(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 471 232 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.12.2024 Bulletin 2024/49

(21) Application number: **24176210.3**

(22) Date of filing: **16.05.2024**

(51) International Patent Classification (IPC):
E04F 15/02 *(2006.01)* ***E04F 15/10*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E04F 15/107; E04F 15/02133; E04F 15/02194; E04F 15/105; E04F 2203/065; E04F 2290/043

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **02.06.2023 PT 2023118695**

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(54) **MODULAR FLOORING AND MODULAR FLOORING SYSTEM**

(57) The invention is related to a modular flooring (1) configured for the assembly of modular flooring systems comprising a modular flooring component (2), which preferably comprises at least one cavity (6) arranged on the lower portion thereof, and a flexible base component (3) having preferably at least one vertical-fastening bulge (4) arranged on the continuous upper face thereof, wherein each vertical-fastening bulge (4) connects in a detachable manner with a cavity (6).

The modular flooring contributes to dampen the noise deriving from usage thereof, eliminates areas where vapors and moisture flow from the base on which it rests, increases adherence to its support base and promotes uniform and continuous shock absorption.

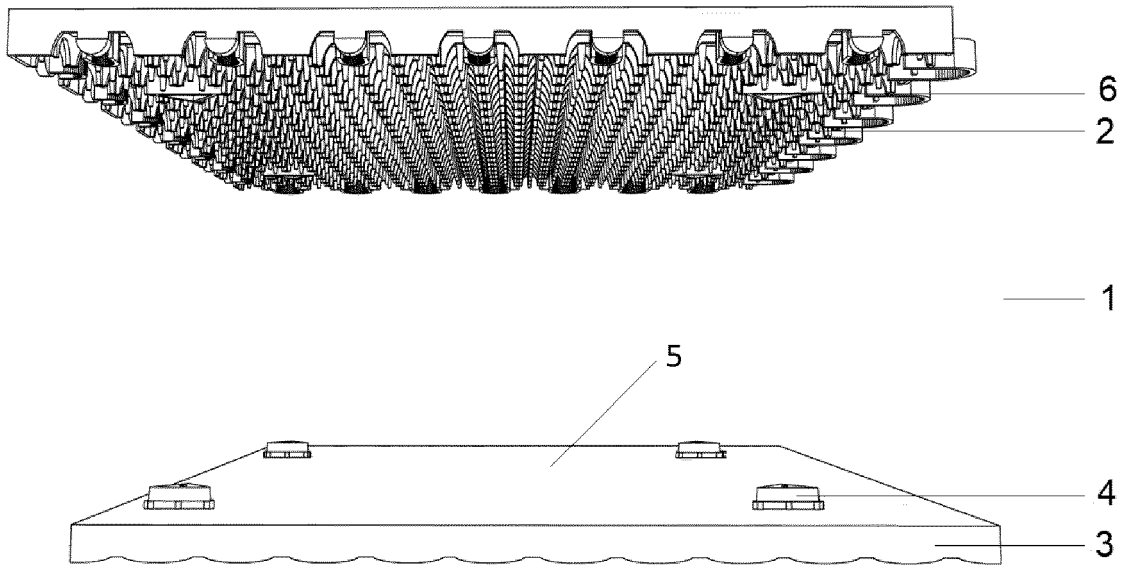

Fig. 1

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Description

TECHNICAL DOMAIN

[0001] The present invention is related to modular floorings and modular flooring systems comprising the interconnection of a plurality of modular floorings, whereby said systems are used in flooring, for example, of sports halls.

PRIOR ART

[0002] Modular floorings are widely used for installing interconnected modular floorings, which are frequently used for the assembly of sports halls.

[0003] The modular floorings of the state of the art comprise a modular flooring component, which comprises side-fastening spigots which allow the interconnection between adjacent modular floorings by means of male and female connectors, which are arranged on the edges of the side walls of the modular floorings. Installing floors in sports halls requires incorporating elements in the modular flooring system which absorb impacts resulting from sporting activities, contribute to the lessening of noise and further allow the adequate draining of water through the modular flooring.

[0004] Portuguese patent application PT 110620 A by Rui Pedro Simões Vicente, published on September 12, 2019, discloses a modular flooring which comprises a modular floor section, interior or exterior, which is fitted and connected to a removable base, whereby said removable base is encased into and fixed on the bottom part of the section of the modular floor tile. The removable base comprises a plurality of holes along the length of the surface thereof, which cross it transversely and contribute to the drainage of water through the modular flooring, which is particularly useful for the removal of water resulting from the weather in case the modular floors are exposed to the outdoors, or even for the removal of water resulting from cleaning of the modular flooring system.

LIMITATIONS OF THE PRIOR ART

[0005] The modular flooring, described in Portuguese patent application PT110620A, has limitations concerning its noise-propagating characteristics, which is especially disadvantageous when the modular floors are used in modular flooring systems of sports venues.

[0006] The existence of the plurality of orifices in the modular flooring described in Portuguese patent application PT110620A has a disadvantageous effect, as these contribute to diffuse the sound waves deriving from the impact of the users of sporting practices. Accordingly, the noise resulting from the footsteps of the users, from the attrition of the footwear on the flooring and of the bouncing ball is easily propagated and raises the decibels of the environment, especially in enclosed spaces, such as sports halls.

[0007] The orifices existing in the modular flooring, described in Portuguese patent application PT110620A are suitable for the drainage of moisture flowing from the modular flooring to the removable base, yet the same orifices result in limitations when the moistures come into contact with a modular flooring system from the based on which the system rests. In this situation, the water vapors and the moisture originating from the base pass through the orifices and end up condensing on the upper surface of the modular flooring. Therefore, a film of water forms on the modular flooring, reducing adherence and the attrition factor of this surface. Consequently, the modular flooring described in said document from the state of the art contributes to increase the risk of accidents among users of the modular flooring.

[0008] Accordingly, the state of the art needs modular flooring that dampens the propagation of noise inherent to the usage thereof, as well as contributing to a safer practice of sports in terms of adherence of user footwear to the upper surface of the modular flooring.

SOLUTION OF THE STATE OF THE ART LIMITATIONS

[0009] The present invention solves the limitations of the state of the art by using a modular flooring comprising a modular flooring component, which includes at least one cavity in the lower portion thereof, and a flexible base component, which includes at least one vertical-fastening bulge on its upper face, wherein the connection between the cavity and a vertical-fastening bulge promotes the detachable connection of said elements, and the flexible base component comprises a continuous upper face with an exception of the at least one vertical-fastening bulge.

ADVANTAGEOUS EFFECTS OF THE INVENTION

[0010] The modular flooring according to the invention, considering the incorporation of a flexible base component comprising a continuous upper face, contribute to dampen the noise deriving from usage of modular flooring, especially in practicing sports. Since the flexible base component is devoid of orifices passing through said component, the propagation of sound waves is mitigated by the modular flooring.

[0011] Additionally, the incorporation of a flexible base component comprising a continuous upper face presents the advantage of eliminating areas where vapors and moisture flow from the base on which it rests, contributing so that the contact surface of the users with the flooring remains dry, increases adherence and safety in using the flooring, especially in practicing sports.

[0012] Another advantage deriving from the incorporation of a flexible base component comprising a continuous upper face lies in the fact that it contributes to a greater area of adherence to the support base, providing a continuous and uniform dampening throughout the en-

tire flooring. The continuous and uniform dampening of vertical loads has the additional advantage of contributing to reduce injuries in users of the modular flooring, which may result from impact upon contact with the flooring.

[0013] Further, the modular floorings according to the invention present a firmer connection between a modular floor tile component and a flexible base component, without the connection ceasing to display the detachable characteristics thereof.

[0014] In this way, the time required for installing a modular flooring system according to the present invention is significantly reduced, making the interconnection activity between adjacent modular floorings more efficient and practical, since it is possible to mitigate the undesired detaching between the modular flooring floor component and the flexible base component. This technical advantage in installing a modular flooring system is particularly relevant in the assembly and maintenance of modular flooring for sports venues, which may present over 9000 modular flooring modules, in the case of basketball fields, and may even exceed 15000 modular flooring modules, such as in the futsal and handball courts.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] With the purpose of providing an understanding of the principles according to the embodiments of the present invention, reference will be made to the embodiments illustrated in the drawings and to the terminology used to describe them. In any case, it should be understood that there is no intention of limiting the scope of the present invention to the contents of the figures. Any subsequent alterations or modifications of the inventive characteristics illustrated herein, as well as any additional applications of the principles and embodiments of the invention illustrated, which would normally occur to a person skilled in the art having the knowledge of this specification, are considered as being within the scope of the claimed invention.

Figure 1 - illustrates a perspective view of a modular flooring according to the invention;
Figure 2 - illustrates a perspective view of a modular flooring with the fastening between the modular flooring component and the flexible base component;
Figure 3 - illustrates a side view of a flexible base component;
Figure 4 - illustrates a view of the upper face of a flexible base component;
Figure 5 - illustrates a view of the lower face of a flexible base component;
Figure 6 - illustrates a perspective view of a flexible base component;
Figure 7 - illustrates a view of the top face of an exterior modular floor component;
Figure 8 - illustrates a view of the top face of an interior modular floor component;
Figure 9 - illustrates a perspective view of a cavity of an exterior modular flooring component;
Figure 10 - illustrates a perspective view of a cavity of an interior modular flooring component;
Figure 11 - illustrates a perspective view of a fastening bulge of a flexible base component;
Figure 12 - illustrates a top view of an embodiment of a cavity of an interior modular flooring component;
Figure 13 - illustrates a top view of a fastening bulge of a flexible base component;
Figure 14 - illustrates a top view of another embodiment of a cavity of an interior modular flooring component.
Figure 15 - illustrates a bottom view of a first connection embodiment between a modular flooring component and a plurality of flexible base components;
Figure 16 - illustrates a bottom view of a second connection embodiment between a modular flooring component and a plurality of flexible base components;
Figure 17 - illustrates a bottom view of a third connection embodiment between a modular flooring component and a plurality of flexible base components;
Figure 18 - illustrates a bottom view of an alternative connection embodiment between a modular flooring component and a flexible base component.

