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(54) **Modular system with connector for fixing wooden floor boards on joists**

(57) Object of the invention is an assembling connector including a frame reinforced with ribbing, for fixing longitudinal finishing elements, having on side walls appropriate concave shaped elements integrated with catches located on the connector, **characterised in that** it is equipped:
- at the side of finishing elements with parallel protrusions 2 and 2' located on edges of the frame 1 perpendicularly to its surface, the protrusion 2 being terminated with a hooked catch 3, and the protrusion 2' with a perpendicular catch 4,
- at the side of carrying elements with parallel protrusions 13 and 13', also perpendicular to the surface of frame 1, the protrusion 13 being terminated with a hooked catch 14, and the protrusion 13' - with a perpendicular catch 15, the protrusions 13 and 13' and catches 14 and 15 being integrated with the carrying elements exhibiting appropriate concave shaped elements on side walls.
- with distance protrusions 5 located on a side wall of the frame 1.

Object of the invention is also a modular system implemented by means of the connectors.

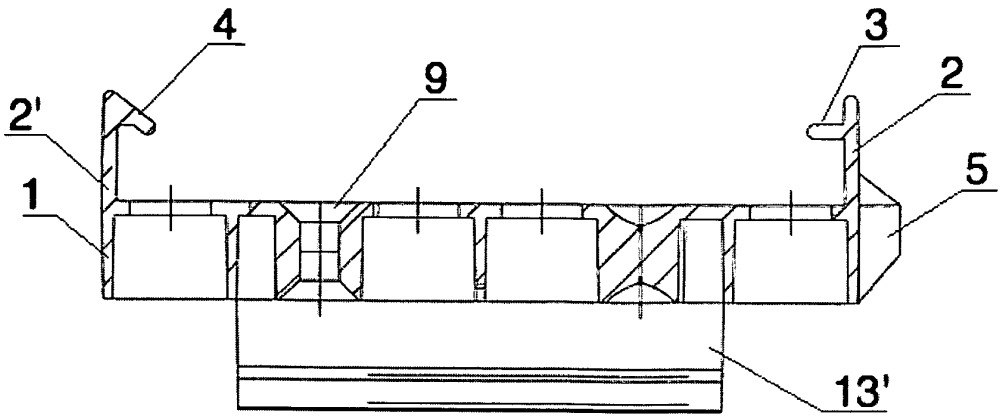

Fig. 4

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Description

[0001] Object of the invention is an assembling connector for fixing longitudinal finishing elements, particularly wooden floorboards and a modular system for fixing the longitudinal finishing elements. The connector finds applications in construction of a modular system of fixing longitudinal finishing elements particularly to the surface of e.g. terraces, summerhouses, garden alleys, swimming pools, garden ponds etc., settled on a base exposed to moisture or precipitation. The connector also finds application for fixing finishing facades i.e. longitudinal facade elements made of wood, plastics, wood-derived and wood-like materials or a combination of said materials. The connectors make it possible to build systems similar to siding-type facades, yet with a use of a modem pattern designing of any direction (horizontal, vertical etc.).

[0002] From European Patent EP1306485, a modular system of ground beams for arrangement of pavement elements and other surfaces of that type, which can be *inter alia* made of wood, is known. The system has a form of a network consisting of elements arranged on a base and individual segments that fix walkway tiles. Subsequent segments are joined with vertical locks, which consolidate subsequent segments of a surface and provide gaps between them, through which moisture can flow down.

[0003] Object of the invention is an assembling connector comprising a frame reinforced with ribbing, for fixing longitudinal finishing elements, exhibiting on side walls appropriate concave shaped elements integrated with catches located on the connector, **characterised in that**, it is equipped:

- at the side of finishing elements with parallel protrusions 2 and 2' located on edges of frame 1 perpendicularly to its surface, the protrusion 2' being terminated with a hooked catch 4, and the protrusion 2 with a perpendicular catch 3,
- at the side of carrying elements with parallel protrusions 13 and 13', also perpendicular to the surface of frame 1, the protrusion 13 being terminated with a hooked catch 14, and the protrusion 13' with a perpendicular catch 15, the protrusions 13 and 13', and catches 14 and 15 being integrated with the carrying elements exhibiting appropriate concave shaped elements on side walls.
- with distance protrusions 5 located on a side wall of the frame 1.

