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Applicant: The Regent Engineering Co. (Walsall)
Limited
Darlaston
West Midlands WS10 8XB (GB)

(72)

Inventor: SHAW, Alan
Walsall, WS3 2JX (GB)

(74)

Representative: Lees, Kate Jane
Kate Lees Consulting Ltd
Office 5
Acorn Business Centre
Roberts End, Hanley Swan
Malvern, Worcestershire WR8 0DN (GB)

(30)

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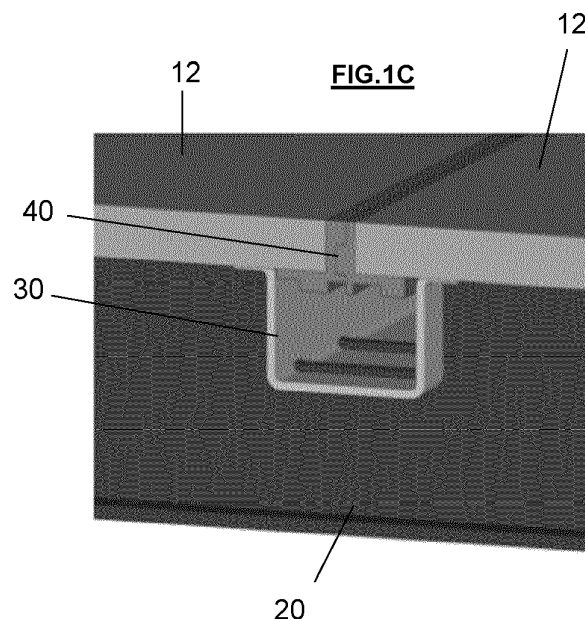
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TEMPORARY FLOORING SYSTEMS

(57)

A temporary flooring system having a modular frame comprising at least two primary support beams (20) and at least two secondary support beams (30) wherein each primary support beam has at least two upwardly extending parallel limbs, an upper edge of each limb having a plurality of spaced apart slots or notches along its length for receiving a secondary support beam

substantially perpendicularly to the primary support beam, the system further comprising at least two flooring panels (12), an edge of each panel having a tongue and groove edging profile (40) for mating with an adjacent panel, the mating profile being received within a cavity of the secondary support beam (30).



Description

Field of the Invention.

[0001] The present invention relates to a compact temporary flooring system.

Background

[0002] The event industry increasingly requires temporary structures to be erected with elevated and/or levelled floors, such as tents, marquees and staging platforms. Other industries may also require temporary floors, for example for field hospitals and military applications.

[0003] Different temporary flooring systems already exist in the marketplace, including the Applicant's Floor-Stak™ system for supporting temporary flooring. Casette flooring provide modular systems that enable interlocking floor boards to be slotted together and supported on metal beams. These systems are entirely fit for purpose but are less suitable for rapid deployment and/or for transportation to remote sites due to the component parts being relatively complex to assemble and bulky to store and transport.

[0004] It is the aim of the present invention to provide a temporary flooring system that overcomes, or at least alleviates, the abovementioned problems.

Summary of the Invention

[0005] According to a first aspect of the present invention there is provided a temporary flooring system comprising a modular frame comprising at least two primary support beams and at least two secondary support beams wherein each primary support beam has at least one recess in its upper surface for receiving a secondary support beam substantially perpendicularly to the primary support beam, the system further comprising at least one flooring panel, the at least one flooring panel being configured to be received on the frame.

[0006] Preferably, the at least one flooring panel is provided with an edging profile along at least one edge for engagement with another edging profile on an adjacent flooring panel. Preferably the edging profiles are configured such that the profiles of adjacent panels mate together to join adjacent panels. Preferably, adjoining profiles are at least partially received within a secondary support beam, the profiles being parallel with the secondary support beams in the assembled system.

[0007] In a preferred embodiment, each primary support beam is an extruded substantially U-shaped section having two parallel limbs. More preferably, an upper part of each limb is provided with spaced apart U-shaped recesses or cut-outs, each recess or cut-out of one limb being provided in line with a recess or cut-out of its parallel limb. An indent or notch may be provided between an upper edge of each limb and each end of the U-shaped

cut-out to form a shoulder.

[0008] Preferably, each free end of a primary support beam is provided with a partial cut-out or recess, more preferably half a cut-out or recess for mating with the free end of another primary support beam to provide beams of indefinite length. The beam is preferably formed of aluminium or steel extrusion so that it can provide the necessary support.

[0009] Each secondary support beam is preferably substantially U-shaped having parallel limbs, a part of each secondary support beam being dimensioned for receipt within parallel recesses or cut-outs of a primary support beam. Preferably, each limb of the secondary support beam has a flange extending substantially perpendicularly outwardly from the limb. In this manner, the secondary support beam may be supported within the primary support beam substantially perpendicularly thereto, with the U-shaped profile of the secondary support beam being received within the U-shaped cut-outs/recesses of the primary support beam, with each flange of each secondary support beam resting on a shoulder of its primary support beam.

[0010] In a preferred embodiment, at least one slot, more preferably at least two parallel slots, is/are provided across a base of each secondary beam, preferably being provided towards each end of the beam. Each slot preferably extends a small distance into each limb. More preferably, the pair of slots are spaced apart by a distance corresponding to the distance between parallel limbs of the primary support beam and the breadth of each slot is such as to allow it to receive an edge of the base of the cut-out or recess of the primary support beam. In this manner, the secondary support beams may be located in precise positions provided by the cut-outs in the primary support beams and held in position by ensuring that the slot features of the secondary beam engages with the primary beam.

