(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 467 720 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.11.2024 Bulletin 2024/48

(21) Application number: **24176523.9**

(22) Date of filing: **17.05.2024**

(51) International Patent Classification (IPC):
E01C 9/08 *(2006.01)* ***E04F 15/02*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E01C 9/08; E01C 9/086; E04F 15/02044; E04F 15/02183

(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:
GE KH MA MD TN

(30) Priority: **23.05.2023 NL 2034897**

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(54) **TEMPORARY CASSETTE FLOOR SYSTEM AND METHOD OF MOUNTING SUCH**

(57) Temporary cassette floor system (100) for outdoor events, the system comprising a plurality of base beams (20) and at least one cassette floor element (1)comprising a support frame (2) configured to be mounted onto said plurality of base beams and a treading surface (3) configured to be fixated on said support frame, wherein each base beam of said plurality of base beams has a first side (20a) configured to face a ground surface and a second side (20b) opposite the first side configured to support said at least one cassette floor element. And a method of mounting such temporary cassette floor system.

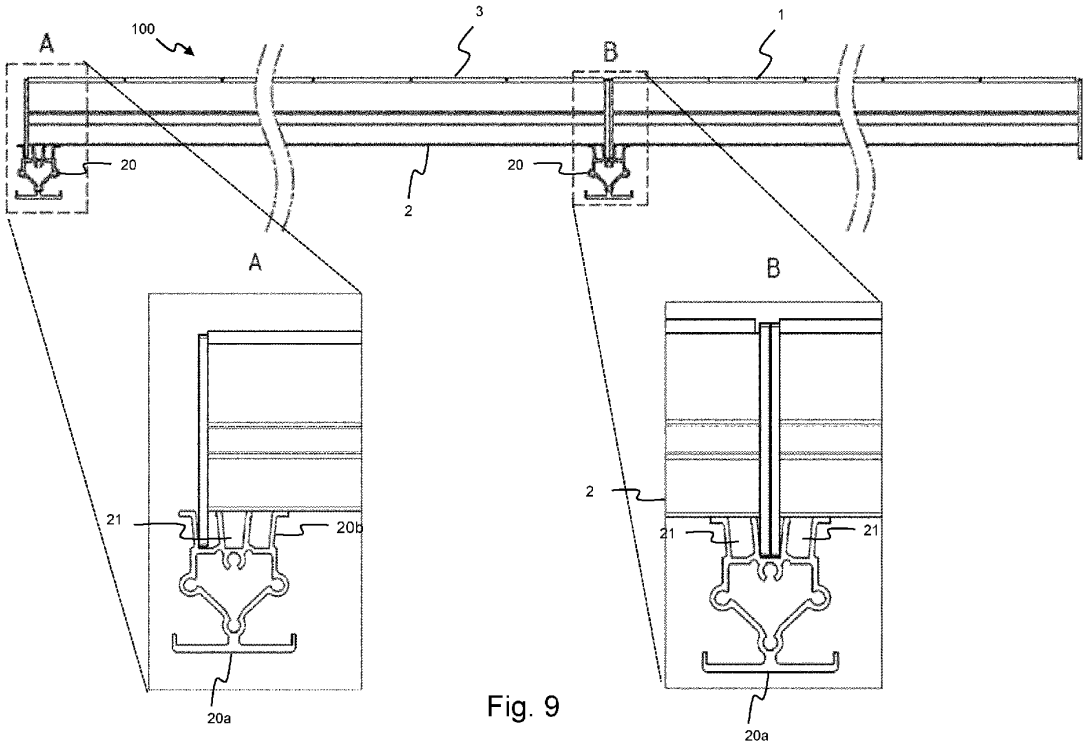

Fig. 9

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Description

Field of the Invention

[0001] The present invention generally relates to a temporary cassette floor system, in particular, for temporary use at an outdoor event.

Background of the Invention

[0002] In the field of outdoor events, it is generally known to install a temporary floor system on an outdoor surface, for example on a lawn, a field, or on any other type of land, or on any kind of hardened foundation, such as on a pavement, a concrete surface or a gravel surface. Said floor systems may be used for events in open-air, such as parties, concerts, gatherings, temporary exhibitions etc. In some cases, a further construction may be mounted on top of said floor systems, for example any kind of large tent or roof cover, to at least partly protect visitors of the event from outside weather conditions. Such a temporary floor system is generally mounted on-site and unmounted again after the event for further reuse on a next site. The floor system can provide a relatively clean and relatively nice surface for an event in that it can prevent visitors from walking on bare land or on a surface which may not be suitable for a given event. At the same time, such a floor system can protect a surface, in particular a natural surface, from being trodden by too many visitors and from potentially being destroyed.

[0003] For such temporary floor systems, it is known to use cassette floor systems. Such cassette floor systems generally include a plurality of base beams which are placed on the outdoor surface. Said base beams are placed substantially in parallel to each other and at a distance of each other. In a longitudinal direction of the base beams, said base beams are placed substantially in line with each other. The cassette floor systems further include a plurality of cassettes. Each cassette generally includes a set of support beams which are configured to support the tread. The cassette further includes a tread, for example a plurality of slats which can be fixated, for example nailed or screwed, onto the support beams substantially transversely. Each cassette can then be mounted on top of these base beams, such that the support beams of the cassettes are substantially transverse to the base beams. Said base beams and said support beams can be generally made of steel, aluminium or any other suitable material, while the tread generally includes wooden slats or suitable floorboards made of for example plastic composites. In this way, a temporary and relatively clean floor can be obtained, even on an uneven underground.

[0004] However, existing cassette floor systems have shown some disadvantages. Since said cassette floor systems are often installed over a relatively large surface, alignment of the base beams has proofed to be in issue. A relatively small deviation in alignment of base beams at a proximal end can amount to a relatively large difference in distance between base beams at a distal end of said base beams, which may result in an impossibility to mount the cassettes onto said base beams, and/or in small gaps between cassettes. A further difficulty may arise when cables, for example for providing electricity, need to be placed, shifted or replaced when the floor has already been mounted. Since a tread of the cassettes generally includes a set of wooden slats screwed or nailed onto the support beams of the cassettes, it may prove to be relatively difficult and/or time-consuming to undo the mounting of the floor or tread of the cassettes. At the same time, a top end of the fixation means, such as screws, nails or other suitable fixation means to fixate the tread onto the support beams of the cassettes, often protrudes from a top surface of the cassettes, or may at least be visible, which may sometimes be undesirable for some floors and/or events. A further disadvantage of known cassette floor systems is that said floor systems have shown to cause quite some noise when being trodden on.

[0005] It is therefore an aim of the present invention to solve or at least alleviate one or more of the above-mentioned problems. In particular, the invention aims at providing an improved temporary cassette floor system which can facilitate mounting and/or unmounting of the floor system.

Summary of the Invention

[0006] To this aim, according to a first aspect of the invention, there is provided a temporary cassette floor system characterized by the features of claim 1. In particular, the temporary cassette floor system is for use at outdoor events, which implies that the cassette floor system is configured to be transported to the event and mounted and unmounted regularly. The cassette floor system is configured to provide a temporary floor system, i.e. for temporary use, in contradiction with permanent outdoor floors, such as terrace floors or permanent garden floors. The temporary cassette floor system comprises a plurality of base beams as well as at least one cassette floor element. The plurality of base beams are positioned substantially in parallel to each other. Said at least one cassette floor element comprises a support frame configured to be mounted onto said plurality of base beams and a treading surface configured to be fixated on said support frame. The treading surface can for example include a plurality of slats. Each base beam of said plurality of base beams has a first side configured to face a ground surface and a second side opposite the first side configured to support said at least one cassette floor element. The ground surface can preferably be an outdoor ground surface, which can be a natural ground surface or a paved ground surface. In case of an uneven ground surface, the base beams may be supported by additional blocks or by any other suitable system to level out the ruggedness of the ground surface. In an inventive

way, the second side of each of said base beams includes at least one groove extending in a longitudinal direction of the base beam, the groove being configured to receive at least part of the support frame of the at least one cassette floor element in said longitudinal direction of the base beam. In other words, the part of the support frame which is receivable in said groove is receivable in said groove in the longitudinal direction of the base beam, which can increase support in said longitudinal direction of the groove and of the base beam. The at least one groove can preferably extend over substantially an entire length of the base beam. Said at least one groove has a double advantage: on the one hand, the groove can simplify mounting of the cassette floor system in that the cassette floor element can be mounted onto the base beams relatively easily just by inserting at least part of the support frame of the cassette floor element into the at least one groove of the base beam. On the other hand, the groove can help in aligning the cassette floor elements on the plurality of base beams.

[0007] The support frame of the at least one cassette floor element can preferably include a plurality of support beams and two end plates, each end plate being configured to be mounted transversely to respective ends of said support beams. Said at least one groove of the base beam is then preferably configured to receive at least part of one of said end plates of the support frame of the at least one cassette floor element. The support frame can for example have a substantially rectangular shape. In that case, the two end plates may form the opposing shorter sides of such a substantially rectangular shape. The at least one cassette floor element is then preferably supported by a set of two substantially parallel base beams, such that a first end plate of the two end plates of the support frame of said cassette floor element is received in the at least one groove of a first base beam, and such that the second end plate of the two end plates of the support frame along an opposing side of the support frame of said cassette floor element is received in the at least one groove of a second base beam which is substantially in parallel to the first base beam and positioned at a distance of said first base beam. The combination of the support frame including said two end plates, which are relatively thin plate-like structures, and the at least one groove of the base beams can provide a cassette floor system which can be mounted relatively easily.

[0008] It is preferred that the cassette floor system comprises a plurality of said cassette floor elements, and that the at least one groove is configured to receive at least part of the support frame of two adjacent cassette floor elements of the plurality of cassette floor elements. In other words, the base beam, in particular the at least one groove of said base beam, may be configured to support ends of two adjacent cassette floor elements. By inserting at least part of a support frame of adjacent cassette floor elements into said same groove, the adjacent cassette floor elements can hold each other in place which can facilitate alignment of the cassette floor elements.

[0009] The second side of the base beam advantageously include three grooves extending in a longitudinal direction of the base beam, said three grooves extending next to each other and substantially in parallel to each other. By providing base beams including three grooves, the same base beams can be manufactured and used independently of a position of the base beams in the floor system. At the same time, said three grooves can allow hiding the base beams completely under the cassette floor elements, even along an edge of the cassette floor system. As an example, when a base beam forms an edge of a cassette floor system, the support frame of the cassette floor element can be inserted into a side groove rather than into a middle groove of the three grooves such that the cassette floor element can substantially entirely cover the base beam, in particular the further two grooves of said base beam. By providing grooves along both longitudinal sides of a middle groove on the second side of the base beam, the base beam can be substantially symmetrical. As a result, the base beam can be equally used in two opposing directions.

[0010] More preferably, a middle groove of said three grooves may be configured to receive two end plates, each end plate being one of the two end plates of the support frame of two adjacent cassette floor elements of the plurality of cassette floor elements. A width of the at least one middle groove may be adapted such that it corresponds to substantially twice a thickness of an end plate of the support frame of a cassette floor element. In this way, when two end plates of adjacent cassette floor elements are received in said middle groove, alignment of the cassette floor elements on the base beams can be improved.

[0011] The at least one groove can include a blocking element configured to retain part of the support frame of the at least one cassette floor element received in said at least one groove. Thereto, the at least one groove, and preferably each of the three grooves, can for example include a hole, preferably towards an end of the base beam. The hole can then be configured to receive a blocking element, for example a screw with a screw head, such that the screw head can protrude upwardly from a bottom of the groove. The support frame of the cassette floor element, in particular the end plates, can then include a corresponding recess configured to receive said blocking element such that the support frame, in particular the end plates, are prevented from sliding within the groove in which part of the support frame is received. Preferably, each of the three grooves of a base beam can include a hole. By providing a hole in each of the three grooves, a user can choose in which groove the blocking element will be inserted depending on the position of the base beam in the cassette floor system, or in other words, depending on the groove which receives part of the support frame. It may also be sufficient to provide a blocking element only on base beams extending along an edge of the cassette floor system. When a cassette floor element

is prevented from sliding by a blocking element in a base beam along a side or edge of the cassette floor system, adjacent cassette floor elements will automatically be prevented from sliding in the groove of the base beam as well, even without a blocking element.

[0012] The first side of the base beam may be formed by a ground plate configured to engage a ground surface. The base beam can preferably further include a V-shaped structure in cross-section on top of said ground plate. The cross-section of the base beam is understood to be substantially transverse to a longitudinal direction of the base beam. The V-shaped structure is fixedly attached to said ground plate and widens from the ground plate upwards, i.e. towards, but not necessarily until, the second side of the base beam. In this way, the base beam can include lateral cavities between the ground plate and the V-shaped structure. Said cavities may for example be filled with additional weights to increase adherence of the base beams to a ground surface if needed. Additionally, and/or alternatively, said lateral cavities may allow attachment of additional structures to be mounted on top of the cassette floor system, for example attachment of connection elements, for example for poles to mount a tent on the cassette floor system.

[0013] A first end of a base beam of said plurality of base beams can be provided with a connecting element configured to connect said base beam with a longitudinally adjacent base beam. Said connecting element may for example include a hook or a screw cap or any other connecting element extending from said first end of the base beam. The connecting element may be such that the first end of the base beam can simply be connected to a corresponding element on a second end of a longitudinally adjacent base beam without the need for further fixation means. Alternatively, the connecting element may need further fixation to the adjacent base beam.

[0014] A second end of a base beam of said plurality of base beams, the second end being opposite the first end in a longitudinal direction of said base beam, can for example include a recess or a cavity configured to receive the connecting element of a longitudinally adjacent base beam. The recess may for example be provided with a retention element behind which the connecting element is retained in the recess. Alternatively, and/or additionally, fixation means may be needed to retain the connecting element in the recess or in the cavity.

[0015] The connecting element may preferably be releasably mountable to said first end of the base beam. The connecting element may for example include a plate which may be releasably fixated to the first end of the base beam, for example with the use of screws or other suitable fixation means. The plate may for example be fixated such that a surface of the plate engages an edge of the first end of the base beam substantially transversally. Alternatively, the plate may for example be at least partially received within the base beam, such that a surface of the plate is substantially in parallel with a first side of the base beam, in particular with a ground plate of the base beam.

[0016] According to a further aspect of the invention, there is provided a method of mounting a temporary cassette floor system having the features of claims 11 - 14. Such a method can provide one or more of the above-mentioned advantages. Such a method may be considered as an invention per se.