DESCRIPTION OF THE EMBODIMENTS

[0016] The present invention refers, in a first aspect, to a modular flooring (1) configured for assembly of modular flooring systems comprising:

a modular flooring component (2), which is selected from the group consisting of an interior modular flooring component or an exterior modular flooring component; and
a flexible base component (3), which is configured to connect in a detachable manner to the lower portion of the modular flooring component (2); wherein said modular flooring component (2) comprises at least one cavity (6), which is arranged on the lower portion thereof; and wherein
said flexible base component (3) comprising at least one vertical-fastening bulge (4), which is arranged on the upper face thereof; and wherein
said vertical-fastening bulge (4) is configured to connect in a detachable manner with the cavity (6); and wherein
said flexible base component (3) comprises a continuous upper face (5) with the exception of the at least one vertical-fastening bulge (4).

[0017] In the preferred embodiments of the present invention, as illustrated in figure 9, said modular flooring component (2) comprises at least one vertical pin (16),

which is arranged in the lower portion thereof, wherein said vertical pin (16) is arranged inside the cavity (6). In these preferred embodiments, as illustrated in figure 11, said vertical-fastening bulge (4) comprises at least one vertical hole (11), which is arranged on the upper face thereof; wherein the vertical pin (16) is configured to connect in a detachable manner to the vertical hole (11). In these preferred embodiments, the modular flooring according to the invention presents a firmer connection between a modular flooring component (2) and a flexible base component (3), without the connection ceasing to display its detachable characteristics, wherein there is a firmer connection between the cavity (6) and a vertical-fastening bulge (4). In this way, the time required for installing a modular flooring system according to the present invention is significantly reduced, making the interconnection activity between adjacent modular floorings more efficient and practical, since it is possible to mitigate the undesired detaching between the modular flooring floor component and the flexible base component.

[0018] In other particularly preferred embodiments, as illustrated in figure 11, a vertical-fastening bulge (4) comprises a top wall (9) and at least two side walls (10); wherein the vertical hole (11) passes through said top wall (9); and each side wall (10) comprises at least one male and female first connection element arranged orthogonally in relation to said side wall lateral (10). Further in these embodiments, as illustrated in figure 10, the cavity (6) comprises an interior base area (14) and at least two side walls (15); wherein the vertical pin (16) is connected to the interior base area (14); and wherein each side wall (15) comprises at least one second male and female connection element orthogonally arranged relative to said side wall (15); and the vertical pin (16) is configured to connect in a detachable manner to the vertical pin (11); and the first male and female connection element is configured to connect in a detachable manner with the second male and female connection element, whereby both said male and female connection elements are aligned on the same vertical plane.

[0019] Preferably, the modular flooring component (2) comprises 4 to 48 cavities (6) arranged on the lower portion thereof; and said flexible base component (3) comprises 4 to 48 vertical-fastening bulges (4), arranged on the upper face thereof. The preferred number of cavities (6) and of vertical-fastening bulges (4) may be in the range of 4 to 36. Even more preferably, the number of cavities (6) and of vertical-fastening bulges (4) may be in the range of 4 to 12. In the preferred embodiments of the present invention, the modular flooring component (2) comprises 4 to 6 cavities (6) arranged on the lower portion thereof; and said flexible base component (3) comprises 4 to 6 vertical-fastening bulges (4), arranged on the upper face thereof.

[0020] As illustrated in figure 1, preferably, the flexible base component (3) comprises at least four vertical-fastening bulges (4), which are arranged on the upper face thereof, and the modular flooring component (2) comprises at least four cavities (6) arranged on the lower portion thereof, wherein each vertical-fastening bulge (4) is configured to connect in a detachable manner with a cavity (6).

[0021] As illustrated in figures 2 to 8, as soon as a modular flooring (1) is assembled by means of the connection of the flexible base component (3) with the modular flooring component (2), the male side-fitting spigots (19) are used for fitting with female side spigots (20), arranged on the edge of at least one side wall of an adjacent modular flooring component (2). Preferably, the male side-fastening spigots (19) are arranged on the two edges of two adjacent side walls of a modular flooring component (2). Similarly, as illustrated in figure 7, the female side-fastening spigots (20) are arranged in a similar manner on the edges of two adjacent side walls of a modular flooring component (2).

[0022] As illustrated in figures 3 and 5, preferably, the flexible base component (3) comprises a plurality of recesses (7) and bulges (8), which are arranged on the lower face thereof, whereby said recesses (7) and bulges (8) contribute with the technical effect of providing an air box for the modular flooring (1), apart from exerting a self-leveling effect of said modular flooring (1). In other embodiments, said flexible base component (3) comprises a plurality of recesses (7) and bulges (8) are arranged in the continuous upper face (5) thereof.

[0023] The technical effects cited in the previous paragraph and the adequate connection between the vertical-fastening bulges (4) and the cavities (6) are emphasized in the preferred embodiments wherein the flexible base component (3) is produced from an elastomeric, rubberized or flexible material, preferably selected from the group consisting of natural rubber, styrene-ethylene-butylene-styrene rubber, polyurethane, polyester, polyolefins, styrene-butadiene rubber, ethylene-vinyl-acetate rubber, mixtures thereof and their copolymers. Alternatively, the flexible base component (3) is produced from a material selected from the group consisting of cork and composites or mixtures of cork with said elastomeric materials.

[0024] As illustrated in figures 1, 4 and 6, preferably, the flexible base component (3) comprises at least four vertical-fastening bulges (4), which are arranged in the upper face thereof.

[0025] In the preferred embodiments of the present invention, as illustrated in figures 11 and 13, each side wall (10) of the vertical-fastening bulge (4) comprises in the exterior portion thereof at least one first male and female connection element selected from the group consisting of a first side-connection bulge (12) or a first side-connection recess (13); and, as illustrated in figures 9, 10 and 12, each side wall (15) of the cavity (6) comprises in the interior portion thereof at least one second male and female connection element selected from the group consisting of a second side-connection bulge (17) or a second side-connection recess (18).

[0026] Alternatively, as illustrated in figure 14, each side wall (15) of the cavity (6) comprises in the exterior portion thereof at least one second male and female connection element selected from the group consisting of a second side-connection bulge (17) or a second side-connection recess (18).

[0027] As illustrated in figures 3 and 11, in the preferred embodiments, the first side-connection bulge (12) or the first side-connection recess (13) occupy a part of each side wall (10) of the vertical-fastening bulge (4), however, it must be interpreted within the scope of this invention that the first side-connection bulge (12) or the first side-connection recess (13) can be vertically arranged along all or part of each side wall (10) of the vertical-fastening bulge (4).

[0028] In other preferred embodiments according to the present invention, the plurality of side walls (10) of the vertical-fastening bulge (4) and the plurality of side walls (15) of the cavity (6) present straight horizontal sections, preferably in the form of a polygon selected from the group consisting of a triangle, a quadrilateral, a pentagon, a hexagon, an heptagon or an octagon, wherein the straight horizontal section of the plurality of side walls (10) presents the same polygonal shape as the horizontal straight section of the plurality of side walls (15).

[0029] As will be evident to a person skilled in the art, the number of vertical-fastening bulges (4) corresponds to the number of cavities (6) in the preferred embodiments, and the vertical-fastening bulges (4), the cavities (6) and the respective male and female connection elements are aligned on the same vertical plane.

[0030] Preferably, as illustrated in figure 2, the width and length of the flexible base component (3) are substantially the same as, respectively, the width and length of the modular flooring component (2).

[0031] In other preferred embodiments according to the present invention, the flexible base component (3) and the modular flooring component (2) present straight horizontal sections in polygonal form, preferably in the form of a polygon selected from the group consisting of a triangle, a quadrilateral, or a hexagon.

[0032] Alternatively, a plurality of flexible base components (3) is arranged under a modular flooring component (2). As illustrated in figures 15 and 16, two or three flexible base components (3) with a rectangular horizontal straight section are arranged along the width of the modular flooring component (2). Alternatively, as illustrated in figure 17, a plurality of flexible base components (3) with a rectangular horizontal straight section is arranged along at least one dimension selected from the group consisting of the width and length of the modular flooring component (2).

[0033] Alternatively, as illustrated in figure 18, the flexible base component (3) comprises a horizontal straight section similar to an "X", with two crossed segments perpendicular to each other. Preferably, the terminal portions of said segments are arranged under the opposite vertices of the modular flooring component (2). The dimensions of each of said segments, perpendicular to each other, which constitute the "X", have a length equal to or less than the distance between the two vertices opposite the modular flooring component (2). Preferably, the width of said segments is equal to about 35% to 25% of the width of the respective side of the modular flooring component (2). In these embodiments, preferably the sum of the areas of the horizontal straight sections of the flexible base components (3) is smaller than or equal to the area of the horizontal straight section of the modular flooring component (2).

[0034] In the particularly preferred embodiments, the modular flooring component (2) has a thickness in the range of 1 mm to 50 mm, more preferably in the range of 1 mm to 10 mm, even more preferably in the range of 1 mm to 3 mm. In the particularly preferred embodiments, the flexible base component (3) has a thickness in the range of 1 mm to 50 mm, more preferably in the range of 1 mm to 20 mm, even more preferably in the range of 2 mm to 8 mm.

[0035] In one of the preferred embodiments of the present invention, the modular flooring component (2) has rigid constructive characteristics and is manufactured from a polymeric material, preferably selected from the group consisting of polypropylene, vinyl polychloride, polyethylene, mixtures thereof and their copolymers.

