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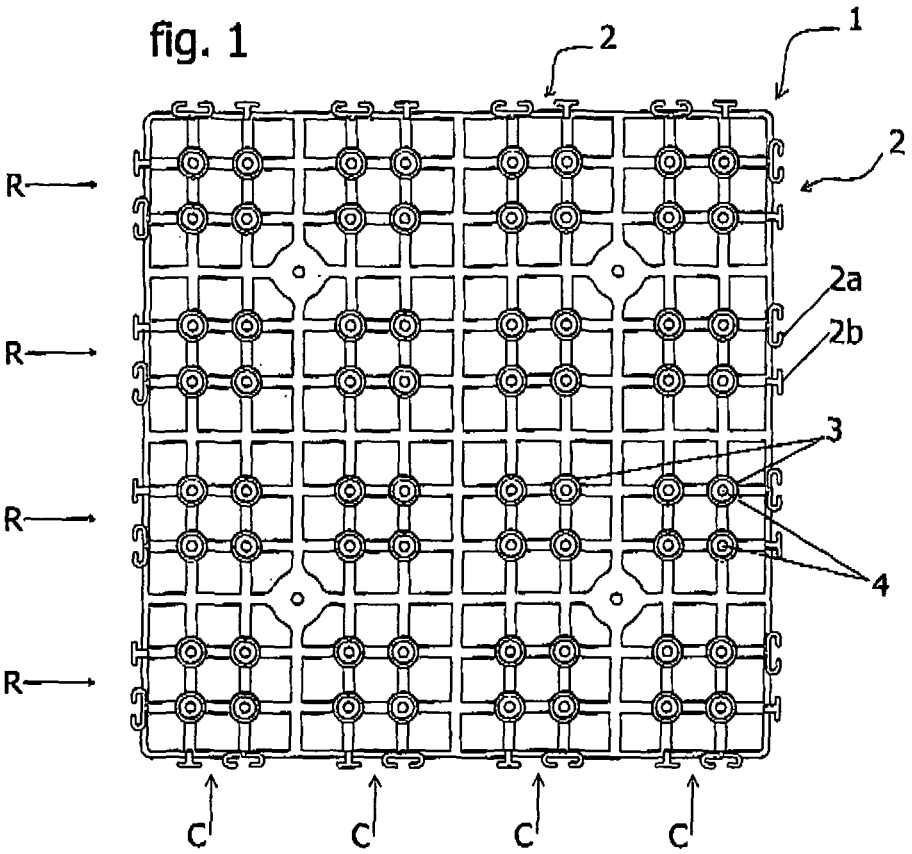
(54) Modular frame for pavement supporting

(57) Modular support frame for flooring comprising a mesh grid (1) made of plastic materials, lateral connectors (2) of complementary shape and spacer feet (3), positioned according to a configuration of rows (R) and columns (C), **characterized in that** a pair of mutually alternated complementary connectors (2) are positioned at the end of each row and column.

fig. 1



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Description

[0001] The invention is directed towards the sector of horizontal floor coverings. In more detail, the invention relates to a modular support system for flooring, and is particularly (but not exclusively) directed towards covering for outdoor public or private locations, such as gardens, swimming pools, terraces, balconies, etc....

[0002] According to prior art, each single tile, forming said covering systems, is obtained through a modular square frame made of plastic material, suitable to receive slats, prevalently made of wood, fastened thereon, and subsequently suitable to be coupled with other identical modules, to produce the entire flooring. Typically, frames available on the market are divided according to geometrical grids of rows and columns and present along their perimeter a series of elements for interlocking with adjacent modules. Said elements are generally connectors of complementary shape of the male/female type and can be positioned along the perimeter of the grid with two different methods. In a first arrangement, male type couplings are present on two adjacent sides and female type couplings are present on the remaining two adjacent sides. In a second arrangement, the male and female couplings are positioned mutually alternated, so that both male and female type couplings are present on each side of the frame. The female type couplings are prevalently C-shaped and are closed inferiorly by a stiffening membrane, while the male type couplings are substantially T-shaped.

[0003] Each single tile can be cut without distinction along separation lines of the columns and of the rows, in order to produce smaller elements, also of different shape, according to the preferred installation method or to the extension requirements of the surface to be covered.

[0004] The slats above the plastic frame are normally fastened with screws, distributed evenly on the area of the tile, so as to ensure fastening thereof even to smaller portions of frame, for example after cutting along the aforesaid lines.

[0005] These modular support systems for flooring present some limits or drawbacks.

[0006] The constructional alternative in which the male and female couplings are distributed on adjacent sides makes the assembly operation more difficult. In the case in which the tiles are positioned according to different directions, so that the slats are alternatively oriented vertically and horizontally, once the two sides of the tile have been coupled, in order to couple the remaining sides the installer is obliged to at least partly lift the portion of floor previously assembled. This also results in complications during the step to remove any one of the tiles, in the case of replacement or temporary removal of the module to inspect the ground below. This also leads to lengthy installation and processing times and, consequently, high costs.