[0011] Each flooring panel preferably comprises a planar square or rectangular panel. Preferably, each panel has an edging profile along at least two parallel edges. Preferably, each edging profile comprises a tongue and groove edging profile. More preferably, each profile has a panel-engaging L-shaped inner surface and an opposing tongue and groove outer surface. The outer surface of the profile is configured to provide a groove along one side of the profile and a tongue along the other side of the profile. Adjacent panels may be located together by mating a tongue of one edging profile with groove of an adjacent edging profile.

[0012] Each edging profile preferably has an overall height of less than 40mm, preferably being less than 30mm, especially about 26mm.

[0013] The edging profiles may be mounted in opposing orientations on the flooring panels wherein one side of the panel has the edging profile with the tongue protruding and the other side has an edging profile with the groove, thereby enabling a single configuration of edging profiles to be provided for the flooring system.

[0014] Preferably, the mating edging profiles of adjacent floor panels are received within a cavity formed between parallel limbs of a secondary support beam. It is preferable for the dimensions of the mating edging profiles to be such that there is only a small gap between outer corners of the mating profiles and upper corners of the cavity of the secondary support beam. Preferably, each gap is less than 2mm, more preferably about 1mm.

[0015] Each flooring panel may be made of any suitable sheet material, preferably plywood. It is to be appreciated that the edging profiles may be permanently attached to a panel but it is preferable for the profiles to be removable therefrom.

[0016] In a preferred embodiment of the present invention, the flooring system comprises a modular frame comprising at least two primary support beams and at least two secondary support beams wherein each primary support beam has at least two upwardly extending parallel limbs, an upper edge of each limb having a plurality of spaced apart slots or notches along its length for receiving a secondary support beam substantially perpendicularly to the primary support beam, the system further comprising at least two flooring panels, an edge of each panel having a tongue and groove edging profile for mating with an adjacent panel, the mating profile being received within a cavity of the secondary support beam.

[0017] Preferably each flooring panel is supported by at least three primary and three secondary support beams, more preferably wherein each panel is supported by a secondary support beam along its junction with another panel and along its centre.

[0018] A second aspect of the present invention provides a kit of parts for installation of a temporary flooring system, the kits of parts comprising a plurality of primary support beams, a plurality of secondary support beams, a plurality of flooring panels and a plurality of edging profiles.

[0019] It is to be appreciated that the flooring system of the present invention may be used in combination with other temporary flooring components as is standard in the art. For example, the flooring system may be provided with a levelling system, such as spaced apart adjustable riser columns that engage with the primary support beams to provide a level floor.

Brief Description of the Drawings

[0020] For a better understanding of the present invention and to show more clearly how it may be carried into effect, reference will now be made by way of example only to the accompanying drawings in which:

Figure 1A is a perspective view of an assembled temporary flooring system according to one embodiment of the present invention, including a floor support and levelling system;

Figure 1B is a perspective expanded and exploded

view of components of the flooring system of Figure 1A;

Figure 1C illustrates the components of Figure 1B shown assembled;

Figure 2 is a perspective view of a constructed temporary floor system according to an embodiment of the present invention, shown without a levelling system;

Figure 3 is a perspective view of a primary support beam for the temporary floor system shown in Figure 2;

Figure 4A is a perspective exploded view of a primary support beam and a secondary support beam for the flooring system shown in Figure 2;

Figure 4B is a perspective view of the assembled primary and secondary support beams shown in Figure 4A;

Figure 5 illustrates an internal junction of two secondary support beams supported on a primary beam;

Figure 6 is a schematic diagram illustrating an assembly of multiple primary and second support beams for forming a frame of the flooring system;

Figure 7 is a perspective view of a single flooring panel provided with edging profiles for the temporary flooring system of Figure 2;

Figure 8 is an expanded view of the edging profile and flooring panel shown in Figure 7; and

Figure 9 is a sectional view illustrating a connection between two adjacent flooring panels supported on a secondary support beam of the flooring system of Figure 2.

Detailed Description

[0021] The present invention provides a compact temporary flooring system for rapid deployment. The components of the system can be assembled rapidly but when disassembled may be packed together in a more compact way to provide for easier and cheaper storage and transportation between sites.

[0022] Figures 1A to 1C illustrate schematically the general structure of a flooring system according to an embodiment of the present invention. The present invention provides a flooring system 1 comprising a frame 10 supporting floor cassette panels 12. The embodiment shown in Figure 1A is shown positioned on riser columns 50 according to the prior art which may be adjusted to

provide a level floor. However, it is to be appreciated that the system may be provided without such a levelling system, as shown in later figures (see in particular Figure 2). The frame 10 comprises multiple spaced apart primary support beams 20 for receiving multiple spaced apart secondary support beams 30. The secondary support beams extend perpendicularly to the primary support beams to form crossbars. Cassette panels 12 are provided with edging profiles 40 along their edges that lie parallel with the secondary support beams 30. Edging profiles 40 are configured such that the profiles of adjacent panels 12 mate together to join adjacent panels (see Fig. 1C). The secondary support beams are received at intervals within recesses of the primary support beams and the engaged edging profiles 40 of adjacent panels are retained within the secondary support beams 30 to provide an assembled flooring system.