[0036] In another of the embodiments of the present invention, the modular flooring floor component (2) has flexible constructive characteristics and is manufactured from a polymeric material, preferably selected from the group consisting of low-density polypropylene, low-density polyethylene, natural rubber, styrene-ethylene-butylene-styrene rubber, polyurethane, polyester, polyolefins, styrene-butadiene rubber, vinyl ethylene-acetate rubber, mixtures thereof and their copolymers.

[0037] The modular flooring component (2) can be suitable for exterior modular flooring as illustrated in figure 7 or suitable for interior modular floorings, as illustrated in figure 8. Similarly, the cavity (6) can be suitable for exterior modular flooring systems, as illustrated in figure 9, or suitable for interior modular flooring systems, as illustrated in figure 10.

[0038] As will be understood by a person skilled in the art, the modular flooring component (2), illustrated in figure 7, is suitable for exterior modular flooring floor components and is preferably manufactured incorporating a plurality of beams or joists which cross orthogonally and a plurality of girders which connect simultaneously with said beams or joists and between each other in 45° or 135° angles relative to a horizontally arranged beam or joist.

[0039] As visualized in figures 8 and 10, the modular flooring component (2) suitable for interior modular flooring systems is also preferably manufactured incorporating a plurality of beams or j oists which cross orthogonally and a plurality of girders which connect simultaneously with said beams or joists and between each other in 45° or 135° angles relative to a horizontally arranged beam

or joist, whereby a flat plate is fixed on the upper face thereof, so as not to allow exposed passages through the set of girders, beams and j oists.

[0040] The present invention is related, in a second aspect, to a modular flooring system comprising a plurality of modular floorings (1), as defined in the first aspect of the invention, interconnected through the connection between side-fastening male spigots (19), arranged on the edge of at least one side wall of a modular flooring component (2), and side-fastening female spigots (20), arranged on the edge of at least one side wall of an adjacent modular flooring component (2).

[0041] As illustrated in figures 7 and 8, the side male fastening spigots (19) are connected to at least one edge of the side wall of the modular flooring component (2) and include a terminal fastening portion, for example, in semicircle or arc shape. In the same figures there are illustrated female side-fastening spigots (20), which are connected to at least one other edge of the side wall of the modular flooring component (2) and have an area delimited by vertical walls, for example similarly semicircle or arc shaped, which is configured to accommodate the terminal fastening portion of a male side-fastening spigot (19). Anyway, as will be understood by a person skilled in the art, other embodiments of male side-fastening spigots (19) and female side-fastening spigots (20) are capable of being used in the modular flooring system (2) included in the modular flooring (1) according to the invention.

[0042] As used in this specification, the expression "modular flooring" refers to a unit of a module comprising a modular flooring component (2) and a flexible base component (3).

[0043] As used in this specification, the expression "modular flooring system" refers to a plurality of interconnected modular floors.

[0044] As used in this specification, the expression "continuous upper face" refers to a surface devoid of interruptions or orifices along the extension thereof, with the exception that said expression "continuous upper face" comprises at least "one vertical-fastening bulge". Additionally, the "continuous upper face" may be substantially flat or present a plurality of recesses and bulges, with the exception that the portions comprise at least "one vertical-fastening bulge".

[0045] As used in this specification, the expression "vertical-fastening bulge" comprises a fastening rod.

[0046] As used throughout this description, the expressions "around" and "approximately" refer to a value range of more or less 10% the specified number.

[0047] As used throughout this patent application, the expression "or" is used in the inclusive sense instead of the exclusive sense, unless the exclusive sense is clearly defined in a specific situation. In this context, a sentence of the type "X uses A or B" must be interpreted as including all the pertinent inclusive combinations, for example "X uses A", "X uses B" and "X uses A and B".

[0048] As used throughout this patent application, the indefinite article "one" must be interpreted generally as "one or more", unless the sense of a singular embodiment is clearly defined in a specific situation.

[0049] As presented in this specification, the expressions related to examples must be interpreted with the purpose of illustrating an example and not indicating a preference.

[0050] As used in this specification, the expression "substantially" means that the real value is within the range of values of about 10% the desired value, variable, or related threshold, particularly within about 5% of the desired value, variable, or related threshold or particularly within about 1% of the desired value, variable, or related threshold.

[0051] The subject matter described above is provided as an illustration of the present invention and must not be interpreted so as to limit it. The terminology used with the purpose of describing specific embodiments, according to the present invention, must not be interpreted to limit the invention. As used in the specification, the definite and indefinite articles, in their singular form, aim at the interpretation of also including the plural forms, unless the context of the description indicates, explicitly, the contrary. It will be understood that the expressions "comprise" and "include", when used in this description, specify the presence of the characteristics, the elements, the components, the steps, and the related operations, however, they do not exclude the possibility of other characteristics, elements, components, steps, and operations also being contemplated.

[0052] All the alterations, providing that they do not modify the essential characteristics of the claims that follow, must be considered as being within the scope of protection of the present invention.

LIST OF REFERENCE INDICATIONS

[0053]

1. A modular flooring
2. A modular flooring component
3. A flexible base component
4. A vertical-fastening bulge
5. A continuous upper face
6. A cavity
7. A recess
8. A bulge
9. An upper wall of a vertical-fastening bulge
10. A side wall of a vertical-fastening bulge
11. A vertical hole
12. A first side-connection bulge
13. A first side-connection recess
14. An interior base area
15. A side wall of a cavity
16. A vertical pin
17. A second side-connection bulge
18. A second side-connection recess
19. A male side-fastening spigot

20. A female side-fastening spigot

List of citations

Patent documents

[0054] Portuguese patent application PT 110620 A by Rui Pedro Simões Vicente, published on September 12, 2019.

Claims

1. A modular flooring (1) configured for assembly of modular flooring systems comprising:

a modular flooring component (2), which is selected from the group consisting of an interior modular flooring component or an exterior modular flooring component; and
a flexible base component (3), which is configured to connect in a detachable manner to the lower portion of the modular flooring component (2); wherein
said modular flooring component (2) comprising at least one cavity (6), which is arranged on the lower portion thereof; **and wherein**
said flexible base component (3) comprising at least one vertical-fastening bulge (4), which is arranged on the upper face thereof; **and wherein**
said vertical-fastening bulge (4) is configured to connect in a detachable manner with the cavity (6);
characterized in that
said flexible base component (3) comprises a continuous upper face (5) with the exception of at least one vertical-fastening bulge (4).

2. The modular flooring (1), according to the preceding claim, **characterized in that**:

said modular flooring component (2) comprises at least one vertical pin (16), which is arranged in the lower portion thereof, wherein said vertical pin (16) is arranged inside the cavity (6); and
said vertical-fastening bulge (4) comprises at least one vertical hole (11), which is arranged on the upper face thereof; wherein
the vertical pin (16) is configured to connect in a detachable manner to the vertical hole (11).

3. The modular flooring (1), according to any of the preceding claims, **characterized in that**:

the vertical-fastening bulge (4) comprising an upper wall (9) and at least two side walls (10); wherein
the vertical hole (11) crosses said upper wall (9); **and wherein**
each side wall (10) comprising at least one first male and female connection element orthogonally arranged relative to said side wall (10); **and wherein**
the cavity (6) comprising an interior base area (14) and at least two side walls (15); wherein
the vertical pin (16) is connected to the interior base area (14); **and wherein**
each side wall (15) comprises at least one second male and female connection element orthogonally arranged relative to said side wall (15); **and wherein**
the vertical pin (16) being configured to connect in a detachable manner to the vertical hole (11); **and wherein**
the first male and female connection element being configured to connect in a detachable manner with the second male and female connection element, whereby both of said male and female connection elements are aligned on the same vertical plane.

4. The modular flooring (1), according to any preceding claim, **characterized in that** said modular flooring component (2) comprises 4 to 6 cavities (6) arranged on the lower portion thereof; and said flexible base component (3) comprises 4 to 6 vertical-fastening bulges (4) arranged on the upper face thereof.

5. The modular flooring (1), according to any one of claims 3 and 4, **characterized in that** each side wall (10) of the vertical-fastening bulge (4) comprising at least one first male and female connection element selected from the group consisting of a first side-connection bulge (12) or a first side-connection recess (13); and **in that**
each side wall (15) of the cavity (6) comprises in the interior portion thereof at least one second male and female connection element selected from the group consisting of a second side-connection bulge (17) or a second side-connection recess (18).

6. The modular flooring (1), according to any of claims 3 to 6, **characterized in that** the plurality of side walls (10) of the vertical-fastening bulge (4) and the plurality of side walls (15) of the cavity (6) presenting straight horizontal sections, preferably polygonal shaped, selected from the group consisting of a triangle, a quadrilateral, a pentagon, a hexagon, an heptagon or an octagon, wherein the straight horizontal section of the plurality of side walls (10) presents the same polygonal shape as the horizontal straight section of the plurality of side walls (15).

7. The modular flooring (1), according to any of the preceding claims, **characterized in that** the width and

length of the flexible base component (3) are substantially the same as, respectively, the width and length of the modular flooring component (2).

8. The modular flooring (1), according to any of the preceding claims, **characterized in that** said flexible base component (3) additionally comprises a plurality of recesses (7) and bulges (8), which are arranged on the lower face thereof.

9. The modular flooring (1), according to any of the preceding claims, **characterized in that** said flexible base component (3) additionally comprises a plurality of recesses (7) and bulges (8), which are arranged on the continuous upper face (5) thereof.

10. The modular flooring (1), according to any of the preceding claims, **characterized in that** the modular flooring component (2) is manufactured from a polymeric material, preferably selected from the group consisting of polypropylene, vinyl polychloride, polyethylene, natural rubber, styrene-ethylene-butylene-styrene rubber, polyurethane, polyester, polyolefins, styrene-butadiene rubber, vinyl ethylene-acetate rubber, mixtures thereof and their copolymers.