Brief Description of the Drawings

[0017]

Fig. 1a shows a perspective view on a preferred embodiment of a cassette floor element of a temporary cassette floor system according to an aspect of the invention;

Fig. 1b shows a perspective view on the cassette floor element of Fig. 1a with part of the treading surface removed;

Fig. 2a - 2b show a front view on a separate panel of the cassette floor element of Fig. 1a;

Fig. 2c shows a perspective view on the separate panel of Fig. 2a - 2b;

Fig. 2d shows a perspective view on a lower side of part of the treading surface of the cassette floor element of Fig. 1a;

Fig. 3a - 3c show a cross-sectional view on the first beam, the third beam and the second beam respectively of the support frame of the cassette floor element of Fig. 1a;

Fig. 4 shows a front view of half of the cassette floor element of Fig. 1a including enlargements of an end of the first support beam and the third support beam;

Fig. 5 illustrates some steps of a method for mounting a cassette floor element according to a further aspect of the invention;

Fig. 6a - 6d shows a top view, a side view, a lower perspective view and a top perspective view on a stack of cassette floor elements of Fig. 1a;

Fig. 7a - 7b shows a side view and a perspective view of a tool for undoing the releasable snap connection of the treading surface from the support frame of the cassette floor element of Fig. 1a; whereas Fig. 7c shows a method of unmounting at least partially the cassette floor element of Fig. 1a;

Figs 8a and 8b show further embodiments of a cassette floor element of a temporary cassette floor system according to an aspect of the invention;

Fig. 9 shows a side view including enlargements of a preferred embodiment of part of a temporary cassette floor system according to an aspect of the invention;

Fig. 10 shows a cross-sectional view of a base beam of the temporary cassette floor system of Fig. 9;

Fig. 11 shows a perspective view of the base beam of Fig. 10;

Fig. 12a and 12b show a perspective view on the base beam of Fig. 10;

Fig. 13a shows a top view of the base beams of Fig. 12a and 12b when connected, and Fig. 13b shows a front view of part of the temporary cassette floor system including the connected base beams of Fig. 13a;

Fig. 14a and Fig. 14b show a cross-sectional and perspective view respectively of a further embodiment of a base beam of the temporary cassette floor system;

Fig. 15a and Fig. 15b show a cross-sectional and perspective view respectively of a further embodiment of a base beam of the temporary cassette floor system; and

Fig. 16 shows a top view of the base beams of Fig. 14b or 15b when connected.

Detailed Description of Embodiment(s)

[0018] Figure 1a shows a perspective view on a preferred embodiment of a cassette floor element 1 of a temporary cassette floor system according to a first aspect of the invention. The cassette floor element 1 is configured as part of a temporary cassette floor system for use at outdoor events, where a temporary floor needs to be provided, which can be mounted and unmounted relatively easily. Such a temporary cassette floor system is shown for example in Figures 9, 13a and 13b and will be described in more detail further on. The cassette floor element comprises a support frame 2 configured to be mounted on a plurality of base beams, as shown in Figure 9, as well as a treading surface 3 configured to be fixated on said support frame 2. Fig. 1b shows a perspective view on the cassette floor element of Figure 1a with part of the treading surface 3 removed. The treading surface 3 can for example include a plurality of slats 3a, preferably wooden slats 3a. Alternatively, the treading surface of a single cassette floor element may only include a single plate-like element as treading surface. The treading surface 3, in particular each of these slats, is fixated on the support frame 2. In an inventive way, the treading surface 3, in particular each of these slats, is fixated on the support frame 2 by a releasable snap connection. As will be shown further, the snap connection includes an insertable element and a receiving element configured to receive said insertable element. The support frame 2 preferably comprises a first support beam 4, a second support beam 5 and a third support beam 6. The first support beam 4 and the second support beam 5 can form opposing longitudinal sides of the cassette floor element 1, while the third support beam 6 can extend substantially in parallel to, at a distance of, and in between said first support beam 4 and said second support beam 5. The support frame can further comprise at least one end plate 7, preferably two end plates, which can be mounted substantially transversely to the first support beam 4, the second support beam 5, and to the third support beam 6. Said end plate 7 can for example be screwed to said first, second and third support beams 4, 5, 6, or fixated in any other suitable way. The end plate 7 can advantageously include one or more cut-outs 7a which can function as handgrips to facilitate manipulation of the cassette floor element 1 while mounting a temporary cassette floor system. The cassette floor element 1, and preferably also the support frame 2, can have a substantially rectangular shape. The first support beam 4 and the second support beam 5, and thus the cassette floor element 1, preferably have a length of between more or less 1000 mm to more or less 3000 mm. The plurality of slats extend in a direction transverse to said first and second support beam 4, 5, and preferably have a length of between more or less 400 mm to more or less 1250 mm, which is thus a width of the cassette floor element 1. Preferred measures of the cassette floor element 1 can for example include 400 mm x 2500 mm or 1000 mm x 2500 mm. Other measures are possible as well. Substantially square cassette floor elements may be possible as well.

[0019] The cassette floor element can advantageously further comprise a separate profile element 8. Figures 2a - 2b show a front view of such a separate profile element 8 of the cassette floor element of Figure 1a, whereas Figure 2c shows a perspective view on said separate profile element 8. Said separate profile element 8 can include one of the insertable element and the receiving element of the snap connection, for example the insertable element. The separate profile element 8 is configured to be fixedly mountable on a lower side of the treading surface 3, the lower side being configured to face the support frame 2, as shown in Figure 2d, which shows a perspective view on a lower side of a slat 3a of the treading surface 3 of the cassette floor element 1 of Figure 1a. The separate profile element 8 can include a plate-like element 8a which needs to be fixated only once on the lower side of a slat 3a by suitable fixation means such as for example screws, in a non-releasable way in opposition to the snap connection of the treading surface on the support frame to simplify mounting and/or unmounting of the temporary cassette floor system in use, in particular by limiting the number of actions to be performed. The separate profile element 8 can further include a flex-

ible portion of the releasable snap connection, in particular a substantially C-shaped element 8b including an opening and a cavity in the substantially rounded or half-rounded shape, which opening can provide the flexibility to the snap connection. Said opening can preferably be, but need not be, a lateral opening. Said substantially C-shaped element 8b may extend over substantially an entire length of the separate profile element or may be shorter than said length. A length of said separate profile element may for example correspond to a width of the slat 3a of the treading surface 3 since the separate profile element 8 is fixated transversely to a longitudinal direction of the slat 3a. Alternatively, such a separate profile element 8 may also be shorter than said length. Flexibility of the substantially C-shaped element is obtained through the opening, gap or cavity of the C-shape of the insertable element. Said cavity 8c of the C-shaped element may be filled with a flexible material 9, such as for example rubber. This flexible material 9 can compensate for some play between the insertable element and the receiving element when the insertable element is received in the receiving element of the snap connection. In case the treading surface 3 is made of plastics or composites, the profile element 8 including the C-shaped element 8b could be integrated into the treading surface, in particular into a lower side of a slat or other floor plate, forming a single body, as an alternative to the embodiment of Figure 2d.

[0020] Figures 3a - 3c show a cross-sectional view on the first beam 4, the third beam 6 and the second beam 5, respectively, of the support frame 2 of the cassette floor element 1 of Figure. 1a. Each of the three support beams 4 5, 6 have a different cross-sectional shape. The first support beam 4 and the second support beam 5 are configured to form opposing longitudinal sides of the cassette floor element 1. These longitudinal sides of the cassette floor element 1 are configured and shaped to match and interlock with an adjacent cassette floor element. Thereto, the first support beam 4 can for example include a protrusion 4a protruding along an exterior longitudinal side of the first support beam 4, preferably over substantially an entire length of the first support beam 4. The second support beam 5 can for example include a recess 5a extending along an exterior longitudinal side of the second support beam 5, of which a length corresponds to a length of the protrusion 4a of the first support beam 4. The recess 5a of the second support beam 5 is configured to receive the protrusion 4a of the first support beam 4 of an adjacent cassette floor element. Each of the first support beam 4, the second support beam 5 and optionally the third support beam 6 include a receiving element of the snap connection, the receiving element at least partly extending in a longitudinal direction of the first support beam 4, the second support beam 5 or the third support beam 6 respectively. In the present embodiment, the receiving element of the snap connection is formed by a groove 10 on an upper side of the support beams 4, 5, 6, i.e. configured to face the treading surface 3 of the cassette floor element 1. An upper opening of the groove 10 is narrower than a width at a bottom of the groove 10 such that the insertable element can be maintained within the receiving element, in particular within the groove 10. Given the flexibility of the insertable element, in particular the substantially C-shaped element 8, the insertable element can be pressed through the narrowed opening of the groove 10. The third support beam 6 can even include two receiving elements which may, but need not, be used simultaneously. Given the substantially symmetrical shape of the third support beam 6, said third support beam can be used in two opposing directions. In an inventive way, the first support beam 4, the second support beam 5 and optionally the third support beam 6 each comprise at least one channel 11, different from the receiving element formed as a groove 10, configured to receive a flexible material. Said flexible material is configured to cushion a play between the treading surface 3 and the support frame 2. By cushioning said play, the flexible material can then at least partially dampen the noise caused by people walking on the temporary floor. Said channel 11 preferably has a relatively limited depth, which is in particular smaller than a depth of the receiving element. The flexible material laid in the channel 11 can preferably have a thickness which is a little thicker than a depth of the channel 11. In this way, the flexible material can be slightly compressed when the treading surface 3 is fixated on the support frame 2. Said channel 11 may extend sideways of the support beam, in particular over an interior longitudinal side of the first support beam 4 or the second support beam 5. The third support beam 6 may include two channels 11 on either longitudinal side. Said channel 11 may further be configured to receive mounting means, said mounting means being configured to mount said separate profile element 8 to the lower side of the treading surface 3. Said channel 11 may for example be configured to receive a screw head (not shown). In this way, the mounting means of the separate profile element 8 to the treading surface 3 can be hidden under the treading surface 3. Moreover, given the releasable snap connection to fixate the treading surface 3 on the support frame 2, an upper side of the treading surface can remain free of any mounting or fixation means, which can improve safety, solidity and aesthetics of the temporary floor. An exterior longitudinal side of the first support beam 4 and/or of the second support beam 5 may further include an upstanding sidewall 12 forming a top end of the first support beam 4 or of the second support beam 5. Said upstanding sidewall 12 can provide a side support, as well as an alignment guidance, to the treading surface 3. Each of the first support beam 4, the second support beam 5 and optionally the third support beam 6 may further include mounting receiving means 13, for example to receive screws or other mounting or fixation means configured to attach the end plate 7 to the first, second and/or third support beam 4, 5, 6. The support beams may for example be manufactured by extrusion, for example from aluminium.

A hollow structure may be preferred to save weight. Alternatively, other suitable manufacturing ways or materials may of course be used.

[0021] Figure 4 shows an exploded front view of the cassette floor element of Fig. 1a when the treading surface 3 is fixated on the support frame 2 via the releasable snap connection. The front view is a view on the end plate 7 attached to ends of the first support beam 4, the second support beam 5 and the third support beam 6, the end plate 7 thus forming a short side of the substantially rectangular cassette floor element 1. The treading surface 3 is preferably formed by a plurality of wooden slats 3a to which a plurality of separate elements 8 including a substantially C-shaped insertable element 8b is mounted, as shown in Figure 2d. These insertable elements on the plurality of slats are then clicked into the corresponding receiving elements of the support frame 2, in particular into the grooves 10 of the first support beam 4, the second support beam 5 and the third support beam 6. The enlarged views of the first support beam 4 and of part of the third support beam 6 show that the respective support beams engage and support both the separate profile element 8, as well as the lower side of the treading surface 3, in particular the slat 3a itself. The enlargement of the first support beam 4 also shows that the channel 11 can receive a flexible material as well as a mounting means configured to mount the separate profile element 8 to the lower side of the treading surface 3. A cavity of the substantially C-shaped insertable element 8b is also filled with a flexible material 9 to compensate for play between said insertable element and the receiving element, in particular groove 10.

[0022] Figure 5 illustrates some steps of a method for mounting a cassette floor element according to a second aspect of the invention. The method comprising the steps of providing a support frame 2 configured to be mounted on a plurality of base beams, providing a treading surface 3 configured to be fixated on said support frame, and fixating the treading surface 3 on the support frame 2 by snap-fitting the treading surface 3 on the support frame 2. Thereto, the method may further comprise the step of providing at least one separate profile element 8 including one of the insertable element and the receiving element of the snap connection, preferably the insertable element, such as the substantially C-shaped element 8b, and mounting said separate profile element 8 on a lower side of the treading surface 3, in particular to each of the slats 3a. To correctly place one or more of said separate profile elements 8 on one said slats 3a, which is important for the functioning of the snap connection, the method can further include the following inventive steps. First, a dedicated calibration tool 14 may be provided, said calibration tool including an end plate 7' fixated to ends of a shortened first support beam 4', a shortened second support beam 5' and optionally a shortened third support beam 6'. A length of said respective shortened support beams 4', 5', 6' is shorter than a width of a slat 3a of the treading surface 3 of the cassette floor element 1. Then, a slat of a plurality of slats of the treading surface may be provided and may be inserted into the calibration tool 14. The slat 3a will be retained in place along three sides by the end plate 7' and by the upstanding sidewalls 12' of the shortened first support beam 4' and the shortened second support beam 5'. Next, a separate profile element 8 may be slid into the calibration tool 14, in particular, a substantially C-shaped insertable element 8b may be slid into the corresponding receiving element, in particular into the groove 10, of the respective shortened support beams 4', 5' and optionally 6'. Since a length of the separate profile element 8 preferably corresponds to a width of the slat 3a and since a length of the respective shortened support beams 4', 5' and optionally 6' is shorter than said width, the separate profile element 8 will protrude from the respective shortened support beams 4', 5' and optionally 6', such that fixations means, for example screws, can be applied to fixate the separate profile element 8 to the lower side of the slat 3a. This can be repeated for each of the separate profile elements 8. The slat 3a including the fixated separate profile elements 8 can then be slid out of the calibration tool 14. In this way, play between the insertable element and the receiving element of the releasable snap connection can be minimized.

