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(54) **Modular flooring**

(57) The invention relates to an easily removable modular flooring comprising a plurality of modules (1), wherein each module (1) comprises a ceramic or natural stone tile (2) which is adhered to a support element (3) with a planar configuration comprising cellulosic fibers, which allows improving the mechanical characteristics of existing floorings by means of a direct transmission of loads to the support elements (3), in addition to increasing the mechanical bending strength and allowing a simple, low-cost and highly versatile manufacture from large standard sized panels by means of cutting operations.

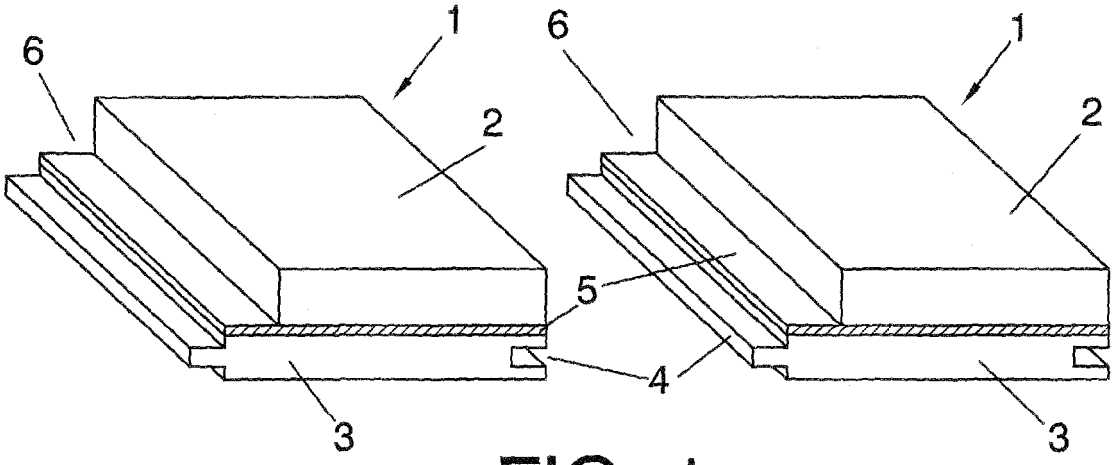

FIG. 1

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Description

Object of the Invention

[0001] The present invention relates to a modular flooring which can be applied in the construction industry, and more specifically in the area of building floors both in cases of new buildings and in restorations, allowing an easily removable and easy to place modular flooring with which the mechanical characteristics, such as mechanical bending strength, are improved with respect to the floorings existing today, in addition to having an easy, low-cost and versatile manufacture from large standard sized panels by means of cutting operations.

Background of the Invention

[0002] In the field of construction today, the use of floorings both in new buildings and in restorations is known, which allow the placement of tile floorings comprising ceramic surfaces.

[0003] Said tile floorings are formed by pieces comprising complex pieces of polymer material, such as base pieces obtained by injection or molding on which the ceramic panels of the tile flooring are arranged.

[0004] Said base pieces of polymer material in turn incorporate complex means for coupling with other pieces of the same dimensions.

[0005] The main drawback of this type of flooring is that the base pieces are manufactured for a certain measurement, being expensive to obtain since it is necessary to have the injection and die-casting equipment for each type of base piece, whereby their versatility for their on site construction is extremely limited given that said base pieces do not allow being cut for adapting them to the dimensions required for covering a slab area.

[0006] On the other hand, for the purpose of making the material lightweight and reducing costs, said pieces incorporate a plurality of openings, like a grating, whereby the transmission of the loads from the ceramic panels to said base pieces is not optimal, being able to cause the fracture of the flooring, especially in cases of overloads in floor slabs caused by a concentration of loads, for example for the case of areas with bookshelves.

Description of the Invention

[0007] The present invention relates to a modular flooring that can be removed for placement when dry, comprising a plurality of modules, in which each module comprises preferably a ceramic or natural stone tile or panel which is adhered to a support element with a planar configuration comprising cellulosic fibers, preferably a fiberboard of said cellulosic fibers.

