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(54) Modular flooring substrate

Modulare Fußbodensubstrat

Substrat de plancher modulaire

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Description

Technical field

[0001] The present invention relates to the field of modular flooring. More specifically, the present invention relates to substrates for use as backing material for flooring surfaces of modular flooring elements.

Background

[0002] Known modular flooring systems typically comprise a plurality of individual flooring panels that are placed on the ground either permanently or temporarily depending on the application. Some modem flooring panels may be assembled without using glue by the provision of specially adapted connectors along the edges of the panels. Such panels typically comprise a surface material having an aesthetic appeal, such as wood, ceramics or plastics. Often, the panel comprises in addition to the surface material a backing material being less expensive, more durable and easier to provide with the connection means, such as plastics or some inexpensive wood-fiber material. Plastic backing materials are especially advantageous when a floor is to be laid on a surface prone to moisture, such as patio floors.

[0003] Modem flooring panels are typically assembled one by one, from one point on the floor and outwards. Some flooring panels may be assembled together without glue, e.g. by means of a snap connection. In case that one assembled flooring panel should be removed, e.g. due to damage of the flooring material provided thereon such as a ceramic material, it is not possible to only replace the flooring panel comprising the damages flooring material, but one has to start with the peripheral flooring panels and remove them one by one from the periphery of the covered area.

[0004] A known floor panel which can be used for laying out temporary floors is shown in DE 202 15 223 U1. See as well WO 2007/129211 A2 and WO 2007/094293 A2.

[0005] A problem with such flooring panels is that it is cumbersome to replace a broken panel in the middle of the floor, since all surrounding flooring panels also has to be removed..

[0006] This problem is especially evident for flooring panels covered with ceramic material, since they are brittle and easily break.

[0007] Hence, an improved flooring panel solving the above described deficiencies would be beneficial.

Summary

[0008] An object of the invention is to provide a flooring system which allows easy replacement of a single flooring panel.

[0009] A particular object of the invention is to provide an improved flooring substrate allowing easy replacement of a flooring panel comprising the substrate.

[0010] These and other objects, which will appear from the following description, have now been achieved by a modular flooring substrate comprising a rectangular frame. The frame has an upper side and a lower side in use. Furthermore, the frame comprises four edge sections. Each edge section extends along an outer edge of the frame and comprises either a male or a female connector. Two adjacent edge sections of the four edge sections comprise the male connector, and the other two of the four edge sections comprise the female connector. The male connector comprises at least two parallel elongate ridges arranged at a distance from each other and protruding in a normal direction of the upper or lower side. Furthermore, the ridges extend along each respective edge section.

[0011] Such a flooring substrate allows for easy removal and replacement of a flooring panel comprising such a substrate, even if the panel is surrounded by a large number of flooring panels.

[0012] In an aspect, at least one ridge of the male connector comprises a protrusion suitable for being received by a female connector of another modular flooring substrate having the corresponding shape.

[0013] Such a flooring substrate allows for removable securing of two adjacent flooring panels in such a way that the panels tightly abut each other to give a substantially even flooring, independently of for example varying humidity and varying temperatures affecting the swelling and shrinkage of the material(s) of the flooring panels.

[0014] In an aspect, the protrusion extends from the ridge in a direction essentially parallel to the upper side or the lower side of the rectangular frame.

[0015] Such a protrusion provides for a snap-locking functionality lockable/releasable by movement of the ridge on which the protrusion is provided into/out of the space formed by the distance between the ridges.

[0016] In another aspect, the protrusion extends from the ridge in a direction essentially perpendicular to the extension of the ridge along the rectangular frame edge

[0017] Such a protrusion makes it possible to ensure the functionality of the snap-lock with as little added material as possible used for producing the protrusions.

[0018] In yet another aspect of the invention, the two parallel ridges of the male connector comprise at least one cut or recess along their extensions.

[0019] This gives an advantage in that support walls may be provided in a female connector means suitable for attachment for the male connector, for increasing the rigidity of the female connector in the area of the support walls. Having such support walls in the female connector provides for a more uniform engagement between the male and female connector along the length of the connectors, effectively leading to a more uniform and safe connection.

