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(54) Reusable constructing system

(57) The present invention relates to a reusable system for constructing a temporary building or tent. The present invention also relates to a temporary building or tent with such a system.

The reusable system according to the invention comprises a pair of beams (3) which extend parallel in a first direction and which at an end are coupled on the upper side by a skirting (5) in a direction perpendicularly of the first direction. The system further comprises floor panels (12) extending perpendicularly of the first direction.

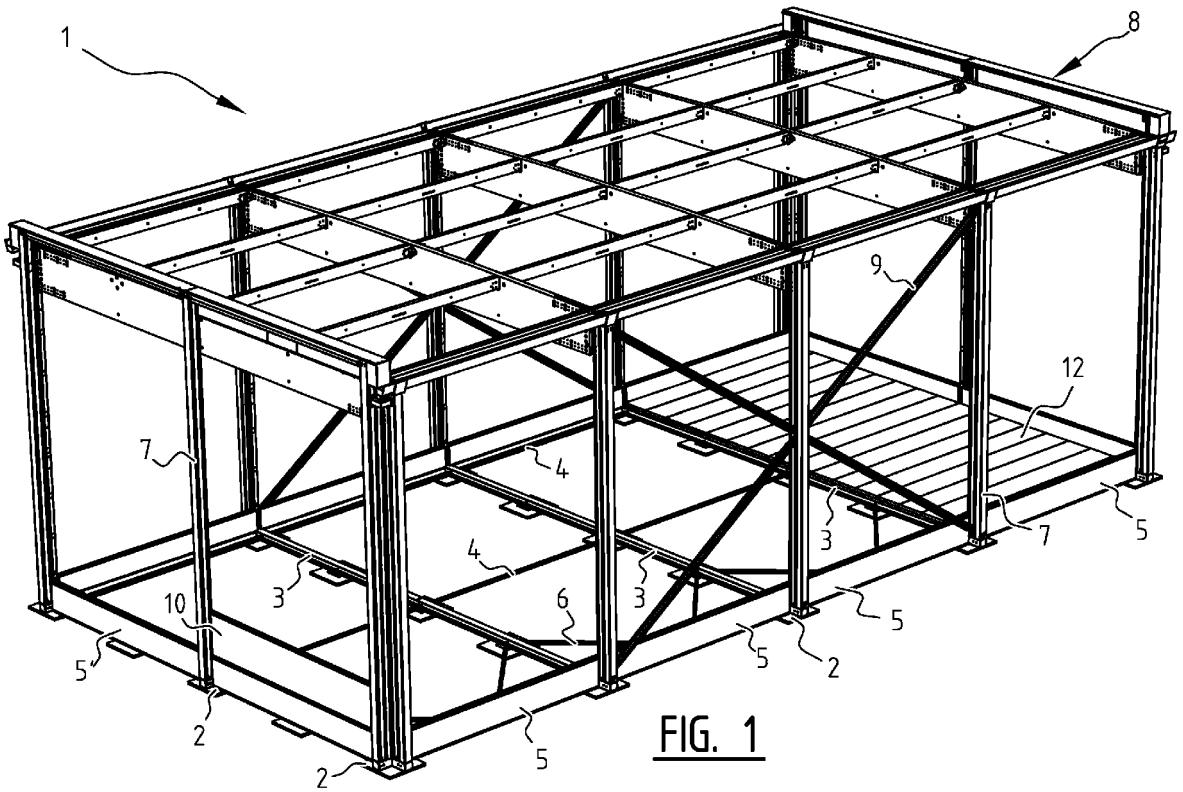

FIG. 1

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Description

[0001] The present invention relates to a reusable construction system for a temporary building or tent. The present invention also relates to a temporary building or tent with such a system.

[0002] Temporary buildings or tents are usually employed in situations where there is an urgent need for (extra) space but where the time-span necessary for permanent construction is not sufficient. Examples of such buildings are temporary accommodation for shops in cases where the original premises are being renovated, or sports centres for large sporting events.

[0003] Despite the fact that such buildings or tents have a temporary character, it is desirable that these buildings or tents can provide a certain degree of comfort and that they have sufficient structural strength to be able to guarantee safety.

[0004] National legislation or regulations usually apply to temporary buildings or tents. An example hereof is the Netherlands Buildings Decree 2003 as published in the Netherlands Gazette 410. Newly constructed temporary buildings or tents must at the same time meet strict requirements here in respect of thermal insulation and strength.

[0005] Temporary buildings or tents are known which comply with the above Buildings Decree. These temporary buildings or tents do however have a significant drawback. In order to be able to comply with the above Buildings Decree a large part of the temporary building or tent is made with non-reusable components. An important example of such a component is the floor and the manner in which it is supported. In the known temporary buildings or tents a concrete foundation is usually first cast to which the rest of the building or tent can be anchored. The floor can likewise be cast. Such components are not reusable and have to be removed when the temporary building or the tent is disassembled. It will be apparent to the skilled person that such operations are costly and time-consuming.

[0006] An object of the present invention is to provide a solution to the above problem, and particularly to provide a solution which makes it possible to place temporary buildings or tents which are largely reusable.