[0023] Figures 6a - 6d shows a top view, a side view, a lower perspective view and a top perspective view respectively of a stack of three cassette floor elements 1a, 1b, and 1c of Figure 1a. Thanks to the end plate 8 including at least one recess 15, and preferably four recesses 15 configured to receive at least part of the support frame 2, the plurality of cassette floor elements can be stacked in a space-saving way. In particular, the recesses 15 are configured to receive one of the first support beam 4, the second support beam 5 or the third support beam 6. As a result, two cassette floor elements 1a, 1b can be stacked on each other with the respective support frames facing each other while being slightly shifted laterally such that a first recess 15a of the first cassette floor element 1a adjacent the first support beam 4 is configured to receive the second support beam 5 of the second cassette floor element 1b. The first support beam 4 of the second cassette floor element 1b then protrudes laterally over the first cassette floor element 1a. A set of two such cassette floor elements 1a, 1b interlocked in this way, of which the respective treading surface 2 is facing outwards, can then be placed on a third cassette floor element 1c with their respective treading surfaces 2 facing each other. In this way, relatively compact stacks of cassette floor elements can be formed of which a height is less than the number of cassette floor elements times the height of a single cassette floor element and is only slightly higher than half of that maximal height. Since the optional third support beam 6 of the support frame is preferably made substantially symmetrical to be used in two opposing directions, the at least one end plate 8 preferably includes four recesses 15, even if only three will be used in a stack of cassette floor elements 1a, 1b, 1c.

More preferably, said four recesses are positioned substantially symmetrically with respect to a middle of said end plate. In this way, a shape of the at least one end plate does not limit the stacking of a plurality of cassette floor elements.

[0024] Figures 7a and 7b show a side view and a perspective view of a tool 16 for undoing the releasable snap connection of the treading surface 3 from the support frame 2 of the cassette floor element 1 of Figure 1a, and Figure 7c illustrates a method of unmounting at least partially the cassette floor element of Figure 1a. The tool 16 comprises a relatively thin plate-like element 16a. A portion of said plate-like element has been partially slit out and forms a pre-tensioned blade portion 16b. Said pre-tensioned blade portion 16b may be connected to the plate-like element 16a near a first end of the plate-like element 16a and may stick out of the plate-like element towards a second end of the plate-like element 16a, the second end being opposite to the first end. The tool may further include a grip 16c, preferably attached to said second end of the plate-like element 16a. When a cassette floor element 1 needs to be unmounted, the releasable snap connection needs to be unsnapped. Thereto, at least one tool 16, or more preferably, a set of two tools 16, for undoing said releasable snap connection can be provided. Said at least one tool 16, more preferably a first end of said tool 16, can then be inserted in between two adjacent slats 3a of a treading surface. The pre-tensioned blade portion 16b will be pressed into the plate-like element 16a until the pre-tensioned element 16b has entirely past the slat 3a. Then the pretensioning causes the blade portion 16b to pop out and the pre-tensioned blade portion 16b can engage a lower side of the treading surface 3, in particular of the slat 3a. A pulling force exerted on the at least one tool 16, in particular on the grip 16c, can then cause the releasable connection between the treading surface 3, in particular the slat 3a, and the support frame 2 to release such that the slat 3a can be taken out of the cassette floor element 1. This may for example be useful when electrical wires and/or cables lying under the cassette floor element 1 need to be repaired, replaced or removed. In this way, part of the treading surface 3 of the cassette floor element 1 can be removed without having to replace an entire cassette floor element 1. Moreover, a cassette floor element can be replaced without having to remove adjacent cassette floor elements.

[0025] Figures 8a and 8b show further embodiments of a cassette floor element according to a first aspect of the invention. In both embodiments, the cassette floor element comprises a support frame 2' as well as a treading surface 3', which are connected by a releasable snap connection including an insertable element as well as a receiving element. The cassette floor element can further include a separate profile element 8' which is mountable on a lower side of the treading surface 3'. The separate profile element 8' can include the receiving element of the snap connection, contrary to the preceding embodiment where the separate profile element included the insertable element. The receiving element may be formed by a clamping element having a flexible portion 8'd into which an insertable element 2'd can be inserted by widening an opening of the receiving element through the flexible portion8'd. The receiving element may for example be a groove (Figure 8b) configured to receive a single insertable element 2'd or may be a relatively wide element configured to receive a plurality of insertable elements 2'd, for example a set of two insertable elements 2'd which are spaced-apart, as shown in Figure 8a. The insertable element 2'd may be incorporated into the support frame 2' and may be formed by a rounded edge of an upper end of the support frame 2', for example of a support beam. The rounded edge may for example have a substantially circular cross-section or any other suitable rounded cross-section. Other alternative embodiments are possible as well, for example where one of the insertable element and the receiving element of the snap connection is integrated into a lower side of the treading surface.

[0026] Figure 9 shows a side view including enlargements of a preferred embodiment of part of a temporary cassette floor system according to a first aspect of the invention. The temporary cassette floor system 100 comprises at least one cassette floor element 1 comprising a support frame 2 configured to be mounted onto a plurality of base beams 20, and a treading surface 3 configured to be fixated on said support frame 2. The at least one cassette floor element 1 can for example be a cassette floor element as embodied and shown in Figure 1a. The temporary cassette floor system 100 further comprises a plurality of base beams 20, of which two base beams are shown. The base beams 20 extend substantially in parallel to each other and are placed at a distance of each other. Additionally, the base beams 20 may be placed in line with each other when a length of a single base beam is shorter than a length of a floor to be mounted. Each base beam 20 of said plurality of base beams has a first side 20a configured to face a ground surface and a second side 20b opposite the first side 20a configured to support said at least one cassette floor element 1. In an inventive way, the second side 20b of each of said base beams includes at least one groove 21 extending in a longitudinal direction of the base beam 20, the groove 21 being configured to receive at least part of the support frame 2 of the at least one cassette floor element 1 in said longitudinal direction of the base beam. In other words, the portion of the support frame 2 which is receivable in said groove 21 is receivable in said groove in the longitudinal direction of the base beam 20. Not only does the groove 21 simplify the mounting of the temporary cassette floor system in that part of the support frame 2 of the cassette floor element 1 can just be laid into the groove 21 without further deformation of material, resistance or clicking, but the groove also simplifies alignment of the cassette floor elements 1 because the groove 21 extending in a longitudinal direction of the base beam 20

can function as a ruler, in that part of the support frame 2 can engage an upstanding side wall of the groove and thus improve orientation of the cassette floor element 1. As shown in enlargement B, the groove 21 may further be configured to receive at least part of the support frame of two adjacent cassette floor elements 1. The base beam 20, in particular the second side 20b of the base beam, can preferably include three grooves 21 extending in a longitudinal direction of the base beam 20, said three grooves extending next to each other and substantially in parallel to each other. When the base beam 20 includes three grooves, the middle groove may preferably receive part of the support frame of adjacent cassette floor elements for reasons of stability. Outer grooves of said three grooves may receive part of the support frame of a cassette floor element along a side of a temporary cassette floor system 100, as shown in enlargement A. In this way, the support beam 20 does not stick out of the floor system 100 but is rather hidden under the floor system 100. Mounting of at least one cassette floor element 1 on a pair of base beams 20 extending substantially in parallel and at a distance of each other, can simply include inserting at least part of the support frame 2 of the at least one cassette floor element 1 into said at least one groove 21 of the base beam 20, without forcing or clicking. In particular, in case of a cassette floor element as shown in Figure 1a, the end plates 7 of the support frame 2 are inserted into said groove 21 in the longitudinal direction of the base beam. As a result, support beams 4, 5, 6 of the support frame 2 are positioned transversally with respect to the base beams 20 while the plurality of slats 3a are positioned substantially in parallel with the base beams 20. A width of said groove 21, in particular of a central groove, may be chosen to be twice a thickness of said end plates 7 of the support frame 2. In this way, shifting of said adjacent cassette floor elements 1 in a direction transversely to the groove 21 is prevented. To facilitate mounting of the cassette floor element 1, in particular insertion of the end plates 7 into the groove 21, a central groove may be slightly tapered having a wider upward opening and a smaller bottom, as can be seen in Figure 10. Instead of mounting an entire cassette floor element 1 to said plurality of base beams 20, only a support frame 2 of said cassette floor element 1 may first be mounted to said plurality of base beams. In a next step, the treading surface 3 of said cassette floor element 1 may be fixated on said support frame 2, preferably through a releasable snap connection.

[0027] Figure 10 shows a cross-sectional view of a base beam 20 of the temporary cassette floor system 100 of Figure 9. The first side 20a of the support beam 20 may include a ground plate 20g, which is configured to provide support on the ground surface in which the floor system 100 is mounted. The ground plate may include an upwardly extending flange 20f along a longitudinal side edge of the ground plate 20g. The base beam 20 can further include a V-shaped structure 20v in cross-section on top of said ground plate 20g. As a result, a substantially triangular cavity 22 can extend along either side of the V-shaped structure 20v. Said cavity 22 may for example be used to add weight elements or to attach further mountings on top of the floor system 100, such as for example a tent. The upwardly extending flange 20f can prevent weight elements received in said cavity 22 from sliding off, for example due to vibration. Said weight elements, or further mounting structures can for example be provided with a T-slot to engage said flange 20f. On an upper side, the V-shaped structure may be closed such that the base beam 20 can include an inner cavity 23. The second side 20b of the support beam 20 may include four upstanding side walls 21a, in between which the three grooves 21 extend. The outer side walls 21a may include an outwardly extending flange 21b which may be configured to support a lower side of the support frame 2 of a cassette floor element 1.

[0028] Figure 11 shows a perspective view of the base beam of Figure 10. The at least one groove 21, and preferably the three grooves, may a blocking element 24 configured to retain part of the support frame 2 of the at least one cassette floor element 1 received in said at least one groove 21. Said blocking element 24 may for example be a screw of which the head sticks out in the groove 21. The blocking element 24 may be releasably mounted into the groove 21, such that the blocking element 24 may be positioned in the groove 21 which will receive part of the support frame 2. To provide a versatile base beam 20, a bottom of each of the three grooves 21 can include a hole near an end of the base beam 20 such that a user can choose in which groove the blocking element 24 will be mounted. Since a width at a bottom of the groove 21 may not be large enough to receive a screw head, the upstanding side walls 21b may include corresponding cut-outs 25 near the holes.

[0029] Figures 12a and 12b show a perspective view on the base beam of Figure 10. A first end of the base beam 20 is referenced as 20c, and a second end 20d is opposite the first end 20c in a longitudinal direction of said base beam 20. The blocking element 24 and the corresponding cut-outs 25 in the grooves 21 may preferably be located near the second end 20d of the base beam 20. When a length of the base beams 20 is shorter than a desired length of the floor system 100, the base beams 20 may be connected to a longitudinally adjacent base beam via a connecting element 26, which may for example be releasably mountable, for example to said first end 20c of the base beam 20. The connecting element 26 preferably protrudes from an end of the base beam 20 in a longitudinal direction and is configured to be received in a corresponding recess or cavity in a longitudinally adjacent base beam. In Figure 12b, the connecting element 26 is a screw of which the screw head protrudes from the first end 20c of the base beam 20. Said first end 20c of the base beam may thereto be provided with a threaded or unthreaded pilot hole 27 (shown in Figures 10 or 11) configured to receive said screw 26. The second end 20d of a base beam 20 can then include

a recess 28 or a cavity configured to receive the connecting element 26 of a longitudinally adjacent base beam. In Figure 12a, the recess 28 is formed by a cut-out of the grooves 21 and the upstanding side walls 21b at said second end 20d of the base beam, which is also visible in Figure 11. In Figure 12a, said recess 28 is covered by a mountable plate 29 which has been mounted transversally to said second end 20d and is fixated to said end 20d with suitable fixation means, for example with a plurality of flat screws. The mountable plate 29 is configured to allow the connecting element 26 to hook behind said plate 29 when the connecting element 26 is received in the recess 28. In this way, two base beams 20 can be connected relatively easily. The first end 20c of the base beam may also be covered with such a mountable plate 29, as shown in Figure 12b.

[0030] Figure 13a shows a top view of the base beams of Figures 12a and 12b when connected, while Figure 13b shows a front view of part of the temporary cassette floor system 100 including the connected base beams of Figure 13a. In both Figures 13a, 13b, the base beam shown to the left is the base beam shown in Figure 12a including a recess 28 at a second side 20d of said base beam in which the connecting element 26 of the base beam shown in Figure 12b is received by hooking the connecting screw 26 protruding from the first end 20c behind the mountable plate 29 which is mounted transversally to the second end of said base beam and at least partially covers the recess 28. In Figure 13b, the cassette floor element mounted onto the plurality of base beams may be a cassette floor element as shown in Figure 1a. The support frame 2 of said cassette floor element 1 may for example include two end plates 7 which are configured to be mounted substantially transversally to a plurality of support beams included in said support frame 2. It is preferred that said end plates 7 are received in one of said grooves 21 of the base beams 20, as shown for example in Figure 9. To prevent said end plates from shifting within said groove 21, the groove may be provided with a blocking element 24, and said end plates 7, in particular a lower side of said end plates 7, may be provided with a cut-out 30 configured to receive said blocking element 24. In Figure 13b, no blocking element 24 is shown, because such a blocking element 24 need not be provided on each base beam 20. It may be sufficient to have a single blocking element 24 in a line of connected base beams 20. As soon as one cassette floor element 1 may be prevented from shifting in said groove 21 by this blocking element 24 received in said cut-out 30, adjacent cassette floor elements will automatically be prevented from shifting as well. Alternatively, every base beam 20 may be provided with a blocking element 24. To facilitate mounting of the temporary cassette floor system 100, the end plates 7 may be made substantially symmetrical, implying that a lower edge of every end plate 7 can include two cut-outs 30, each of them being located towards opposite ends. The lower edge is understood as being the edge of the end plate configured to face the plurality of base beams 20.