[0020] In an aspect, a ridge of the male connector is at least partly made of, or coated with, a rubber material.

[0021] Such a flooring substrate typically increases friction in the connection between two adjacent flooring

substrates, thereby reducing the risk of unintended relative movements, such as vibrations, between connected substrates, without limiting the possibility of easy removal of the substrate.

[0022] In a further aspect, the each ridge has a cross-sectional width of about 1 mm and a cross-sectional height of about three times its width.

[0023] Such cross-sectional dimensions are proven suitable for providing a strong, yet flexible, connection.

[0024] In an aspect, the distance between the ridges is at least as large as the protrusion depth of the protrusion in a direction perpendicular to the extension of the ridge along the rectangular frame edge and parallel to the upper side or the lower side of the rectangular frame.

[0025] Such a minimum distance ensures that there is enough room between the ridges for them to move relatively each other during extraction of an injection molded male connector from an injection mold, thereby allowing use of a far less complicated and thereby less expensive molds for production of flooring substrates through injection molding, effectively enabling a larger number of mold cavities per mold, thereby largely increasing the production capacity per injection molding machine.

[0026] Furthermore, the ability of the protrusion to move into the space makes it possible to use a more rigid female connector which does dot need to deform outwards during separation of the connectors, which is of advantage since adjacent flooring panels typically do not allow space for such deformations.

[0027] In a further aspect, the female connector comprises a receiving member suitable for receiving a male connector of another modular flooring substrate in an insertion direction along a normal direction of the upper side or lower side.

[0028] Such a female connector provides for vertical attachment and removal of flooring panels.

[0029] In yet an aspect, a sealing means is provided along at least one of the edge sections of the flooring substrate for filling a gap to an adjacent flooring panel.

[0030] Such a sealing means reduces, or eliminates, any need of grout between adjacent flooring panels, and keeps dirt away without limiting the ease of attachment and removal of a panel.

[0031] In an aspect, a flooring system is provided, comprising at least two modular flooring substrates. The male connector of a first modular flooring substrate is connected to a female connector of a second modular flooring substrate.

[0032] Such a flooring system allows for easy replacement of individual flooring panels in the middle of a floor.

[0033] According to an aspect a method of removing a modular flooring substrate from a system of interconnected modular flooring substrates is provided. The method comprises the following steps. First, a first corner of the first modular flooring substrate is lifted to release a connection between the male connector of the first modular flooring substrate and the female connector of the second modular flooring substrate. The first corner is the corner between two adjacent edge sections, both of them being superpositioned over corresponding edge sections of further connected modular flooring substrates. Then the first modular flooring substrate is pulled away from a second corner opposite of the first corner in order to detach any remaining connections between the first modular flooring substrate and any other modular flooring substrate.

[0034] The method provides for easy removal of a flooring panel independently of if the panel is positioned in the middle of a flooring surface or along the edge of the flooring surface.

Description of figures

[0035] In the following, embodiments of the invention will be described with reference to non-limiting examples shown in the accompanying drawings, in which:

Fig. 1 shows a bottom view in perspective of a modular flooring substrate according to an embodiment;
Fig. 2 shows a top view in perspective of a modular flooring substrate according to an embodiment;
Fig. 3 shows an enlarged bottom view in perspective of a portion of a modular flooring substrate and a male connector according to an embodiment;
Fig. 4 shows an enlarged cross-sectional bottom view in perspective of a portion of a modular flooring substrate and a female connector according to an embodiment;
Fig. 5 shows a partial side view of the male connector of Fig. 3; and
Fig. 6 shows a partial side view of a flooring panel comprising a substrate, a flooring surface material, and sealing means according to an embodiment.
Fig. 7 shown a top view of a system of interconnected modular flooring substrates according to an embodiment of the invention; and
Fig. 8 illustrates a side view of two connected modular flooring substrates, wherein the edge section of a first modular flooring substrate, overlapping the corresponding edge section of the second modular flooring substrate, comprises a female connector.

Detailed description

[0036] In an embodiment, a modular flooring system S is provided. The modular flooring system S comprises a number of modular flooring substrates to which a suitable surface material M may be attached. Suitable surface materials M may for example be wooden ribs, plastic ribs, ceramic tiles or textile- or plastic mats.