[0023] The particular components making up the system allow for installation of a secure and level surface quickly and easily with the added benefit that all components have small/shallow profiles, enabling the components to be packed compactly together for transportation and storage.

[0024] Figures 3 to 9 of the accompanying drawings illustrate the support beams 20, 30, cassette panels 12 and edging profiles 40 in further detail. Figure 2 illustrates a flooring system assembled from these components. Figure 3 shows a primary support or main bearer beam 20 in further detail. The beam is an extruded substantially U-shaped section having two parallel limbs 20a, 20b. The upper part of each limb is provided with spaced apart U-shaped recesses or cut-outs 22 which are provided in line with the cut-outs of a parallel limb. An indent or notch is provided between the upper edge of each limb and each end of the U-shaped cut-out forming a shoulder 22a (see Fig. 4A). Each free end of the beam is provided with half a cut-out 22 to enable it to be mounted inline with the free end of an adjacent beam to produce beams of indefinite length. The beam is preferably formed of aluminium or steel extrusion so that it can provide the necessary support.

[0025] Figures 4A and 4B illustrate a secondary support beam or cross bar 30 in further detail. The beam 30 is also substantially U-shaped having parallel limbs 30a, 30b, each free end of the limb having a flange 32 extending substantially perpendicularly outwardly from the limb. The beam is supported within the primary beam substantially perpendicularly thereto, with the U-shaped profile of the secondary support beam being dimensioned to fit snugly within the U-shaped cut-outs 22 of the primary support beam 20, as shown in Figure 4B, with the flange 32 resting on shoulder 22a. Additionally, the base of each secondary beam 30 is provided with a couple of parallel slots 34 towards each end of the beam. The slots 34 extend a small distance into the vertical limbs of the beam and are spaced apart by a distance corresponding to the distance between the parallel limbs 20a, 20b of the primary support 20. The breadth of each slot 34 is such as

to allow it to receive the edge of the base of the cut-out 22 of the primary support beam. In this manner, the secondary support beams 30 may be located in precise positions provided by the cut-outs in the primary support beams and held in position by ensuring that the slot features 34 of the secondary beam engages with the primary beam.

[0026] It is to be appreciated that in practice, the double slot feature 34 is only used in relation to the perimeter of the flooring system. The inner slot is used in relation to internal junctions, leaving the adjacent outer slot free so that the beam may abut with an adjacent beam at their ends 36, see Figures 5 and 6, thereby forming the frame 10 for supporting cassette panels 12. As shown in Figure 6 multiple primary 20 and secondary support beams 30x-z, 30x'-z' can be assembled together to provide a frame 10 of the desired dimensions.

[0027] Figures 7 and 8 of the accompanying drawings illustrate the cassette panels 12 with edging profiles 40 in further detail. The cassette panels may comprise plywood or other sheet material to which tongue and groove edging profiles 40 are attached. The profiles 40 serve to strengthen and locate the cassette panels on the frame 10. Each profile has a panel-engaging L-shaped inner surface 42 and an opposing tongue and groove outer surface 44, 46. The outer surface of the profile is configured to provide a groove 46b, being flanked by extensions 46a, 46c along one side of the profile and a tongue 44b, being flanked by indentations 44a, 44c along the other side of the profile. Adjacent panels may be located together by mating a tongue 44b of one edging profile with groove 46b of an adjacent edging profile.

[0028] The profiles can be mounted in opposing orientations on the panels (see Fig. 9), where one side of the panel has the edging profile with the tongue protruding and the other side has an edging profile with the groove, thereby enabling a single configuration of edging profiles to be provided for the flooring system. Once adjacent panels 12 are interlocked via their edging profiles 40, they are positioned across secondary support panels 30 (see Fig. 9). The mating edging profiles 40 are received within the cavity formed between parallel limbs 30a, 30b of the secondary support beam 30. The underside corners presented by the tongue and groove profiles 40 are close enough to the inside upper corners of the support beam 30 so as to prevent disengagement of the profiles, thereby ensuring that the cassette panels 12 cannot slide and separate to produce gaps in the finished floor. Preferably, the gap A between the corners is less than 2.5mm, more preferably less than 1.5mm, especially about 1mm.

[0029] Thus, the present flooring system incorporates much lower profile tongue and groove profiles, as well as non-fixed strengthening spines or secondary support beams, so that the components of the system can all be disassembled, stored and transported in a compact format, thus requiring less space overall. The tongue and groove edging profile of the system of the invention typically has an overall height of less than 40mm, preferably

less than 30mm, especially being about 26mm. In contrast, conventional cassette flooring systems have profiles of more than 80mm, typically being around 96mm.

[0030] The system consists of main or primary support beams incorporating two vertical legs into which specially shaped slots or notches have been introduced at specific intervals along its length. Secondary support beams or "cross rails" are located in precise positions provided by the shaped notches, and are held in position on both horizontal axes by ensuring that the slot feature in the cross rail is engaged with the main beam. Adjacent connecting cassette panels are engaged via mating edging profiles which are then retained within the secondary support beam.

[0031] The flooring system benefits from being quick and easy to assemble and disassemble, breaking down into a small number of constituent parts, so the system is easy to pack and transport from warehouse to site. The flooring system is fully reusable for frequent installations and can be configured in a variety of panel sizes to suit different applications.