[0004] The protrusions 13 and 13' are located in a direction perpendicular with respect to the protrusions 2 and 2'.

[0005] The frame 1 is equipped with reinforcing ribbing having a form of elements 10, 11 and 11'.

[0006] The frame 1 includes additionally ventilation and drainage elements in form of orifices 7 and 8 and indentations 12.

[0007] Distance elements 5 are located on a wall of the frame having the protrusion 2.

[0008] Object of the invention is also a modular system for fixing longitudinal finishing elements, **characterised in that** it includes longitudinal finishing elements and optionally longitudinal carrying elements and assembling connectors which are equipped:

- at the side of finishing elements with the parallel protrusions 2 and 2' located on edges of the frame 1 perpendicularly to its surface, the protrusion 2' being terminated with a hooked catch 4, and the protrusion 2 with a perpendicular catch 3,
- at the side of carrying elements with the parallel protrusions 13 and 13', also perpendicular to the surface of the frame 1, the protrusion 13 being terminated with a hooked catch 14, and the protrusion 13' with a perpendicular catch 15, the protrusions 13 and 13', and the catches 14 and 15 being integrated with carrying elements exhibiting appropriate concave shaped elements on side walls.
- with distance protrusions 5 located on a side wall of the frame 1.

[0009] Protrusions 13 and 13' are located in a direction perpendicular with respect to protrusions 2 and 2'.

[0010] The frame 1 is equipped with reinforcing ribbing having a form of elements 10, 11 and 11'.

[0011] The frame 1 includes additionally elements to ensure ventilation and drainage, in a form of orifices 7 and 8 and indentations 12.

[0012] Distance elements 5 are located on a wall frame having protrusion 2. Preferably, finishing elements are floorboards or floor elements made of plastics and/or wood-like and/or wood-derived materials or wooden facade elements, made of plastics and/or wood-like materials and/or wood-derived materials, whereas the carrying elements are bars or slats made of wood, metal, plastics or wood-like and/or wood-derived materials.

[0013] The connector and the system of the invention ensures easy and fast assembly of elements of floor or facades, e.g. floorboards, particularly terrace floorboards, on longitudinal carrying elements e.g. joists settled on a base (or on facades). Through mutual perpendicular arrangement of carrying elements and finishing elements, the whole structure is stable and durable. The connector constitutes a repeated element of the modular system, which does not require separate fixing of all connectors with screws. The system is stable also in cases where only some of the connectors, preferably terminal ones, are fastened with screws to the base (or to joists or other carrying elements). Finishing elements of floors or facade elements, e.g. wooden boards, can be easily replaced, in case they are damaged or are fully disassembled e.g. in winter. Stabilising elements for the laid floor are the joists (subfloor or other longitudinal carrying elements) fastened in a conventional way, e.g. with

screws, directly to a base/walls or other structural elements, e.g. side walls/bars of e.g. a terrace or a summerhouse construction. By fixing several joists it is possible to lay the whole floor and thanks to connectors, the floor elements are fixed in ideally equal interspaces and form aesthetic and even surface. The connectors of the invention allow for fast assemble of terraces, summerhouses or recreational elements of seashore, having no permanent base or exhibiting an uneven base. These structures can also be mounted as "hanging" over a base through application of additional poles or bars, which can serve as carrying elements for joists. The joists can be separately levelled, independently from irregularities of the base. Similarly, in case of facade elements - the connectors can be fixed not only directly on walls of the building or other vertical or skew structures, but also at some distance from facade surfaces to form optionally "clearance" between a facade surface - composed by means of the connectors of the invention - and a surface of building walls (the original facade).