[0037] Fig. 1 illustrates a modular flooring substrate 1 according to an embodiment. The modular flooring substrate comprises a rectangular frame 2 having an upper side U and a lower side L in use. In use the upper side U faces away from the foundation, e.g. floor, onto which the modular flooring substrate is placed. A surface ma-

terial M (see Fig. 3) may be supported directly by the frame 2, and/or by a support structure 3 provided within the frame 2 for supporting the surface material M. The support structure 3, if any, may for example be a framework of injection molded plastic forming a light-weight and well-vented structure suitable for supporting the surface material M and distributing loads from the surface material M and down to an underlying surface, such as a concrete floor. The support structure 3 may be provided with lower vent channels 4 for allowing fluid, such as condensed water or air, to pass under and/or through the substrate 1. Also, the support structure 3 may be provided with a plurality of screw holes 5 distributed over the surface of the support structure 3 in predetermined positions for providing an easy way of attaching a surface material M suitable to be attached by screws, such as wood, plastics or metal. If there are pre-drilled holes in the surface material M to be attached, the position of the surface material M is given by the predetermined positions of the screw holes 5 in the support structure 3, effectively making production of flooring panels easier and more effective. In addition to, or as an alternative to, holes 5 with predetermined position, guiding recesses/guiding protrusions 6 may be provided on the substrate 1 for receiving a flooring surface material M, such as wooden ribs, and keeping the flooring surface material M guided in a predetermined position during attachment to the substrate 1, thereby making production of the flooring panels easier and more effective.

[0038] Furthermore, the frame 2 comprises four edge sections 7, 8, 9, 10. Each edge section 7, 8, 9, 10 extends along an outer edge of the frame 2 and comprises either a male connector 11 or a female connector 12. Two adjacent edge sections 9, 10 of the four edge sections 7, 8, 9, 10 comprise the male connector 11, and the other two edge sections 7, 8 of the four edge sections 7, 8, 9, 10 comprise the female connector 12.

Male connector

[0039] As shown in Figs 1, 3 and 4, the male connector 11 comprises at least two parallel elongate ridges 13, 14 arranged at a distance from each other. The ridges 13, 14 protrude in a normal direction N of the upper U or lower L side of the substrate 1. Furthermore, the ridges 13, 14 extend along each respective edge section 9, 10.

[0040] The distance D between the ridges 13, 14 give room for them to deform and bend without hindering each other, thereby allowing the ridges 13, 14 to function independently of each other, both as guiding means for guiding two adjacent flooring panels relatively each other, and as a snap locking means for securing two adjacent flooring panels to each other.

[0041] Since the ridges 13, 14 of the male connector 11 protrude essentially along a normal direction N of the upper U or lower L side, the male connector 11 is suitable for receiving a female connector 12 along the normal direction N, effectively allowing a substrate 1 to be attached to, and detached from, another substrate laying on a horizontal floor by a vertical relative movement between the substrates 1. This is of advantage when a substrate 1 is to be detached from the middle of a floor and the substrate 1 is connected to other substrates along its edges, since the substrate 1 to be removed can be separated from underlying male connectors by vertical movement without any need of sideway movements, and hence, without a need of removal of surrounding flooring substrates. Thus, instead of removing peripheral flooring substrates one by one until the periphery of the flooring reaches the substrate to be removed from the middle of the floor, one can simply remove the substrate to be removed from the middle of the floor without spending a lot of time and effort on removing surrounding substrates.

[0042] Snap locking functionality of the male connector 11 is preferably provided by a protrusion 15 extending from the outer ridge 14 in a direction essentially parallel to the upper side U or the lower side L of the rectangular frame 2, as can be seen in Fig. 4. However, protrusions for snap-locking may be provided on either of the ridges 13, 14, as can be seen in Fig. 4.

[0043] Having the protrusion on the outer ridge 14 is preferable from a production point-of-view if the substrate 1 is to be injection molded, since an undercut is easier to handle when on the outside of the substrate, by providing a side-core, than an undercut caused by a protrusion on the inner ridge 13 is. On the other hand, mold design is already made easier by the fact that the ridges 13, 14 are spaced apart, since a simple core for forming the space can be withdrawn, where after the ridges can bend into the space between the ridges during extraction of the molded substrate from the mold.

