



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: **24.03.2004 Bulletin 2004/13** (51) Int Cl.7: **E04F 15/02, E04F 15/08**

(21) Application number: **03425071.2**

(22) Date of filing: **07.02.2003**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
 HU IE IT LI LU MC NL PT SE SI SK TR**  
 Designated Extension States:  
**AL LT LV MK RO**

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(30) Priority: **09.09.2002 IT MC20020071**

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(54) **Modular bearing structure for the construction of floating floors with tiles**

(57) A modular bearing structure for the realisation of floating floors with ceramic, stone or similar tiles (P), which is composed of:

a) a support panel (1) made of wood or other suitable materials, provided in the upper part with a series of rectilinear grooves (1a) located in parallel position slightly behind the perimeter sides; and

b) a plastic moulded grid (2) limited by raised sides (3) provided, under the perimeter sides, with segments that exactly engage in the rectilinear grooves (1a) of the support panel (1); the grid (2), comprising also a central crosswise reticulation (4), as well as a perimeter shelf (5) on the inside of the sides (3) coplanar to the reticulation (4), said grid limiting compartments for housing tiles (P).

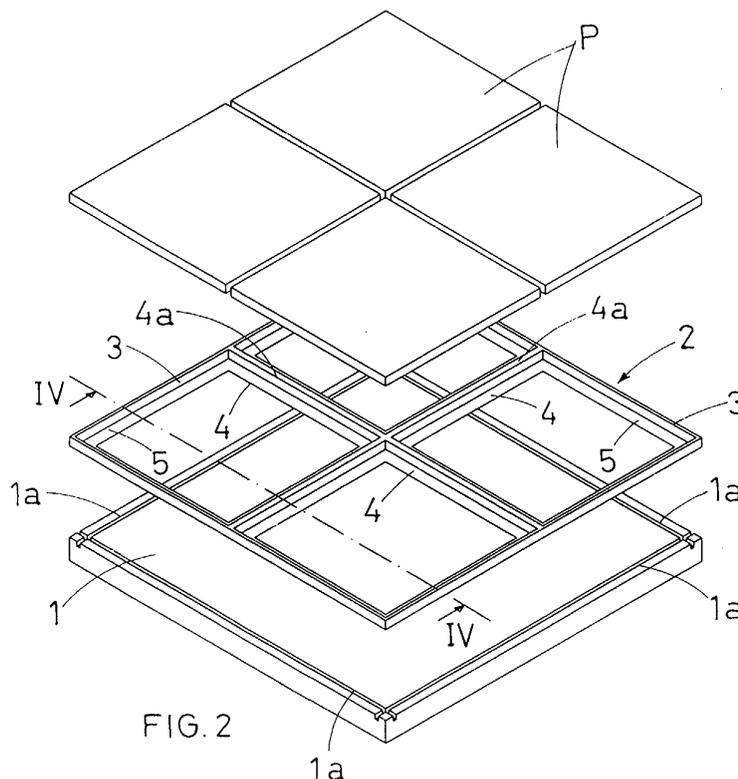


FIG. 2

## Description

### Summary

**[0001]** The present invention relates to a modular bearing structure for the realisation of floating floors with ceramic, stone or similar tiles, composed of two combinable elements, that is to say: a support panel made of wood or other suitable materials provided in the upper part with a series of rectilinear grooves located in parallel position slightly behind the perimeter sides and a plastic moulded grid capable of exactly containing one or more tiles and having, under the perimeter sides, segments that exactly engage in the rectilinear grooves of the support panel.

**[0002]** The present patent application relates to a modular bearing structure for the realisation of floating floors with ceramic, stone or similar tiles.

**[0003]** As it is known, according to the current technology for the realisation of floating floors, the various elements are laid over a sort of support grid arranged on the bottom of the room to be floored.

**[0004]** This technology, which has been known for a long time, does not create special problems in case of wooden floating floors.

**[0005]** In this case, the various wooden elements applied over support panels made of non valuable wood, are laid over the grid, in close contact between them. As a matter of fact, in order to favour their close adhesion, the elements are provided with lateral hinging that allows for fast, mutual coupling.

**[0006]** Difficulties are encountered in case of floating floors made with ceramic, stone and similar elements, in particular tiles.

**[0007]** This kind of floors requires the presence of rectilinear interstices between the flooring elements, which are filled with suitable fixing and finishing mortars.

**[0008]** The impossibility of placing similar ceramic or stone flooring elements end to end has imposed the need to develop special supports that, once they have been laid on the traditional bearing grid arranged on the bottom to be floored, permit the formation of traditional interstices between the floor tiles.

**[0009]** The type of supports that is currently available is composed of a square panel made of wood or other suitable materials (such as calcium sulphate) provided with four perimeter sides and two central partitions arranged at 180° used to limit four small square compartments.