[0008] Although the modular flooring of the invention is preferably applied in floorings for covering floors, the possibility that it can also be used as a covering in walls and ceilings is contemplated.

[0009] The modular flooring of the invention allows an increase of the mechanical characteristics with respect to removable ceramic floorings existing today, as it allows transmitting the mechanical stresses received by the ceramic tiles to the support elements, in addition to increasing the mechanical bending strength of the module as a whole.

[0010] The integral connection of the tiles to the support element creates a single uniform assembly which considerably improves the mechanical performance of the module.

[0011] Another productive advantage of the support element that is proposed by means of fiberboard is that it is typically available in large formats, whereby its custom-cut is allowed in a simple manner, whatever the format in which the module to be obtained must be manufactured, whereas in floorings of the state of the art for each ceramic product format and for each joint width desired, a considerable investment in injection die-casting must be made because it is necessary to shape the injected base pieces with the necessary size, whereas in the case of the invention, it is only necessary to cut the support elements to the desired measurement, allowing to market this type of product without incurring costs prior to the manufacture thereof.

[0012] Likewise, in floorings of the state of the art, the base pieces of plastic polymers force rectifying, i.e., cutting, the ceramic material to a certain measurement to maintain the same intermediate joint width constant, whereas in the case of the invention, since the custom-cut of the support element is allowed by means of the modification of its dimensions, it is adapted to the different formats of tiles occurring in different manufactures, without needing an added process, such as rectifying the ceramic pieces, which involves a cost that is greater than the cost of each module of the modular flooring of the invention.

[0013] Accordingly, since it is a product that can be cut, it is easy to adapt the dimensions of the support element to any format, caliber and joint width for the final covering.

[0014] The modular flooring of the invention additionally has a sustainable nature given that fiberboard are obtained from residues, whereas the plastics in floorings of the state of the art are contaminating and not sustainable.

[0015] The support elements being fiberboards produced with wood fibers bound with synthetic resins, such as MDF for example, in which they are previously ground by means of a thermomechanical process, and the lignin has been removed, bound with additives such as synthetic resins by means of a pressing process in which pressure and temperature are applied simultaneously until reaching medium density, is contemplated as a possibility.

[0016] On the other hand, the possibility that the support elements are a high-density, non-porous material formed by layers of cellulosic fiber material impregnated

with heat-setting resins and connected to one another by means of a high pressure pressing process according to a core of sheets of Kraft cellulosic fibers impregnated with phenol-formaldehyde resins, such as HPL for example, is contemplated.

[0017] To obtain them, pressure exceeding 5 MPa and temperature exceeding 130° are applied simultaneously to the assembly of stacked sheets, which allows the heat-setting resins to flow and cure.

[0018] The possibility that the modules are connected by tongue and grooving means preferably located on the edges of the support elements is also contemplated, in which said tongue and grooving means are configured to allow successive operations for assembling and removing the modules comprised by the modular flooring. The support elements, which are solid, allow being perimetrically machined to achieve mechanical fixing by means of a tongue and grooving and at the same time to maintain an optimal degree of flexibility.

[0019] The desired custom-cut of the support elements or even the use of different tile sizes contemplates the possibility that, in correspondence with the edges of the support elements, the modules can incorporate an upper channel with different widths, which allows the subsequent filling thereof with an insulating and/or sealing material, facilitating the connection between modules.

[0020] The tiles and the support elements being adhered to one another by means of high bonding synthetic adhesive, favored by the composition of the support elements, which allows transmitting stresses on the entire surface of the back of the tile, is contemplated as a possibility.

[0021] Finally, the possibility that the synthetic adhesive is selected from epoxy adhesives or polyurethane adhesives is contemplated.

Description of the Drawings

[0022] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which the following is depicted with an illustrative and non-limiting character:

Figure 1 shows a schematic perspective view of two modules according to the flooring of the invention, the mode of connection between said modules being depicted by means of the facing arrangement of tongue and grooving means located on their edges, as well as an upper channel which is in correspondence with said connection for the subsequent filling thereof.

Figure 2 shows a schematic perspective view such as that of Figure 1, in which an embodiment variant of the modules is depicted in which the channel is narrower than in the embodiment depicted in said Figure 1.