[0044] It should be understood that snap-locking is not absolutely needed between the male connectors 11 and female connectors 12 of adjacent flooring panels. Rather, friction between the male and female connectors 11, 12 may be enough to keep the male and female connectors 11, 12 together. Also, gravity may be enough on its own to keep them together.

[0045] The elongate ridge shape of the male connector 11 allows a female connector 12 to move slightly along the ridge (as long as no other geometries of the substrate hinder such movement), thereby enabling easier simultaneous detachment of connectors which are substantially perpendicular to each other, partly because friction tends to be lower during relative movement of surfaces than when the surfaces are stationary, but also because of the large simultaneous normal forces that may be applied to the ridges by exerting a force in a diagonal direction across the substrate, from a corner between two male or two female connectors towards an opposite corner. Such deformation will slightly deform the ridges of connectors adjacent the corner around a respective longitudinal axis through the base of the ridges, resulting in that normal forces of outer surfaces of the ridges act partly in a normal direction of the substrate, thereby helping detachment of the connection.

[0046] Hence, the shape of the male connector 11 is especially advantageous when removing a flooring panel from the middle of a floor surface, as will be further described below.

[0047] Moreover, as is indicated in Figs.1 and 3, the male connector 11 may comprise at least one recess 16, such as a cut, along its extension. Such cuts or recesses 16 make the substrate 1 more flexible, which is of advantage during detachment of the male and female connectors 11, 12. Furthermore, such recesses facilitate bending of the modular flooring substrate along the ridges which is also advantageous during detachment. Hence, local stress acting where the male and female connectors are about to detach from each other only acts on a limited length of connector and thereby more easily may deform that portion of the male connector 12 so that the male 11 and female 12 connectors more easily disconnect.

[0048] Furthermore, according to an embodiment, instead of utilizing two ridges 13, 14 of the male connector 11, it is possible to utilize only one ridge having a protrusion allowing for easy detachment.

Female connector

[0049] As shown in Figs 1, 2 and 4, the female connector 12 is shaped to fit with a corresponding male connector of another substrate. However, it is to be understood that the female connector 12 of a first substrate 1 does not necessarily have to be designed to fit with a male connector having the same design and dimensions as the male connector 11 of the first substrate 1. Hence, although it seems to be highly advantageous to have a single design of male and female connectors 11, 12, several designs could be combined on different types of substrates, which may then be used together to create a flooring.

[0050] The female connector 12 comprises one or more receiving recesses, or receiving members, shaped to fit a male connector 11. The female connector 12 may further comprise snap-locking recesses 20 (see Fig. 4) for receiving corresponding snap-locking protrusions 15 of the male connector 11.

[0051] According to an embodiment, as shown in greater detail in Fig. 4, the one or more receiving recesses, or receiving members, of the female connector 12 comprise an inner wall 17 and an outer wall 18. The inner wall 17 is attached to, or integrated with, the frame 2. The outer wall 18 is attached to the inner wall 17 or to the frame 2, by means of one or more distance walls 19. The distance walls may either be provided in the form as cross-walls 19 (as shown in Figs 1, 2 and 4), or as a continuous body (not shown) extending as a 'bottom' of the female connector 12 for joining the outer and inner walls. When cross-walls 18 are used, the male connector 11 has to be provided with corresponding cuts or recesses 16.

[0052] An advantage of having many cross-walls 18 is that the outer wall 18 does not have to be as rigid and therefore its dimensions can be kept down, which leads to a reduced material need. Another advantage is that the outer wall can act more evenly along the male connector 11 than what would have been possible without cross-walls 18, effectively leading to a more uniform connection.

[0053] The male connector 11 is configured to be received by a female connector of 12 of a further modular flooring substrate, and vice versa. When two modular flooring substrates are connected, one edge section of one of the flooring substrates will be superpositioned over the corresponding edge section of the further modular flooring substrate. This is illustrated in Fig. 7. It should be understood that it is not essential which one of two connected edge sections comprise the male and the female connectors respectively, as long as one edge sections comprising one kind of connector, is always adjacent another edge section comprising the same kind (male or female) of connector.

