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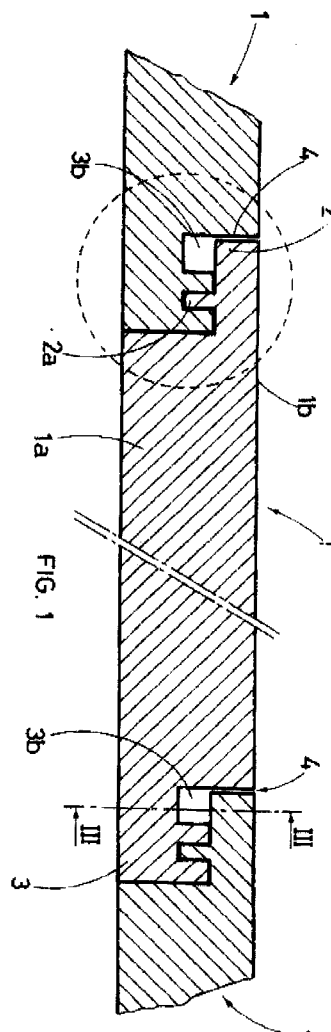
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(54) **Modular floor panels for the construction of climatic chambers.**

(57) The present invention concerns a modular panel (1) for the manufacturing of modular floors for climatic (or thermostatic) chambers complete with longitudinal edges suitably drawn, in order to enable a joint assembling with other identical panels placed side by side; being provided that in correspondence to its longitudinal edges are used suitable composite coverings instead of the simple metallic sheet (1b).



The subject of the present invention apply for a patent concerning a floor panel assembly made by jointing together several similar panels. They are used for the construction of suitable modular floors of climatic chambers for testing of equipment or products to be subjected to temperature or temperature and relative humidity conditions.

These chambers are able to simulate, at users' will, different environmental conditions - cold, heat, humidity and dry - according to the type of tests to be carried out. The chambers consist mainly of suitably insulated rooms having a compoundable floor made with panels to be assembled side by side in order to cover the superficial extent of the chambers.

The problematic point of the chambers actually produced is just about the floor manufacturing, this considering the precarious solutions used till now for its realization. In particular the main functional lack that can be pointed out on these floors is the reduced sealing capacity they have; this due to the water condensation often present inside these chambers and due to the temperature variations to be performed inside.

Really, at present, the floors are made with panels jointed side by side using connecting hooks and sealed, in correspondence to their matching edges, with siliconic materials or similar. These structures allow the gathering and drainage outside the chambers of the water condensation (eventually present on the floor) by means of draining holes. These are placed at the corners of the chamber floors.

Such a structure is not very efficient in respect to the specific conditions of the use of a climatic chamber: in fact, the gathering and drainage of the water from the floor by means of the above mentioned draining holes is not completely assured. Puddles formation in the zones of the floor, farther from the special draining holes, are often an unavoidable consequence.

A long staying of this water on the floor of a climatic chamber is a considerable disadvantage for a good maintenance and the efficiency of the structure; this because this water easily risks to become iced as a consequence of a significant temperature decrease.

Icing of the water stagnant on the floor is quite undesirable, but it becomes fully harmful if a little quantity infiltrates, in some way, within the panel junctions, also passing through the holes in which are set the hooks for the panels blocking.

It is obvious that, due to the ice formation, the volume of the water infiltrated between the floor panels increases; this causes a tension of the materials with a deformation (sometimes permanent) of the matching edges of the floor panels.

Just in order to avoid similar problems, the panels of the floors actually manufactured are subjected to meticulous sealing operations, both regarding the contact points with other panels and in correspond-

ence of any hole or gap present on them. These are weak points for the water infiltration.

Anyhow in the case, not so unusual, of chamber displacement in another location, it would cause another disadvantage related to the difficulties in the disassembling of the above mentioned floor panels without damaging them.

Taking in consideration this operative difficulties, typical for the actual climatic chambers, it has been provided a realization of the modular floors according to the present invention. It is essentially characterized from its excellent draining capacity of the water from the climatic chamber using this floor; this allows a perfect and complete drainage of all the condensate.

This satisfactory draining capacity is related to the panel configuration; the new floor in question has been made according to this purpose.