[0032] Further modifications to the flooring system of the invention may be made without departing from the principles embodied in the examples described and illustrated herein.

Claims

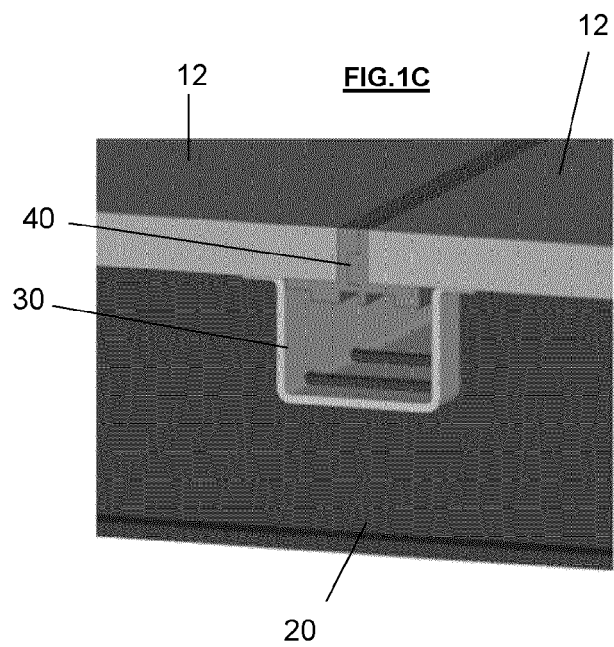
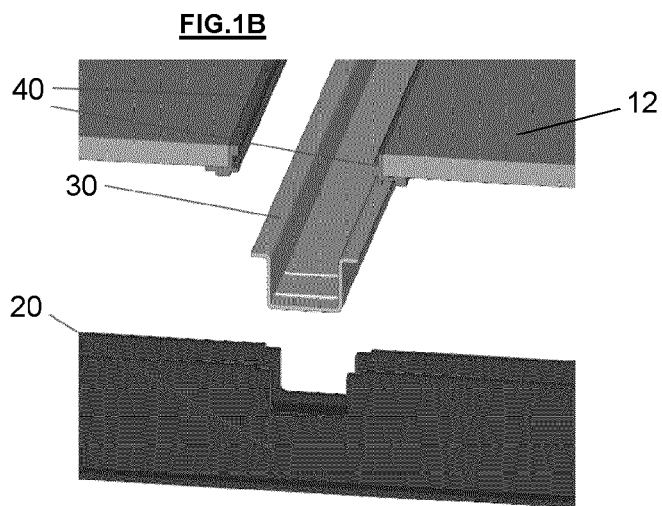
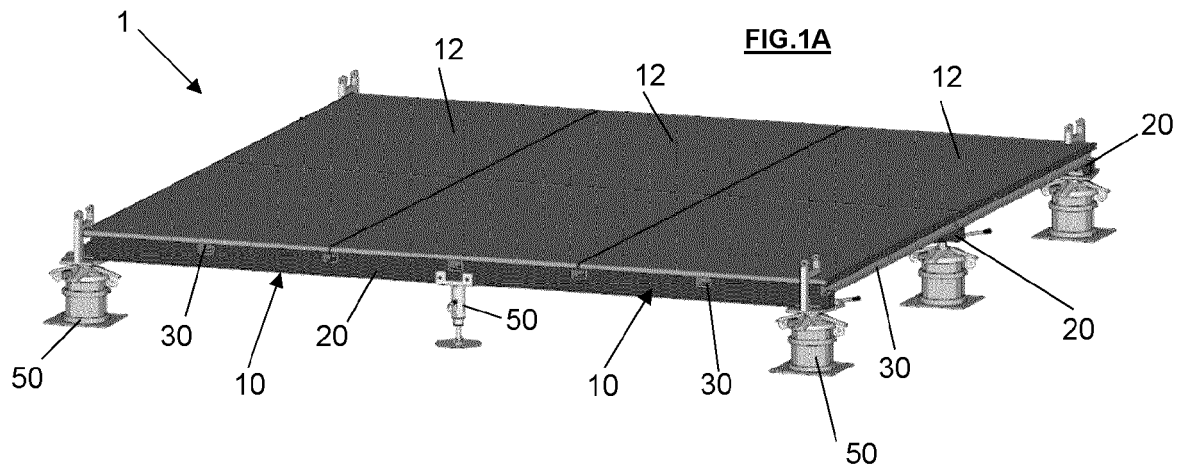
1. A temporary flooring system comprising a modular frame comprising at least two primary support beams and at least two secondary support beams wherein each primary support beam has at least one recess in its upper surface for receiving a secondary support beam substantially perpendicularly to the primary support beam, the system further comprising at least one flooring panel, the at least one flooring panel being configured to be received on the frame.
2. The flooring system as claimed in claim 1, wherein the at least one flooring panel is provided with an edging profile along at least one edge for engagement with another edging profile on an adjacent flooring panel.
3. The flooring system as claimed in claim 2, wherein adjoining profiles are at least partially received within a secondary support beam, the profiles being parallel with the secondary support beams in the assembled system.
4. The flooring system as claimed in any one of the preceding claims, wherein each primary support beam is an extruded substantially U-shaped section having two parallel limbs.
5. The flooring system as claimed in claim 4, wherein an upper part of each limb is provided with spaced

apart U-shaped recesses or cut-outs, each recess or cut-out of one limb being provided in line with a recess or cut-out of its parallel limb, preferably wherein an indent or notch is provided between an upper edge of each limb and each end of the U-shaped cut-out to form a shoulder.