[0007] As mentioned above, there is a constructional variant in which only one coupling, male or female alternatively, is provided on each column and each row. The problem with this solution is that it is not versatile, as it does not allow the tile to be assembled staggered by only one row or only one column, not allowing inclined or curved lines to be followed with good approximation and precluding some compositions, making the direction of orientation of the slats obligatory and restricted. A further disadvantage consists in the waste of material, in the creation of scraps and waste that are difficult to dispose of.

[0008] Another problem of prior art types of frame derives from the system for resting on the ground. This flooring system is in fact of the floating type, i.e. it can be placed without distinction of soft and rough grounds, or on hard and flat grounds, such as a layer of concrete. In the first case it is the entire frame, with its mesh grid that rests on the ground creating a wide supporting surface, while in the second case the frame rests on the installation surface with spacer feet, also used to screw and fasten the slats. These plastic portions are distributed evenly, but prevalently in the central part and do not involve the perimeter of the tile. In the case of an edge load, which discharges its weight along the side of the tile, there is a considerable risk of overturning, with consequent damage and deformation of the entire composition.

[0009] The invention intends to overcome these limits, by producing a modular support frame for pavements, which is easy to install and perform maintenance on, extremely versatile, stable, long lasting and strong.

[0010] These aims are achieved with a modular support frame for flooring comprising a mesh grid made of plastic material, lateral connectors of complementary shape and spacer feet positioned according to a configuration of rows and columns, characterized in that a pair of mutually alternated complementary connectors are positioned at the end of each row and column.

[0011] According to a preferred aspect of the invention, the grid is square in shape and comprises four rows and four columns, and consequently four pairs of connectors on each side.

[0012] The plurality of interlocking lateral connectors allows the module to engage temporarily with other similar elements, to create a floor surface, and the series of spacer feet, as well as allowing the slats of the covering to be screwed to the plastic grid, contribute towards the stability of the tile.

[0013] The invention presents numerous advantages: the Interlocking connectors, thus positioned and due to their connection section, without horizontal stiffening membranes, make installation extremely easy and fast, and also facilitate removal of one or more elements, even in the centre of the flooring, for maintenance and inspection purposes.

[0014] The aforesaid distribution of the connectors makes the tile element extremely versatile and allows any preferred composition to be produced, with the cov-

ering slats oriented as required, even after cutting into smaller portions, along lines parallel to the sides of the grid. It is also possible to cut only one single row to be used as decorative finishing edge of the flooring or as baseboard. When used as baseboard, the presence of two connectors for each side of each row allows stable coupling to prevent rotation between subsequent elements. The presence of two complementary connectors at the ends of each row and of each column also allows these to be coupled without any restriction of mutual orientation. Finally, the arrangement of the connectors allows the modules to be fastened staggered by only one column or one line, so as to easily follow specific oblique or curvilinear profiles, without increasing cuts and scraps, and therefore limiting costs and expenses for dealing with waste.

[0015] The floating support system allows installation on any pre-existing surface, ensuring maximum support, maximum strength and maximum safety against overturning also due to the vertical dimensions of the lateral connectors: advantageously, these connectors are positioned so that their lower height corresponds to the lower height of the spacer feet positioned in the centre of the grid, to increase the supporting surface and also ensure maximum stability along the perimeter.

[0016] The advantages of the invention will be more apparent below, where a preferred embodiment is described by way of non-limiting example, and with the aid of the figures, wherein:

Fig. 1 represents a bottom view of a support module for flooring;
Fig. 2 represents a side view of this module;
Fig. 3 represents a generic cross section of the module of Fig. 1;
Fig. 4 represents a perspective top view of an interlocking portion between two mutually coupled support modules;
Figs. 5 to 8 represent various possible compositions.

[0017] With reference to Fig. 1, this shows a square mesh grid 1, made of plastic material, which can be easily divided into rows R and columns C, and complete, along its perimeter, with lateral connectors 2 of complementary shape, of female 2a and male 2b type. Spacer feet 3 are distributed evenly on the grid, positioned in pairs along rows and columns inside the mesh, suitable to ensure that the tile rests on the installation surface, and which can also be used, due to their axial holes 4 to screw the covering portion 5 onto the grid 1.

[0018] With reference to Fig. 2, each column or row terminates with a pair of connectors, one male and one female. This latter is of the completely "open" type, i.e. it does not present horizontal stiffening membranes, and this ensures that the male connectors can be inserted from above or below and makes it extremely easy to install and perform maintenance on the entire flooring.