Each panel incorporates a draining groove, within which the water present on the floor can flow by means of the small slot that, at this purpose, is present within the edges of adjacent panels. It is still foreseen that such a groove has a slope to help the water to be collected outside.

Another characteristic of the floor, realized as per this invention, is represented by the system projected to joint the panels, adapting the panel edges in order to fit and fix them as per a male / female joint.

First of all it can be definitively avoided any risk to have presence of water outside the above mentioned draining groove. On the other hand, it is allowed the composition of all the panels to build up the climatic chamber floor only jointing them, without using any other hooking system or sealing material.

Furthermore without any fitting materials between the panels - unlike actually it is used - it can be realized a perfect smooth walking surface on the floor that does not hamper in any way the activity of the personell that have to load (unload) the devices to be tested into the chamber (to be carried manually or using a trolley).

It is obvious that beyond an easy and effective assembling, it has to be possible to perform an easy dismounting activity of such a floor. If necessary to dismount, it is enough to remove the panels from the above mentioned jointing position, without any risk to cause damages that could cause a difficult re-use.

For a better understanding of the description of this invention, see the enclosed drawings (having only indicative purposes and obviously do not limit the invention):

- figure 1 shows the fitting between three panels, placed side by side, used for the realization of the floor in question, as per a transversal plane (perpendicular to the longitudinal axis of each panel);
- figure 2 is an enlarged drawing of the edges fitting by jointing two panels (side by side), that are represented in a closer position, immediately before to be jointed;

– figure 3 is the section of figure 1 in the panel III-III.

With reference to figure 1, a floor for climatic chambers can be made using similar rectangular panels (1), with their length having the same dimension as the width of the climatic chamber and to be placed side by side in the needed number. It has been foreseen the presence of the thin parallel slots that separate the panel edges and located according to the transversal section (of the chamber).

Each of the panels (1) consists of a parallelepiped polyurethane body (1a) covered with a thin steel sheet (1b). An peculiar characteristic of such a panel is represented by the special profile of the longitudinal edges.

Really, each of the longitudinal panel edges (1) (see left side of enclosed drawing) shows a horizontal wing (2) whose upper face is aligned with the walking floor; the lower face shows a longitudinal bead (2a) extended all its length, having a rectangular cross section.

The lateral counter-edge (see right side of enclosed drawing shows a horizontal wing (3) whose lower face is aligned with the base surface of the panel (1); the upper face of the wing (3) has two joints (3a) and (3b) extended all its length. The first one (3a) is external and it is the right site for the above mentioned bead (2a) of the wing (2) of the adjacent panel (1); the second one (3b) is placed inner and it is equipped with a suitably inclined base wall. This is for the gathering and drainage of the condensed water, that is conveyed by means of the thin slot (4) between the longitudinal edges of the two panels (1) placed side by side.

In order to allow the presence of such a slot (4), the wing (3) must result a little bit wider than the wing (2). This last once works as a roof of the grip (3b) once they are fitted.

With reference to figure 2, it is stated, first of all, that the longitudinal panel edges (1) are coated with special PVC films; they avoid both the thermal bridges between the internal and external metallic sheets and assure a perfect sealing of the drain grip (3b).

In particular the wing (2), foreseen on the left panel edge (1), is covered on the upper side with the same steel sheet (1b) that works as the walking surface of the whole panel (1); sideways the wing (2) is covered, for a short part on the lower side, with a PVC profile (5) having peculiar anti-wearing features. It is able to suitably protect this zone of the wing (2) that is particularly subjected to impacts, frictions or deformations.

For the lower section, included the bead (2a), the above-mentioned wing (2) is coated with a thermoinsulating PVC profile (6) that reaches the bottom side of the panel (1).

The wing (3), present on the right side of the panel (1), is coated with a thermoinsulating PVC profile (7);

this one covers the lateral side and the external channel (3a) stopping at the drain grip (3b); the drain grip (3b) is coated with the same metallic sheet (1b) that covers the surface of the walking panel (1).

Finally it is stated that all contact points between the different coating materials have to be sealed with silicone, in order to avoid that the internal poliurethan foam (1a) of each panel (1) could be infiltrated by the water passing through the drain grip (3b).