Figure 3 shows a schematic perspective view such as that of the previous figures, in which an embodiment variant of the modules without a channel is depicted.

Figure 4 shows a view relating to the assembly of the modules depicted in Figure 1, in which the filling material between channels is observed.

Figure 5 shows a view relating to the assembly of the modules depicted in Figure 2, in which the filling material between channels with smaller dimensions is observed.

Figure 6 shows a view relating to the assembly of the modules depicted in Figure 3, in which the filling material is not necessary because there are no channels between the modules.

Preferred Embodiment of the Invention

[0023] In view of the mentioned figures, it can be observed how in one of the possible embodiments of the invention the modular flooring proposed by the invention comprises a plurality of modules (1), in which each module (1) comprises a ceramic or natural stone tile (2), which is adhered to a support element (3) with a planar configuration comprising a cellulosic-based fiberboard.

[0024] According to an embodiment of the invention, the support elements (3) are fiberboards produced with wood fibers bound with synthetic resins, MDF, in which they are previously ground by means of a thermomechanical process, and the lignin has been removed, bound with additives such as synthetic resins by means of a pressing process in which pressure and temperature are applied simultaneously until reaching medium density.

[0025] On the other hand, according to another embodiment of the invention the support elements (3) are made of HPL, a high-density, non-porous material formed by layers of cellulosic fiber material impregnated with heat-setting resins and connected to one another by means of a high pressure pressing process according to a core of sheets of Kraft cellulosic fibers impregnated with phenol-formaldehyde resins, in which pressure exceeding 5 MPa and temperature exceeding 130° are applied simultaneously to the assembly of stacked sheets, which allows the heat-setting resins to flow and cure, to obtain them.

[0026] As can be seen in the figures, the modules (1) are connected by means of tongue and grooving means (4) located on the edges of the support elements (3), in which said tongue and grooving means are configured to allow successive operations for assembling and removing the modules (1) comprised by the modular flooring.

[0027] The desired custom-cut of the support elements (3) or even the use of different tile (2) sizes means that, in correspondence with the edges of the support elements (3), the modules (1) can incorporate an upper

channel (6) with different widths, which allows the subsequent filling thereof with an insulating and/or sealing material (7), which facilitates the connection between modules (1).

[0028] The tiles (2) and the support elements (3) are adhered to one another by means of high bonding synthetic adhesive (5), favored by the composition of the support elements (3), which allows transmitting stresses on the entire surface of the back of the tile, said synthetic adhesive (5) being an epoxy adhesive and/or a polyurethane adhesive.

[0029] In view of this description and set of drawings, the person skilled in the art will understand that the embodiments of the invention which have been described can be combined in many ways within the object of the invention. The invention has been described according to several preferred embodiments thereof, but for the person skilled in the art, it will be evident that many variations can be introduced in said preferred embodiments without exceeding the object of the claimed invention.

Claims

1. Modular flooring, **characterized in that** it comprises a plurality of modules (1), wherein each module (1) comprises a ceramic or natural stone tile (2) which is adhered to a support element (3) with a planar configuration comprising cellulosic fibers.

2. Modular flooring according to claim 1, **characterized in that** the support elements (3) are fiberboards produced with wood fibers bound with synthetic resins.

3. Modular flooring according to claim 1, **characterized in that** the support elements (3) are a high-density, non-porous material formed by layers of cellulosic fiber material impregnated with heat-setting resins and connected to one another by means of a high pressure pressing process according to a core of sheets of Kraft cellulosic fibers impregnated with phenol-formaldehyde resins.

4. Modular flooring according to any of the previous claims, **characterized in that** the connection between the modules (1) is carried out by tongue and grooving means (4), configured to allow successive operations for assembling and removing the modules (1) comprised by the modular flooring.

5. Modular flooring according to claim 4, **characterized in that** the modules (1) corresponding with the edges of the support elements (3) incorporate an upper channel (6) with different widths to allow the filling thereof with an insulating and/or sealing material (7) facilitating the connection between modules (1).

6. Modular flooring according to any of the previous claims, **characterized in that** the adhesion between the tiles (2) and the support elements (3) is carried out by means of high bonding synthetic adhesive (5), favored by the composition of the support elements (3).