Other aspects

[0054] For some flooring surfaces M, such as ceramic tiles, it is often not desirable to lay them in absolute abutment with each other, but rather to have a few millimeters of space in between the flooring surface modules (the ceramic tiles). Normally, for ceramic tiles, such spaces are filled with liquid grout, which then fills the space and sets. Once set, the grout keeps dirt away from the space and gives a pleasant look. When laying floors which are to be easily removed it is not always desirable to use grout, since it acts as glue between the tiles and that would prevent easy removal of flooring panels.

[0055] According to an embodiment of the invention, the flooring panels may be provided with sealing means 16 attached either to the flooring substrate 1 or to the surface material M, or to both, such that the sealing means 16 is positioned along at least one of the edges of the surface material M of the flooring panel when in use. Preferably, the sealing means 16 is positioned, colored and shaped to look like ordinary grout when in use. Also, the sealing means 16 should preferably be flexible enough to allow relative movement between flooring panels. For example, the sealing means 16 may be a flange of silicone rubber or foamed rubber.

Method of connecting substrates

[0056] Flooring panels according to the invention are assembled by laying out panels on a floor and attaching new panels to already laid panels one-by-one by bringing the connectors of a subsequently laid panel, on top of corresponding connectors of already laid panels. In order to join the connectors, a vertical force is applied to move the female connector(s) onto the male connector(s). The applied force causes a vertical movement of the subsequently laid panel.

Method of removing a flooring panel

[0057] In order to remove a flooring panel (a substrate with surface material) the flooring substrate 1 should be diagonally tilted by lifting a first corner of the flooring substrate 1 by applying to the flooring surface, or to the substrate, a force in a direction normal to the upper side of the substrate or of the flooring surface. The applied force will cause the connection between a male connector 11 of the modular flooring substrate 1 and a female connector of a further modular flooring substrate to release.

[0058] The first corner is a corner between two adjacent edge sections, both of them being superpositioned and connected to corresponding edge sections of further connected modular flooring substrates, see Fig 7. This corner is also the corner which is most easy to lift straight up and should be easy to find if you do not remember which corner it is. For a substantially planar flooring surface, a standard suction cup can be used to apply the force.

[0059] Finally, the substrate 1 shall be pulled away from a second corner opposite of the first corner in order to detach any remaining connections between the first modular flooring substrate and any other modular flooring substrate. Preferable, the substrate is pulled away in a direction along the tilted substrate, from the second corner towards the first corner. It might help to slightly wiggle the substrate 1.

Claims

1. A modular flooring substrate, comprising:

a rectangular frame (2) having an upper side (U) and a lower side (L) in use, the frame comprising four edge sections (7, 8, 9, 10), wherein
each edge section extends along an outer edge of the rectangular frame (2), and comprises either a male (11) or a female (12) connector, **characterized in that**
two adjacent edge sections (9, 10) of the four edge sections (7, 8, 9, 10) comprise the male connector (11), whereas the other two (7, 8) of the four edge sections (7, 8. 9, 10) comprise the female connector (12), wherein
the male connector (11) comprises at least two parallel elongate ridges (13, 14) arranged at a distance (D) from each other and protruding in a normal direction (N) of the upper side (U) or lower side (L), wherein the ridges (13, 14) extend along each respective edge section (9, 10).

2. The modular flooring substrate according to claim 1, wherein at least one ridge (13, 14) of the male connector (11) comprises a protrusion (15) for being received by a female connector (12) of another modular flooring substrate having the corresponding shape.

3. The modular flooring substrate according to claim 2, wherein the protrusion (15) extends from the ridge (13, 14) in a direction essentially parallel to the upper side (U) or the lower side (L) of the rectangular frame (2).

4. The modular flooring substrate according to claims 2 or 3, wherein the protrusion (15) extends from the ridge (13, 14) in a direction essentially perpendicular to the extension of the ridge (13, 14) along the respective edge section (7, 8, 9, 10).