6. The flooring system as claimed in any one of the preceding claims, wherein each free end of a primary support beam is provided with a partial cut-out or recess, preferably wherein half a cut-out or recess is provided for mating with the free end of another primary support beam to provide beams of indefinite length.
7. The flooring system as claimed in claim 5 or claim 6, wherein each secondary support beam is substantially U-shaped having parallel limbs, a part of each secondary support beam being dimensioned for receipt within parallel recesses or cut-outs of a primary support beam.
8. The flooring system as claimed in claim 7, wherein each limb of the secondary support beam has a flange extending substantially perpendicularly outwardly from the limb whereby the secondary support beam is supported within the primary support beam substantially perpendicularly thereto, with the U-shaped profile of the secondary support beam being received within the U-shaped cut-outs/recesses of the primary support beam, with each flange of each secondary support beam resting on a shoulder of its primary support beam.
9. The flooring system as claimed in any one of the preceding claims, wherein at least one slot is provided across a base of each secondary beam, preferably wherein the at least one slot is provided towards each end of the beam, more preferably wherein each slot extends a small distance into each limb.
10. The flooring system as claimed in claim 9 wherein a pair of slots is provided towards the end of each beam, the pair of slots being spaced apart by a distance corresponding to the distance between parallel limbs of the primary support beam and the breadth of each slot is such as to allow it to receive an edge of the base of the cut-out or recess of the primary support beam.
11. The flooring system as claimed in any one of the preceding claims, wherein each flooring panel comprises a planar square or rectangular panel, each panel having an edging profile along at least two parallel edges, each edging profile comprising a tongue and groove edging profile.
12. The flooring system as claimed in claim 11, wherein

each profile has a panel-engaging L-shaped inner surface and an opposing tongue and groove outer surface, the outer surface of the profile being configured to provide a groove along one side of the profile and a tongue along the other side of the profile whereby adjacent panels are locatable together by mating a tongue of one edging profile with a groove of an adjacent edging profile, preferably wherein the mating edging profiles of adjacent floor panels are received within a cavity formed between parallel limbs of a secondary support beam and wherein the dimensions of the mating edging profiles provide a gap of less than 2mm between outer corners of the mating profiles and upper corners of the cavity of the secondary support beam.

13. A flooring system comprising a modular frame comprising at least two primary support beams and at least two secondary support beams wherein each primary support beam has at least two upwardly extending parallel limbs, an upper edge of each limb having a plurality of spaced apart slots or notches along its length for receiving a secondary support beam substantially perpendicularly to the primary support beam, the system further comprising at least two flooring panels, an edge of each panel having a tongue and groove edging profile for mating with an adjacent panel, the mating profile being received within a cavity of the secondary support beam.
14. The flooring system as claimed in claim 13, wherein each flooring panel is supported by at least three primary and three secondary support beams, more preferably wherein each panel is supported by a secondary support beam along its junction with another panel and along its centre.
15. A kit of parts for installation of a temporary flooring system according to any one of the preceding claims, the kit of parts comprising a plurality of primary support beams, a plurality of secondary support beams, a plurality of flooring panels and a plurality of edging profiles.



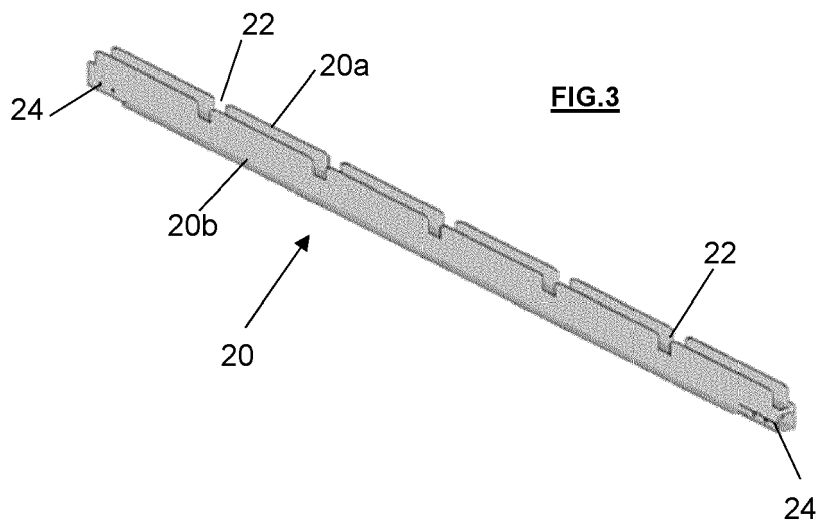
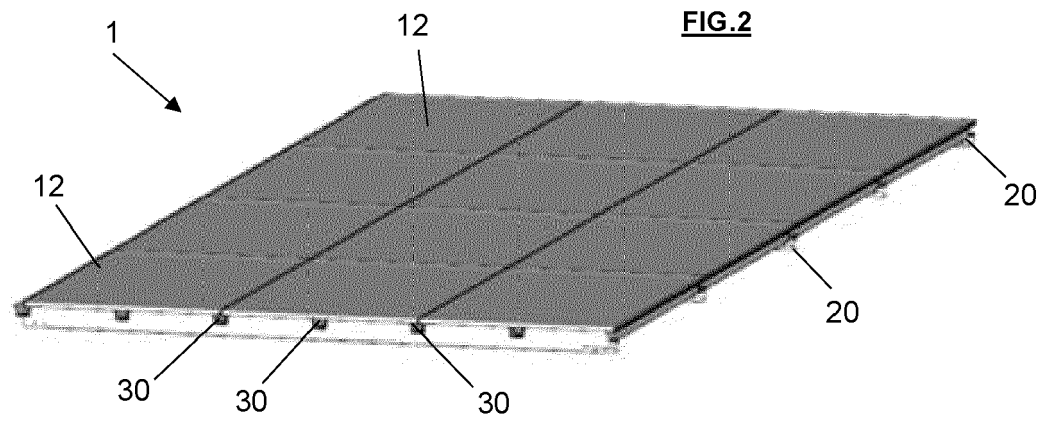