**[0010]** Each compartment is designed to exactly house a tile, while the 180° partition define the interstices between the four tiles of each support element, while the perimeter sides define the interstices between contiguous support elements.

**[0011]** This kind of support elements has always guaranteed the satisfactory realisation of floating floors with ceramic, stone and similar tiles. However, the realisation modes are criticizable.

**[0012]** According to one of these technologies, the perimeter sides are manually fixed on the wooden bearing panel. Once the tiles have been laid between the perimeter sides, suitable elastic seals are manually applied to create the aforementioned 180° partitions, which define the interstices between the tiles.

**[0013]** It goes without saying that, being basically founded on a series of fine manual operations, this technology is quite complicated and expensive.

**[0014]** In view of this, an alternative technology has been developed, according to which the perimeter sides and central crosswise partitions are realised on each wooden bearing panel with plastic moulding process.

**[0015]** More precisely, this alternative technology provides for the insertion of the wooden bearing panel and the four tiles laid above it into a suitable mould, thanks to suitable supports mounted on the same mould, in the position they have to occupy at the end of the process, with respect to the underlying wooden panel.

**[0016]** Suitable thermoplastic resin is then injected to form the four perimeter sides of the bearing panel designed to contain the four tiles, as well as the two 180° partitions between the four tiles, by taking advantage of the interstices in the mould.

**[0017]** The additional effect of the resin injection is to irreversibly join the four tiles to the wooden bearing panel.

**[0018]** However, as anticipated, this second technology is not free of drawbacks, among which the most significant ones are represented, on one side, by the process complexity, and on the other side by the difficult centring of the four tiles with respect to the bearing panel, and therefore by the difficulty to guarantee constant quality.

**[0019]** The main purpose of the present invention is to introduce a new technology for the realisation of support elements for ceramic, stone and similar tiles used for floating floors. In particular, this technology is free of the traditional drawbacks, as mentioned above, and is particularly appreciated for its simple inexpensive execution, as well as for total reliability and regularity that guarantee the quality of final products.

**[0020]** These purposes have been reached thanks to the special bearing structure of the invention, which is composed of two elements that can be easily and rapidly assembled. The structure consists in a square panel made of wood or other suitable materials, which features four rectilinear grooves situated slightly behind the four perimeter sides, and a plastic moulded grid with has the same dimensions as the panel and incorporates longitudinal segments under the four perimeter sides, designed to exactly engage in the grooves located on the four sides of the wooden support panel.

**[0021]** Moreover, the grid incorporates the 180° partitions that define the four compartments used to exactly house ceramic, stone or similar tiles.

**[0022]** The advantages of the invention appear evident from this short description, that is to say structure

simplicity and easy, fast assembling.

**[0023]** In addition, the invention guarantees the realisation of absolutely perfect products in terms of regular location of the tiles, also with respect to the support panel.

**[0024]** In particular, the absolute perfect location of the different elements of the structure of the invention is guaranteed by the forced prismatic coupling of the various components. As a matter of fact, the correct centring of the grid with respect to the panel is guaranteed by the engagement of the segments of the grid into the corresponding grooves of the panel, while the perfect centring of the tiles with respect to the grid is guaranteed by the specific "housings" defined by the perimeter sides and 180° partitions.

**[0025]** In view of the above, it appears evident that the most important advantage of the invention in comparison with traditional supports consists in the more accurate position of the tiles with respect to the wooden bearing panel.

**[0026]** In the manufacture of the invention, the positioning of the tiles inevitably produces excellent results, since it is "guided" by the presence of the four compartments on the upper side of the grid thanks to the presence of the 180° partitions.

**[0027]** Vice versa, in traditional supports as illustrated above, this operation is much more difficult and, most of all, results often in unsatisfactory results, since the tiles must be placed on the wooden support without intermediate partitions.

**[0028]** Both in the case of supports in which seals are inserted between the tiles positioned on the wooden bearing panel, and in the case of supports in which the partitions are obtained with a mould that contains the tiles and bearing panel, the said partitions (that is to say the elements that define the position of individual tiles) originate after laying the tiles on the wooden support.

**[0029]** For major clarity the description of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration and not in a limiting sense, whereby:

- Fig. 1 is an axonometric top view of the bearing structure of the invention designed to support four tiles
- Fig. 2 is an exploded view of Fig. 1 showing the structure of the invention components;
- Fig. 3 is the cross-section of Fig. 1 with plane III-III;
- Fig. 4 is the cross-section of Fig. 2 with plane IV-IV;
- Figs. 5 and 6 are a top and bottom view of the plastic grid, respectively, shown in the exploded view of Fig. 2;
- Fig. 7 is an axonometric top view of the bearing structure of the invention designed to support only one tile.
- Fig. 8 is an exploded view of Fig. 7 showing the structure of the invention components;
- Fig. 9 is the cross-section of Fig. 7 with plane IX-IX;

- Fig. 10 is the cross-section of Fig. 8 with plane X-X;
- Figs. 11 and 12 are a top and bottom view of the plastic grid, respectively, shown in the exploded view of Fig. 8.