[0014] Thanks to its universal nature, the connector of the invention and the system of the invention can have various uses in buildings and can be used for fixing longitudinal finishing elements of floors, walls, ceilings, or external facades. For manufacturing of finishing elements and carrying elements, boards/bars/slats made of wood, plastics, metal, wood-like and wood-derived materials can be utilised. Combination of the above mentioned materials can also be used.

[0015] Object of the invention is shown in an example of embodiment on a drawing, on which fig. 1 shows the connector in a general view slantwise from above (from the side of finishing elements), fig. 2 shows a general view of the connector slantwise from bottom (from the side of carrying elements), fig. 3 shows the connector in a view from above, fig. 4 shows a lateral cross section of the connector, fig. 5 shows the connectors (one of it as a whole and two other in part) arranged with floor boards and carrying elements to show functioning of the whole system of arrangement of finishing elements of floors and facades, and fig. 6 shows a schematic view of floor (facade) upon assembling of finishing elements (two carrying elements are also shown, the connectors of the invention being marked in black).

[0016] The connector of the invention is made of a rectangular frame 1, on opposite edges of which the protrusions 2 and 2' are located in parallel, the protrusion 2 being terminated with a perpendicular catch 3, whereas the protrusion 2' - with a hooked catch 4. The abovementioned elements are located on a side, on which finishing elements of floors are to be fixed, i.e. from above. At the side of the base, i.e. the side of joists, the connector is equipped with the parallel protrusions 13 and 13'. Structure of these elements and its principle of action is analogous to the that of the protrusions 2 and 2', although its spacing is narrower than that of the protrusions 2 and 2' located on edges of the connector. The protrusion 13 is terminated with a catch 14, the protrusion 13' - with a catch 15. On a side wall of the frame 1, distance protrusions 5 are located. They are located on a wall, on which the protrusion 2 is located. On an upper surface 6 of the connector, entilation and drainage orifices 7 and 8 and two assembling orifices 9 are located. The connector is also provided with two large, symmetrically located, rectangular orifices 10 surrounded by side walls additionally reinforcing the connector structure. Inside the frame 1 reinforcing ribbing (walls) in a form of mutually rectangular elements 11 and 11' are also located. From the side of joists, the frame 1 on its edge is equipped with the indentations 12.

[0017] The connector of the invention is equipped with a similar system of protrusions on both sides of the frame, i.e. at the side of carrying elements (joists) settled on the base and at the side of finishing floor elements. The joists in the system of the invention are narrower than finishing boards, therefore a span of protrusions 13 and 13' is smaller. The whole system must be moisture-resistant and permeable to air. The technical means used in a form of the orifices 7, 8 and 10 and the indentations 12 provide ventilation of the system and moisture flowing-away. Large orifices 10 make it possible to observe during assembling the joists co-working with the catches 14 and 15, which during assembling are located at the bottom of the connector. To provide convenience, the assembling orifices 9 are located in all connectors, but it is not necessary to fasten all connectors with screws. Essence of the invention is fast assemble of individual elements of the system by means of catches, which make it possible to simply "snap-in" and "snap-out" - in the first stage - connectors to a structure of joists, and - in the second stage - finishing elements (boards) to the connectors. The snapping-in and snapping-out of elements is simplified thanks to a structure of catches. The floorboard is at first inserted into the connector at the side of the catch 3, and then it is pressed-in (by pressing the finishing element) at the side of the catch 4, until the catch acts as a lock through insertion to the longitudinal concave shaped element on floorboard side walls.

[0018] The connectors of the invention "co-work" with finishing elements of floors or facades through application of specifically shaped protrusions 2, 2', 13 and 13' and locks 3, 4, 14 and 15, which was schematically presented on fig. 5. Finishing elements "A" are equipped with longitudinal shaped elements "a" fitted to dimensions of the protrusions 2 and 2', and the protrusions 3 and 4. Carrying elements "B" are equipped with shaped elements "b".

[0019] Through a change in a size of the protrusions 1, 2' and 13, 13', the modular system of the invention can be adapted to match any finishing and carrying elements, which can also be adapted to size of connectors, depending on particular need.