FIG.4A

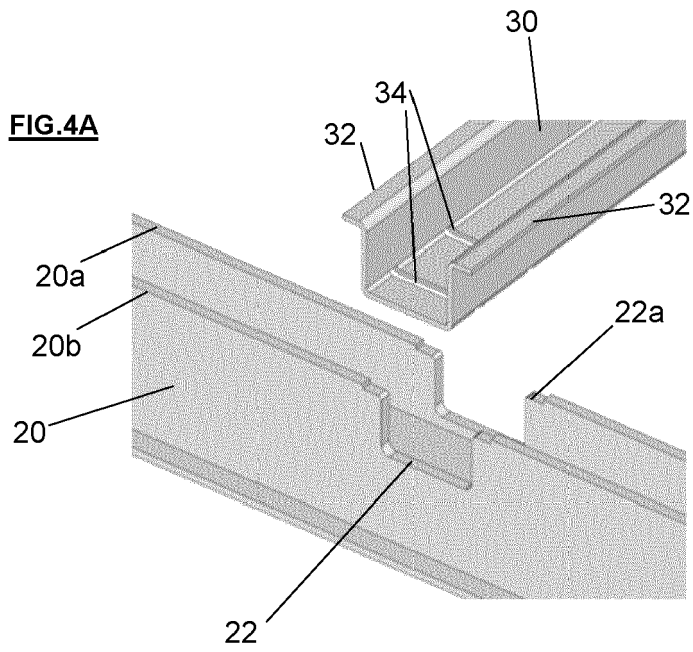
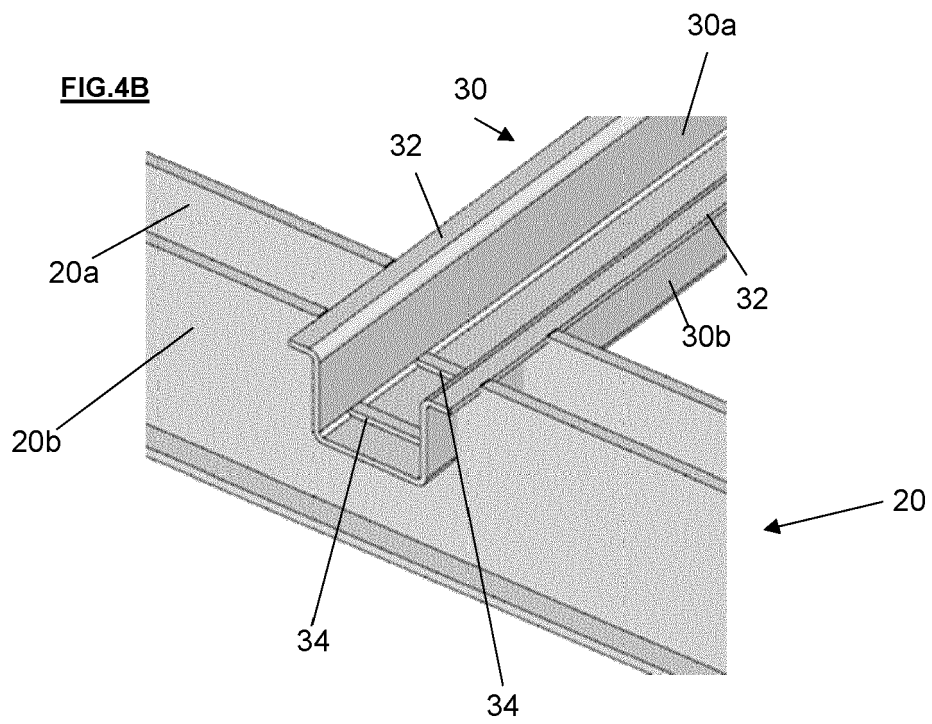