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**[0030]** With reference to the aforementioned figures, the support of the invention is designed to be placed next to identical supports on the bearing structure of floating floors.

10 **[0031]** In the embodiment shown in Figs. From 1 to 6, the support is composed of a panel made of wood or other suitable materials (1) provided with a series of rectilinear grooves (1a) located in parallel position slightly behind the perimeter sides.

15 **[0032]** A plastic grid (2) defined by raised perimeter sides (3) is exactly matched on the support panel (1), which features, under the perimeter sides, segments (2a) suitable to exactly engage inside the rectilinear grooves (1a) of the panel (1).

20 **[0033]** The grid (2) is centrally provided with a crosswise reticulation (4) on which two partitions (4a) sideways protrude, limiting, together with the raised perimeter sides (3), four compartments suitable to exactly house ceramic, stone and similar tiles (P).

25 **[0034]** The tiles (P) are laid inside each compartment, towards the inside, on the corresponding sections of the reticulation (4) and, towards the outside, on the sections of a suitable shelf (5) that protrudes for the entire perimeter of the grid (2) from the sides (3).

30 **[0035]** Figures 3, 4 and 6 show the longitudinal segments (2a) under the perimeter shelf (5), which engage into the corresponding grooves (1a) of the bearing panel (1).

35 **[0036]** According to the common technique, the crosswise partitions (4a) also define the interstices between the four tiles (P), while the perimeter sides (3) define the interstices between multiple elements of the bearing structure of the invention.

40 **[0037]** The same figures 3 and 4 also show how the thickness ( $\alpha/2$ ) of the perimeter sides (3) of the grid (2) is exactly half of the thickness ( $\alpha$ ) of the central partitions (4a). This condition is necessary because, when two structures of the type of the invention are placed side by side, the side of one structure and the side of the contiguous structure, being in close contact, originate an interstice having the same width of the interstices defined by the crosswise partitions (4a) inside the structures.

50 **[0038]** This allows for obtaining a regular texture on the entire floor, where this expression refers to the presence of interstices with identical width between the tiles of the same floor.

55 **[0039]** In the alternative embodiment shown in Figures 7 to 12, the wooden panel (1) is designed to be matched with a grid (20) that, although has the same characteristics as the grid illustrated above, is characterised by the lack of crosswise central partitions.

**[0040]** In fact, this version of the grid (20) is designed

to contain a single tile (P) of suitable dimensions, with the bottom grid (4) having a simple support function in combination with the usual perimeter shelf (5) that horizontally protrudes towards the inside from the perimeter sides (3) of the grid (20).

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**[0041]** Of course, this second grid (20) is provided with segments (2a) suitable for engaging into the grooves (1a) of the bearing panel (1).

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## Claims

1. Modular bearing structure for the realisation of floating floors with ceramic, stone or similar tiles, **characterised by** the fact that it is composed of:
  - a support panel (1) made of wood or other suitable materials provided in the upper part with a series of rectilinear grooves (1 a) located in parallel position slightly behind the perimeter sides;
  - a plastic moulded grid (2, 20) limited by raised sides (3) provided, under the perimeter sides, segments (2a) that exactly engage in the rectilinear grooves (1a) of the support panel (1); it being provided that the grid (2, 20) also a central crosswise reticulation (4), as well as a perimeter shelf (5) on the inside of the sides (3) coplanar to the reticulation (4).
2. Modular bearing structure according to claim 1, **characterised by** the fact that, over the central reticulation (4), the grid (2) incorporates two crosswise partitions (4a) whose thickness ( $\alpha$ ) is double the thickness ( $\alpha/2$ ) of the perimeter sides (3).
3. Modular bearing structure according to claim 1, **characterised by** the fact that the segments (2a) of the grid (2) are positioned under the perimeter shelf (5).
4. Modular bearing structure according to claims 1 and 2, **characterised by** the fact that the segments (2a) of the grid (2) are positioned under the perimeter shelf (5).