[0019] With reference to Fig. 3, it is evident that the spacer feet 3 and the lateral connectors 2 have the same lower height, so as to ensure high stability, especially in the case in which the supporting surface is of the impenetrable type and edge loads occur along the perimeter of the tile, which could cause overturning. It should be noted how the spacer feet 3 can be used to fasten the covering 5 characterizing the tile, by means of screws 6 to be inserted in the holes 4. Said covering can be produced by tonguing and grooving plastic or wooden slats, but according to alternative variants it can take different forms in different materials.

[0020] Fig. 4, purely by way of example, shows an interlocking portion between two adjacent modules, where the "female" element 2a encloses the "male" element 2b to ensure perfect coupling.

[0021] Finally, with reference to Figs. 5 to 8, the support frames can be mutually coupled so as to obtain various compositions, also adaptable to specific solutions.

[0022] In particular, Fig. 5 shows a flooring with an edge composed of a row R; figure 6 shows a flooring with the frames mutually connected rotated by 90°, Fig. 7 shows how by coupling the frames staggered by one row it is possible to follow the inclined sides of the surface to be floored; finally, Fig. 8 shows the use of single rows mutually coupled to produce a baseboard. As is apparent to those skilled in the art, the invention has been described with reference by way of example to modular plastic frames for removable outdoor flooring, but it can be used more in general as a support for any covering, of any material and form, both for outdoors and indoors, in public or private locations, also in the presence of water and humidity.

Claims

1. Modular support frame for flooring comprising a mesh grid (1) made of plastic material, lateral connectors (2) of complementary shape and spacer feet (3), positioned according to a configuration of rows (R) and columns (C), **characterized in that** a pair of mutually alternated complementary connectors (2) are positioned at the end of each row and column.

2. Modular support frame for flooring according to claim 1, **characterized in that** at least two pairs of alternated connectors (2), i.e. at least two male type couplings (2b) alternated with two female type couplings (2a) are positioned on each side of the grid (1).

3. Modular support frame for flooring according to claim 1, **characterized in that** the female type connectors (2a) are of the "open" type, i.e. they do not present horizontal stiffening membranes.

4. Modular support frame for flooring according to claim 1, **characterized in that** the spacer feet (3) and the lateral connectors (2) have the same lower height.

5. Modular support frame for flooring according to claim 1, **characterized in that** said feet (3) are provided with holes (4) so as to allow fastening of any floor surface on the grid.

6. Modular support frame for flooring according to claim 5, **characterized in that** said floor surface can be of the type with slats or strips (5).

7. Modular support frame for flooring according to claim 6, **characterized in that** said slats (5) can be produced in different materials such as wood, plastic, rubber, resin, stone, etc...

8. Modular support frame for flooring according to claim 7, **characterized in that** said slats (5) are fastened to the grid by means of screws (6) passing through holes (4) of the feet (3).

9. Modular support frame for flooring according to one or more of the preceding claims, **characterized in that** said grid (1) is square in shape and can be divided into four rows (R) or four columns (C).

10. Flooring tile **characterized in that** it comprises a modular support frame according to any one of the preceding claims.