Claims

1) Modular panel for the manufacturing of modular floors for climatic (or thermostatic) chambers having a parallelepiped shape, made in polyurethane foam (1a) and metallic sheets (1b), characterized in that it presents longitudinal edges suitable to allow assembling by means of joints to other similar panels positioned side by side; being provided that one of the edges of the panel (1) has an horizontal wing (2) having the upper face perfectly smooth and aligned with the walking plane, and the lower face having a longitudinal bead (2a) all over its length, the longitudinal bead (2a) has a rectangular transversal section; on the opposite side of the same panel (1) it is present an horizontal wing (3) having the lower face aligned with the bottom of the panel (1), and the upper face having two splines (3a) and (3b) present all over its length. The first spline (3a), towards the exterior, works as a housing for the mentioned longitudinal bead (2a) of the wing of the adjacent panel (1), while the second spline is placed towards inside, and it is complete with a bottom suitably inclined; this works as a draining collector for the condensation water that is collected through the slim slot (4) staying between the two longitudinal edges of the panels (1) once placed side by side. It is provided that the width of the wing (3) has to be larger than the wing (2) in order that, once coupled, it works as a roof for the draining collector (3b).

2) Modular panel for the manufacturing of modular floors for climatic (or thermostatic) chambers as per claim 1) characterized in that it provides, in correspondence to its longitudinal edges, suitable composite coverings instead of the simple metallic sheet (1b); being provided that the wing (2) is only covered on the upper part with the same stainless steel sheet (1b) covering the walking plane of the whole panel (1); on the lateral side and for a short part on the lower side it is covered with a PVC sheet (5) having strong anti-wear characteristics, and on the remaining lower part, including the longitudinal bead (2a), it is covered with a thermoinsulating PVC drawn sheet (6) extending till the end wall of the panel (1); being otherwise provided the wing (3) is covered with a thermoinsulating PVC drawn sheet (7) covering the lateral surface and the outer groove (3a), the cover stops in corris-

pondence to the draining groove (3b) that is covered with the same metallic frame (1b) covering the walking plane of the whole panel (1); being provided to take care in all contact points between the above mentioned covering materials to provide an accurate sealing with siliconic materials.