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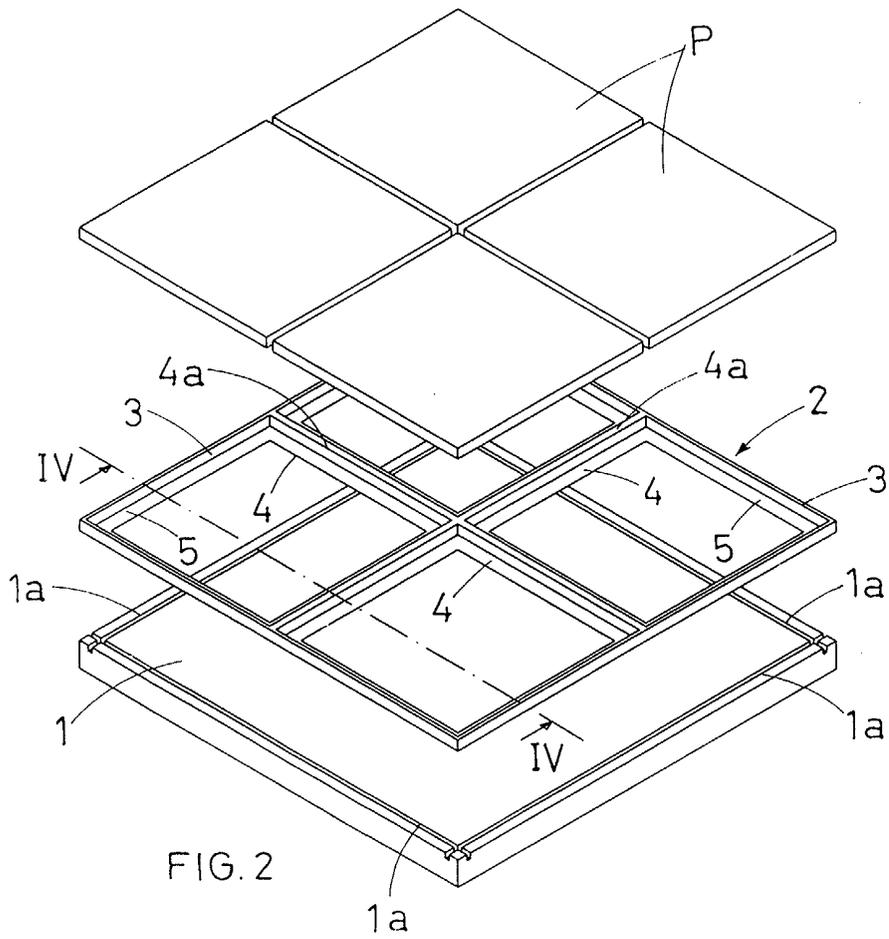
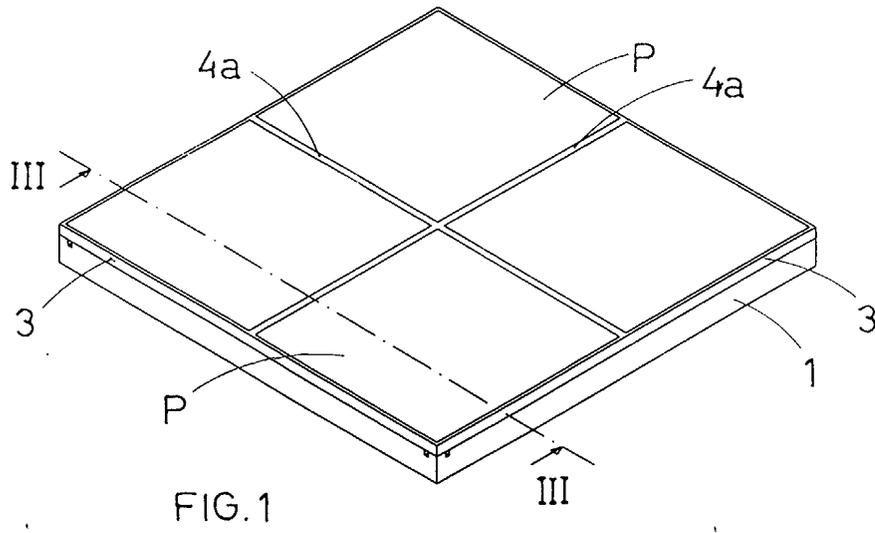
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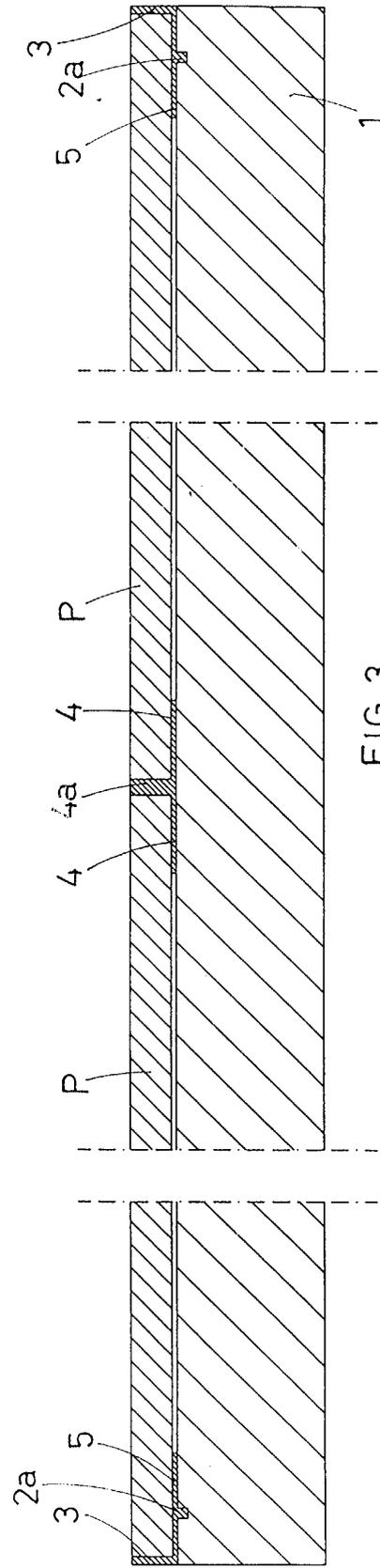