[0007] This object is achieved according to the invention with a reusable system for constructing a temporary building or tent comprising a pair of beams which extend parallel in a first direction and which are each connected fixedly at an end thereof, for instance in integral manner, to a separate coupling part, which coupling part is provided on an upper side with first and second coupling means and further comprises a support element for supporting an upright placed on the coupling part. The reusable system also comprises a skirting provided on an underside thereof with third and fourth coupling means placed on opposite sides of the skirting, wherein the skirting is placed perpendicularly of the first direction on the pair of beams by coupling between the first coupling means of the coupling part of the one beam and the third coupling means of the skirting and by coupling between the second coupling means of the coupling part of the other beam and the fourth coupling means of the skirting. The skirting comprises here, for instance on an upper side thereof, a profiling or other type of coupling element for coupling to a side wall of the system extending between uprights placed on the upright supports. The reusable system also has a floor panel extending between the beams in a direction perpendicularly of the first direction and resting thereon, wherein the floor panel is provided on an underside, at least at the position of the beams, with a thermally insulating spacer for preventing a cold bridge between floor panel and beam.

[0008] According to the invention both the floor and the uprights for the side walls, as well as the side walls themselves, rest on the beams via the skirtings. It is hereby not necessary in many cases to anchor the beams to the ground surface. It is usually possible to suffice with pressure distributors, which are preferably thermally insulating and which are placed under the beams at the different pressure points in the system.

[0009] A type of steel or metal is usually used as material for the beams. Such materials are characterized by a high thermal conductivity. The use of thermally insulating spacers prevents much heat being lost from the temporary building or the tent via the floor and the beams.

[0010] The floor panels are preferably thermally insulated. This can be made possible in that the floor consists of a material which conducts heat poorly, such as wood, or in that the floor is provided with an insulating layer.

[0011] Because the skirting preferably has a thermal conduction coefficient many times lower than that of the beams, good insulation of the temporary building or the tent is achieved. At the same time the mechanical construction achieves that the temporary building or the tent can meet strength requirements.

[0012] In an embodiment of the present invention the beams are substantially of metal and/or the floor panel is a substantially wooden floor panel and/or the skirting is substantially a concrete skirting. The particular combination of the above materials provides an advantageous construction in terms of strength and thermal insulation.

[0013] In embodiment of the present invention the skirting has a support edge at the position of the upper side of the beams for the purpose, together with the upper side of the beams, of supporting the floor panel. The support edge of the skirting makes it easier for a user to place the floor panels. Such an edge further enhances the sealing of the whole system. The pressure distribution via this edge also provides for a stable construction.

[0014] In an embodiment of the present invention the floor panel is provided on a side facing toward the beams with a recess for partially flush placing of the floor panel between the beams. The thickness of the floor panel is for instance smaller here at the position of the beams than between the beams, while the floor panel takes a

flat form on the upper side. Such a recess achieves that floor panels are confined between the beams.

[0015] In an embodiment of the present invention the skirting is provided on the underside with a recess for partially flush placing of the skirting between the beams. This also realizes a clamping of the skirting between the beams.

[0016] A further advantage of the above recesses in skirting and floor part is that the overall height of the system can be smaller and that the thermal insulation is further improved.

[0017] In an embodiment of the present invention a plurality of floor panels are placed adjacently of each other on the beams, wherein the floor panels are provided with coupling means for mutually coupling the floor panels in the first direction. In a further embodiment these coupling means of the floor panels comprise co-acting protrusions and recesses. These can for instance be embodied as a groove on one side of the floor panel and an edge connecting thereto on the other side. Different floor panels can hereby be coupled to each other.

[0018] In an embodiment of the present invention the skirting is provided on a side thereof with a recess which extends in the skirting in a direction opposite to the first direction and which at least partially surrounds an upright coupled to the coupling part. Because an upright is generally surrounded on two sides by a skirting, it can be partially or wholly enclosed by the skirting. In addition to providing an aesthetically desirable appearance, this once again enhances the thermal insulation.

[0019] In an embodiment of the present invention the first and third and the second and fourth coupling means can co-act to form a releasable and reusable connection. The invention therefore provides a system which can suffice without use, or with moderate use of existing coupling means such as adhesive or cement. This increases reusability of the system and reduces the environmental impact.

[0020] In a further embodiment of the present invention the third and fourth or the first and second coupling means comprise protrusions, for instance in the form of pins, and the respective first and second or the third and fourth coupling means comprise holes or recesses for co-action with the protrusions.

[0021] In an embodiment of the present invention the system comprises spacer elements placed between the beams and connected thereto. Such spacer elements are advantageous in placing the beams at the correct distance. They further have a structurally strengthening effect on the system.

[0022] In an embodiment of the present invention the system comprises a plurality of aforementioned beams which are mutually coupled by aforementioned skirtings and on which a plurality of floor panels are placed adjacently of each other. Such a system can be obtained by placing a plurality of beams adjacently of each other. These beams can be mutually connected by skirtings. It is advantageous here for the floor panels to cover in each case half an upper side of a beam so that the other half can be utilized by an adjacent floor panel.

[0023] In a further embodiment of the present invention a beam lying on the outer side of the system is fixedly connected at the end thereof in a direction perpendicularly of the first direction, for instance in integral manner, to a further coupling part to which an upright can be coupled. The outermost beams of the system give shape to the outer periphery of the system. By also providing these with a coupling part embodied as described above, the system can be provided on all sides with uprights. In a further embodiment the system comprises a skirting embodied as described above. This skirting is placed in the first direction between two further coupling parts.