5. The modular flooring substrate according to claims 1 to 4, wherein the two parallel ridges (13, 14) of the male connector (11) comprises at least one recess (16) along its extension.

6. The modular flooring substrate according to any one of the preceding claims, wherein a ridge (13, 14) of the male connector (11) is at least partly made of or coated with a rubber material.

7. The modular flooring substrate according to any one of the preceding claims, wherein each ridge (13, 14) has a cross-sectional width of about 1 mm and a cross-sectional height of about three times its width.

8. The modular flooring substrate according to any one claims 2 to 7, wherein the distance (D) between the ridges (13, 14) is at least as large as the protrusion depth of the protrusion (15) in a direction perpendicular to the extension of the ridge (13, 14) along the respective edge section (7, 8, 9, 10) of the frame (2), and parallel to the upper side (U) or the lower side (L) of the frame (2).

9. The modular flooring substrate according to any one of the preceding claims, wherein the female connector (12) is suitable for receiving a male connector (11) of another modular flooring substrate in an insertion direction along a normal direction (N) of the upper side (U) or lower side (L).

10. The modular flooring substrate according to any one of the preceding claims, wherein a sealing means (17) is provided along at least one of the edge sections (7, 8, 9, 10) of the flooring substrate (1), for filling a gap to an adjacent flooring panel.

11. A modular flooring system comprising at least two modular flooring substrates (1) according to any one of the preceding claims, wherein a male connector (11) of a first modular flooring substrate (1a) is connected to a female connector (12) of a second modular flooring substrate (1b).

12. A method of removing a modular flooring substrate (1a) from a system (S) of interconnected modular flooring substrates (1) according claim 11, comprising the steps of:

lifting a first comer of the first modular flooring substrate (1a) to release a connection between the male connector (11) of the first modular flooring substrate (1) and the female connector of the second modular flooring substrate (1b),
the first corner being a corner between two adjacent edge sections, both of them being superpositioned over corresponding edge sections of further connected modular flooring substrates (1c, 1d), and
pulling the first modular flooring substrate (1) away from a second corner opposite of the first corner in order to detach any remaining connections between the first modular flooring substrate (1a) and any other modular flooring substrate (1c, 1d).

Patentansprüche

1. Modulares Bodenbelagssubstrat, umfassend:

einen rechteckigen Rahmen (2) mit einer Oberseite (U) und einer Unterseite (L) bei Verwendung, der Rahmen umfasst vier Randabschnitte (7, 8, 9, 10), wobei
sich jeder Randabschnitt entlang einer Außenkante des rechteckigen Rahmens (2) erstreckt und entweder einen Stecker (11) oder eine Buchse (12) umfasst, **dadurch gekennzeichnet, dass**
zwei aneinander grenzende Abschnitte (9, 10) der vier Randabschnitte (7, 8, 9, 10) den Stecker (11) umfassen, während die anderen beiden (7, 8) der vier Randabschnitte (7, 8, 9, 10) die Buchse (12) umfassen, wobei der Stecker (11) mindestens zwei parallele langgestreckte Stege (13, 14) umfasst, die voneinander in einem Abstand (D) angeordnet sind und in senkrechter Richtung (N) von der Oberseite (U) oder Unterseite (L) hervorstehen, wobei die Stege (13, 14) sich entlang der jeweiligen Randabschnitte (9, 10) erstrecken.

2. Modulares Bodenbelagssubstrat nach Anspruch 1, wobei zumindest ein Steg (13, 14) des Steckers (11) einen Vorsprung (15) umfasst um in einer Buchse (12) eines anderen modularen Bodenbelagssubstrats mit entsprechender Form Aufnahme zu finden.

3. Modulares Bodenbelagssubstrat nach Anspruch 2, wobei sich der Vorsprung (15) vom Steg (13, 14) in eine zu der Oberseite (U) oder Unterseite (L) des rechteckigen Rahmens (12) im Wesentlichen parallelen Richtung erstreckt.

4. Modulares Bodenbelagssubstrat nach Anspruch 2 oder 3, wobei sich der Vorsprung (15) vom Steg (13, 14) in eine Richtung erstreckt, die im Wesentlichen senkrecht zu der Erstreckung des Stegs (13, 14) entlang des jeweiligen Randabschnitts (7, 8, 9, 10) ist.