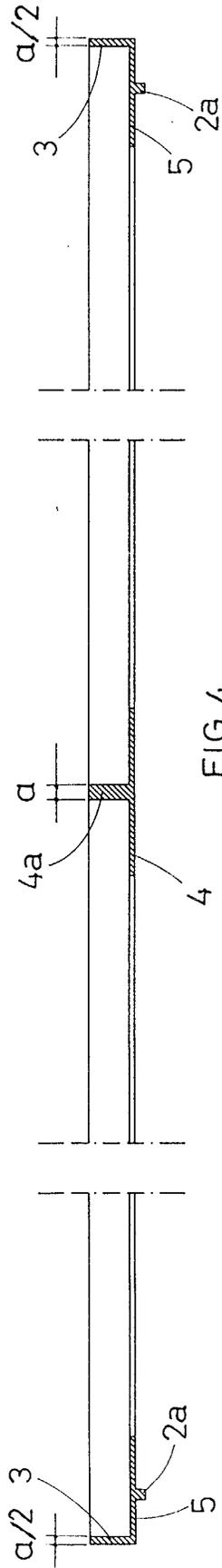
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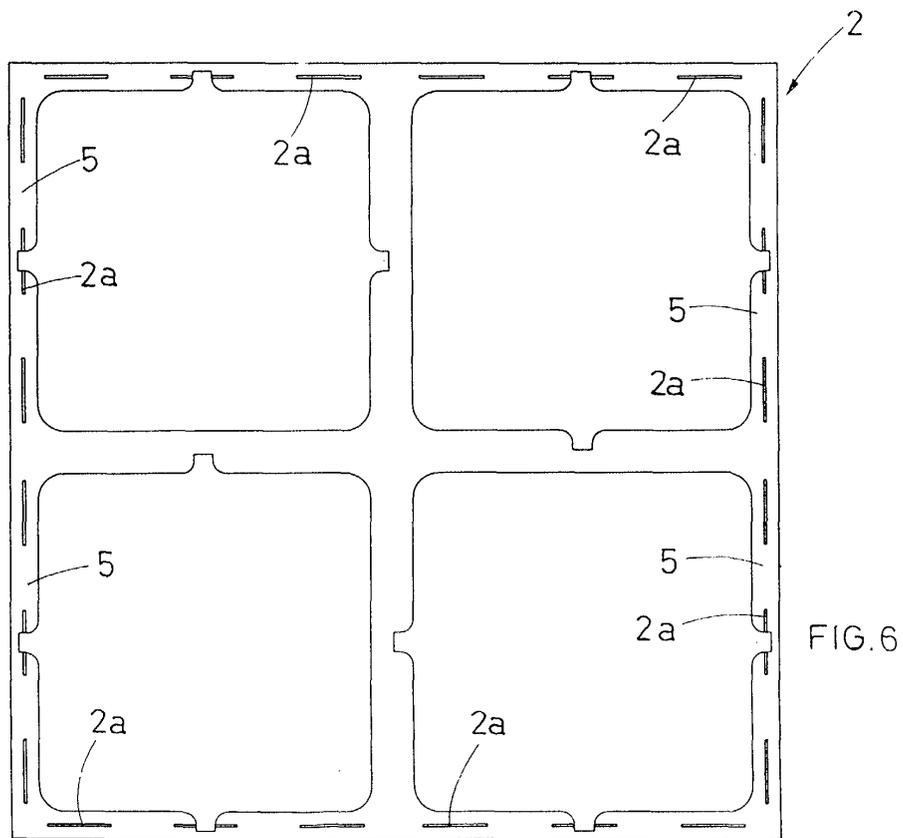
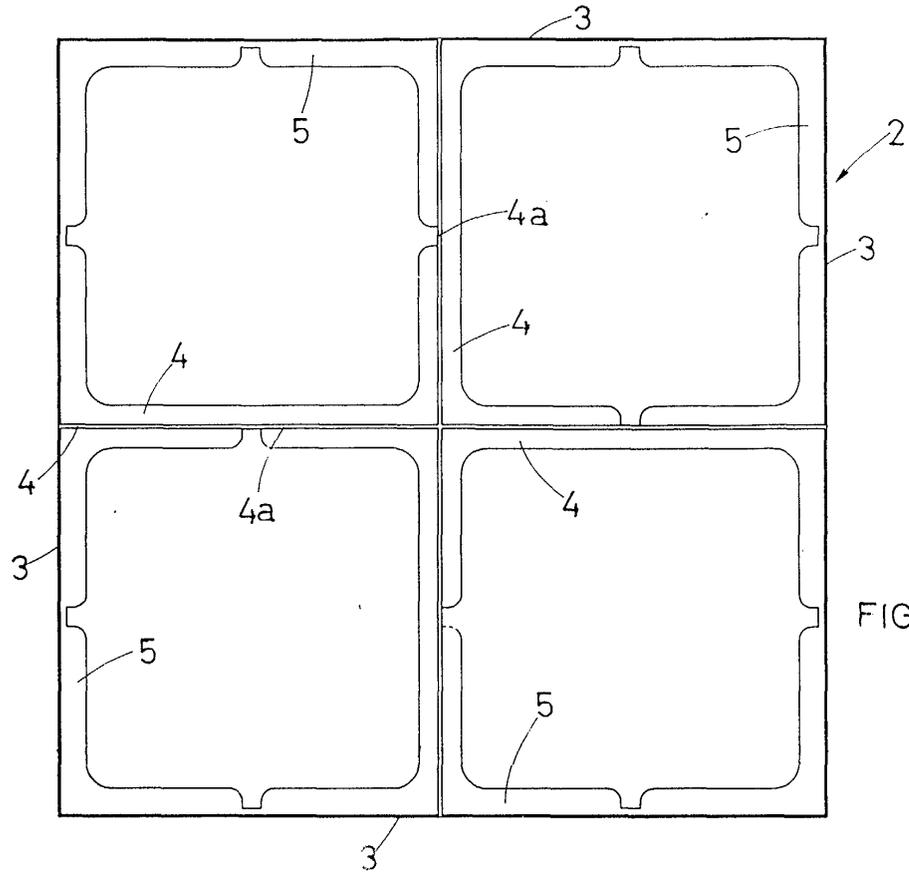
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