[0024] In an embodiment of the present invention at least one of the aforementioned beams comprises a plurality of mutually coupled sections, wherein at least the end sections are coupled to the aforementioned coupling parts and/or wherein at least an end of a section is coupled to a further coupling part in a direction perpendicularly of the first direction. An end section is here the final section in a given direction, and the end of a section is the final part of a given section. With the combination of the above stated measures a system can be obtained which is provided round its whole periphery with skirtings and wherein uprights are also placed all the way around.

[0025] The invention also provides a temporary building or tent comprising the above described reusable system, in addition to a plurality of uprights placed on separate coupling parts of the reusable system. The temporary building or tent further comprises a plurality of side walls placed between the uprights, a lower side wall of which is coupled to a skirting of the reusable system, and it is provided with a roof coupled to the uprights.

[0026] The invention will be discussed in more detail hereinbelow, wherein:

Figure 1 shows the framework of a temporary building in which the reusable system according to the invention is incorporated;
Figure 2 is a detail view of the right-hand upper corner of the framework of figure 1;
Figure 3 is a detail view of the right-hand lower corner of the framework of figure 1;
Figure 4 is a detail view of the connection between a beam, skirting and upright in the embodiment of figure 1;
Figure 5 shows an embodiment of a beam which can be used in the system according to the invention;
Figure 6 is a perspective view of a floor panel of the embodiment of figure 1;
Figure 7 shows a cross-section of a second embodiment of the reusable system according to the invention; and
Figure 8 shows another cross-section of the embodiment of figure 8.

[0027] Figure 1 shows a framework of a temporary

building 1 according to the invention. Building 1 is placed on pressure distributors 2. It is not usually necessary to anchor pressure distributors 2 to the ground, for instance by placing pins through pressure distributors 2. This is related to the mechanical construction of building 1.

[0028] The core of the bearing construction of building 1 is formed by a plurality of metal beams 3 in parallel arrangement. These are mutually connected by spacer elements 4, which in this embodiment take the form of beams. Beams 3 are also mutually connected by skirtings 5. It is noted here that spacer elements 4 are also disposed adjacently of skirtings 5, see figure 2. These elements 4 can be connected by means of bars 6 to beams 3.

[0029] Building 1 comprises a plurality of uprights 7 which support on separate coupling parts 3', 3" of beams 3. Uprights 7 in this way connect beams 3 to a per se known roof construction 8. Crossbars 9 can also be arranged between roof construction 8 and beams 3, between different uprights 7, between upright 7 and beam 3 or between combinations thereof.

[0030] A number of side walls 10 can be received between uprights 7. The lower row of side walls 10 is coupled here to skirtings 5 in that these latter are provided on the upper side with a profiling 11. For the sake of clarity only one side wall 10 is shown in figure 7.

[0031] Placed on beams 3 are floor panels 12, of which only a small number are shown in figure 1. Floor panels 12 preferably take an elongate form in a direction perpendicularly of beams 3.

[0032] Figure 2 is a detail view of the right-hand upper corner of the framework of figure 1, wherein several floor panels are shown separately of each other for the sake of clarity. Skirtings 5 and 5' are shown in figure 2. These differ from each other in that skirting 5, i.e. the skirting placed perpendicularly of beams 3, is provided with a support edge 13 lying in the same horizontal plane as the upper side of beams 3, see also figure 4. Edge 13 together with beams 3 hereby provides a support surface on which floor panels 12 can be placed. Skirting 5' does not have such an edge because this skirting lies against a beam 3. Also shown in figure 2 is the profiling 11 which can be engaged by a side wall 10 lying above (not shown) for mutual coupling.

[0033] Figure 3 is a detail view of the right-hand bottom corner of the framework of figure 1. This figure shows clearly that floor panel 12 is provided at the position of beam 3 with a recess 12' , whereby floor panel 12 can be placed flush between beams 3. Figure 6 is a perspective view of floor panel 12. Shown herein are thermally insulating spacers 14 which for instance comprise rubber. These spacers prevent a direct contact between floor panel 12 and metal beam 3. A direct contact would after all result in the formation of a cold bridge. Arranged in floor panels 12 are grooves 18 which can co-act with edges 19 formed on the opposite side of floor panels 12, see also figure 4. Adjacent floor panels can in this way be mutually coupled in the direction of beams 3.

[0034] Figure 4 is a detail view of the connection between a beam, skirting and upright in the embodiment of figure 1. Figure 4 shows that skirting 5 also has a recess 5'. This enables the forming of support edge 13, while it also provides for confinement of skirting 5 between adjacent beams 3. Skirtings 5 are also provided with recesses 15 which ensure that upright 7 is partially surrounded by skirtings 5. This also achieves a better sealing of the system.

[0035] Figure 5 shows an embodiment of a beam 3 which can be used in the system according to the invention. This figure shows how beam 3 is integrally connected to a coupling part 3'. This part comprises a support element 16 for coupling to an upright 7 to be placed thereon by means of a pin 21 through corresponding openings in upright 7 and support element 16. Coupling part 3' also comprises first and second coupling means, here in the form of holes 17. These holes can co-act with third and fourth coupling means which comprise pins 20 (shown in broken lines) arranged on the underside of skirting 5. Use is made here of metalwork attached to the underside of skirting 5 during casting of skirting 5.