Claims

1. Assembling connector including a frame reinforced with ribbing, for fixing longitudinal finishing elements having on their side walls appropriate concave shaped elements integrated with catches located on the connector, **characterised in that** it is equipped:

   - at the side of finishing elements with parallel protrusions (2) and (2') located on edges of the frame (1) perpendicularly to its surface, the protrusion (2') being terminated with a hooked catch (4), and the protrusion (2) - with a perpendicular catch (3),
   - at the side of carrying elements with parallel protrusions (13) and (13'), also perpendicular to the surface of the frame (1), the protrusion (13) being terminated with a hooked catch (14), and the protrusion (13') with a perpendicular catch (15), and the protrusions (13) and (13') and catches (14) and (15) are integrated with carrying elements exhibiting appropriate concave shaped elements on side walls.
   - with distance protrusions (5) located on a side wall of the frame (1).

2. Connector according to claim 1, **characterised in that**, the protrusions (13) and (13') are located in a direction perpendicular with respect to the protrusions (2) and (2').

3. Connector according to claim 1, **characterised in that** the frame (1) is equipped with reinforcing ribbing having a form of elements (10), (11) and (11').

4. Connector according to claim 1, **characterised in that** the frame (1) additionally comprises ventilation and drainage elements in form of orifices (7) and (8) and indentations (12).

5. Connector according to claim 1, **characterised in that** the distance elements (5) are located on a wall of the frame having the protrusion (2).

6. Modular system for fixing longitudinal finishing elements, **characterised in that** it includes longitudinal finishing elements and optionally longitudinal carrying elements and assembling connectors equipped:

   - at the side of finishing elements - with parallel protrusions (2) and (2') located on edges of frame (1) perpendicularly to its surface, the protrusion (2') being terminated with a hooked catch (4), and the protrusion (2) - with a perpendicular catch (3),
   - at the side of carrying elements with parallel protrusions (13) and (13'), also perpendicular to the surface of frame (1), the protrusion (13) being terminated with a hooked catch (14), and the protrusion (13') - with a perpendicular catch (15), the protrusions (13) and (13') and the catches (14) and (15) are integrated with the carrying elements exhibiting appropriate concave shaped elements on side walls.
   - with distance protrusions (5) located on a side wall of the frame (1).

7. System according to claim 6, **characterised in that** the protrusions (13) and (13') are located in a direction perpendicular with respect to the protrusions (2) and (2').

8. System according to claim 6, **characterised in that** the frame (1) is equipped with reinforcing ribbing having a form of the elements (10), (11) and (11').

9. System according to claim 6, **characterised in that** the frame (1) additionally includes ventilation and drainage elements in form of orifices (7) and (8) and indentations (12).

10. System according to claim 6, **characterised in that** the distance elements (5) are located on a wall frame having the protrusion (2).

11. System according to claim 6, **characterised in that** the finishing elements are floorboards or floor elements made of plastics and/or wood-like and/or wood-derived materials or facade elements made of wood, plastics and/or wood-like and/or wood-derived materials, and the carrying elements are bars or slats made of wood, metal, plastics or wood-like and/or wood-derived materials.