[0031] Figures 14a and 14b show a cross-sectional and perspective view respectively of a further embodiment of a connecting element 26' of a base beam of the temporary cassette floor system. The connecting element 26' may be a plate including a plurality of holes 31 configured to receive fixation means 32. The connecting element 26' may be releasably mountable to the base beam and may be configured to protrude from the first end 20c of the base beam 20. The connecting element 26' may be further configured to be received in a cavity 34 of the base beam 20, for example at a second end 20d of the base beam 20. Said cavity 34 may for example be formed by the V-shaped structure 20v and a bottom 21c of the grooves 21. The connecting element 26' may extend substantially in parallel to the ground plate 20g of the base beam 20 when mounted to an end of the base beam and/or when received in the cavity 34. The connecting element 26' may preferably extend over substantially an entire width of said cavity 34 to prevent sliding or shifting within said cavity 34. To fixate said connecting element 26' within the base beam 20, one of the grooves 21, for example the middle groove, may include one or more holes 33 configured to receive a fixation means 32. Said fixation means 32, for example a screw may be configured to extend through said hole 33 provided in a bottom 21c of a groove 21 and through the connecting element 26'. Said fixation means 32 may further be configured to engage an inner lower side of the cavity 34, in particular of the V-shaped structure 20v. Contrary to the connecting element 26 shown in Figures 12a to 13b, the connecting element 26' shown in Figures 14a to 15 is a symmetrical connecting element, which is advantageous for the manufacturing of both the base beams and the connecting element, as well as for the mounting of the cassette floor system. Moreover, there is no need to provide a recess in the upstanding side walls 21a nor in the groove at a second end 20d of the base beams.

[0032] Figures 15a and 15b show a cross-sectional and perspective view respectively of a further embodiment of a connecting element 26" of a base beam of the temporary cassette floor system. The connecting element 26" only differs from the embodiment described above with respect to Figures 14a and 14b in that the connecting element 26" additionally includes a second plate or a pair of wings 35 mounted in a substantially cross-shaped way with respect to the first plate, as shown in Figure 15a. The first plate may be positioned as described above, while the second plate 35 can then preferably extend over substantially an entire inner height of the cavity 34 to prevent said connecting element 26" from shifting in two substantially transverse orientations, in particular in a substantially horizontal and a substantially vertical orientation when the base beam is in use3. Said second plate or wings 35 need not extend over an entire length of the connecting element 26" and is preferably shorter than said length such that the connecting element 26" may be fixated within the cavity 34 in the same way

as described above, in particular via fixation means 32 received in holes 33 towards an end of the connecting element 26".

[0033] Figure 16 shows a top view of the base beams of Figure 14b or Figure 15b when connected with a connecting element 26' as shown in Figures 14a and 14b or Figures 15a and 15b respectively. In this embodiment, ends of longitudinally adjacent base beams 20 engage each other directly, contrary to the embodiment shown in Figures 13a - 13b. The connecting element 26', 26" can for example be fixated by a set of four fixation means 32, in particular two fixations means 32 per base beam and per connecting element 26', 26". A typical length of a base beam may for example be comprised in a range of more or less 3 m to more or less 6 m, but if needed, a base beam may be longer or shorter. A length of a base beam can advantageously be an integer multiple of a width of the cassette floor element 1. By connecting said base beams longitudinally, a wide variety in surface areas of a temporary cassette floor system may be obtained.

[0034] Although the present invention has been illustrated by reference to specific embodiments, it will be apparent to those skilled in the art that the invention is not limited to the details of the foregoing illustrative embodiments, and that the present invention may be embodied with various changes and modifications without departing from the scope thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein. In other words, it is contemplated to cover any and all modifications, variations or equivalents that fall within the scope of the basic underlying principles and whose essential attributes are claimed in this patent application. It will furthermore be understood by the reader of this patent application that the words "comprising" or "comprise" do not exclude other elements or steps, that the words "a" or "an" do not exclude a plurality, and that a single element, such as a computer system, a processor, or another integrated unit may fulfil the functions of several means recited in the claims. Any reference signs in the claims shall not be construed as limiting the respective claims concerned. The terms "first", "second", third", "a", "b", "c", and the like, when used in the description or in the claims are introduced to distinguish between similar elements or steps and are not necessarily describing a sequential or chronological order. Similarly, the terms "top", "bottom", "over", "under", and the like are introduced for descriptive purposes and not necessarily to denote relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances and embodiments of the invention are capable of operating according to the present invention in other sequences, or in orientations different from the one(s) described or illustrated above.

Claims

1. Temporary cassette floor system for outdoor events, the system comprising:

   - a plurality of base beams;
   - at least one cassette floor element comprising

     i. a support frame configured to be mounted onto said plurality of base beams; and
     ii. a treading surface configured to be fixated on said support frame,

   wherein each base beam of said plurality of base beams has a first side configured to face a ground surface and a second side opposite the first side configured to support said at least one cassette floor element;
   wherein the second side of each of said base beams includes at least one groove extending in a longitudinal direction of the base beam, the groove being configured to receive at least part of the support frame of the at least one cassette floor element.

2. Temporary cassette floor system according to claim 1, wherein the support frame of the at least one cassette floor element includes a plurality of support beams and two end plates, each end plate being configured to be mounted transversely to respective ends of said support beams, wherein said at least one groove of the base beam is configured to receive at least part of one of said end plates of the support frame of the at least one cassette floor element.

3. Temporary cassette floor system according to any of the preceding claims, wherein the system comprises a plurality of said cassette floor elements, and wherein the at least one groove is configured to receive at least part of the support frame of two adjacent cassette floor elements of the plurality of cassette floor elements.

4. Temporary cassette floor system according to any of the preceding claims, wherein the second side of the base beam includes three grooves extending in a longitudinal direction of the base beam, said three grooves extending next to each other and substantially in parallel to each other.

5. Temporary cassette floor system according to claims 2 to 4, wherein a middle groove of said three grooves is configured to receive two end plates, each end plate being one of the two end plates of the support frame of two adjacent cassette floor elements of the

plurality of cassette floor elements.

6. Temporary cassette floor system according to any of the preceding claims, wherein the at least one groove includes a blocking element configured to retain part of the support frame of the at least one cassette floor element received in said at least one groove.

7. Temporary cassette floor system according to any of the preceding claims, wherein the first side of the base beam is a ground plate, and wherein the base beam further includes a V-shaped structure in cross-section on top of said ground plate.

8. Temporary cassette floor system according to any of the preceding claims, wherein a first end of a base beam of said plurality of base beams is provided with a connecting element configured to connect said base beam with a longitudinally adjacent base beam.

9. Temporary cassette floor system according to claim 8, wherein a second end of a base beam of said plurality of base beams, the second end being opposite the first end in a longitudinal direction of said base beam, includes a recess or a cavity configured to receive the connecting element of a longitudinally adjacent base beam.

10. Temporary cassette floor system according to claim 8 or 9, wherein the connecting element is releasably mountable to said first end of the base beam.

11. Method of mounting a temporary cassette floor system, in particular a temporary cassette floor system according to any of the preceding claims, the method comprising the steps of

- installing a plurality of base beams substantially in parallel to each other and such that a first side of each base beam of said plurality of base beams faces a ground surface and such that a second side opposite the first side is configured to support at least one cassette floor element;
- providing a support frame of at least one cassette floor element, as well as a treading surface of said at least one cassette floor element;
- mounting said support frame substantially transversally on said plurality of base beams;
- fixating the treading surface of the at least one cassette floor element on the support frame;

wherein the second side of each of said base beams includes at least one groove extending in a longitudinal direction of the base beam, and wherein the step of mounting said support frame substantially transversally on said plurality of base beams includes inserting at least part of the support frame of the at least one cassette floor element into said at least one groove of the base beam.

12. Method according to claim 11, wherein the step of installing said plurality of base beams includes connecting a base beam with a longitudinally adjacent base beam by providing a connecting element on a first end of said base beam and receiving said connecting element in a recess or a cavity provided on a second end of said longitudinally adjacent base beam.

13. Method according to any of the preceding claims 11 -12, wherein the treading surface is fixated on said support frame by a releasable snap connection, the snap connection including an insertable element and a receiving element configured to receive said insertable element.

14. Method according to any of the preceding claims 11 - 13, wherein the step of fixating the treading surface of the at least one cassette floor element on the support frame can be performed before or after the step of mounting said support frame substantially transversally on said plurality of base beams.