7. Modular flooring according to claim 6, **characterized in that** the synthetic adhesive (5) is selected from epoxy adhesives or polyurethane adhesives.

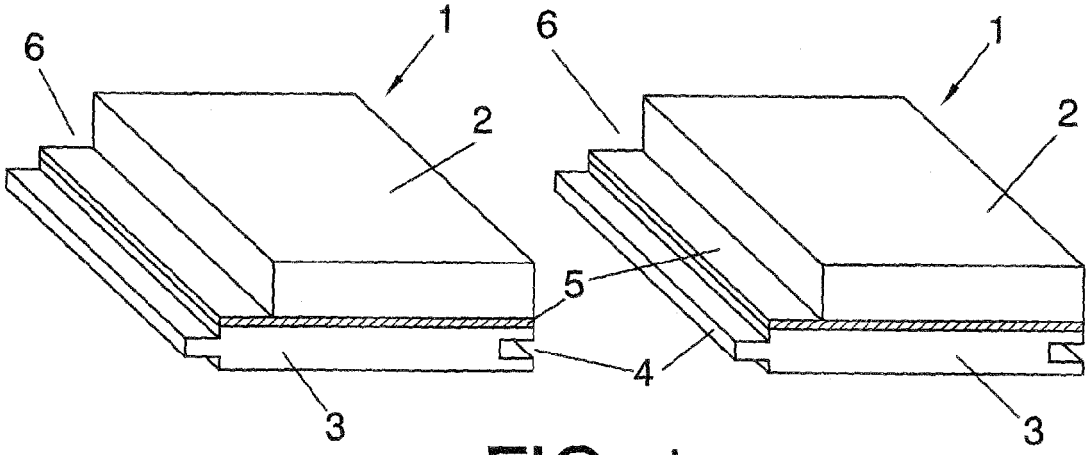

FIG. 1

