);
- bringing slats (12) into engagement with the clips (111).

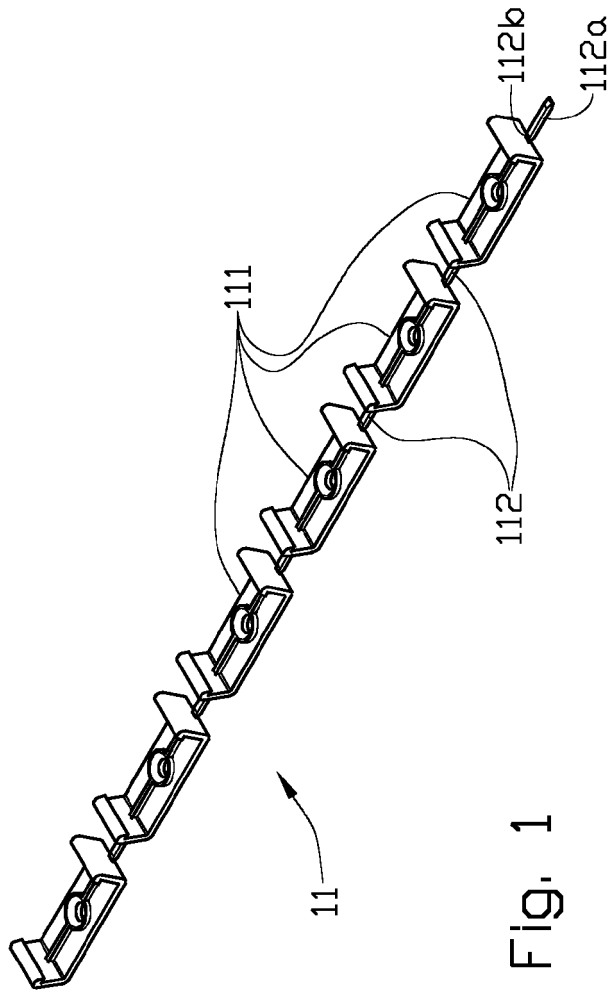


Fig. 1

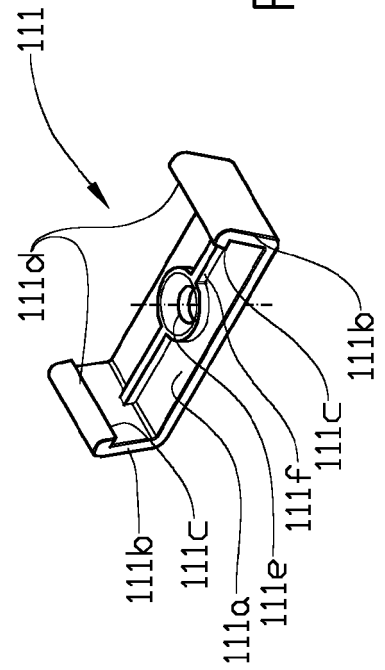


Fig. 2

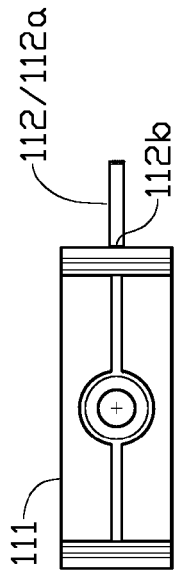


Fig. 3

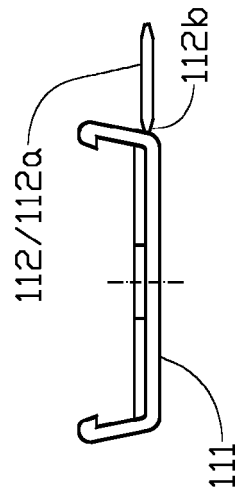


Fig. 4

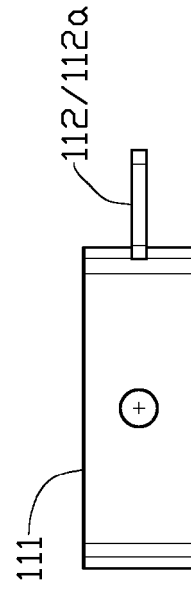


Fig. 5

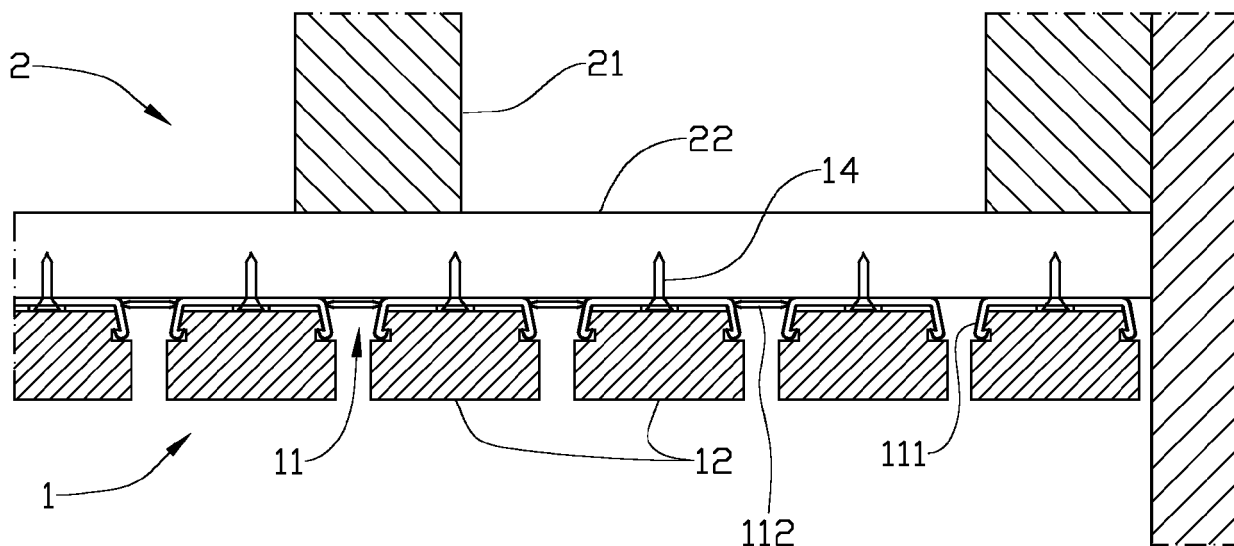


Fig. 6

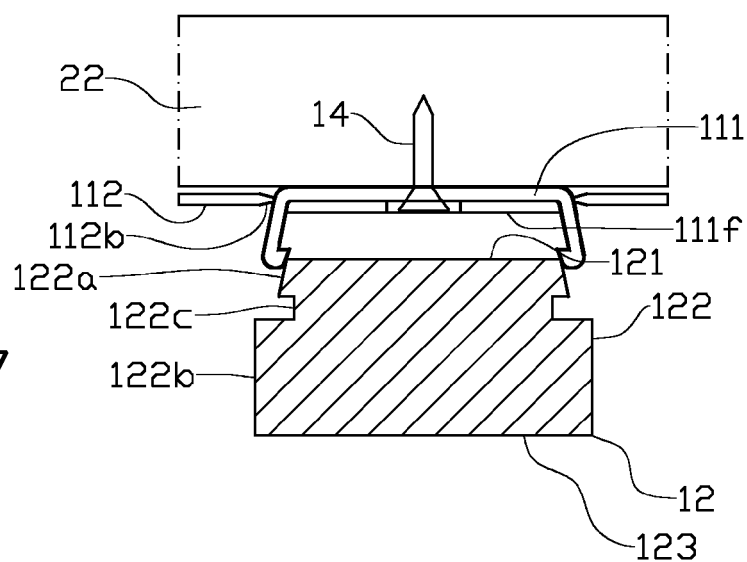


Fig. 7

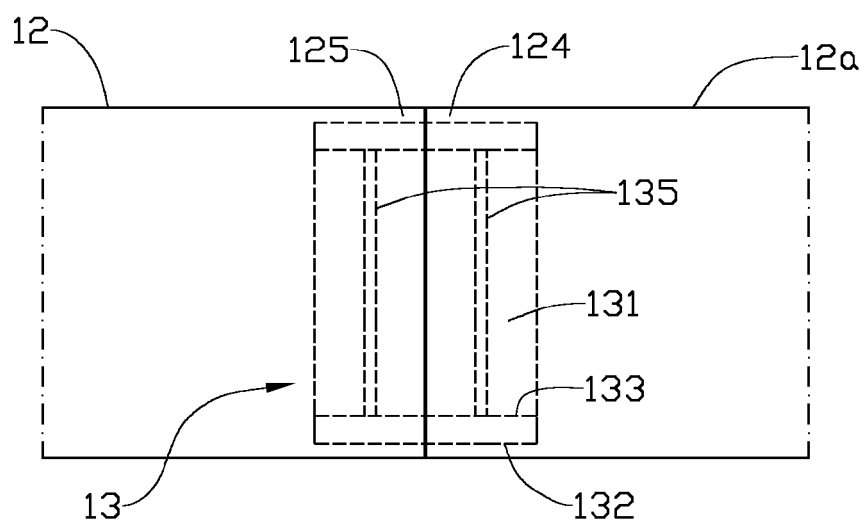


Fig. 8

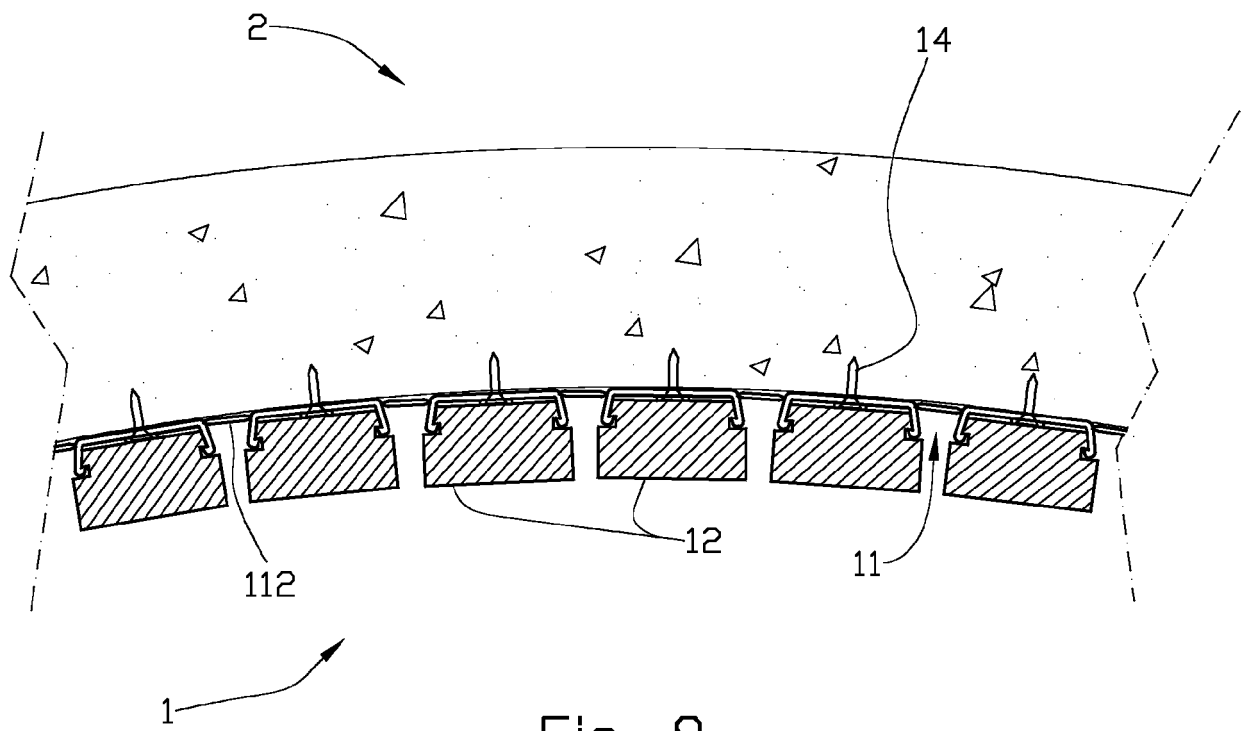


Fig. 9



EUROPEAN SEARCH REPORT

Application Number

EP 23 16 0322

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	EP 3 392 427 A1 (NOVO TECH GMBH & CO KG [DE]) 24 October 2018 (2018-10-24) * paragraphs [0025], [0027], [0028]; figures 1A-1F, 5-7, 10 * -----	1, 4, 6-12, 15 2, 3, 5, 13, 14	INV. E04F13/10 E04B9/36 E04F15/02
			TECHNICAL FIELDS SEARCHED (IPC)
			E04B E04F
The present search report has been drawn up for all claims			

1

EPO FORM 1503 03.82 (P04C01)

Place of search

Munich

Date of completion of the search

21 July 2023

Examiner

Topcuoglu, Sadik Cem

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 23 16 0322

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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21-07-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3392427 A1	24-10-2018	DE 102017108590 A1	25-10-2018
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REFERENCES CITED IN THE DESCRIPTION

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