[0036] Figure 5 also shows a further coupling part 3". This part can be fixed to beam 3 but can also be connected integrally to this beam. The resulting combination of beam 3 and coupling parts 3', 3" can for instance be used in the corners of building 1 where two uprights 7 are placed. The upper hole 17 of further coupling part 3" in figure 5 can be used for the coupling to a skirting 5' for the purpose of forming the side of building 1 running parallel to beam 3, see also figure 1. The lower hole 17 can be left unused here. The other coupling part 3" necessary for placing of such a skirting 5' is likewise connected to a beam 3. The locations where this has taken place can be identified in figure 1 in that an upright 7 is placed at these locations.

[0037] Figure 7 shows a cross-section of a further embodiment of the present invention. Shown here are beams 30 which fulfil a similar function to beams 3 of the above described embodiment. Connected to beams 30 are projections 31 on which rest floor panels 120. It is noted here that the end floor panels 120 do not support on an edge of a skirting 50 such as edge 13 of skirting 5 of figures 2 and 4. This aspect also follows from figure 8 which shows a cross-section parallel to the longitudinal direction of beams 30.

[0038] Floor panels 120 are mutually coupled in a direction parallel to the longitudinal direction of beams 30 by co-acting recesses and projections of adjoining floor panels 121 in similar manner as shown in respect of elements 18 and 19 in figures 4 and 6. These recesses and projections are designated in their entirety with numeral 122.

[0039] For flat finishing of the floor, cover plates 121 are used in order to fill the space between floor panels 120.

[0040] Use is preferably also made in the embodiment of figures 7 and 8 of thermally insulating spacers similar to element 14 of figure 6, in order to prevent the formation

of cold bridges between beam 30 and floor panel 12.

[0041] It will be apparent from the above description that load on building 1 is transmitted to the ground via beams 3. Due to the own weight of building 1 an anchoring of beams 3 is therefore never or hardly ever necessary. In addition, a good thermal insulation is achieved with the construction according to the invention. This combination makes it possible to realize in a reusable manner temporary buildings which comply with currently valid building regulations. The buildings can hereby also remain in use for a longer time. The environmental impact of buildings realized according to the present invention can also be described as very low because the material to be discarded is limited to a minimum.

[0042] It will be apparent to the skilled person that various modifications are possible to the embodiments shown here without departing from the scope of protection of the present invention, which is defined by the following claims.

Claims

1. Reusable system for constructing a temporary building or tent, comprising:

   a pair of beams which extend parallel in a first direction and which are each connected fixedly at an end thereof, for instance in integral manner, to a separate coupling part, which coupling part is provided on an upper side with first and second coupling means and further comprises a support element for supporting an upright placed on the coupling part;
   a skirting provided on an underside thereof with third and fourth coupling means placed on opposite sides of the skirting, wherein the skirting is placed perpendicularly of the first direction on the pair of beams by coupling between the first coupling means of the coupling part of the one beam and the third coupling means of the skirting and by coupling between the second coupling means of the coupling part of the other beam and the fourth coupling means of the skirting, wherein the skirting comprises on an upper side thereof a profiling for coupling to a side wall of the system extending between uprights placed on the upright supports; and
   a floor panel extending between the beams in a direction perpendicularly of the first direction and resting thereon, wherein the floor panel is provided on an underside, at least at the position of the beams, with a thermally insulating spacer for preventing a cold bridge between floor panel and beam.

2. System as claimed in claim 1, wherein the beams are substantially metal beams and/or wherein the floor panel is a substantially wooden floor panel and/or wherein the skirting is a substantially concrete skirting.

3. System as claimed in claim 1 or 2, wherein the skirting has a support edge at the position of the upper side of the beams for the purpose, together with the upper side of the beams, of supporting the floor panel.

4. System as claimed in any of the foregoing claims, wherein the floor panel is provided on a side facing toward the beams with a recess for partially flush placing of the floor panel between the beams.

5. System as claimed in any of the foregoing claims, wherein the skirting is provided on the underside with a recess for partially flush placing of the skirting between the beams.

6. System as claimed in any of the foregoing claims, wherein a plurality of floor panels are placed adjacently of each other on the beams, wherein the floor panels are provided with coupling means for mutually coupling the floor panels in the first direction.

7. System as claimed in claim 6, wherein the coupling means of the floor panels comprise co-acting protrusions and recesses.

8. System as claimed in any of the foregoing claims, wherein the skirting has on a side thereof a recess which extends in the skirting in a direction opposite to the first direction and which at least partially surrounds an upright coupled to the coupling part.

9. System as claimed in any of the foregoing claims, wherein the first and third and the second and fourth coupling means can co-act to form a releasable and reusable connection.

10. System as claimed in claim 9, wherein the third and fourth or the first and second coupling means comprise protrusions, for instance in the form of pins, and wherein the respective first and second or the third and fourth coupling means comprise holes or recesses for co-action with the protrusions.

11. System as claimed in any of the foregoing claims, further comprising spacer elements placed between the beams and connected thereto.

12. System as claimed in any of the foregoing claims, comprising a plurality of aforementioned beams which are mutually coupled by aforementioned skirtings and on which a plurality of floor panels are placed adjacently of each other.

13. System as claimed in claim 12, wherein a beam lying on the outer side of the system is fixedly connected at the end thereof in a direction perpendicularly of the first direction to a further coupling part.

14. System as claimed in claim 13, further comprising a skirting according to claim 1 placed in the first direction between two further coupling parts.

15. System as claimed in any of the foregoing claims, wherein at least one of the aforementioned beams comprises a plurality of mutually coupled sections, wherein at least the end sections are coupled to the aforementioned coupling parts and/or wherein at least an end of a section is coupled to a further coupling part in a direction perpendicularly of the first direction.