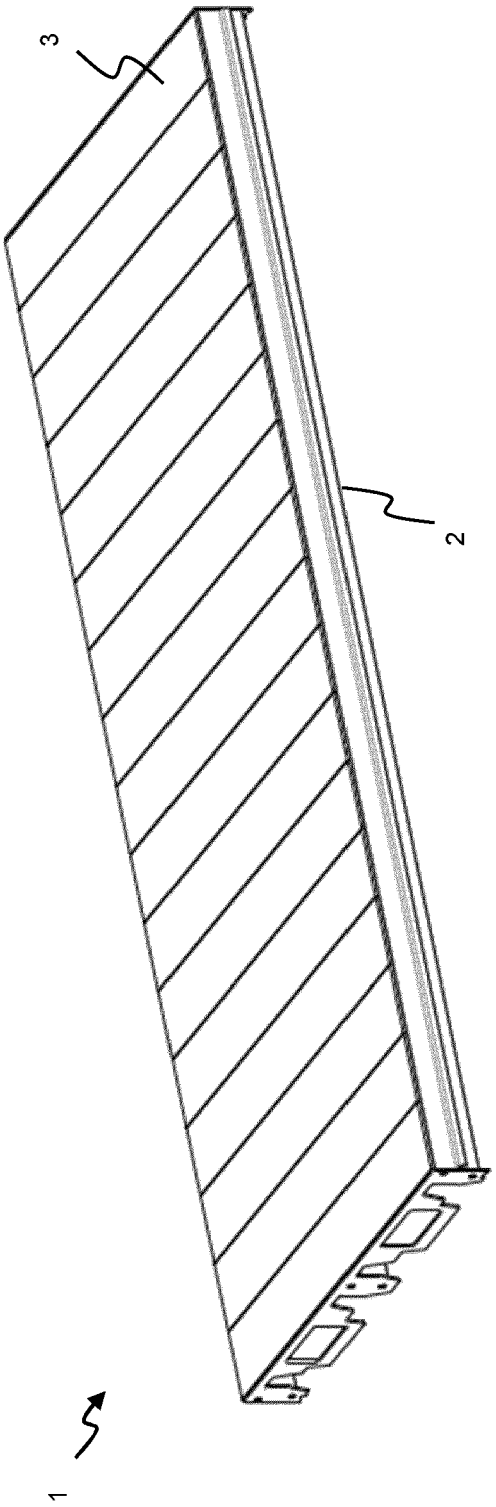

Fig. 1a

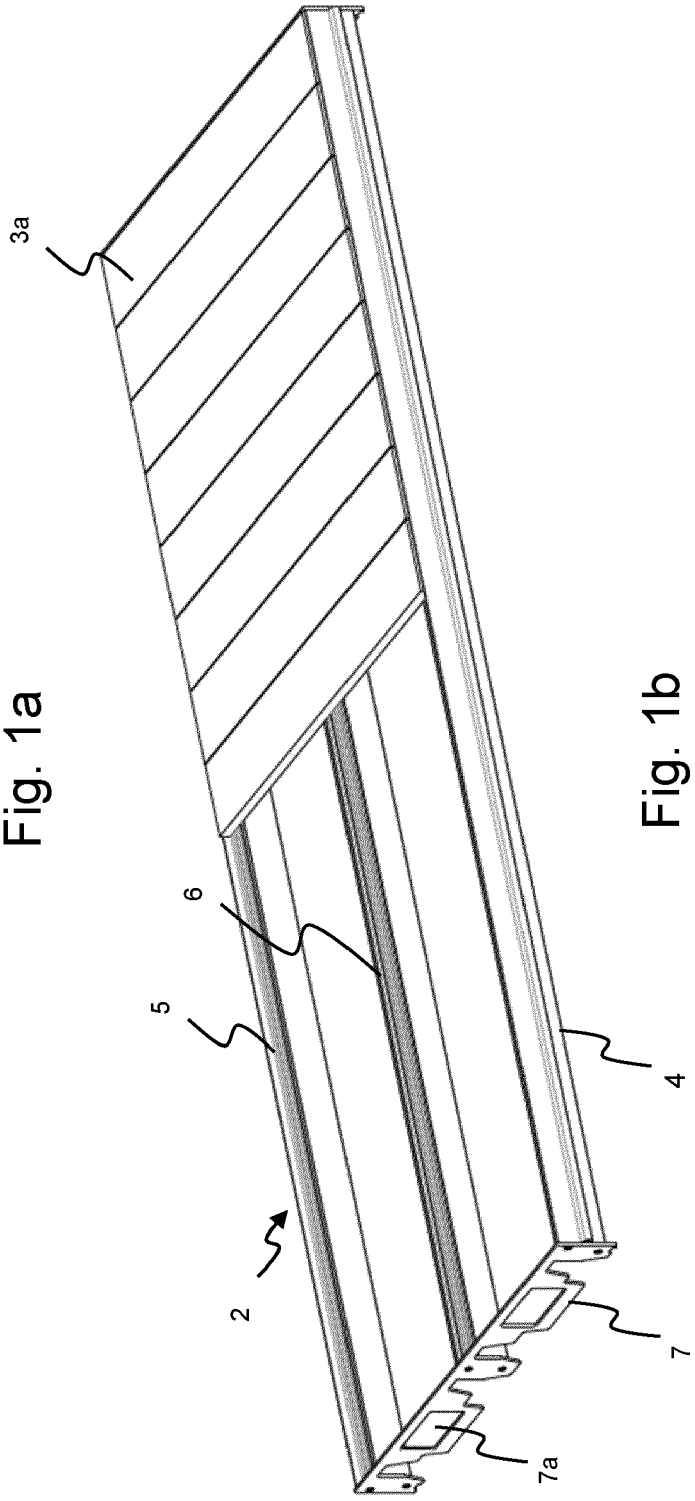

Fig. 1b

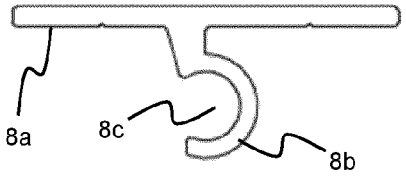

Fig. 2a

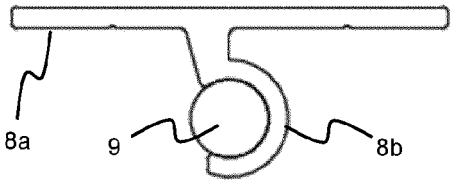

Fig. 2b

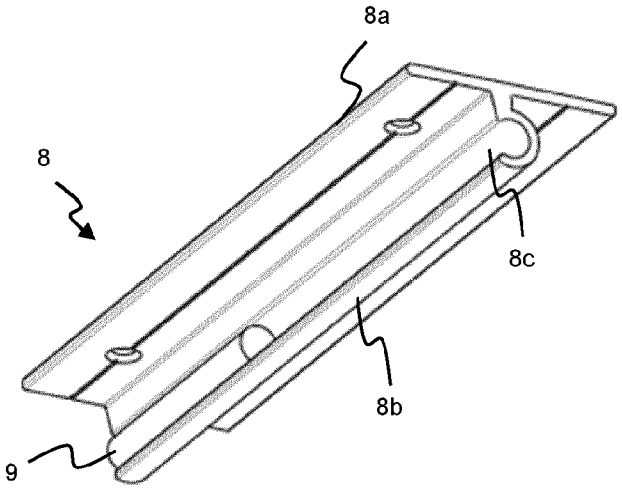

Fig. 2c

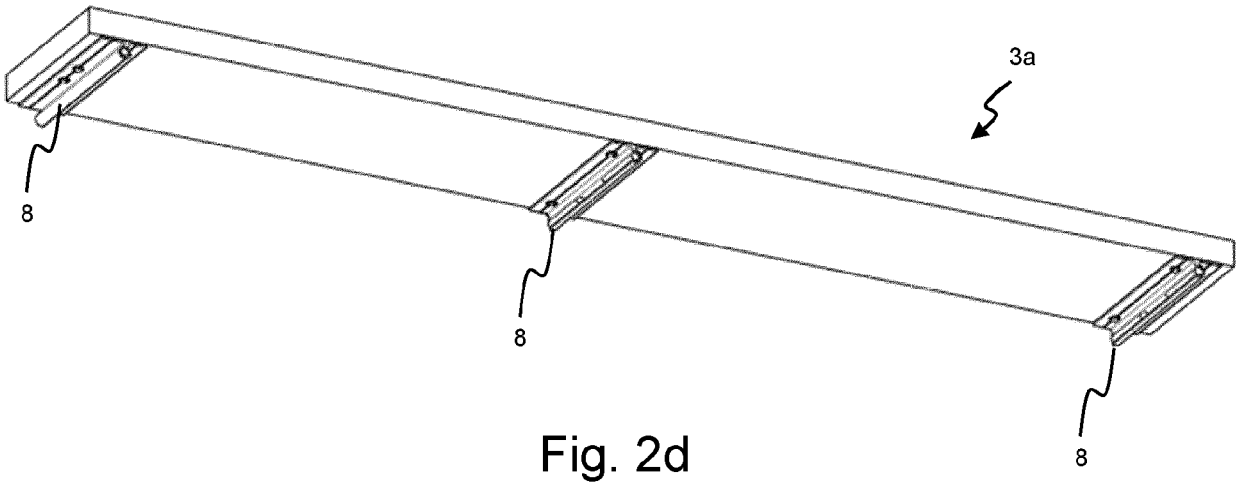

Fig. 2d

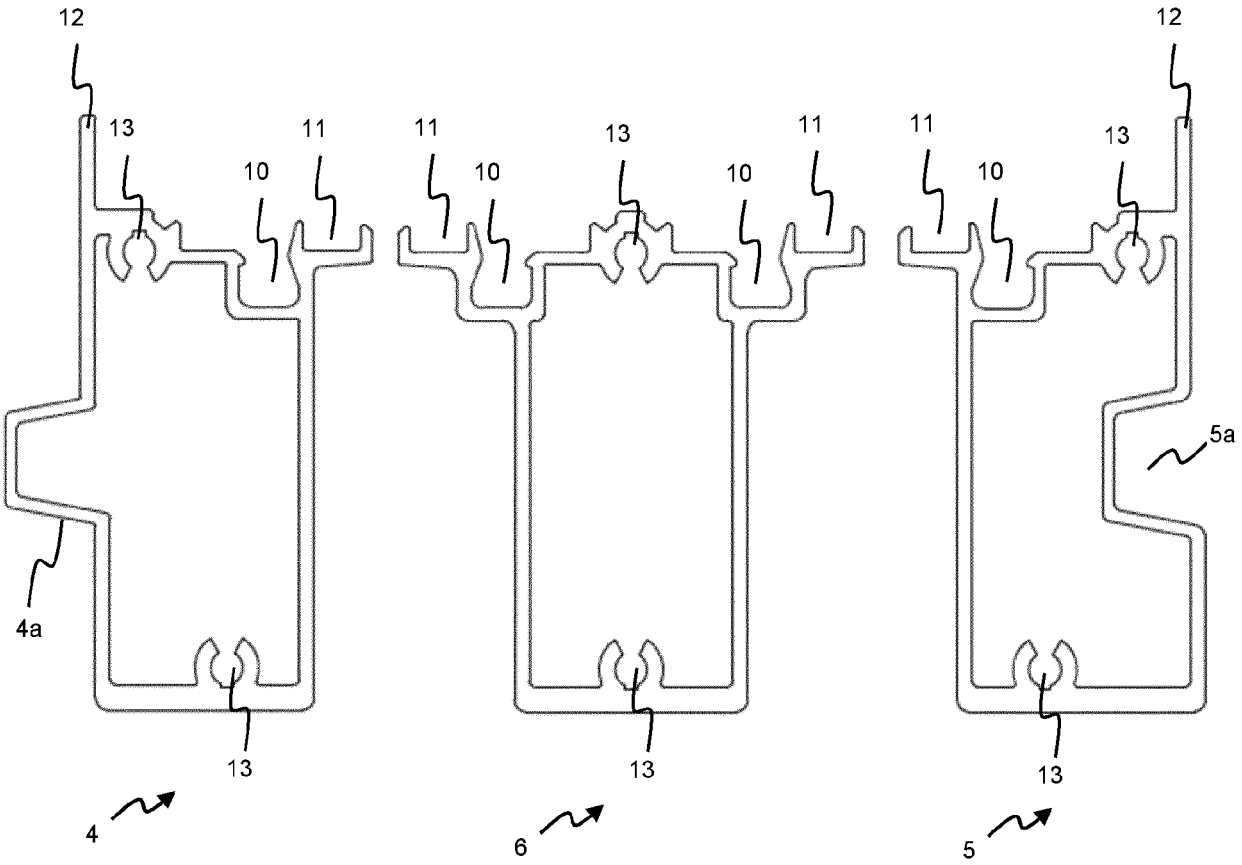

Fig. 3a Fig. 3b Fig. 3c

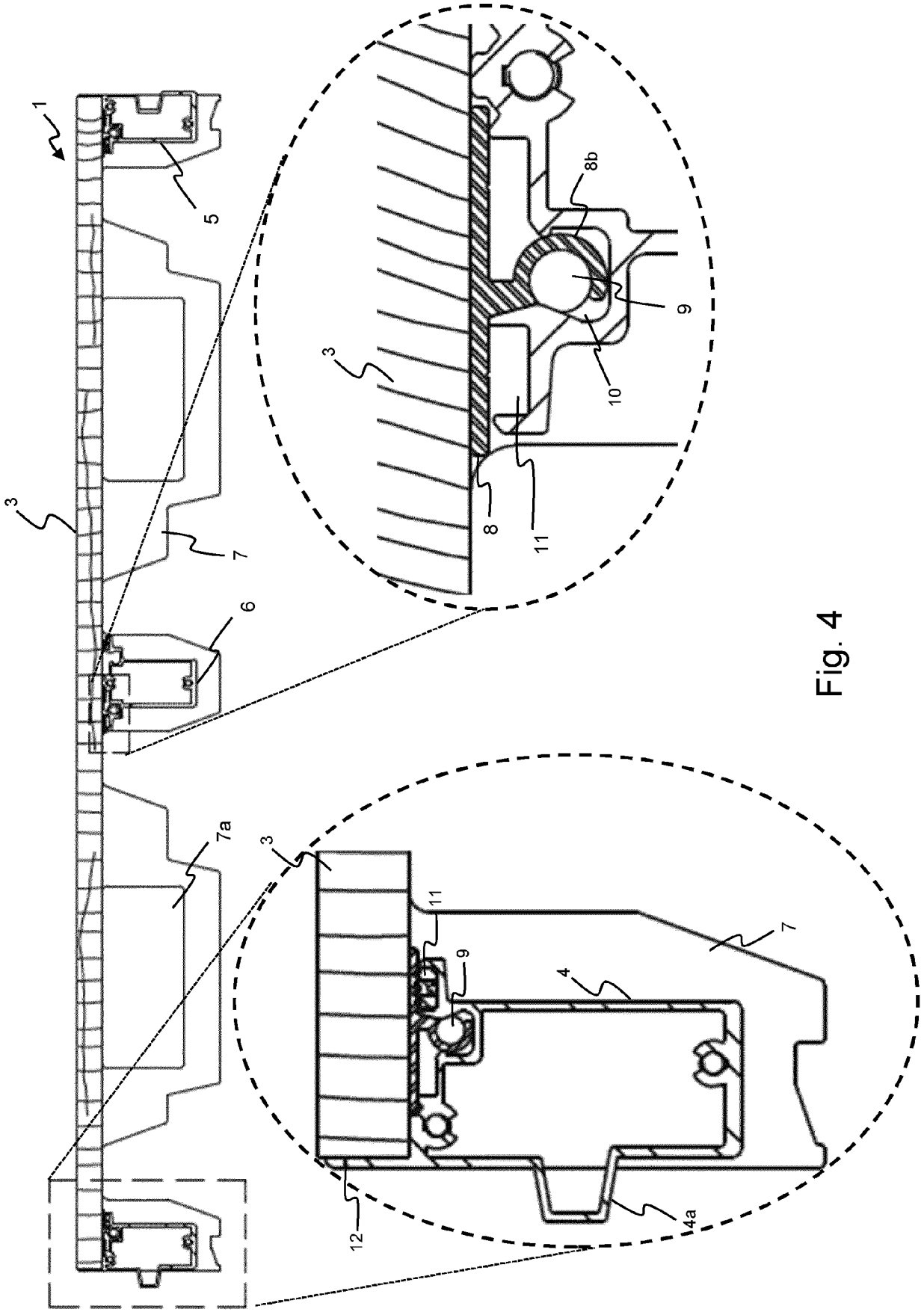