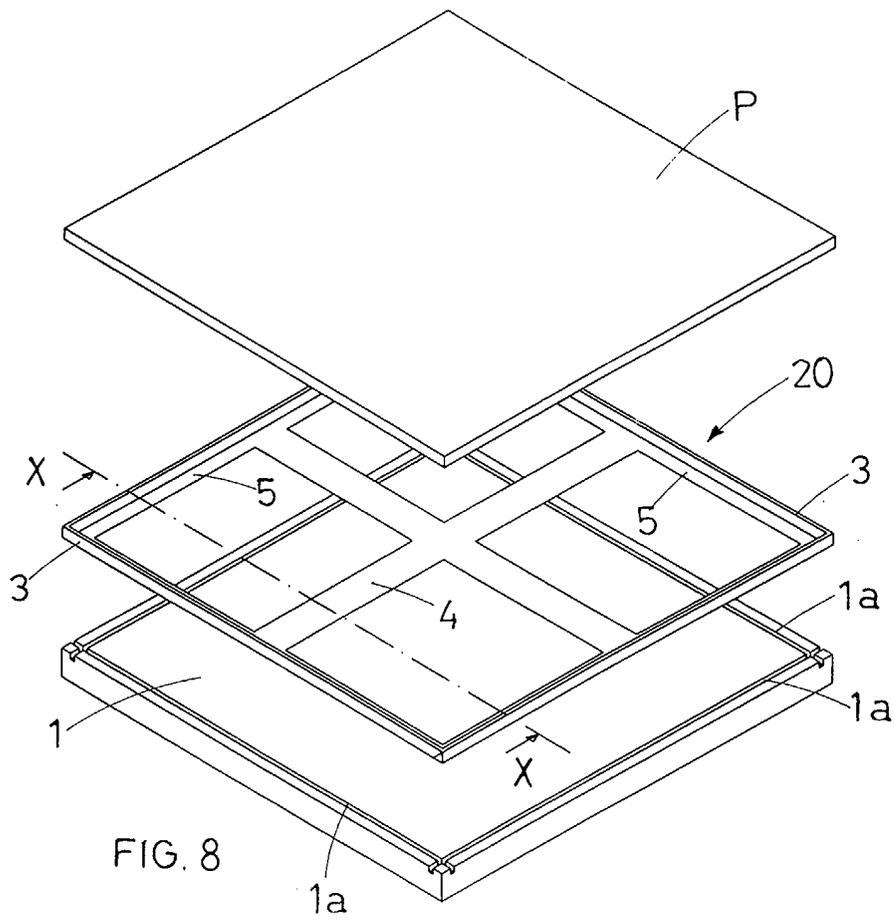
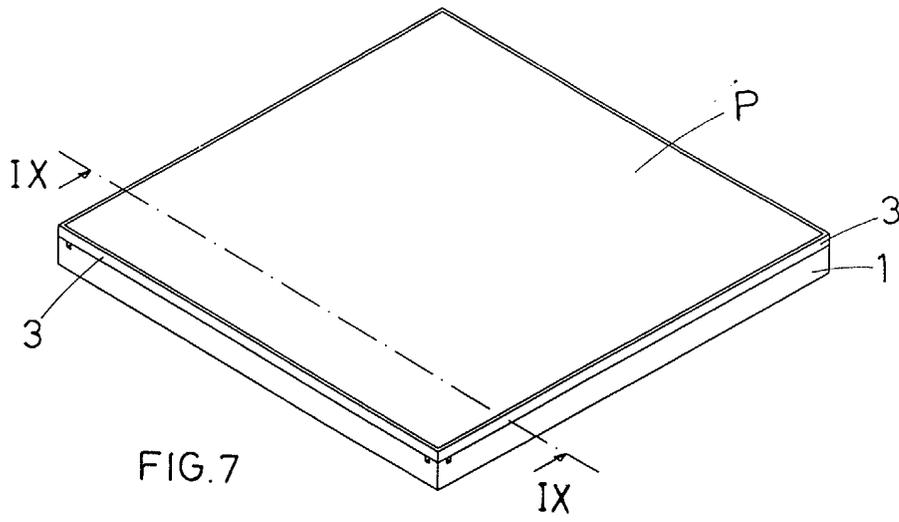
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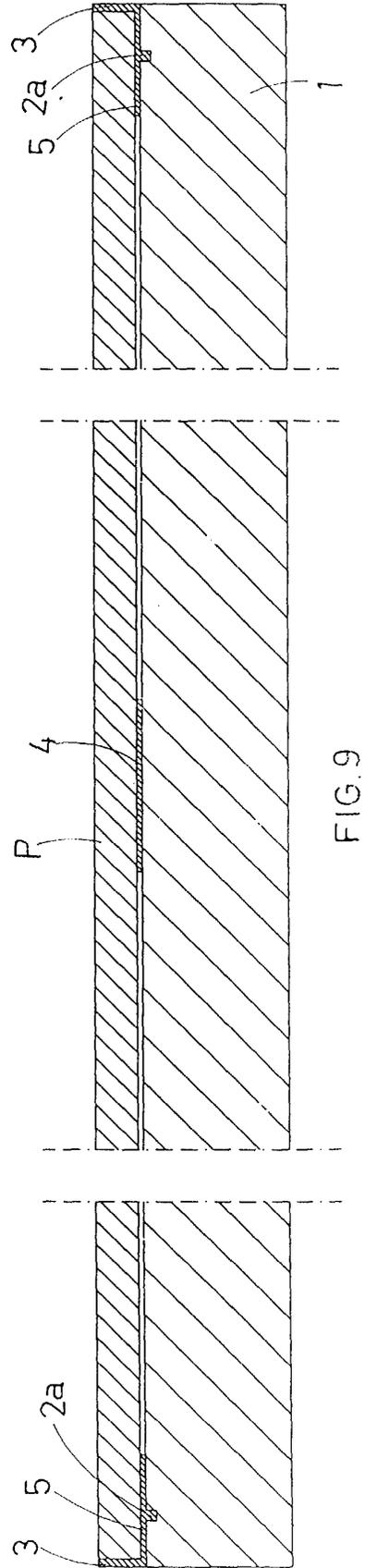
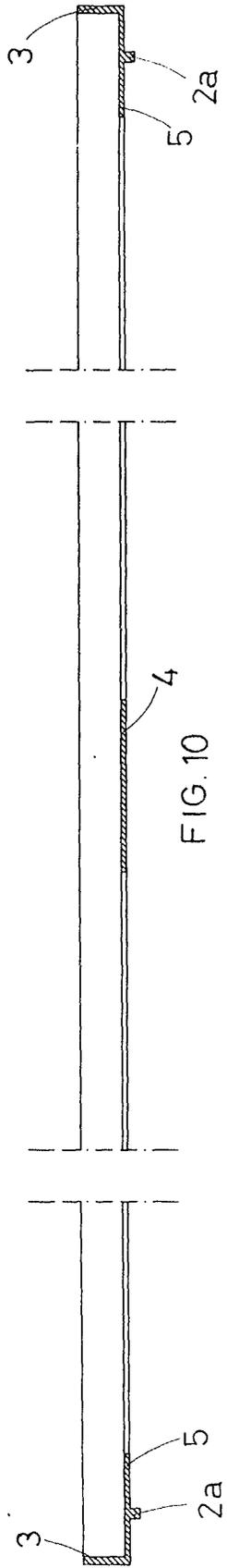