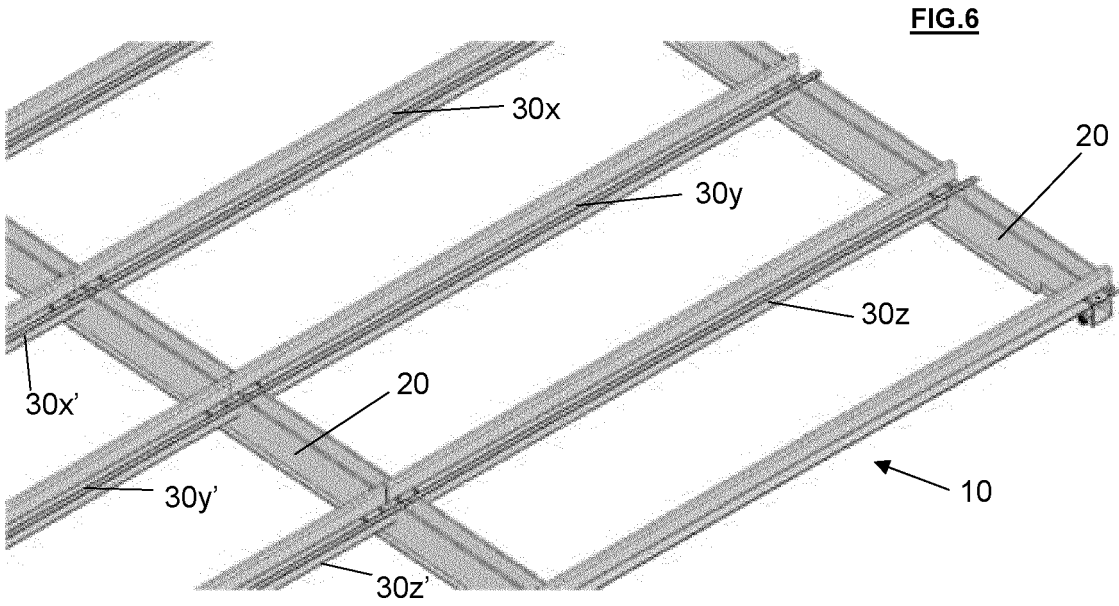
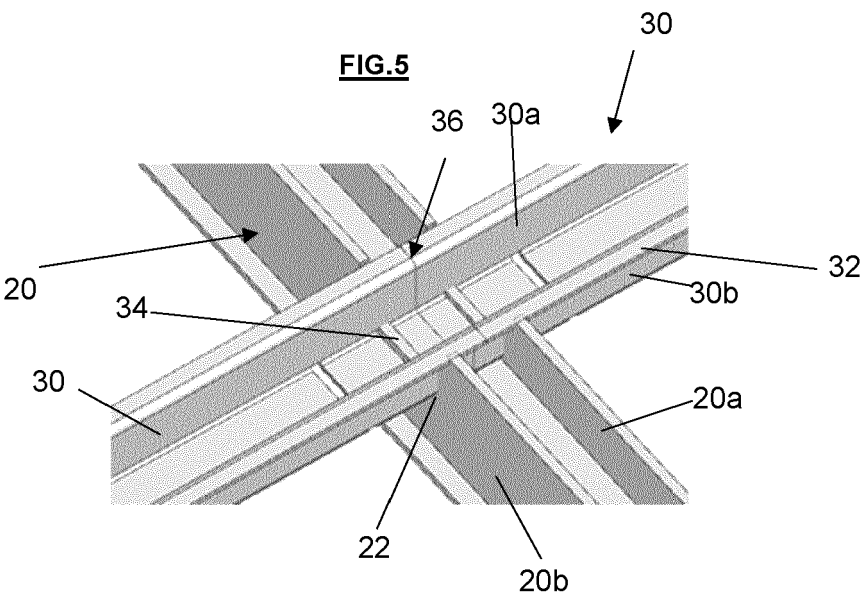