Fig. 4

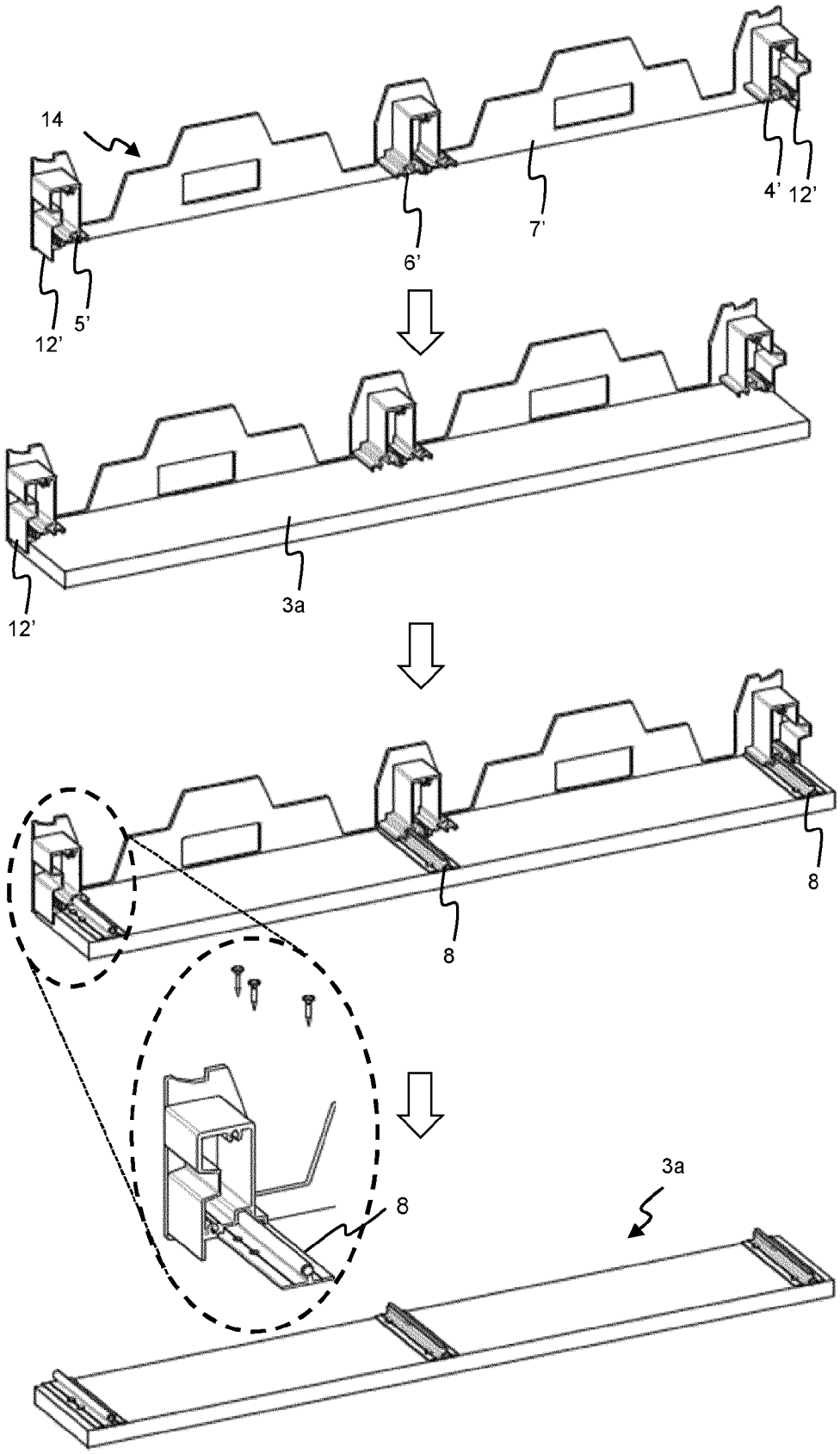

Fig. 5

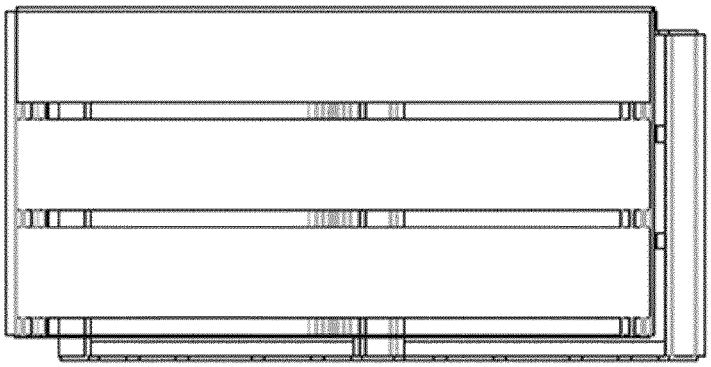

Fig. 6a

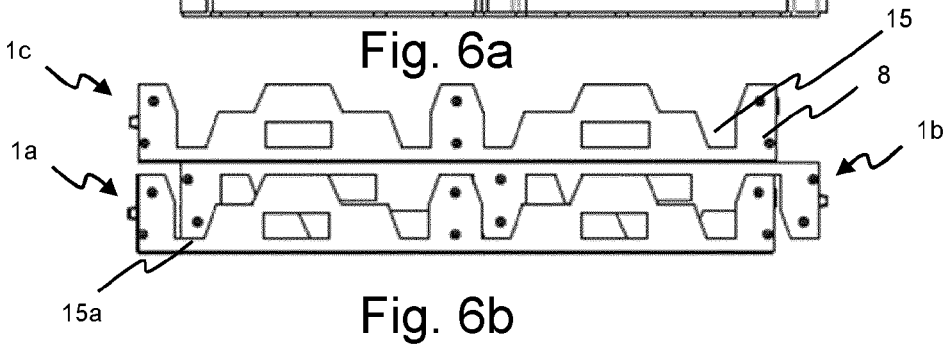

Fig. 6b

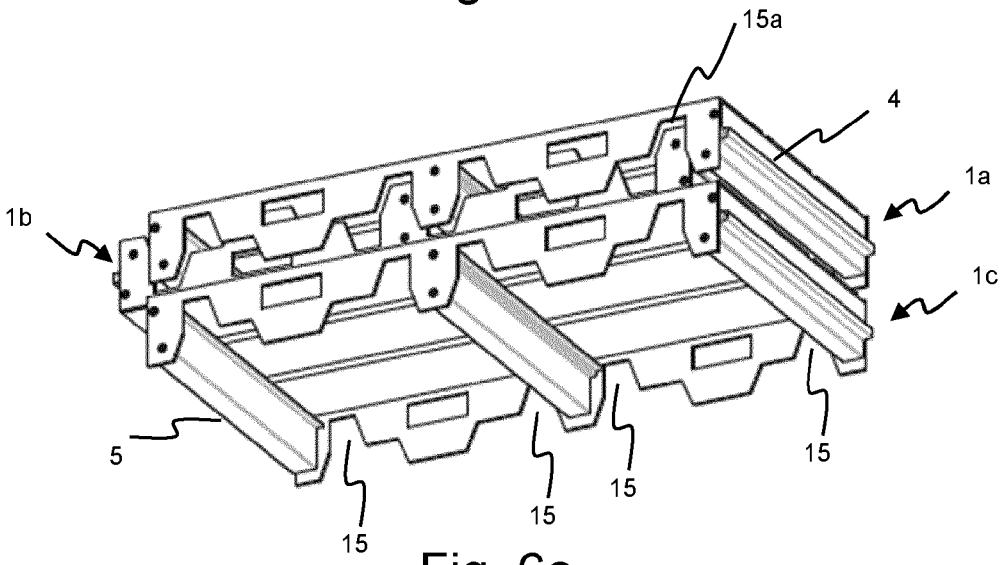

Fig. 6c

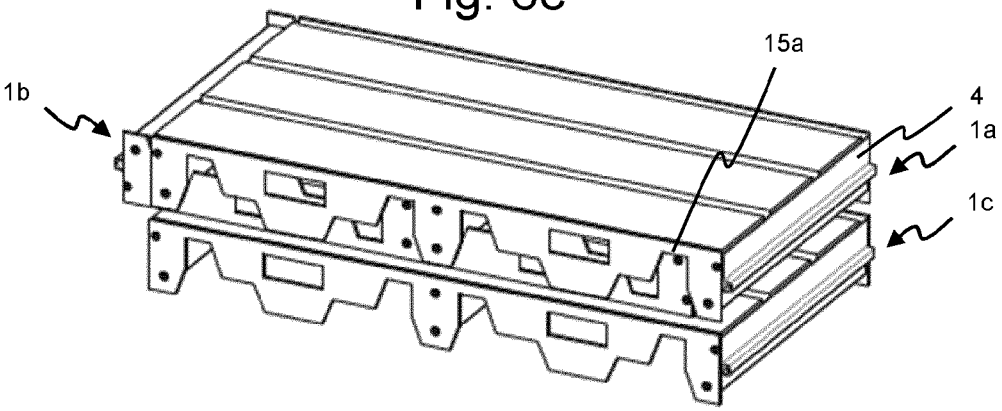

Fig. 6d

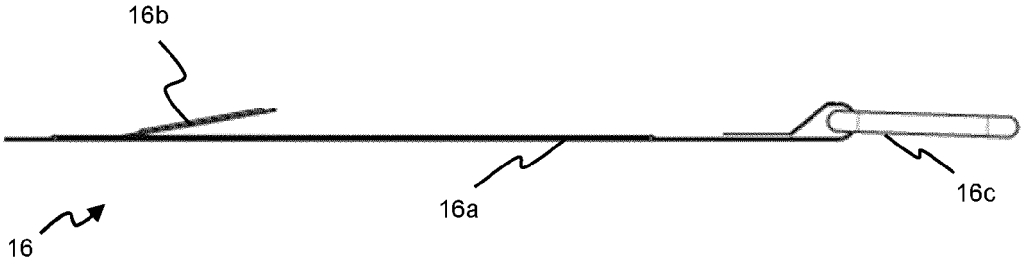

Fig. 7a

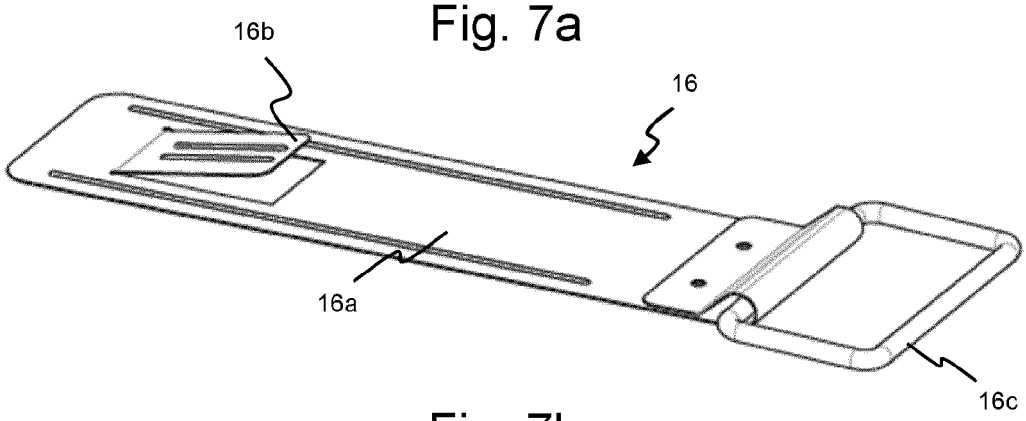

Fig. 7b