11. The modular flooring (1), according to any of the preceding claims, **characterized in that** the flexible base component (3) is manufactured from an elastomeric, rubberized, or flexible material, preferably selected from the group consisting of natural rubber, styrene-ethylene-butylene-styrene rubber, polyurethane, polyester, polyolefins, styrene-butadiene rubber, vinyl ethylene-acetate rubber, cork, mixtures thereof and their copolymers.

12. The modular flooring (1), according to any of the preceding claims, **characterized in that** the modular flooring component (2) has a thickness in the range of 1 mm to 50 mm, more preferably in the range of 1 mm to 10 mm, even more preferably in the range of 1 mm to 3 mm.

13. The modular flooring (1), according to any of the preceding claims, **characterized in that** the flexible base component (3) has a thickness in the range of 1 mm to 50 mm, more preferably in the range of 1 mm to 20 mm, even more preferably in the range of 2 mm to 8 mm.

14. The modular flooring (1), according to any of the preceding claims, **characterized in that** a plurality of flexible base components (3) with a rectangular horizontal straight section being arranged along at least one dimension selected from the group consisting of the width and length of the modular flooring component (2).

15. The modular flooring (1), according to any of the preceding claims, **characterized in that** the flexible base component (3) comprises a horizontal straight section similar to an "X", with two crossed segments perpendicular to each other.

16. A modular flooring system **characterized by** comprising a plurality of modular floorings (1), as defined in any of the preceding claims, interconnected through the connection between side-fastening male spigots (19), arranged on the edge of at least one side wall of a modular flooring component (2), and side-fastening female spigots (20), arranged on the edge of at least one side wall of an adjacent modular flooring component (2).