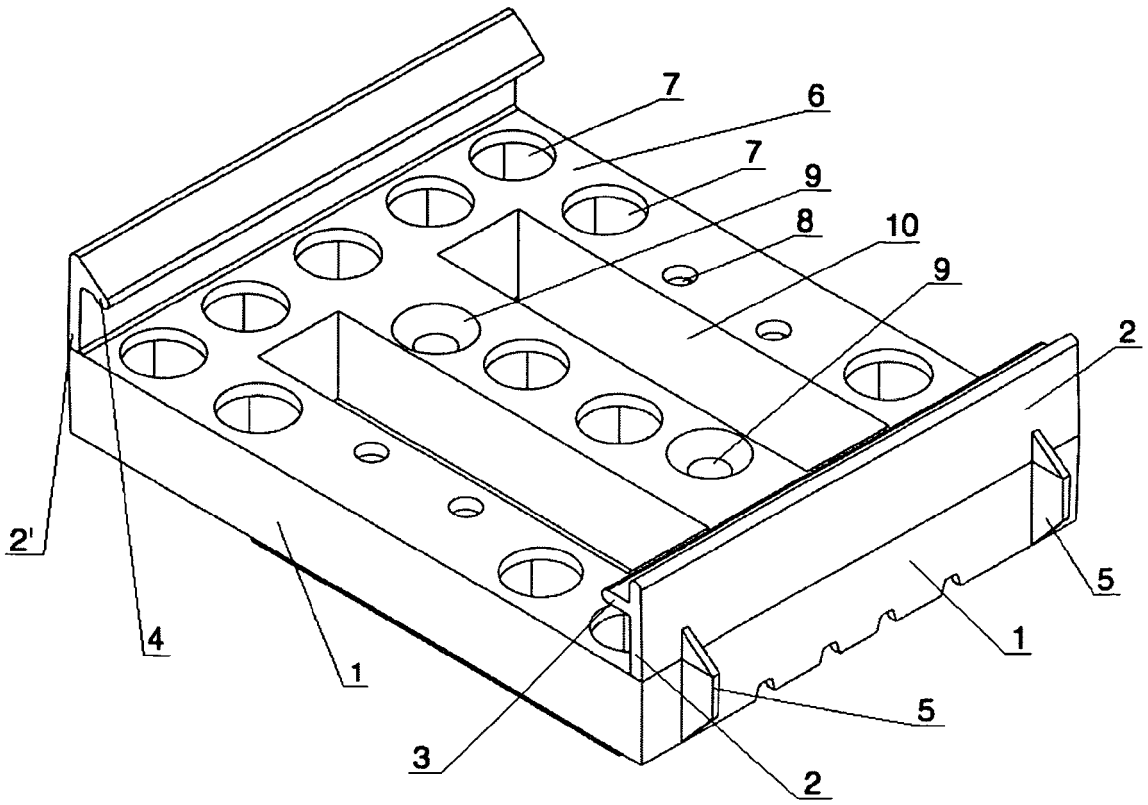

Fig. 1

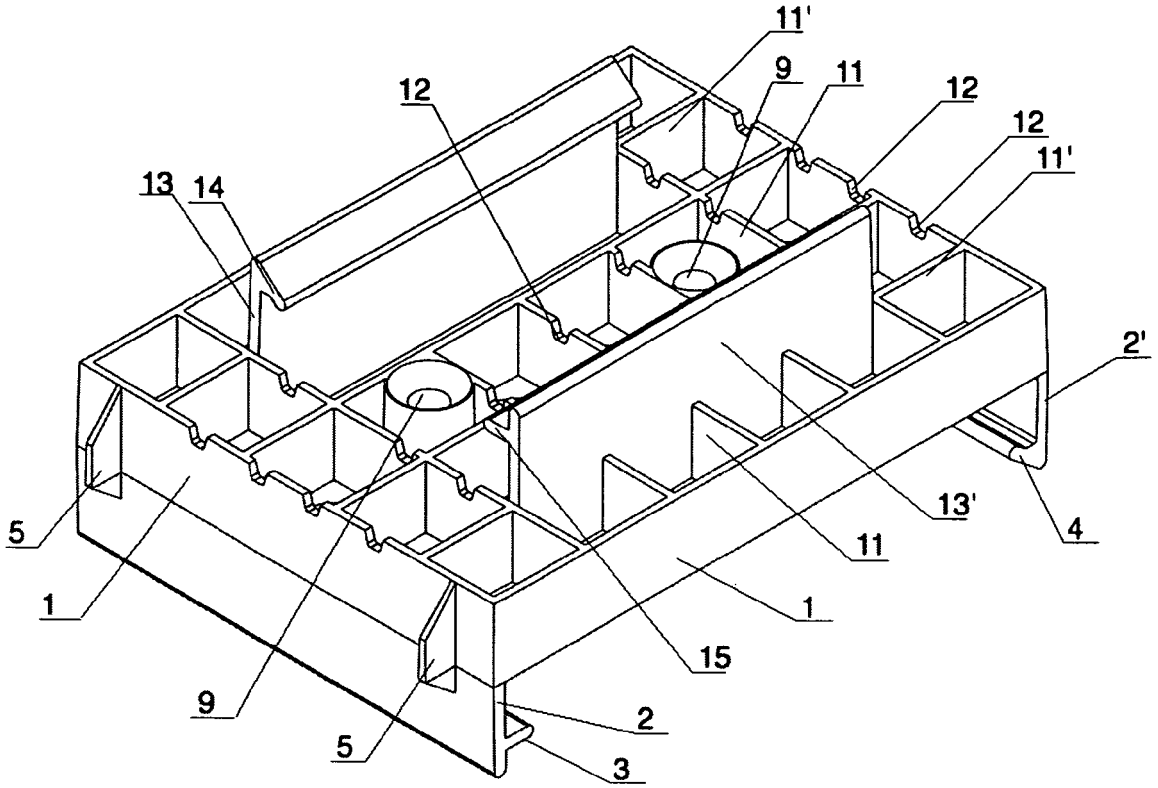

Fig. 2

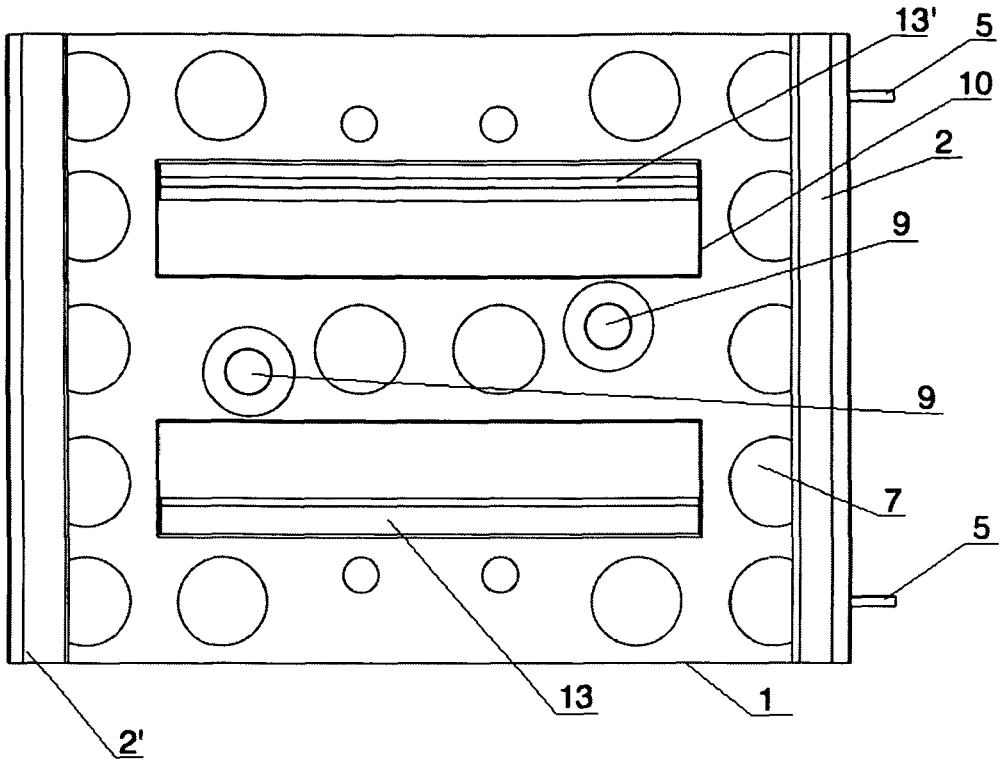