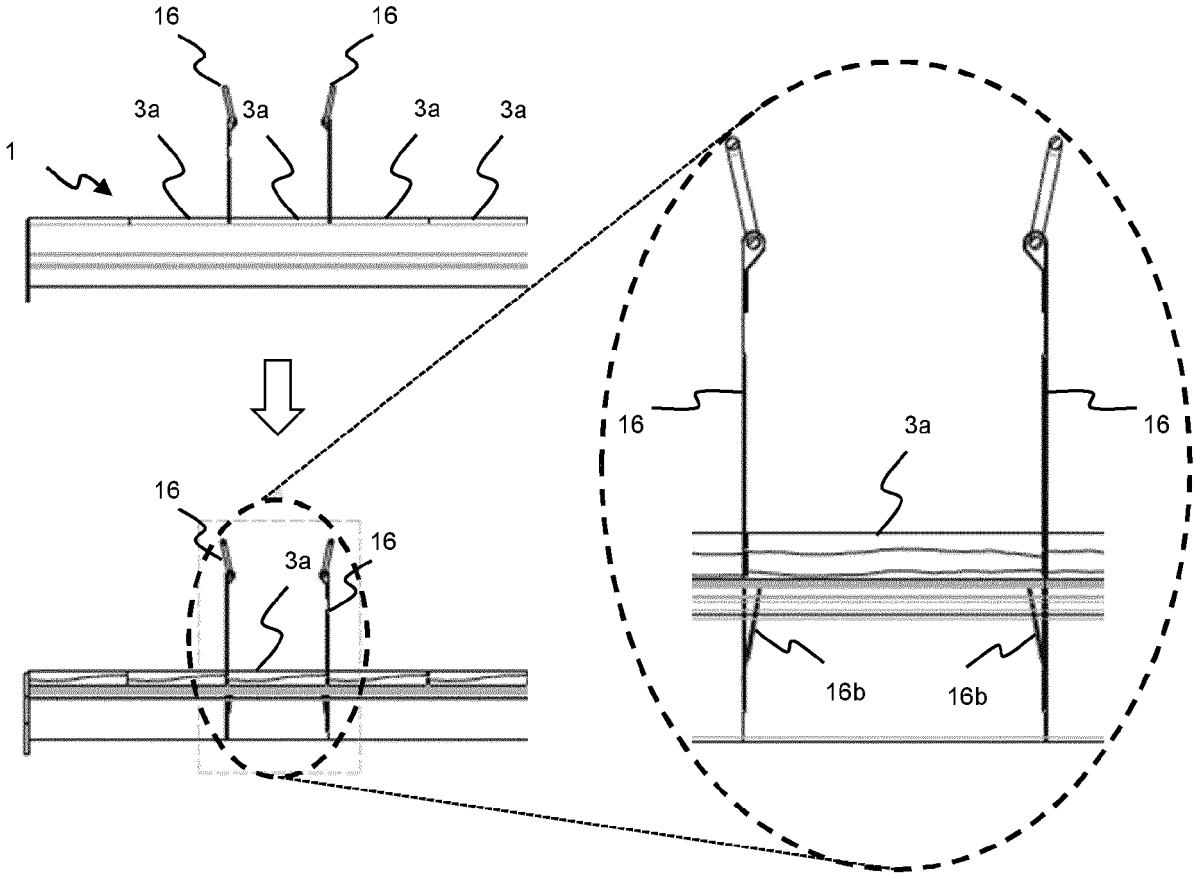

Fig. 7c

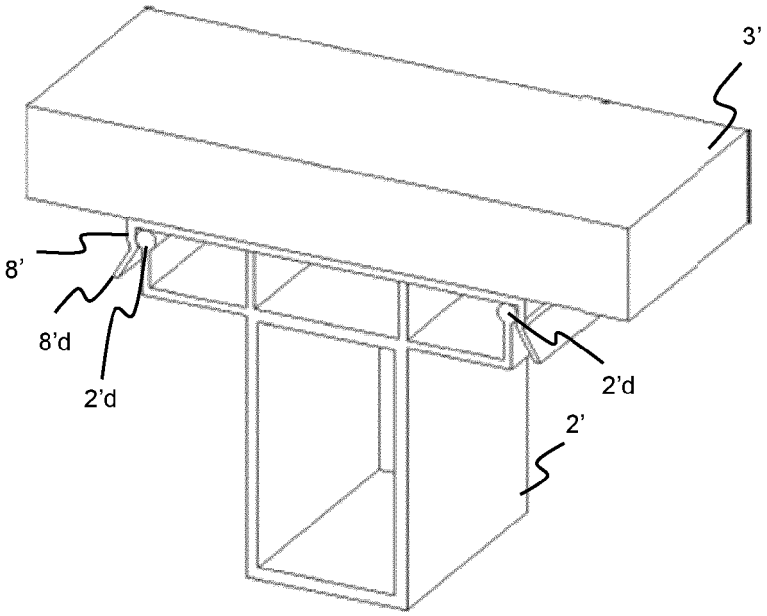

Fig. 8a

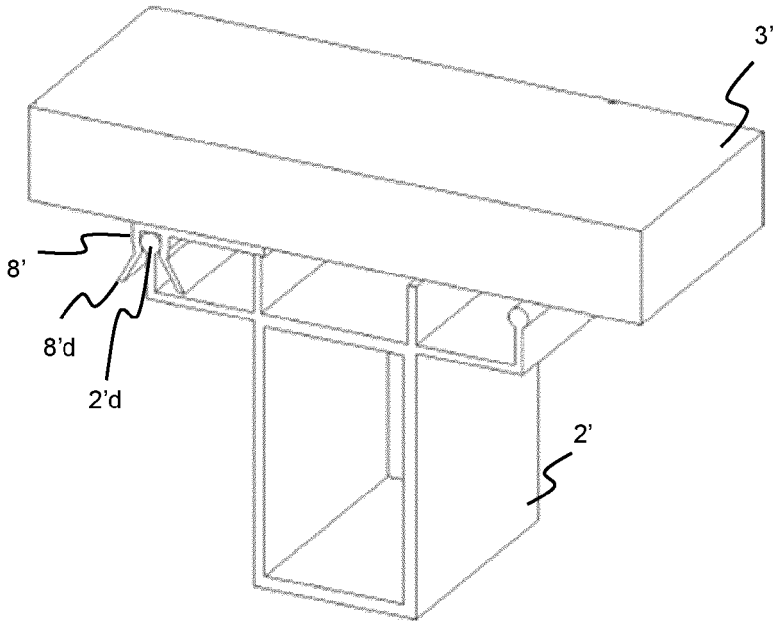

Fig. 8b

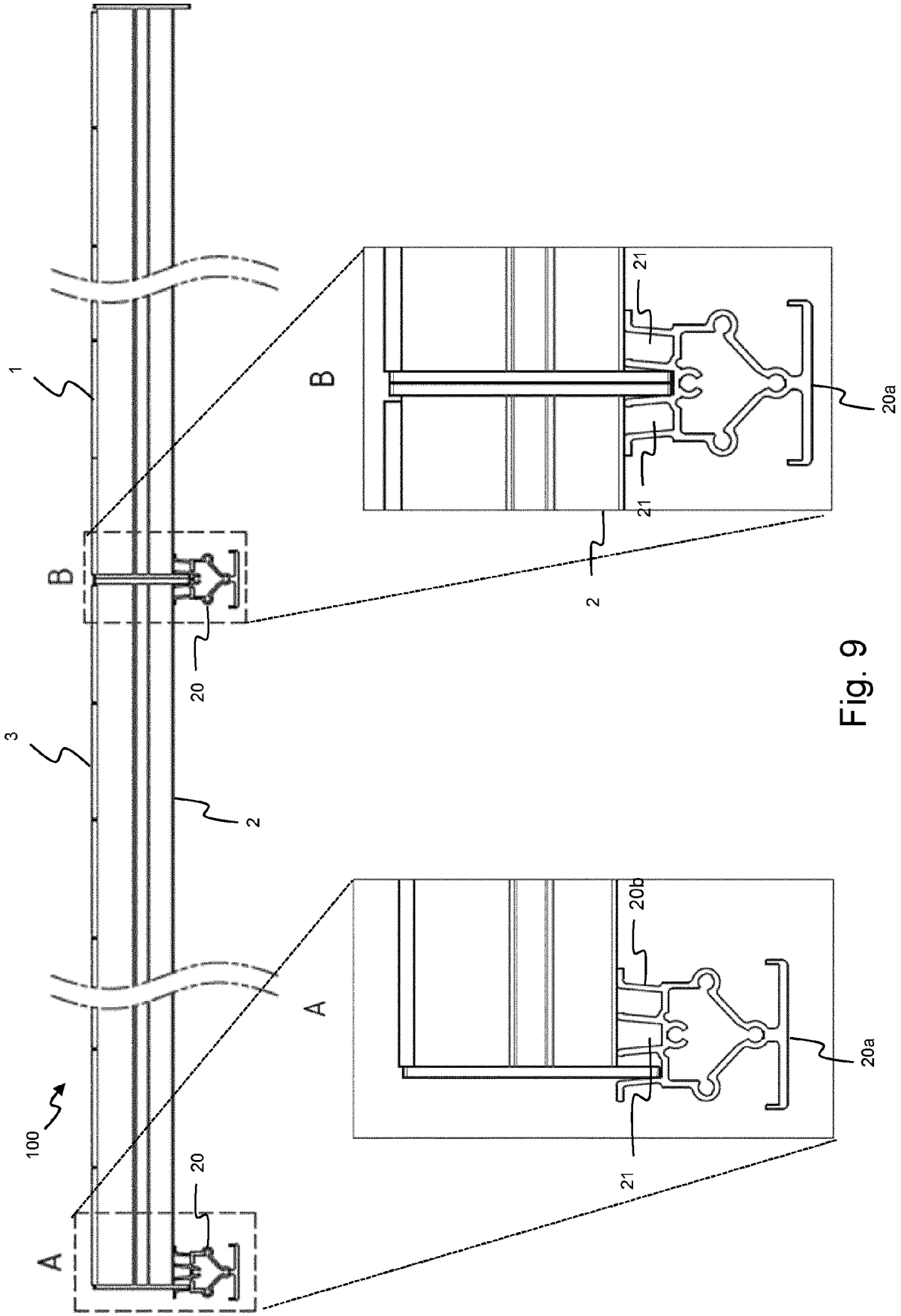

Fig. 9

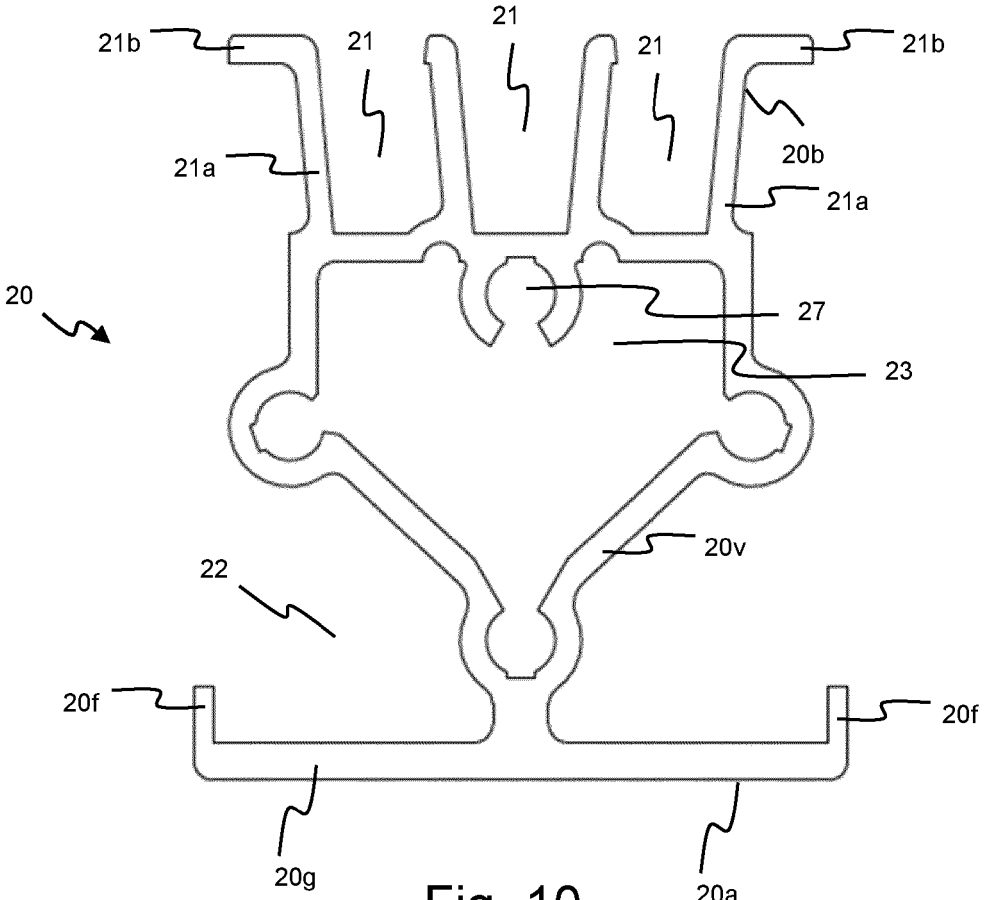
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Fig. 10

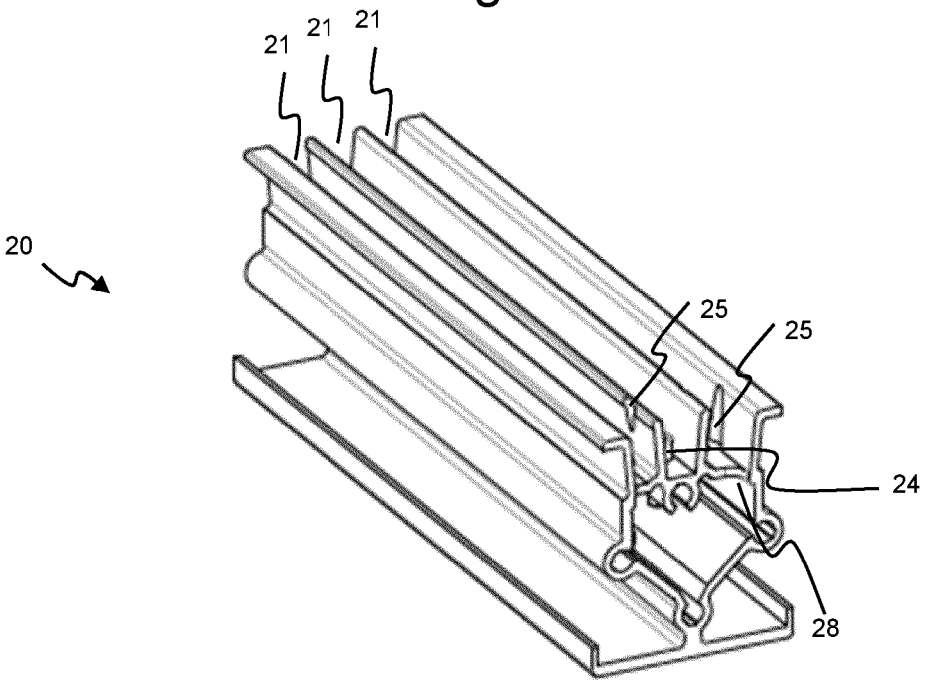
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Fig. 11