5. Modulares Bodenbelagssubstrat nach den Ansprüchen 1 bis 4, wobei die zwei parallelen Stege (13, 14) des Steckers (11) mindestens eine Aussparung (16) entlang ihrer Erstreckung haben.

6. Modulares Bodenbelagssubstrat nach einem der vorangehenden Ansprüche, wobei ein Steg (13, 14) des Steckers (11) zumindest teilweise aus Gummi ist oder damit beschichtet ist.

7. Modulares Bodenbelagssubstrat nach einem der vorangehenden Ansprüche, wobei jeder Steg (13, 14) eine Querschnittsbreite von etwa 1 mm und eine Querschnittshöhe von etwa dreimal seiner Höhe hat.

8. Modulares Bodenbelagssubstrat nach einem der Ansprüche 2 bis 7, wobei der Abstand (D) zwischen den Stegen (13, 14) zumindest so groß ist, wie die Tiefe des Vorsprungs (15) in senkrechter Richtung zu der Erstreckung des Stegs (13, 14) entlang des jeweiligen Randabschnitts (7, 8, 9, 10) des Rahmens (2) und parallel zu der Oberseite (U) oder der Unterseite (L) des Rahmens (2).

9. Modulares Bodenbelagssubstrat nach einem der vorangehenden Ansprüche, wobei die Buchse (12) zur Aufnahme des Steckers (11) eines anderen modularen Bodenbelagssubstrates in Einschubrichtung entlang der senkrechten Richtung (N) der Oberseite (U) oder Unterseite (L) geeignet ist.

10. Modulares Bodenbelagssubstrat nach einem der vorangehenden Ansprüche, wobei eine Dichtung (17) entlang von mindestens einem der Randabschnitte (7, 8, 9, 10) des Bodenbelagssubstrats (1) bereitgestellt wird um einen Zwischenraum zu einer benachbarten Bodenbelagsplatte zu füllen.

11. Modulares Bodenbelagssystem umfassend mindestens zwei modulare Bodenbelagssubstrate (1) nach einem der vorangehenden Ansprüche, wobei ein Stecker (11) eines ersten modularen Bodenbelagssubstrats (1a) mit der Buchse (12) eines zweiten modularen Bodenbelagssubstrates (1b) verbunden wird.

12. Verfahren zum Entfernen eines modularen Bodenbelagssubstrats (1a) aus einem System (S) von miteinander verbundenen Bodenbelagssubstraten (1)

nach Anspruch 11, umfassend die Schritte:

Hochheben einer ersten Ecke des ersten modularen Bodenbelagssubstrats (1a) um eine Verbindung zwischen dem Stecker (11) des ersten modularen Bodenbelagssubstrats (1) und der Buchse des zweiten modularen Bodenbelagssubstrats (1b) zu lösen,
die erste Ecke ist eine Ecke zwischen zwei benachbarten Randabschnitten, die beide entsprechende Randabschnitte von weiteren angebundenen modularen Bodenbelagssubstraten (1c, 1d) überlagern und
Wegziehen des ersten modularen Bodenbelagssubstrats (1) von einer zweiten Ecke, die der ersten Ecke gegenüberliegt, um jegliche verbleibende Verbindung zwischen dem ersten modularen Bodenbelagssubstrat (1a) und jeglichen anderen modularen Bodenbelagssubstrat (1c, 1d) zu lösen.

Revendications

1. Substrat de plancher modulaire, comprenant :

un cadre rectangulaire (2) comportant un côté supérieur (U) et un côté inférieur (L) durant l'utilisation, le cadre comprenant quatre sections de bord (7, 8, 9, 10), dans lequel
chaque section de bord s'étend le long d'un bord extérieur du cadre rectangulaire (2), et comprend un raccord mâle (11) ou femelle (12), **caractérisé en ce que**
deux sections de bord adjacentes (9, 10) des quatre sections de bord (7, 8, 9, 10) comprennent le raccord mâle (11), alors que les deux autres (7, 8) des quatre sections de bord (7, 8, 9, 10) comprennent le raccord femelle (12), dans lequel
le raccord mâle (11) comprend au moins deux saillies oblongues parallèles (13, 14) agencées à une distance (D) l'une de l'autre et faisant saillie dans une direction normale (N) du côté supérieur (U) ou du côté inférieur (L), dans lequel les saillies (13, 14) s'étendent le long de chaque section de bord respective (9, 10).