16. Temporary building or tent comprising:

the reusable system as claimed in any of the foregoing claims;
a plurality of uprights placed on separate coupling parts of the reusable system;
a plurality of side walls placed between the uprights, a lower side wall of which is coupled to a skirting of the reusable system;
a roof coupled to the uprights.

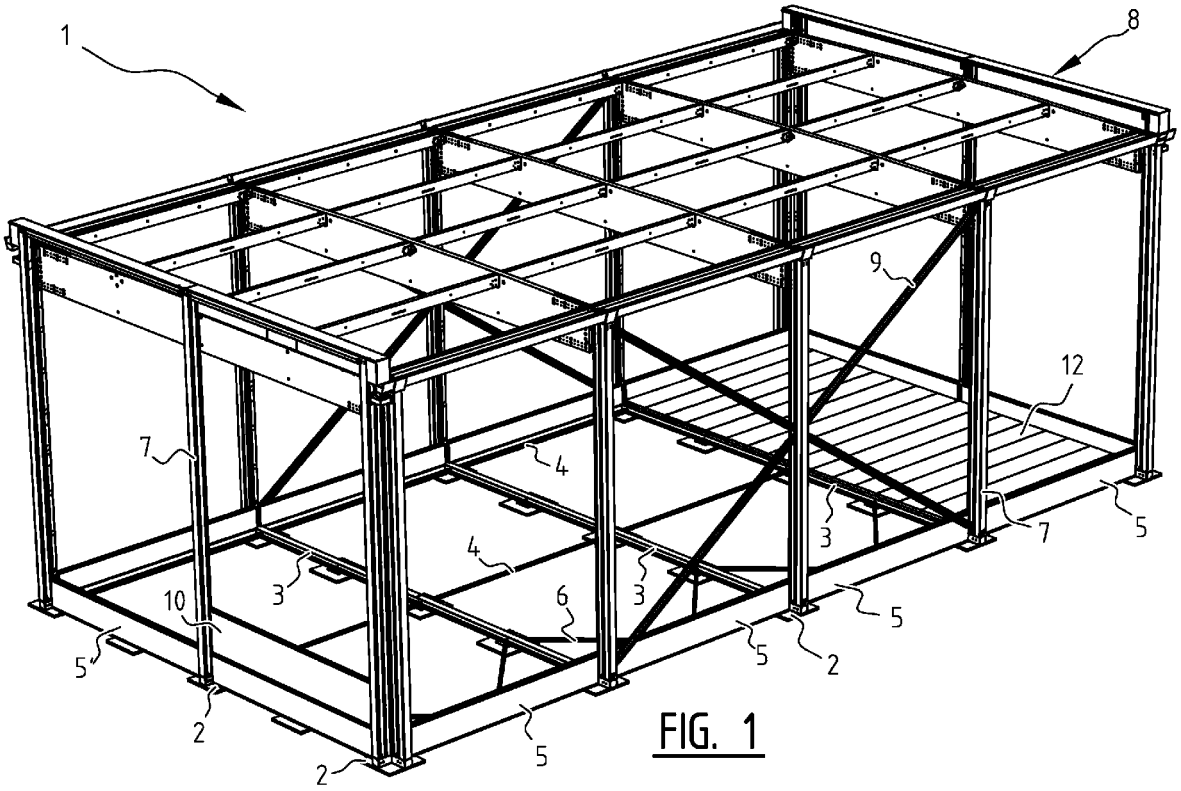

FIG. 1

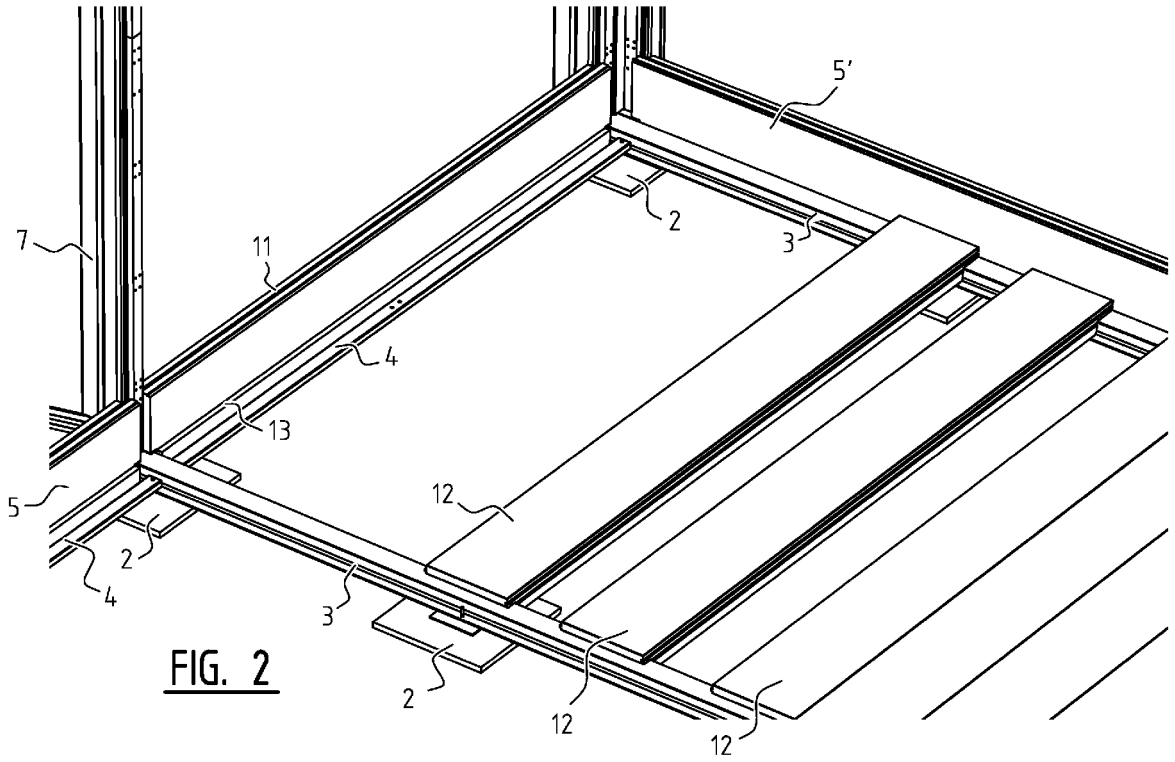

FIG. 2

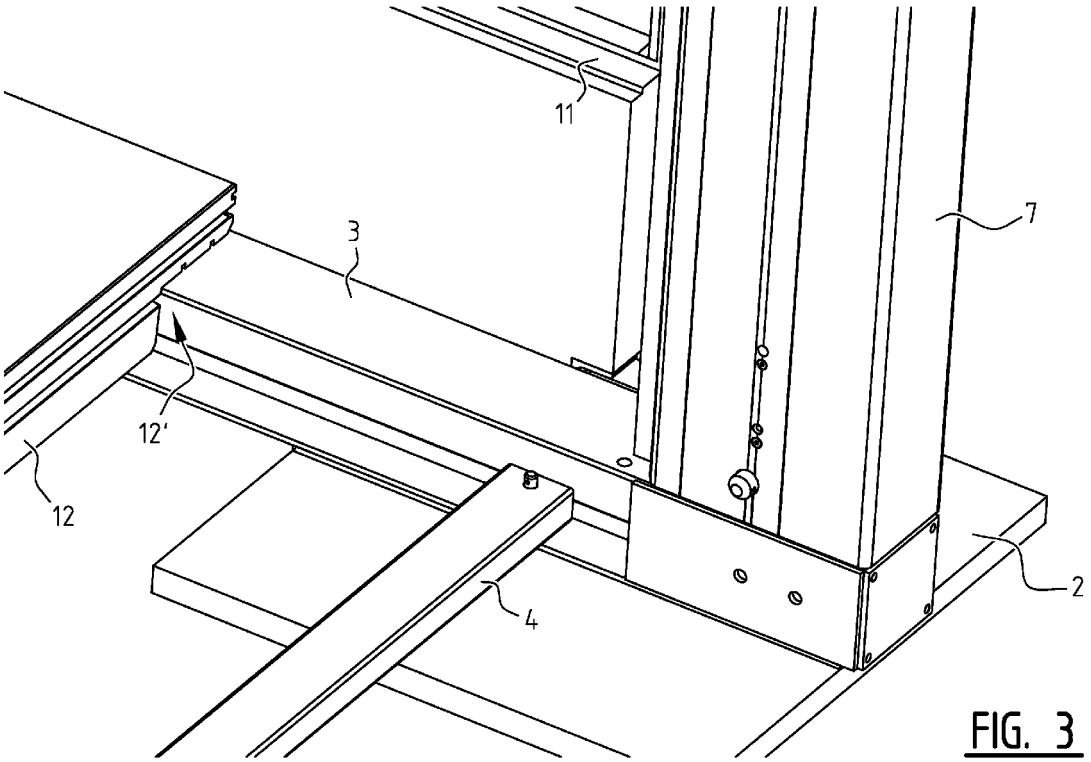

FIG. 3

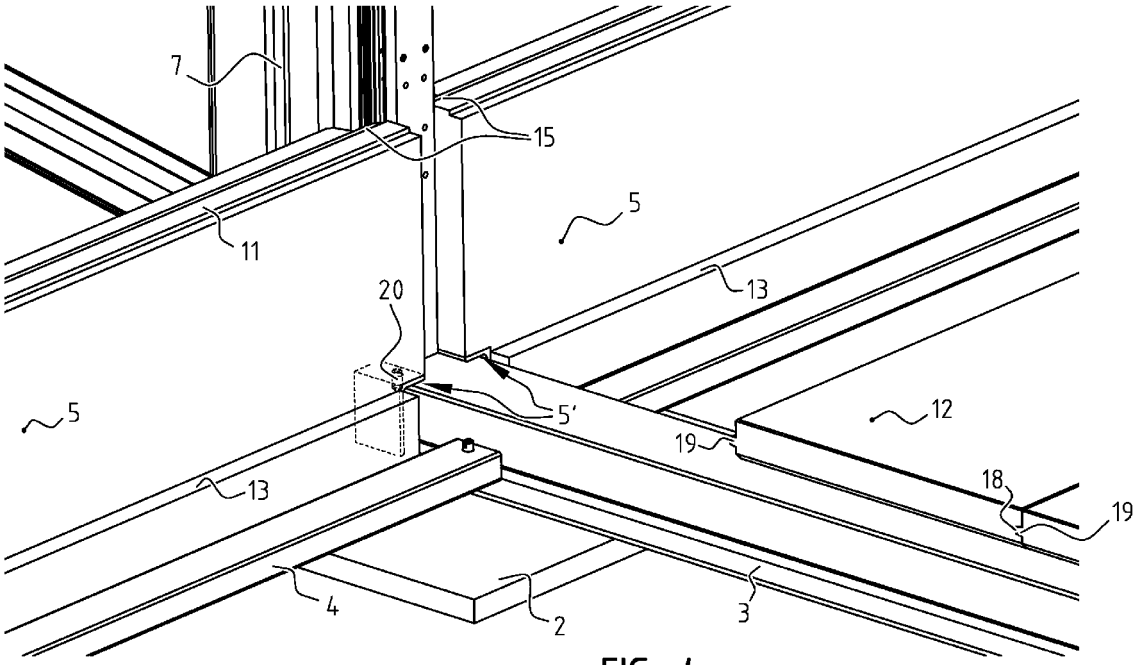

FIG. 4