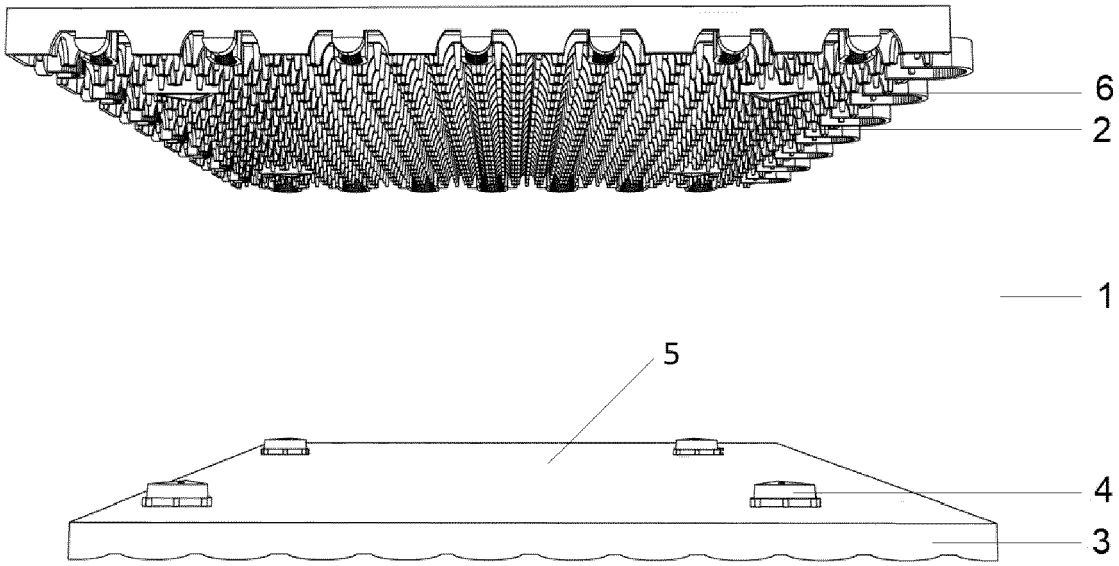

Fig. 1

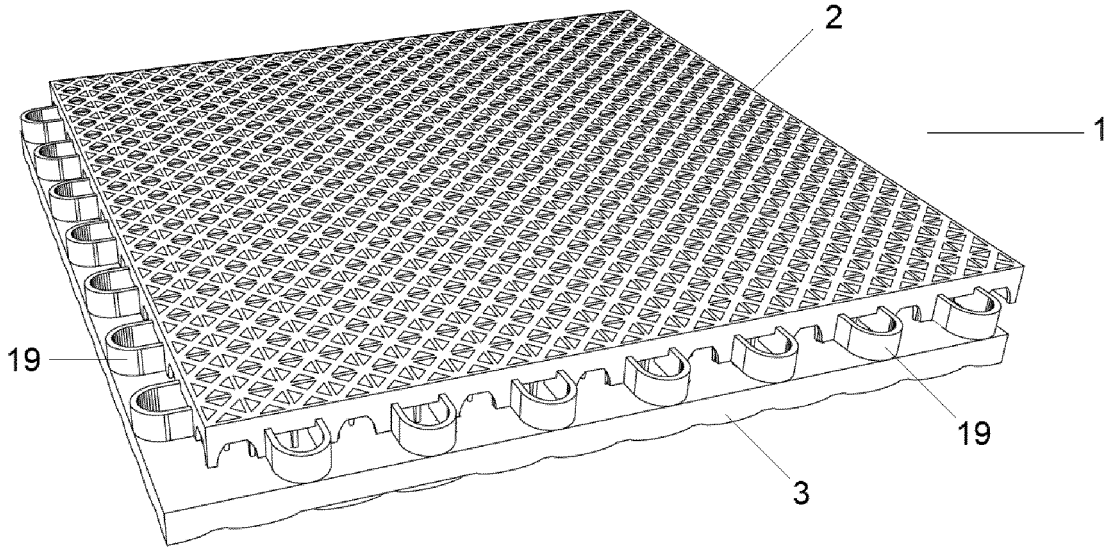

Fig. 2

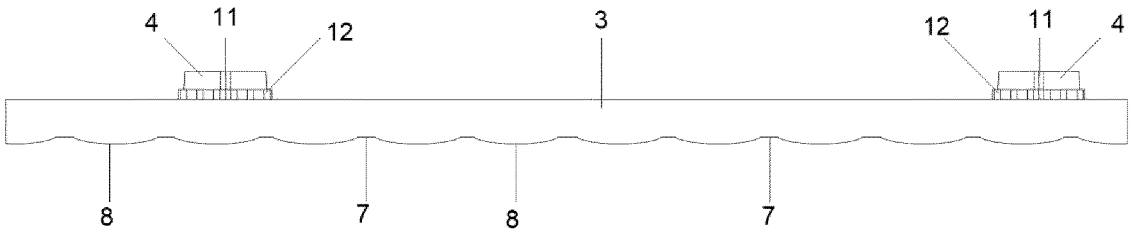

Fig. 3

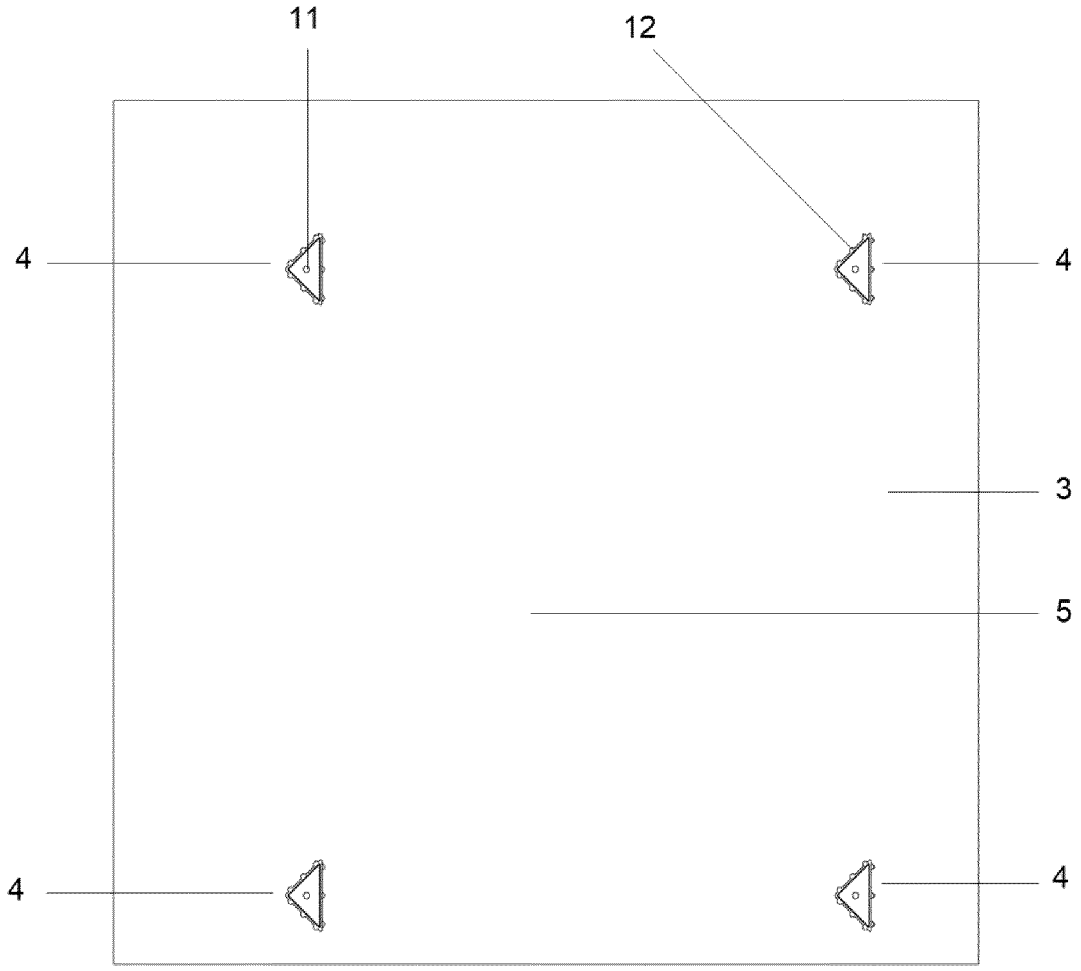

Fig. 4

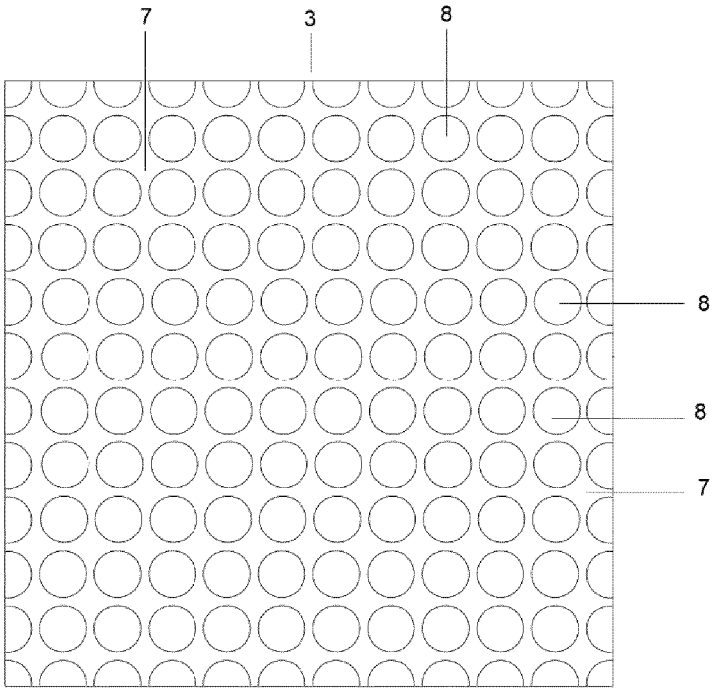

Fig. 5

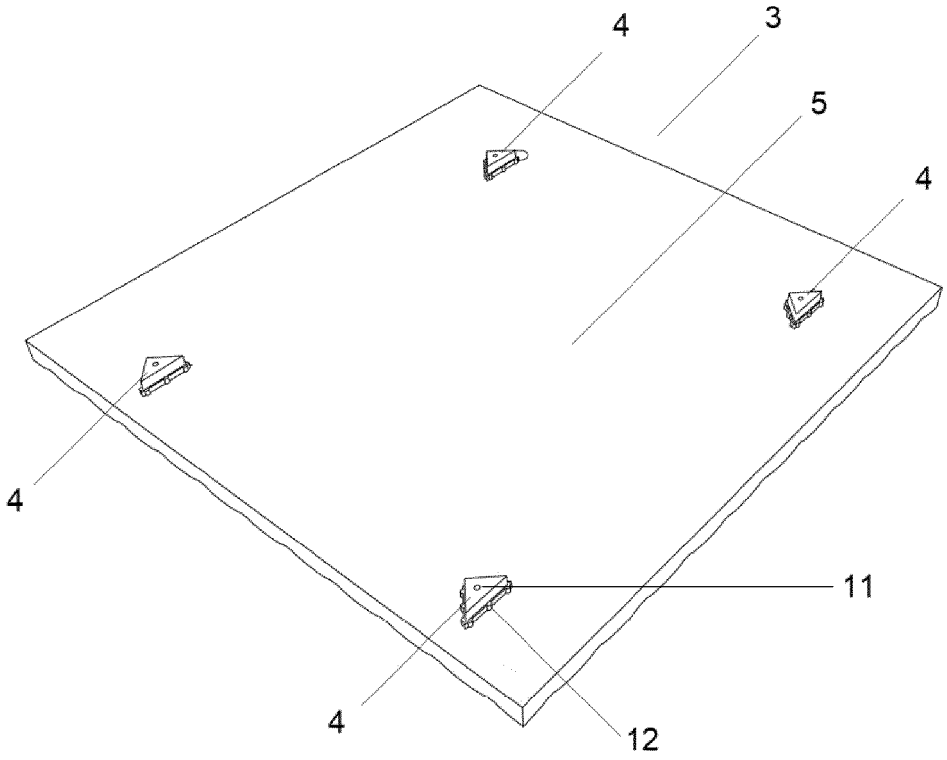

Fig. 6

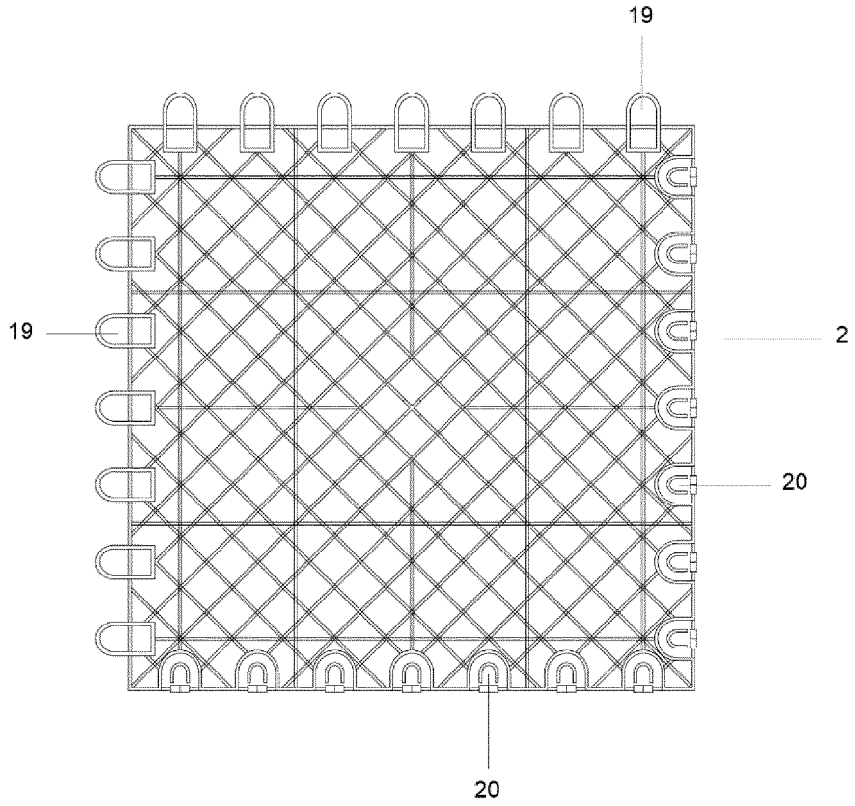

Fig. 7

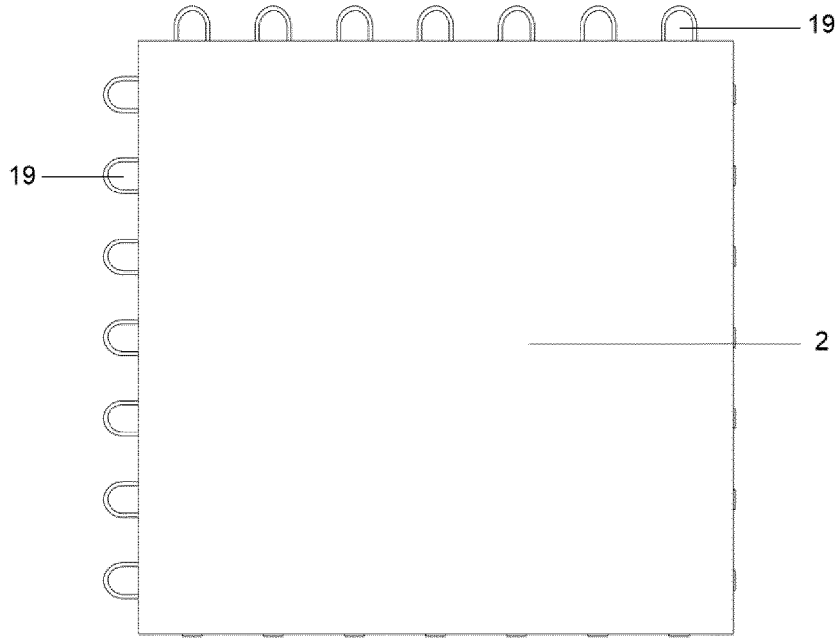

Fig. 8

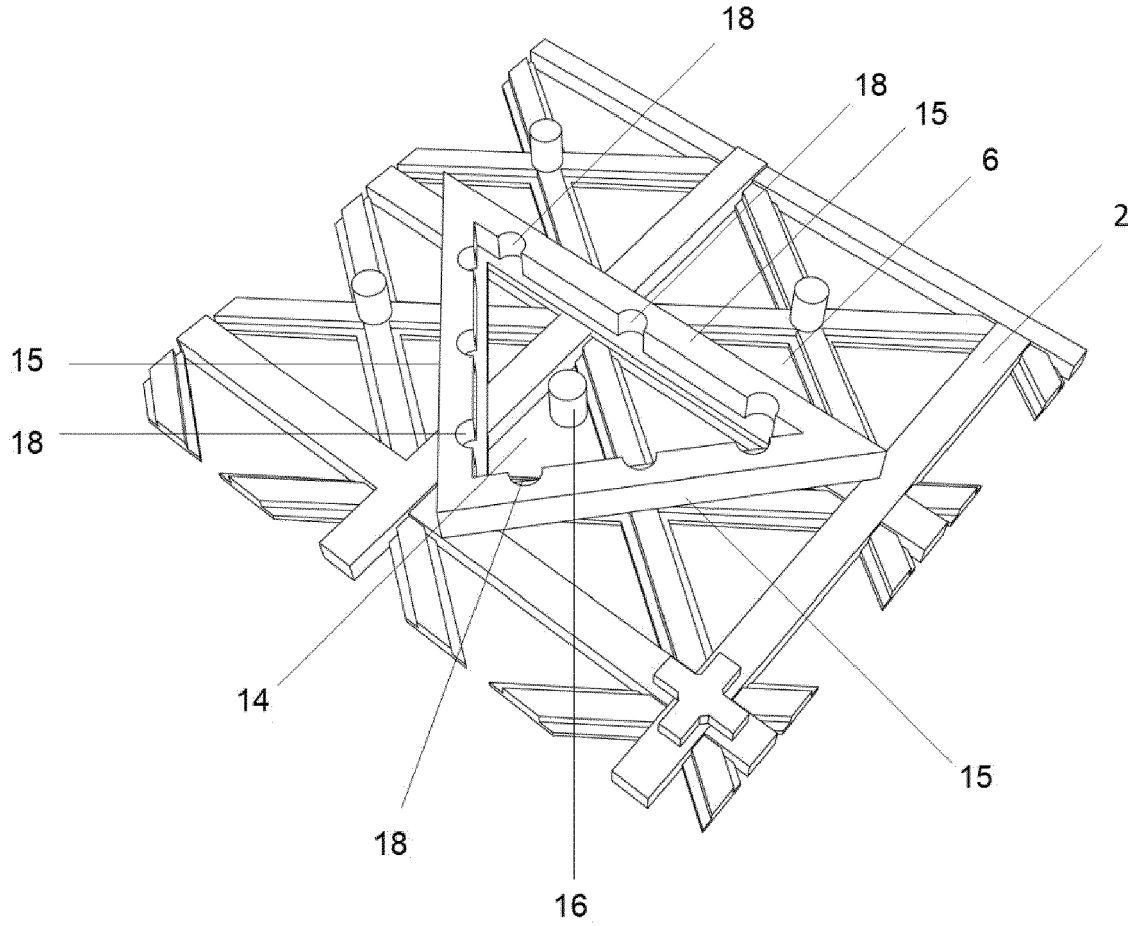

Fig. 9

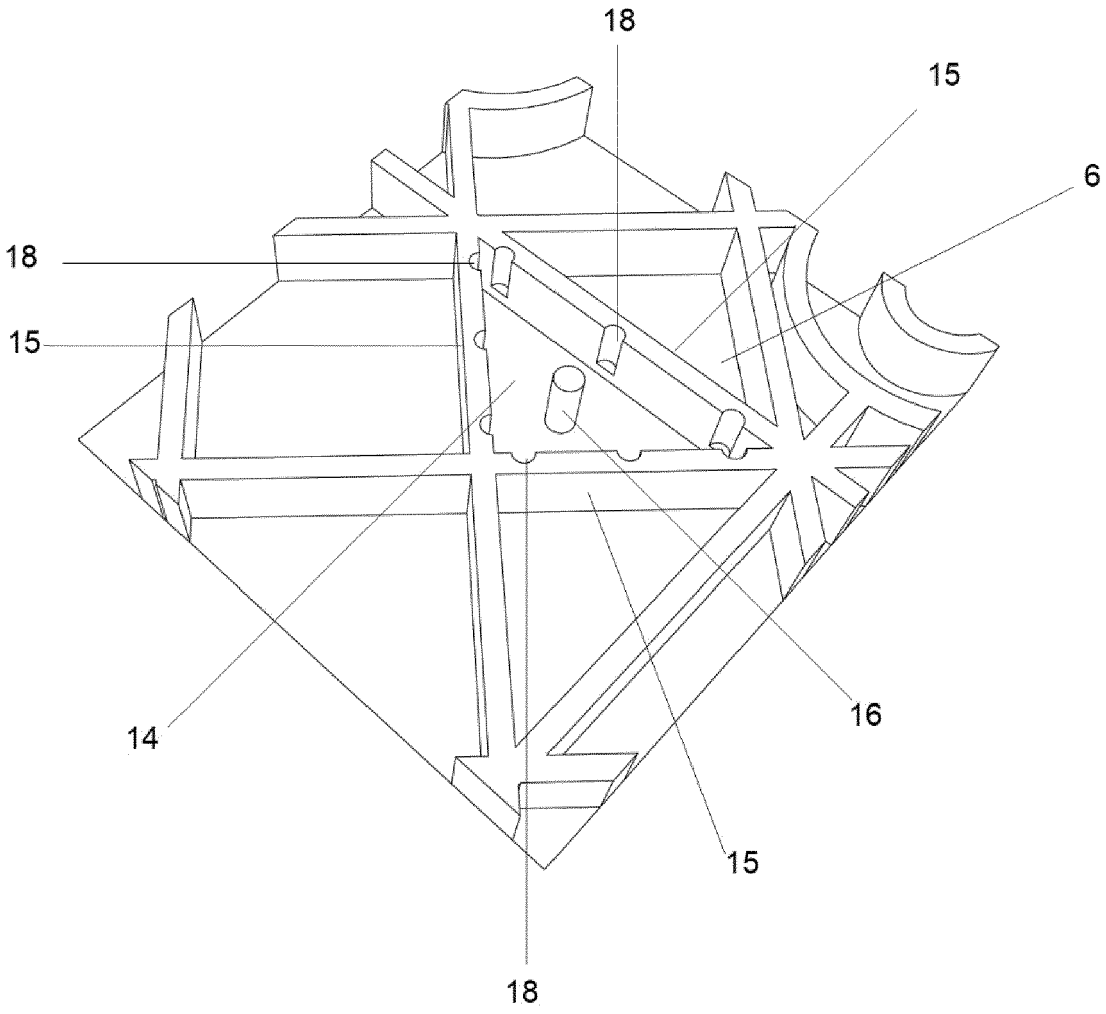

Fig. 10