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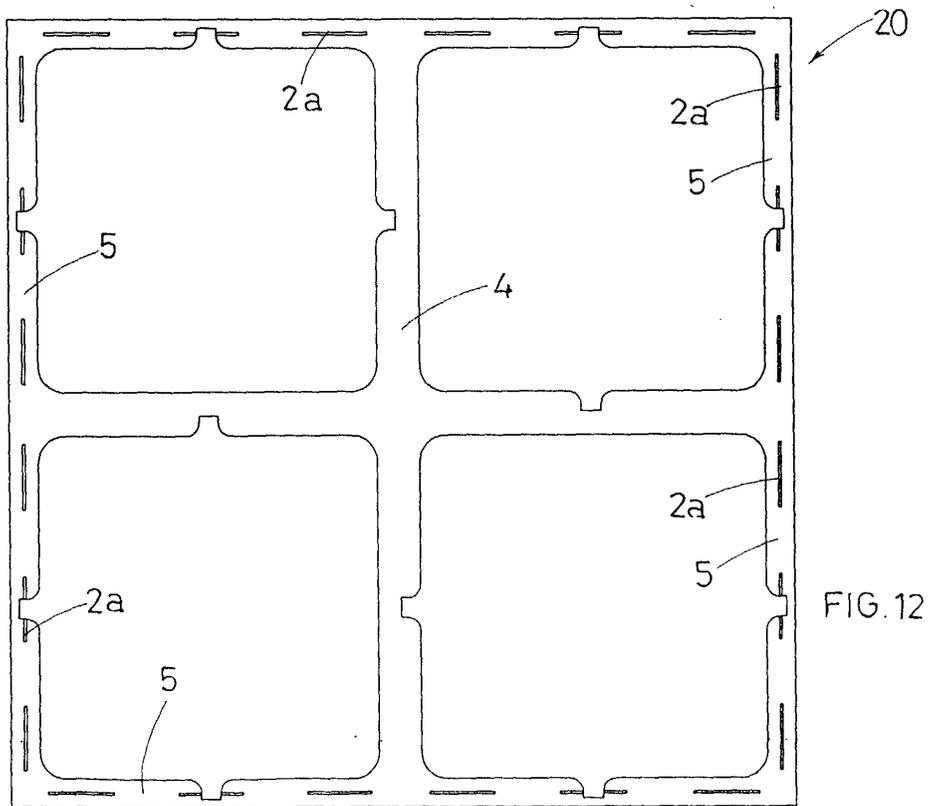
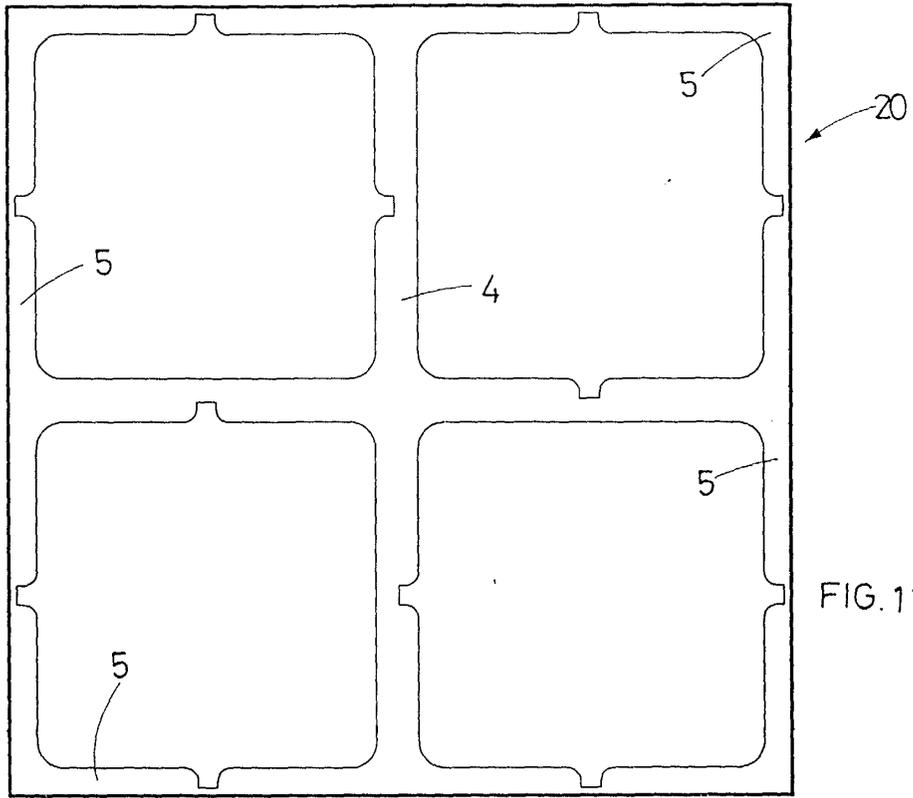














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Place of search <b>MUNICH</b>		Date of completion of the search <b>19 August 2003</b>	Examiner <b>Bouyssy, V</b>
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This 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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