fig. 1

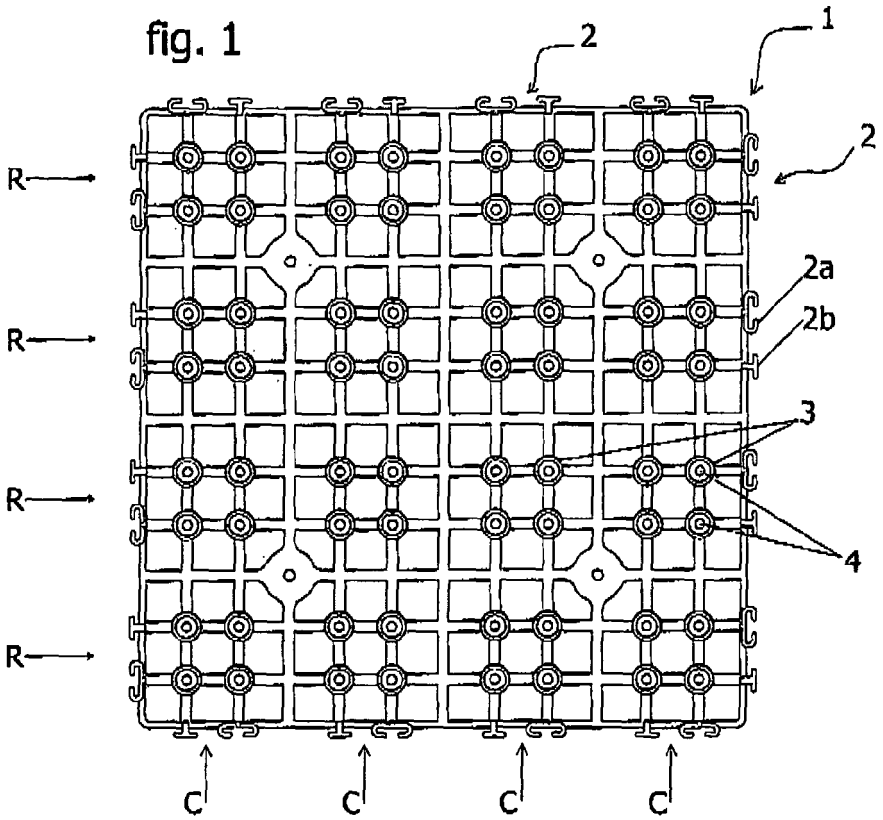

fig. 2

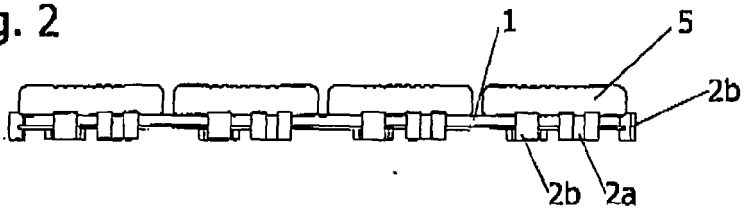

fig. 3

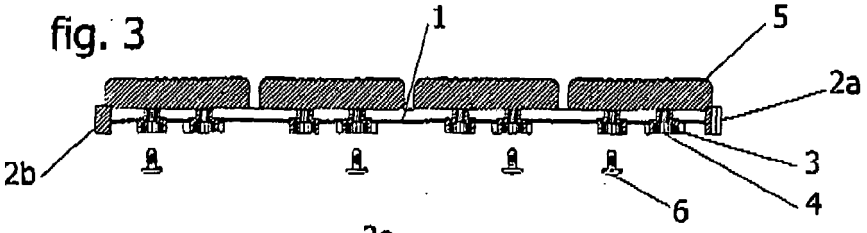

fig. 4

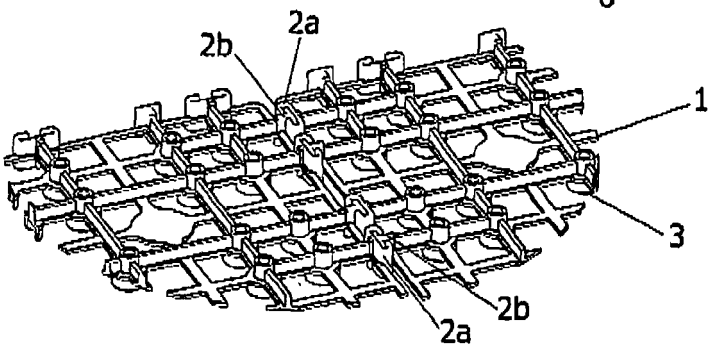

fig. 5

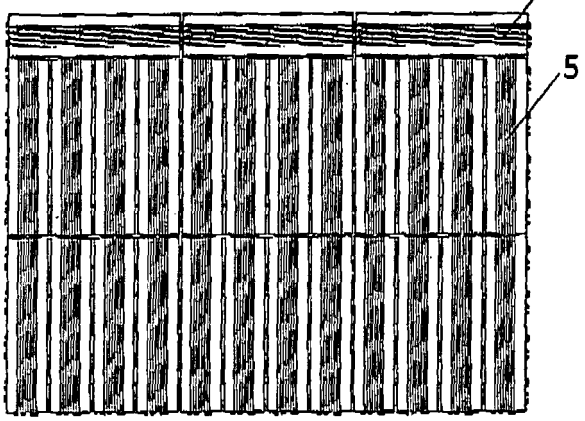

fig. 6

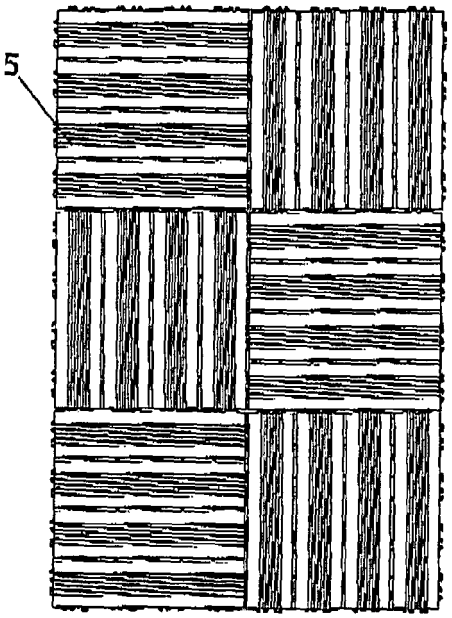

fig. 7

fig. 8