Fig. 3

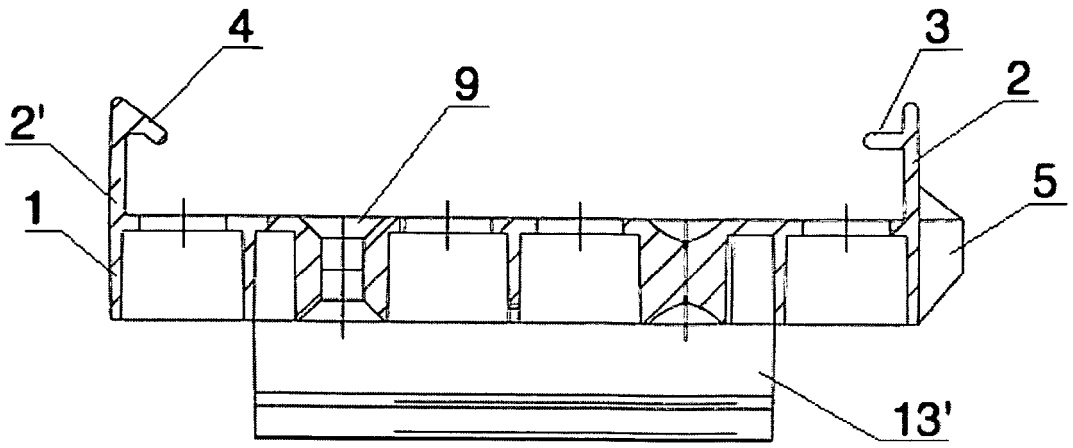

Fig. 4

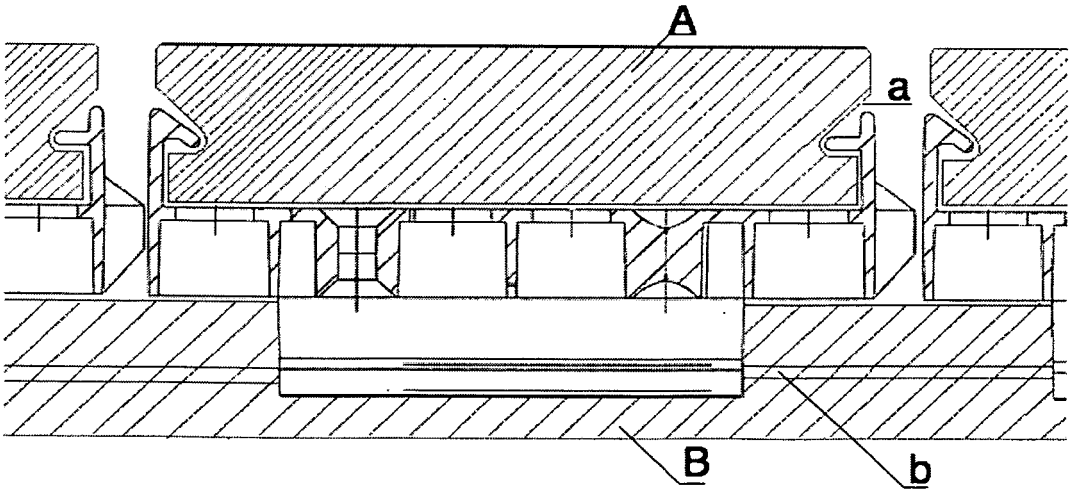

Fig. 5

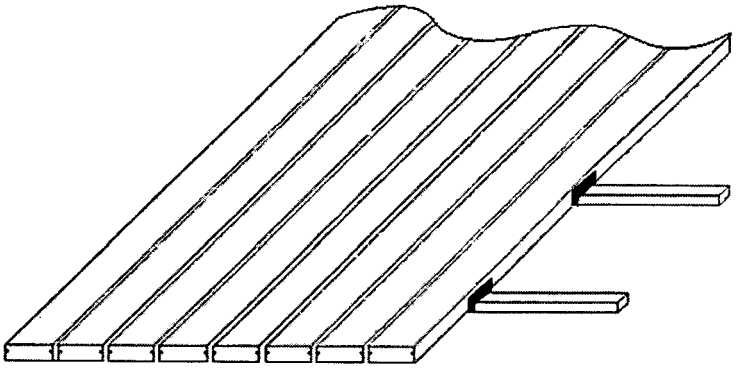

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1306485 A **[0002]**