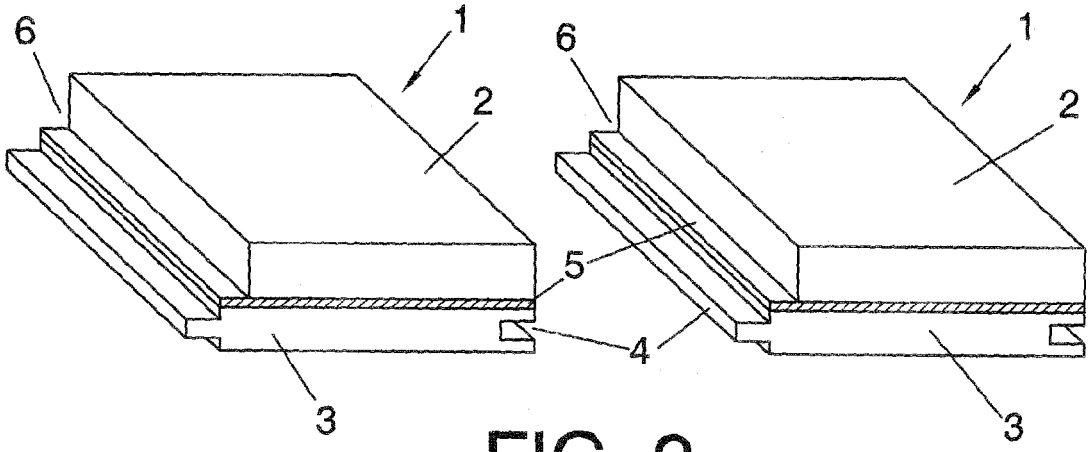

FIG. 2

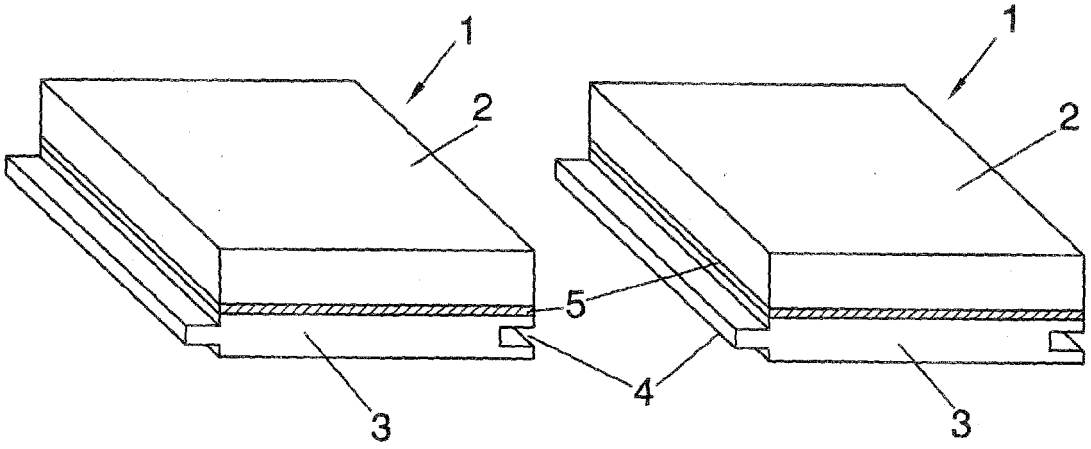

FIG. 3

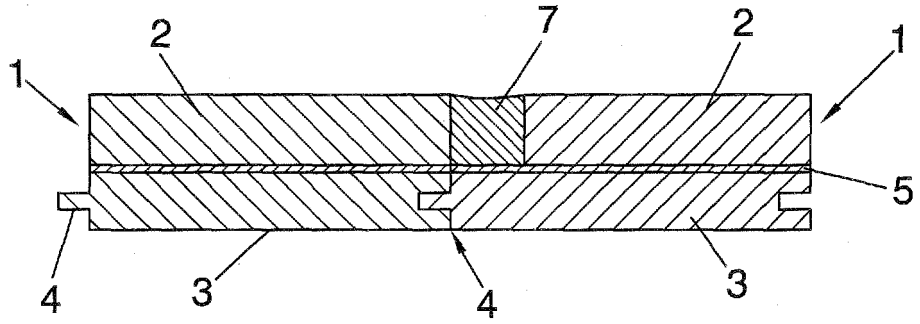

FIG. 4

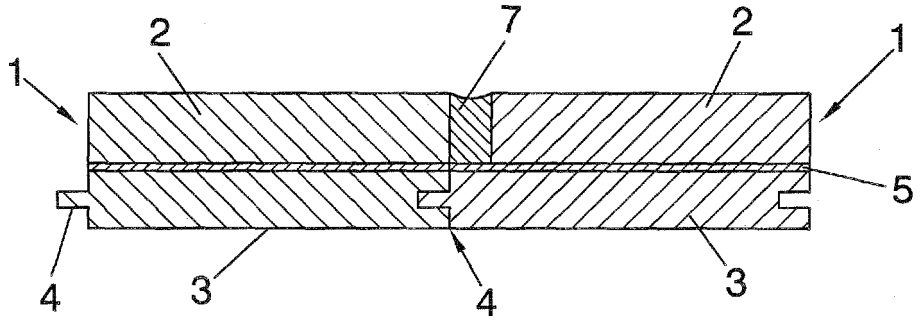

FIG. 5

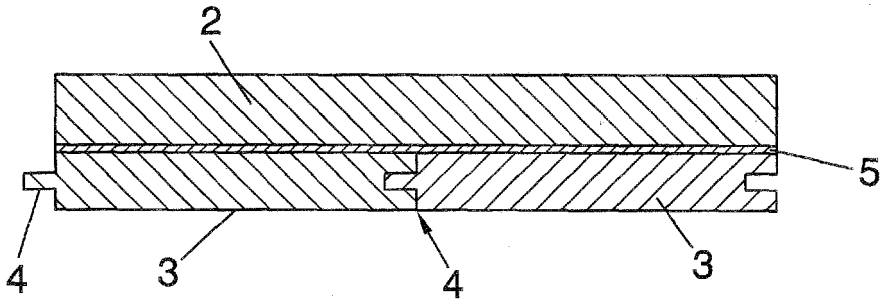

FIG. 6