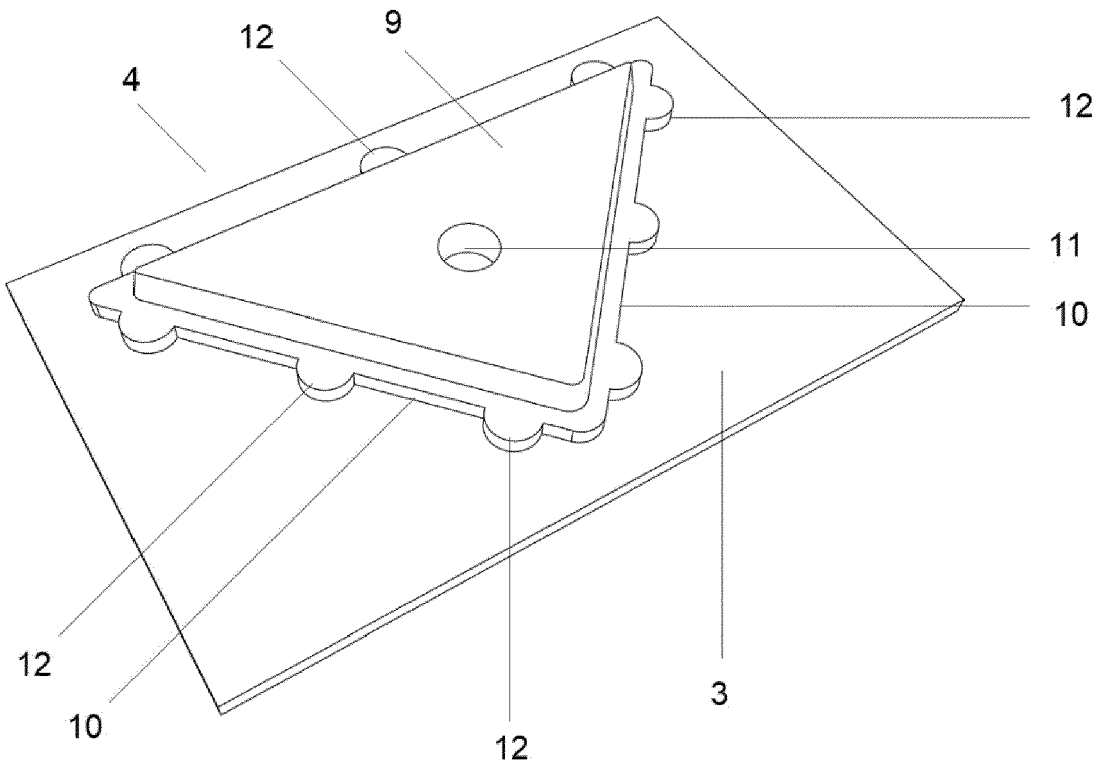

Fig. 11

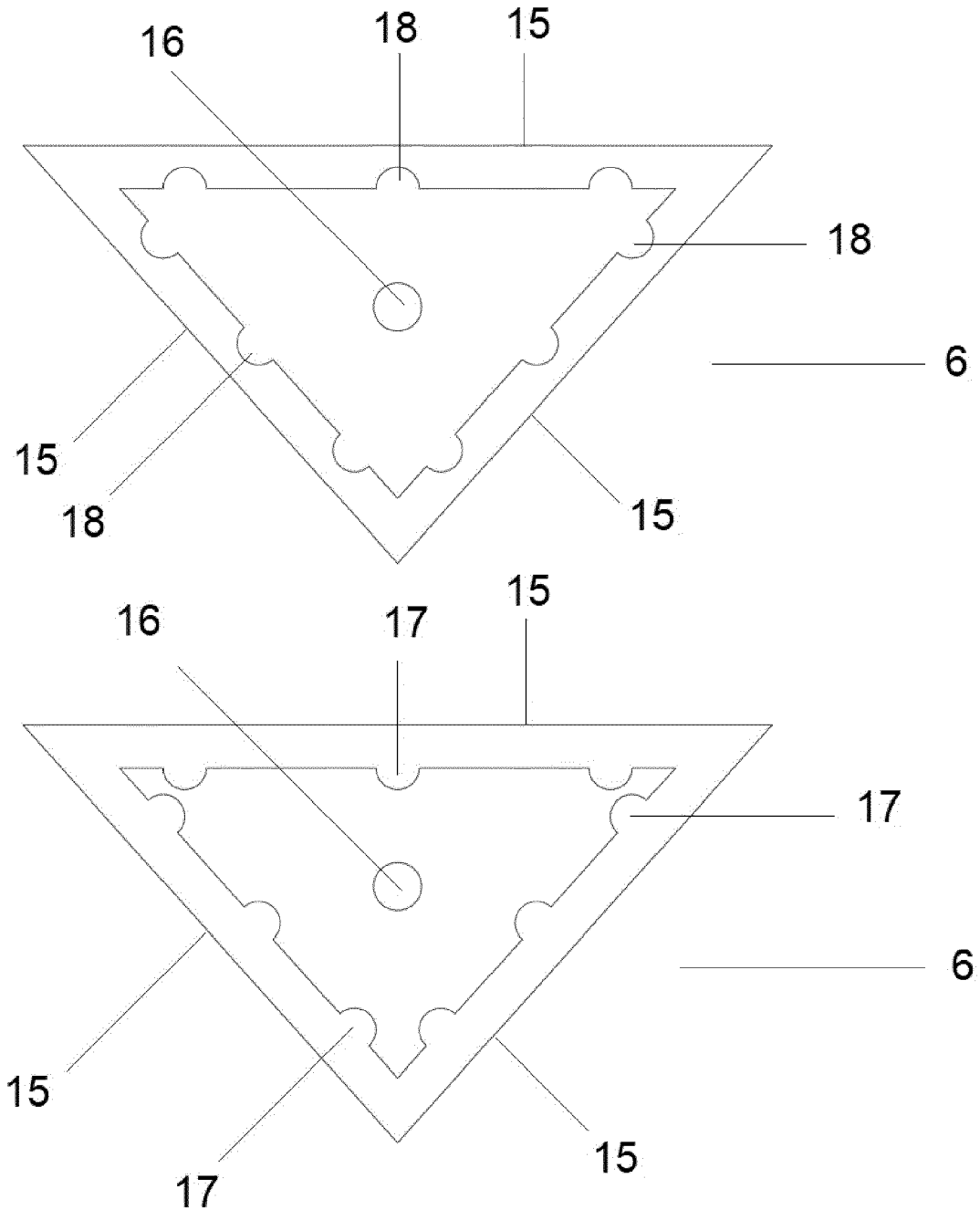

Fig. 12

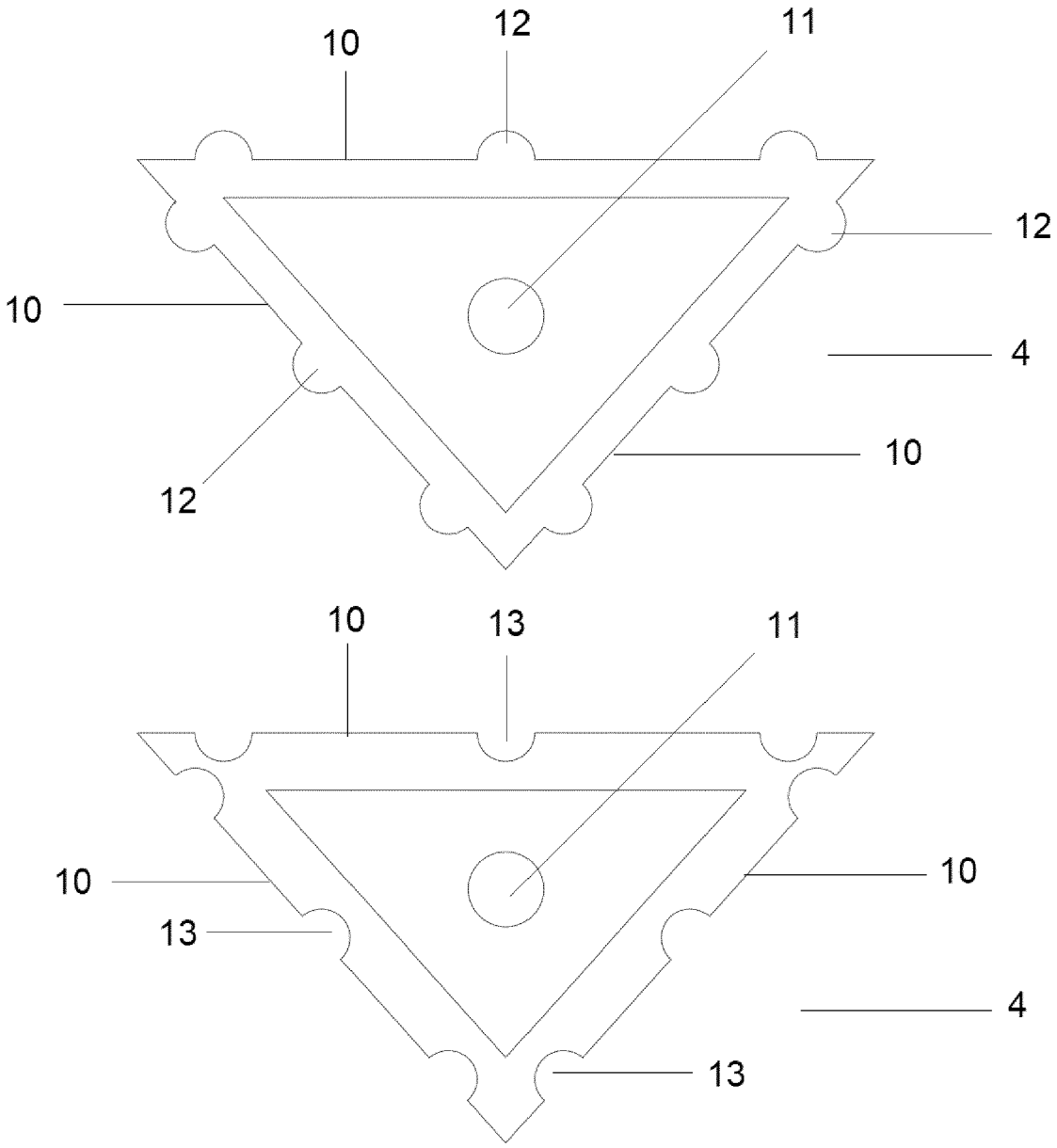

Fig. 13

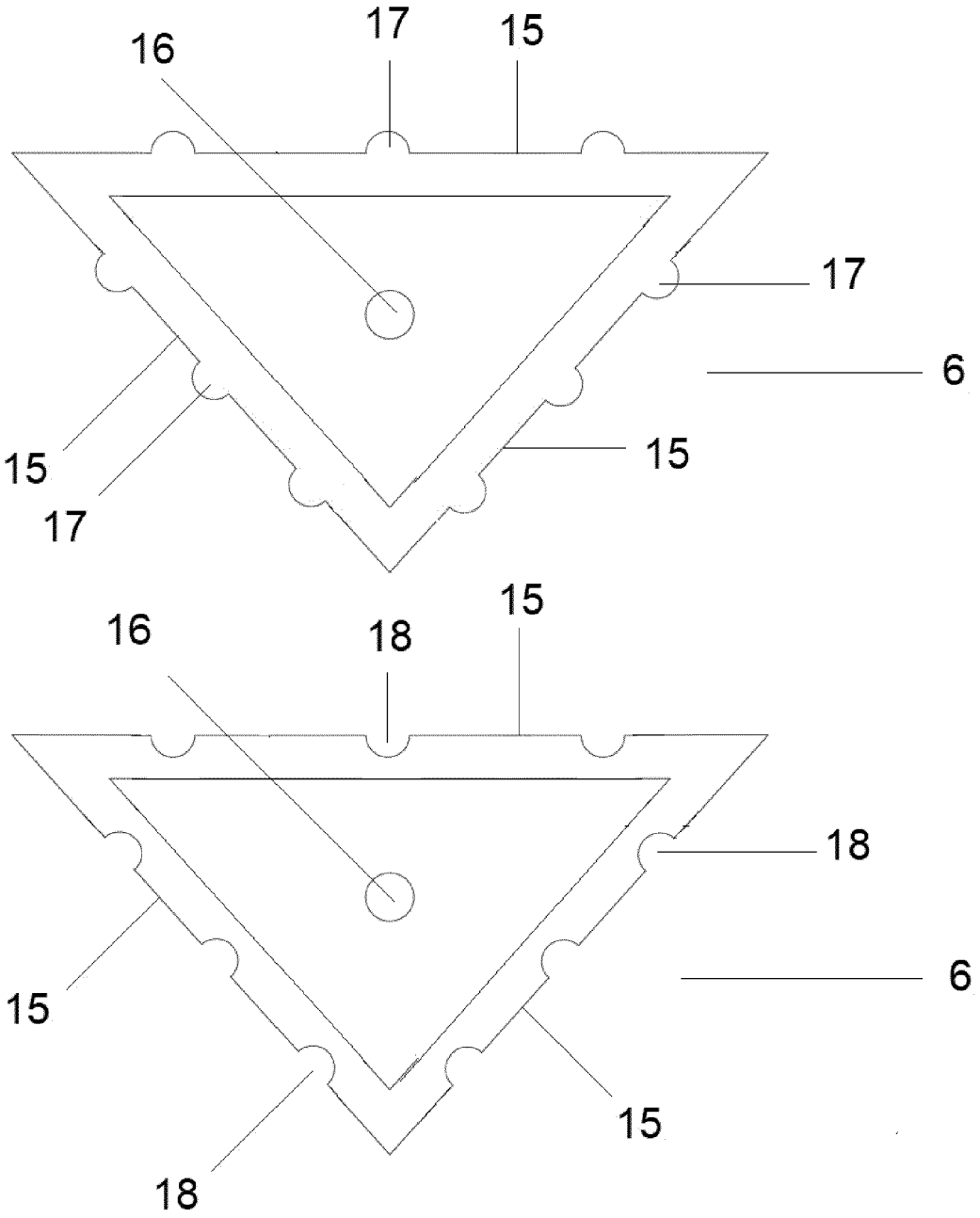

Fig. 14

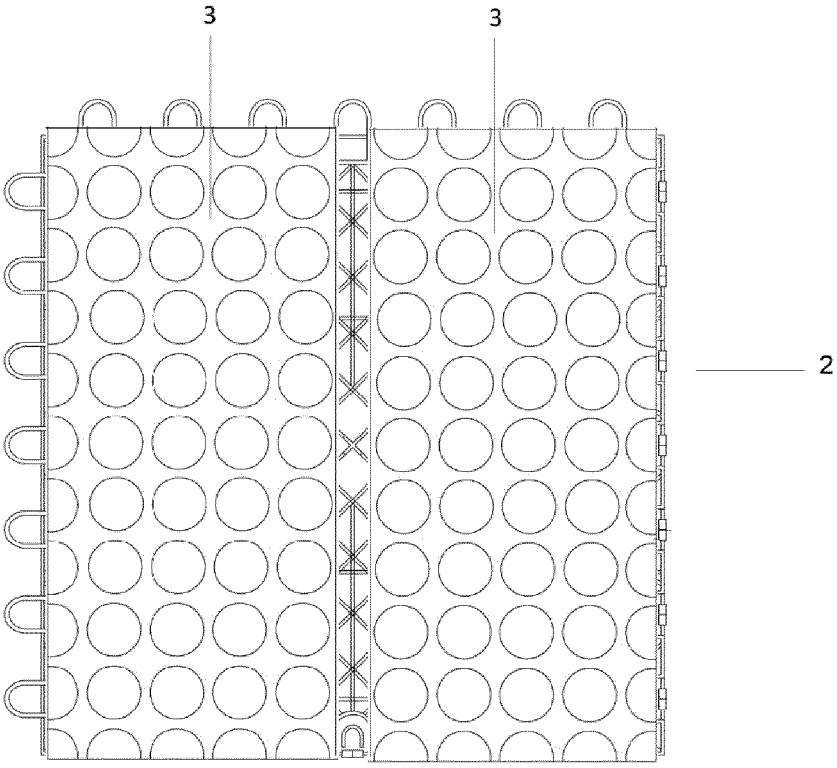

Fig. 15

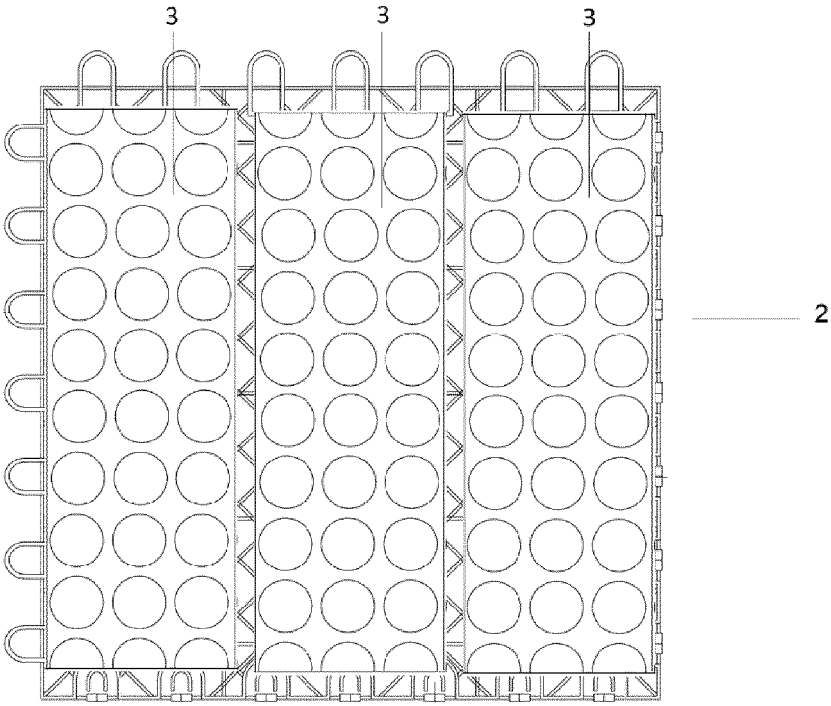

Fig. 16

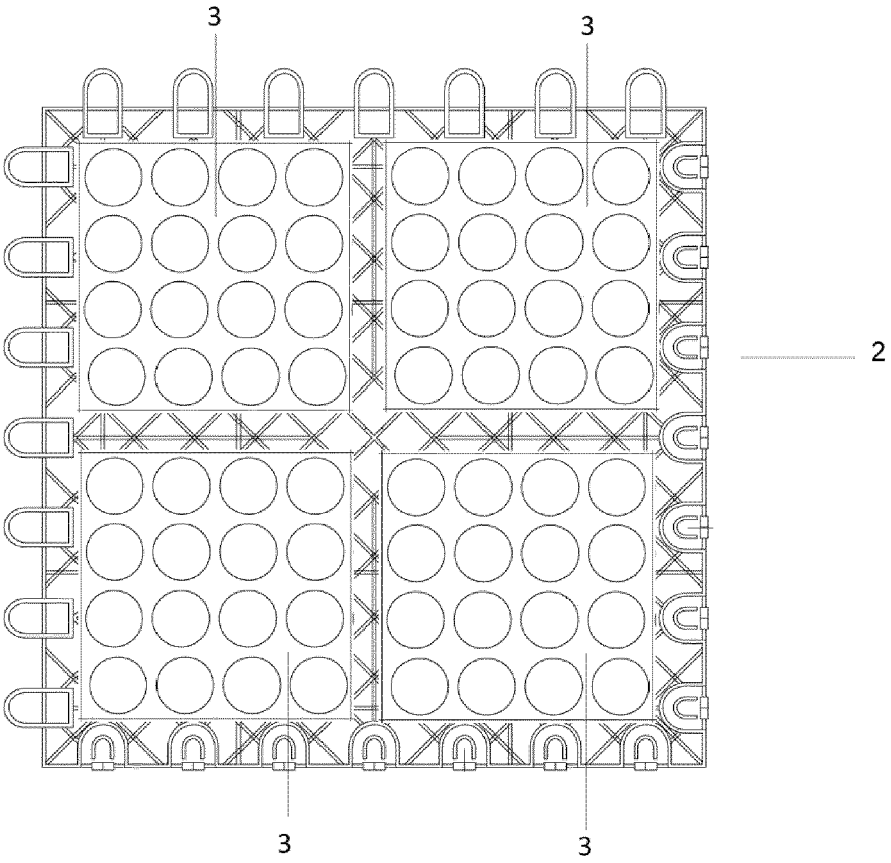

Fig. 17

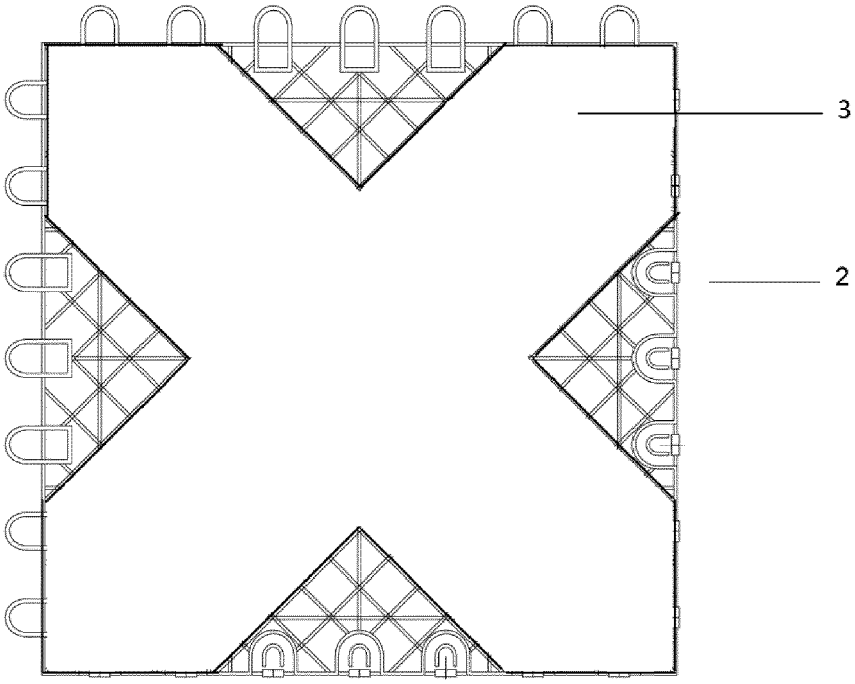

Fig. 18

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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 6210

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	EP 1 514 499 A1 (VAGNOLI IVANO [IT]) 16 March 2005 (2005-03-16) * paragraphs [0017], [0018], [0028] - [0031], [0035]; figures 2D, 6, 8 * -----	1,4,7, 9-14 8,15,16 2,3,5,6	INV. E04F15/02 E04F15/10
Y,D	PT 110 620 A (RUI PEDRO SIMOES VICENTE [PT]) 12 September 2019 (2019-09-12) * figure 1 * -----	8,15,16	

TECHNICAL FIELDS SEARCHED (IPC)

E04F
E01C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 October 2024	Fournier, Thomas

CATEGORY OF CITED DOCUMENTS

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14-10-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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PT 110620 A	12-09-2019	EP 3766385 A1	20-01-2021
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		WO 2019177477 A1	19-09-2019

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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- PT 110620 A, Rui Pedro Simões Vicente **[0004] [0005] [0006] [0007] [0054]**