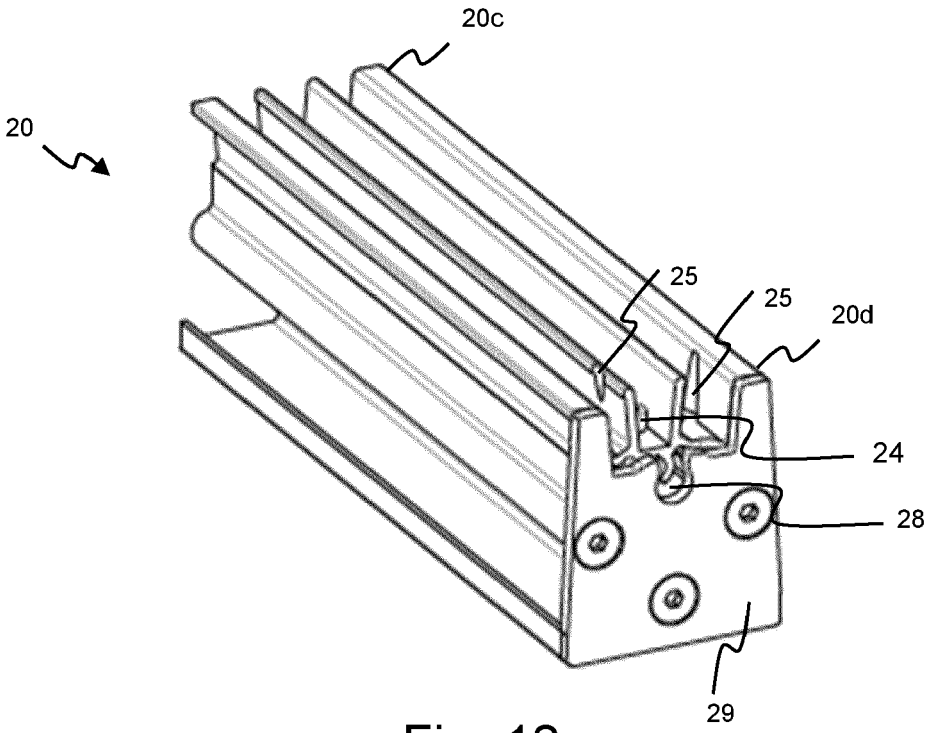

Fig. 12a

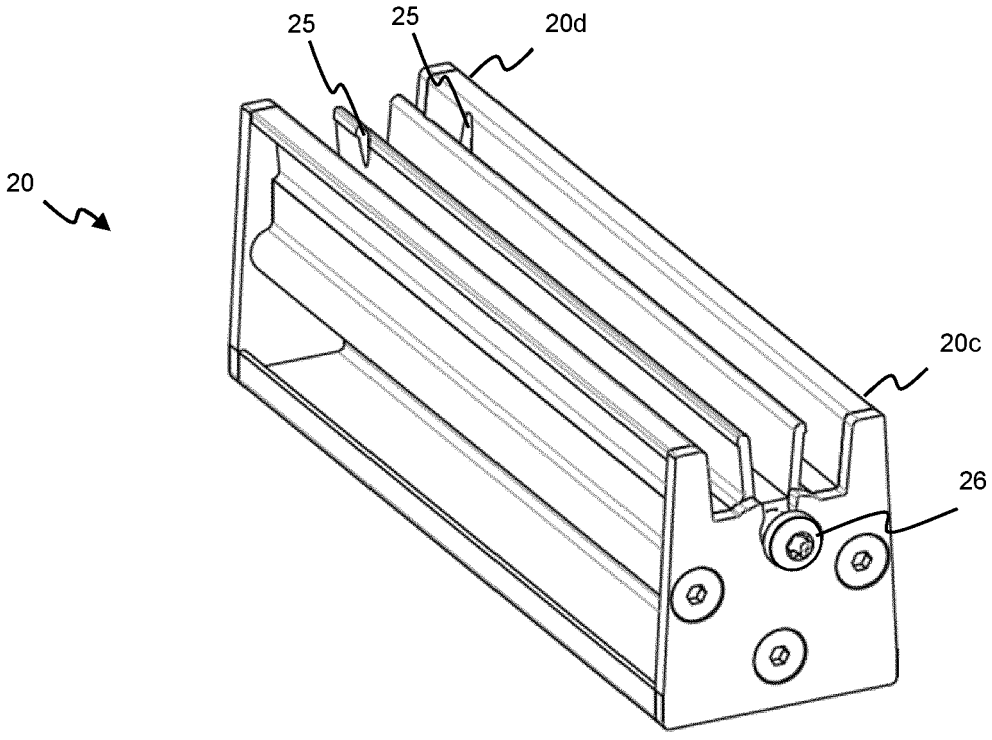

Fig. 12b

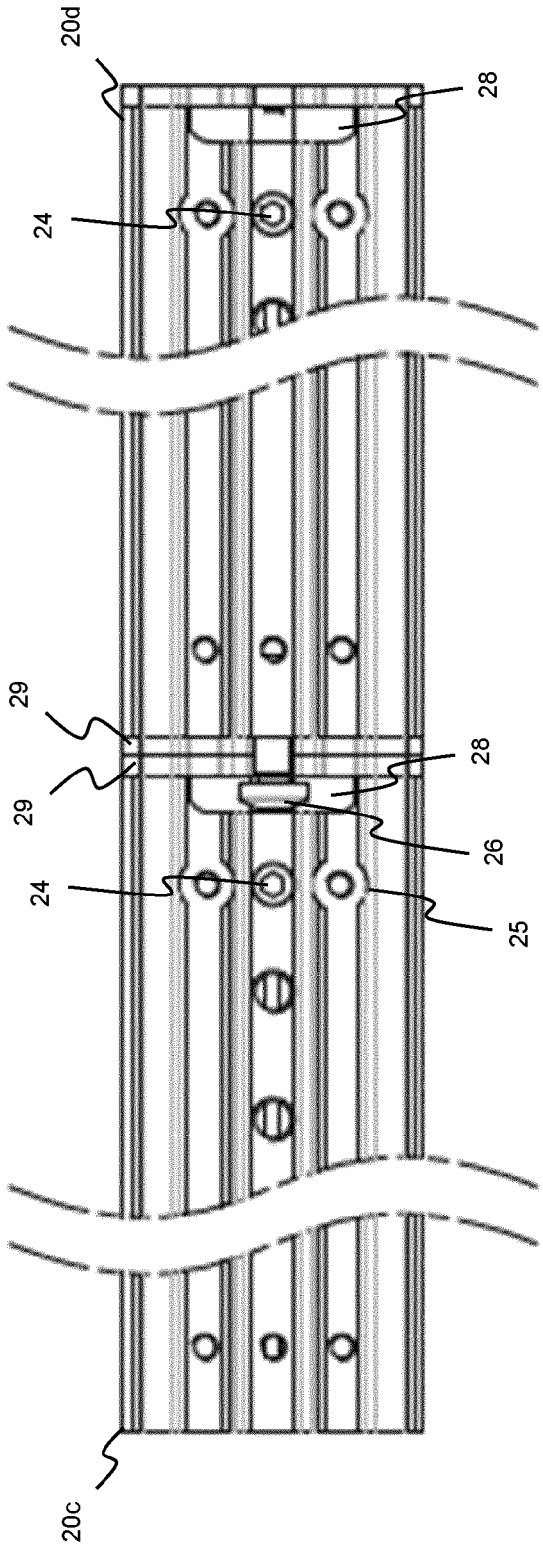

Fig. 13a

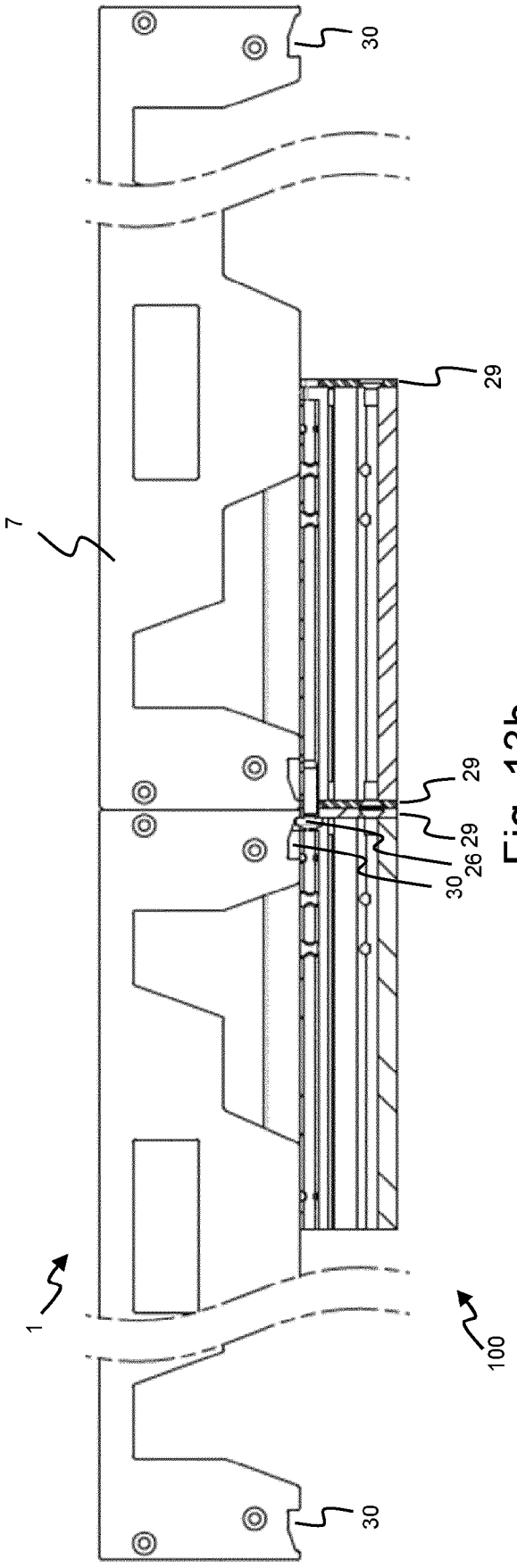

Fig. 13b

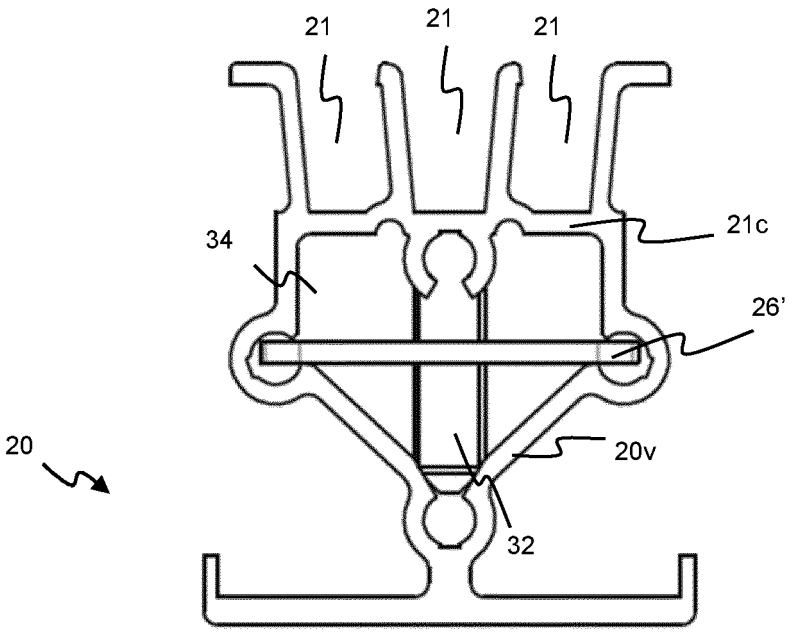

Fig. 14a

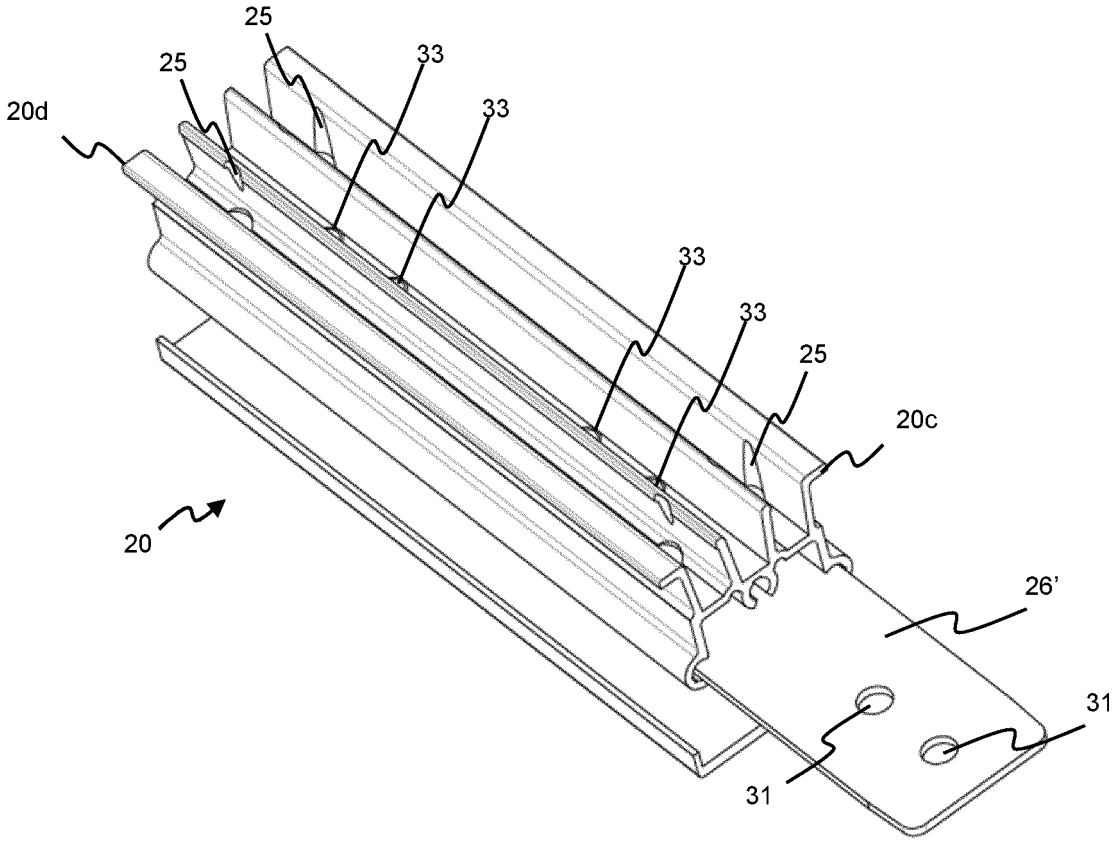

Fig. 14b

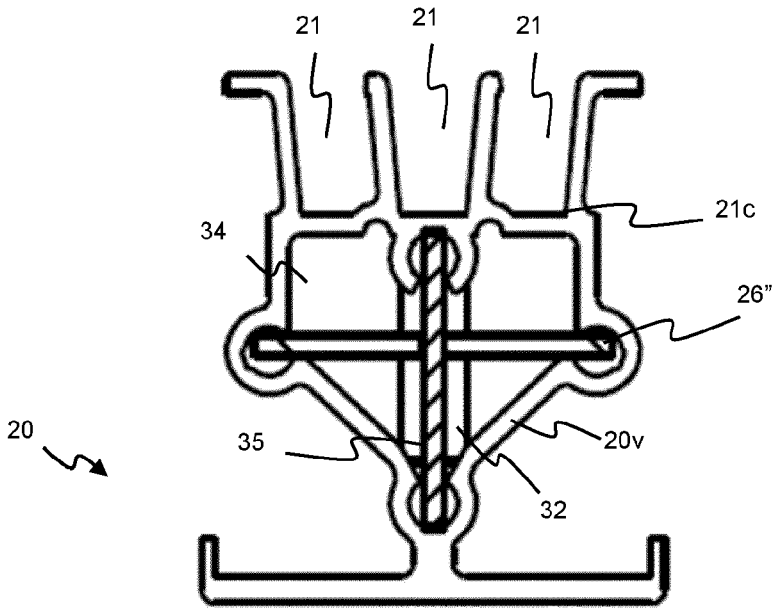

Fig. 15a

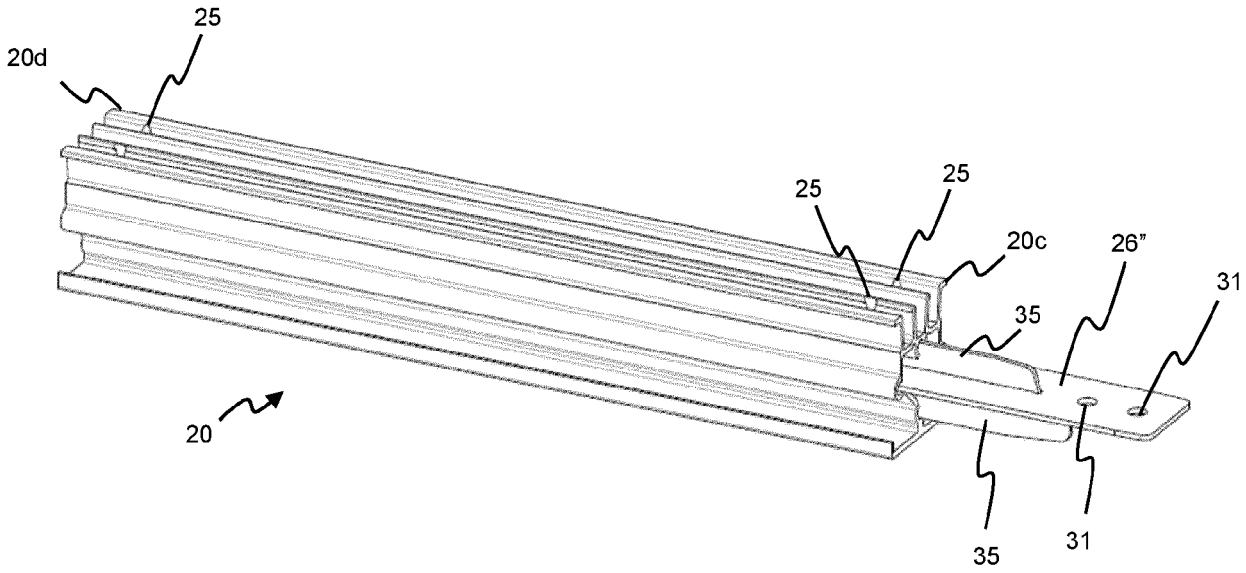

Fig. 15b

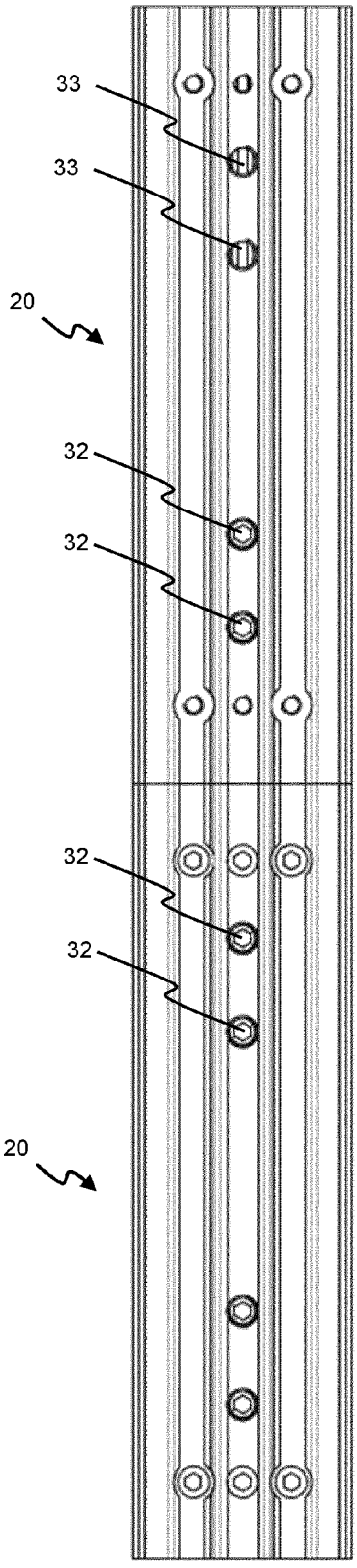

Fig. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 6523

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 10 119 273 B2 (ARCH DU BOIS [FR]) 6 November 2018 (2018-11-06) * figures 1-8 * * the whole document *	1-14	INV. E01C9/08 E04F15/02
A	KR 100 887 332 B1 (NURIPLAN CO LTD [KR]) 5 March 2009 (2009-03-05) * figures 1-7 * * paragraphs [0002], [0056], [0057], [0069], [0070] * * the whole document *	1-14	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 September 2024	Klein, A

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