FIG.4B





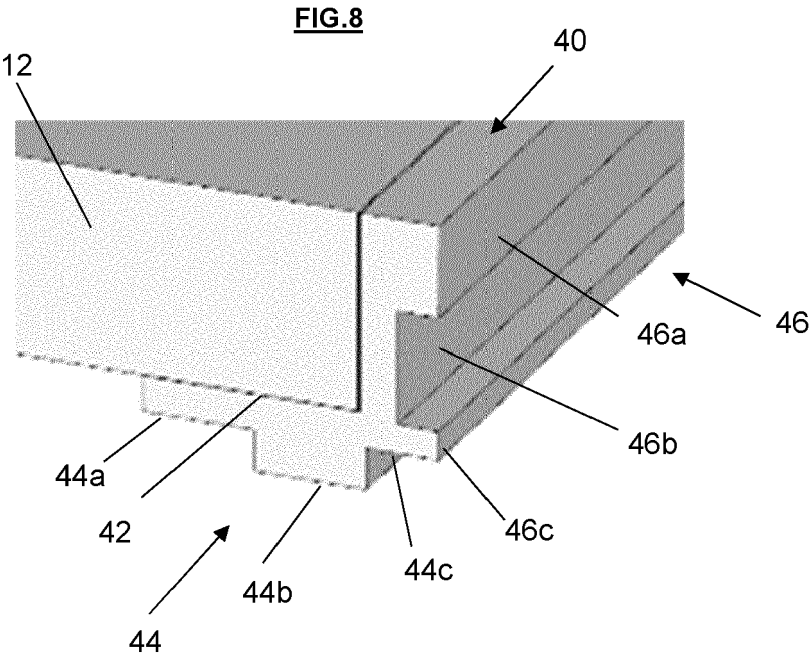
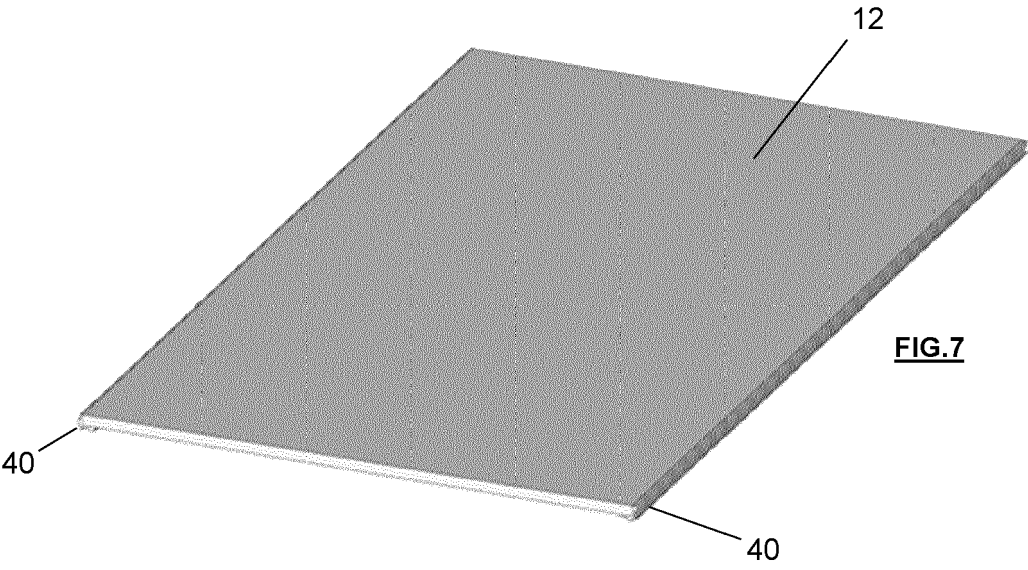
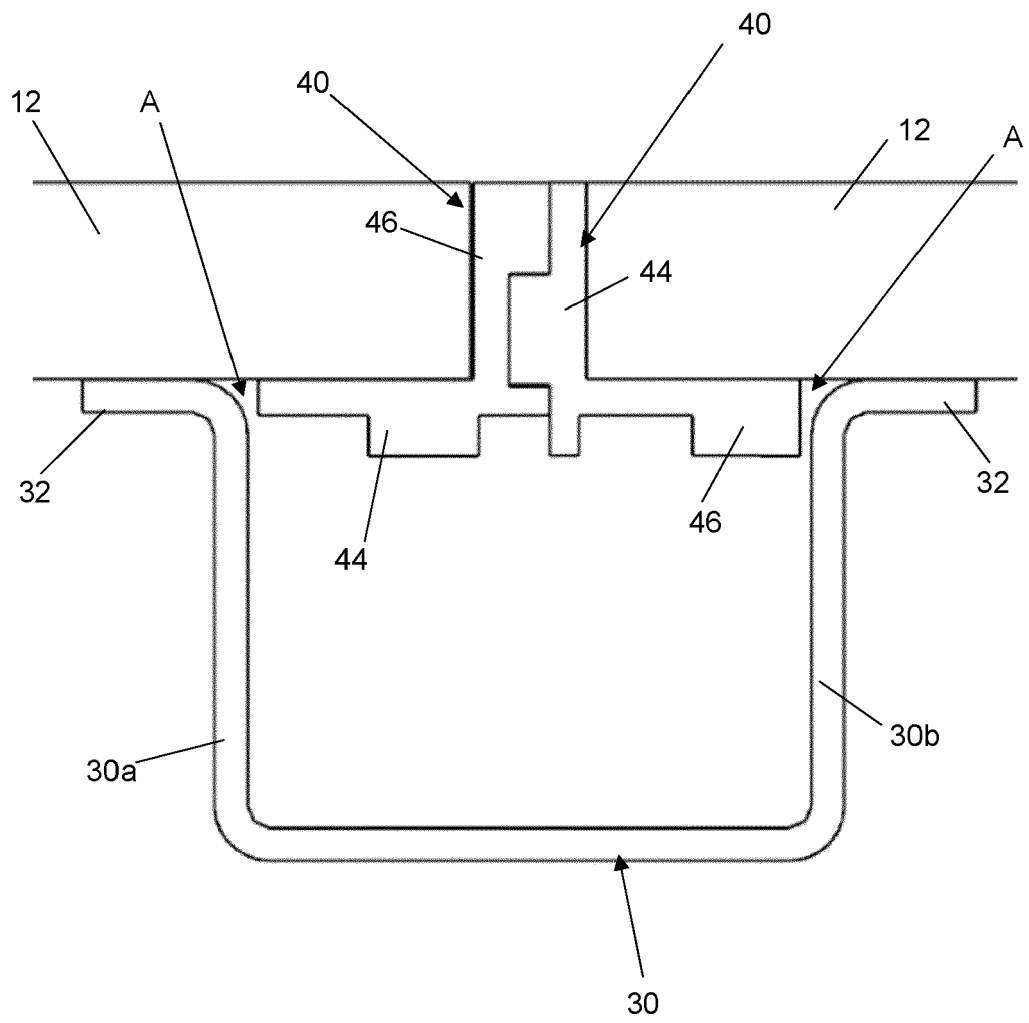


FIG.9





EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

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Y	* figures 3,5 * * column 9, line 12 - line 18 * * column 9, line 39 - line 55 * -----	2,3,8, 11-15	E04F15/02
Y	US 2013/232892 A1 (PERMESANG CLAUS [DE]) 12 September 2013 (2013-09-12) * figures 1,8 * * paragraph [0051] * -----	2,3, 11-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 October 2024	Examiner Estorgues, Marlène
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

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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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