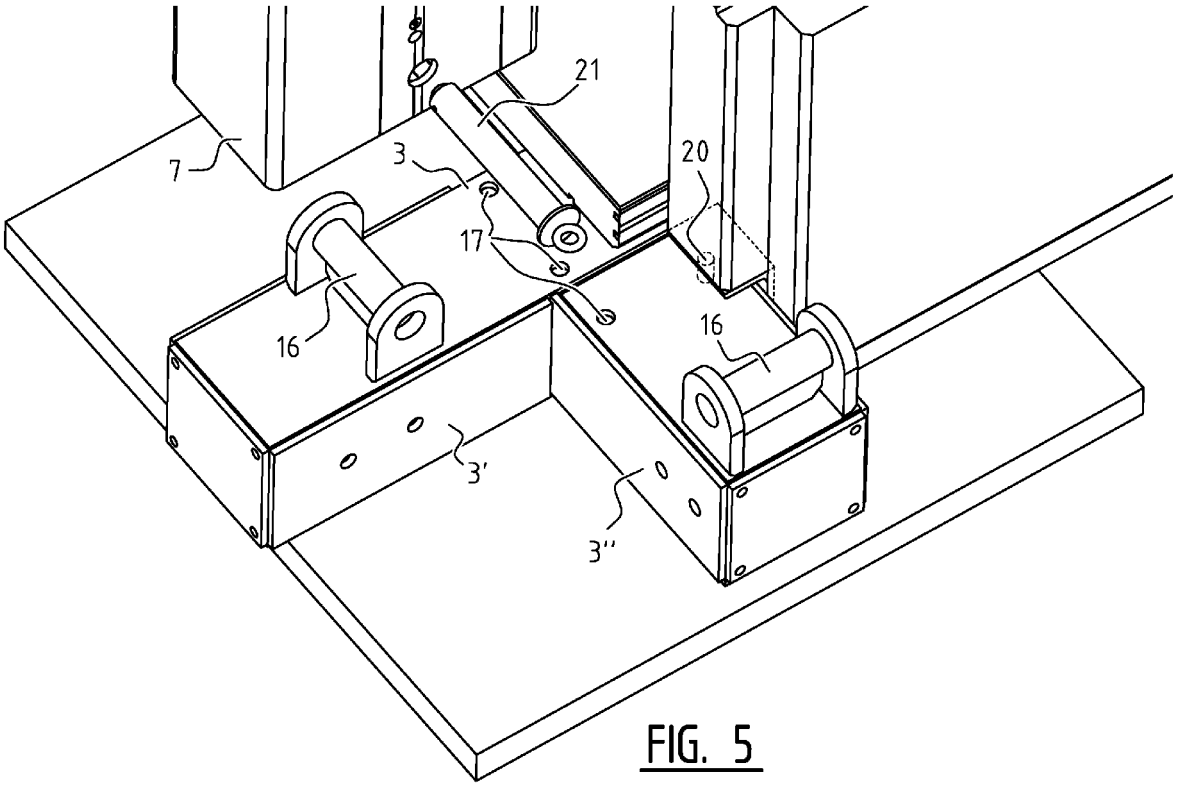

FIG. 5

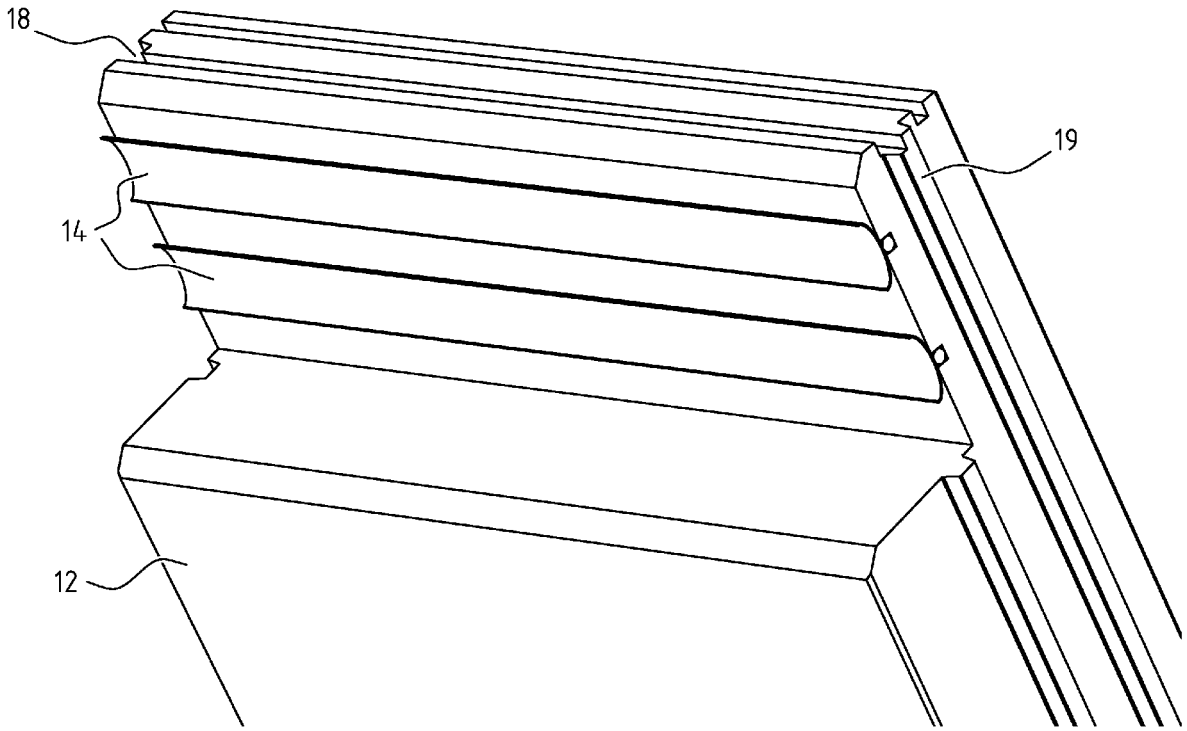

FIG. 6

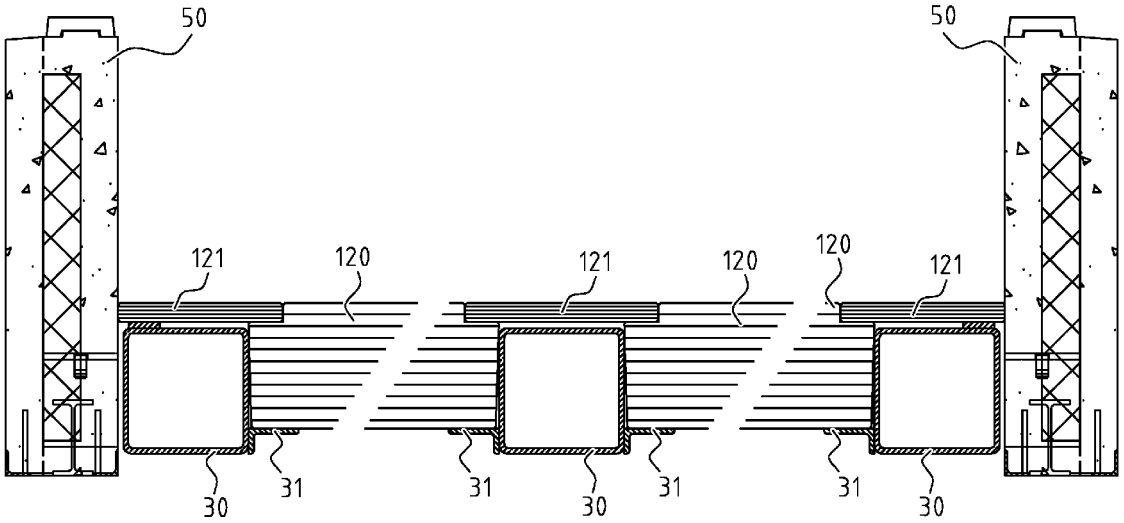

FIG. 7

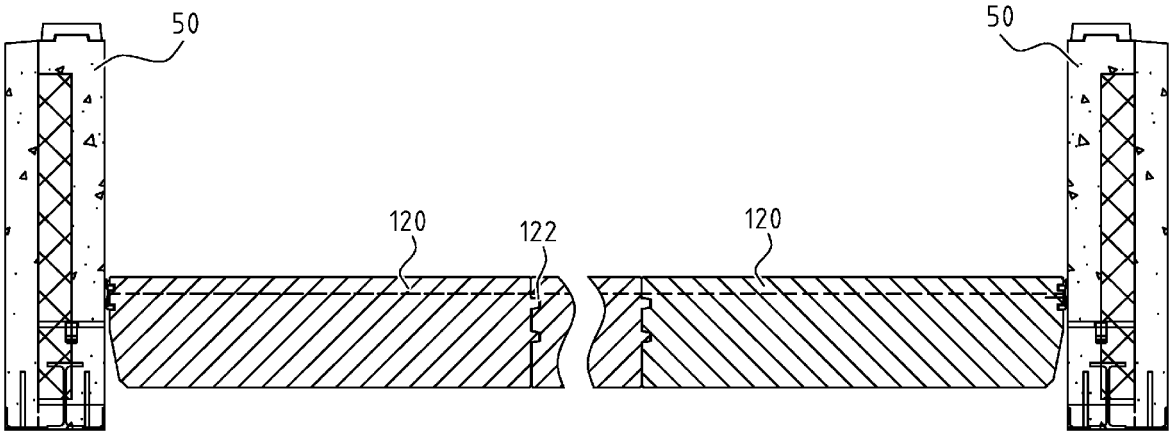

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
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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
The Hague	17 July 2012	Zuurveld, Gerben

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 16 8541

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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