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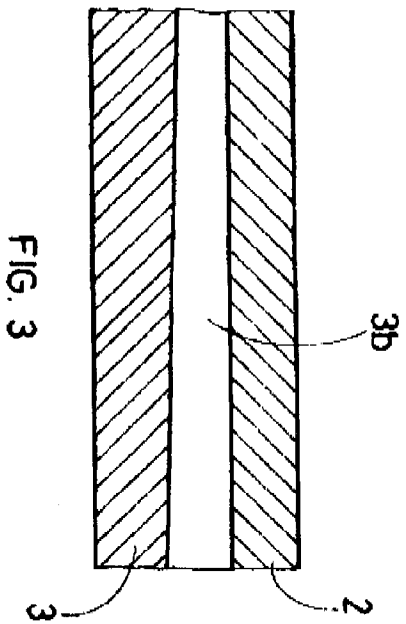
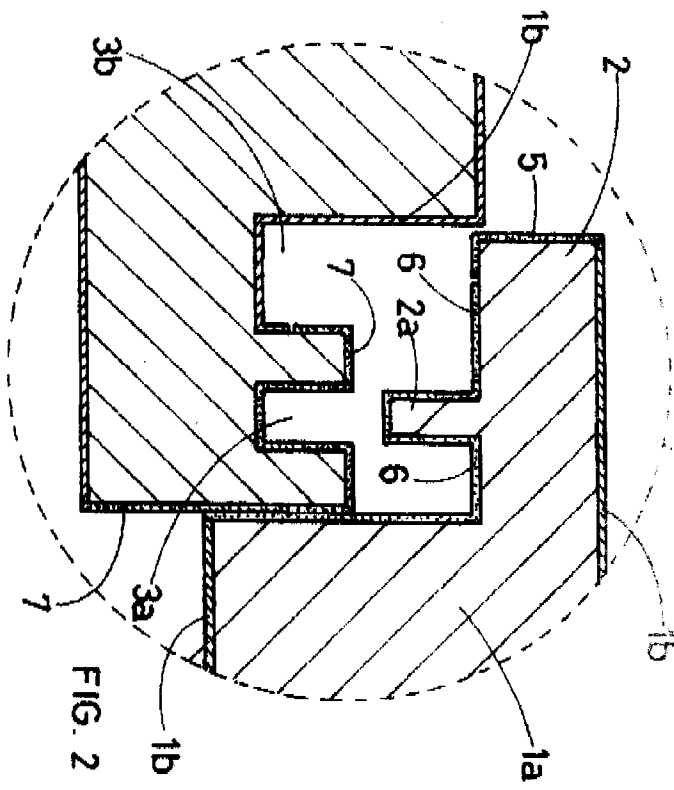
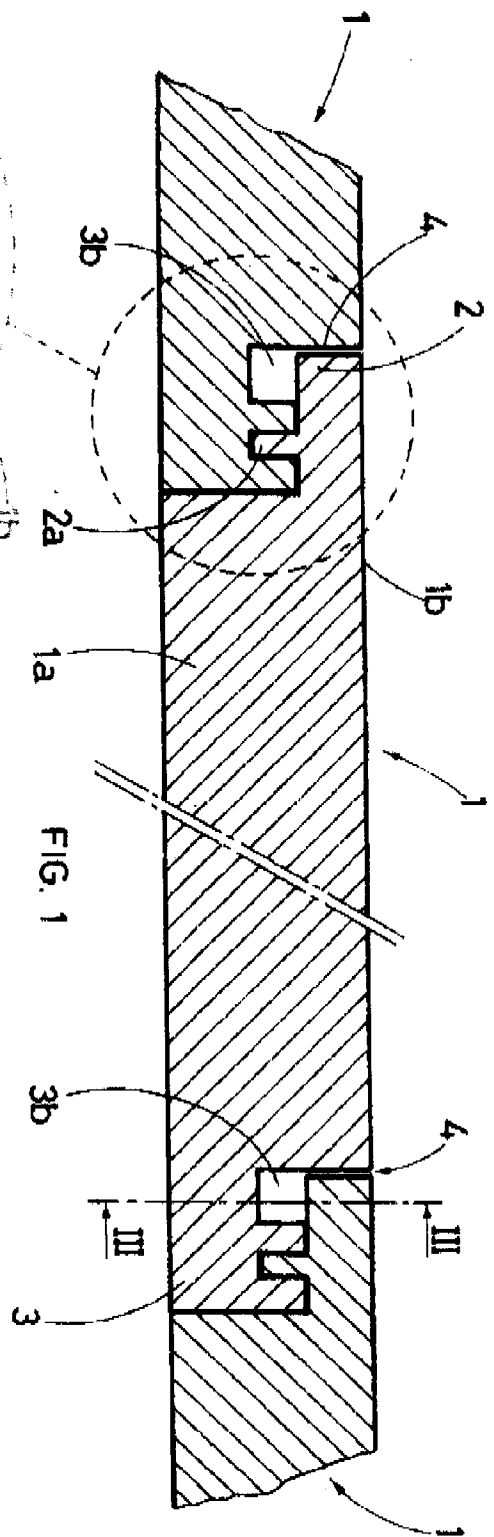
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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0050

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 115 475 (OSSIDAZIONE AVIANESE SRL) * page 1, line 16 - line 26 * * page 3, line 3 - line 15; figures * ---	1,2	E04F15/06 E04C2/26
A	FR-A-2 594 873 (D. CANCELLIERI ET AL.) * page 3, line 13 - page 4, line 35; figures * ---	1,2	
A	EP-A-0 303 738 (H. VAN DELZEN) * column 2, line 16 - line 20; claims 9,10; figures * ---	1,2	
A	EP-A-0 202 944 (DERRYGATE LTD) * page 3, line 16 - line 25; figures * ---	1,2	
A	EP-A-0 368 720 (WANNER ISOFI ISOLATION) * abstract; figures * ---	1,2	
A	EP-A-0 085 196 (JANSSEN & FRITSEN B.V.) * claims 5,6; figures * ---	1,2	
A	EP-A-0 397 278 (SHELL INTERNAT.) * abstract; figures 6,7 * -----	1,2	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E04F E04C E04H E04D E04B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 MAY 1992	Examiner RIGHETTI R.
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			

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