2. Substrat de plancher modulaire selon la revendication 1, dans lequel au moins une saillie (13, 14) du raccord mâle (11) comprend une protubérance (15) destinée à être reçue par un raccord femelle (12) d'un autre substrat de plancher modulaire présentant la forme correspondante.

3. Substrat de plancher modulaire selon la revendication 2, dans lequel la protubérance (15) s'étend à partir de la saillie (13, 14) dans une direction essentiellement parallèle au côté supérieur (U) ou au côté inférieur (L) du cadre rectangulaire (2).

4. Substrat de plancher modulaire selon les revendications 2 ou 3, dans lequel la protubérance (15) s'étend à partir de la saillie (13, 14) dans une direction essentiellement perpendiculaire à l'extension de la saillie (13, 14) le long de la section de bord respective (7, 8, 9, 10).

5. Substrat de plancher modulaire selon les revendications 1 à 4, dans lequel les deux saillies parallèles (13, 14) du raccord mâle (11) comprennent au moins un évidement (16) le long de leur extension.

6. Substrat de plancher modulaire selon une quelconque des revendications précédentes, dans lequel une saillie (13, 14) du raccord mâle (11) est au moins partiellement faite d'un, ou enduite avec un, matériau caoutchouc.

7. Substrat de plancher modulaire selon une quelconque des revendications précédentes, dans lequel chaque saillie (13, 14) possède une largeur en section transversale d'environ 1 mm et une hauteur en section transversale d'environ trois fois sa largeur.

8. Substrat de plancher modulaire selon une quelconque des revendications 2 à 7, dans lequel la distance (D) entre les saillies (13, 14) est au moins aussi importante que la profondeur de protubérance de la protubérance (15) dans une direction perpendiculaire à l'extension de la saillie (13, 14) le long de la section de bord respective (7, 8, 9, 10) du cadre (2), et parallèle au côté supérieur (U) ou au côté inférieur (L) du cadre (2).

9. Substrat de plancher modulaire selon une quelconque des revendications précédentes, dans lequel le raccord femelle (12) est approprié pour recevoir un raccord mâle (11) d'un autre substrat de plancher modulaire dans une direction d'insertion le long d'une direction normale (N) du côté supérieur (U) ou du côté inférieur (L).

10. Substrat de plancher modulaire selon une quelconque des revendications précédentes, dans lequel un moyen d'étanchéité (17) est prévu le long d'au moins une des sections de bord (7, 8, 9, 10) du substrat de plancher (1), pour remplir un espace jusqu'à un panneau de plancher adjacent.

11. Système de plancher modulaire comprenant au moins deux substrats de plancher modulaire (1) selon une quelconque des revendications précédentes, dans lequel un raccord mâle (11) d'un premier substrat de plancher modulaire (1a) est raccordé à un raccord femelle (12) d'un second substrat de

plancher modulaire (1b).

12. Procédé de dépose d'un substrat de plancher modulaire (1a) à partir d'un système (S) de substrats de plancher modulaire mutuellement raccordés (1) selon la revendication 11, comprenant les étapes de :

le levage d'un premier coin du premier substrat de plancher modulaire (1a) pour libérer un raccordement entre le raccord mâle (11) du premier substrat de plancher modulaire (1) et le raccord femelle du second substrat de plancher modulaire (1b),
le premier coin étant un coin entre deux sections de bord adjacentes, les deux étant superposées pardessus des sections de bord correspondantes de substrats de plancher modulaire supplémentaires raccordés (1c, 1d), et
l'éloignement du premier substrat de plancher modulaire (1) à partir d'un second coin opposé au premier coin afin de séparer de quelconques raccordements restants entre le premier substrat de plancher modulaire (1a) et un quelconque autre substrat de plancher modulaire (1c, 1d).

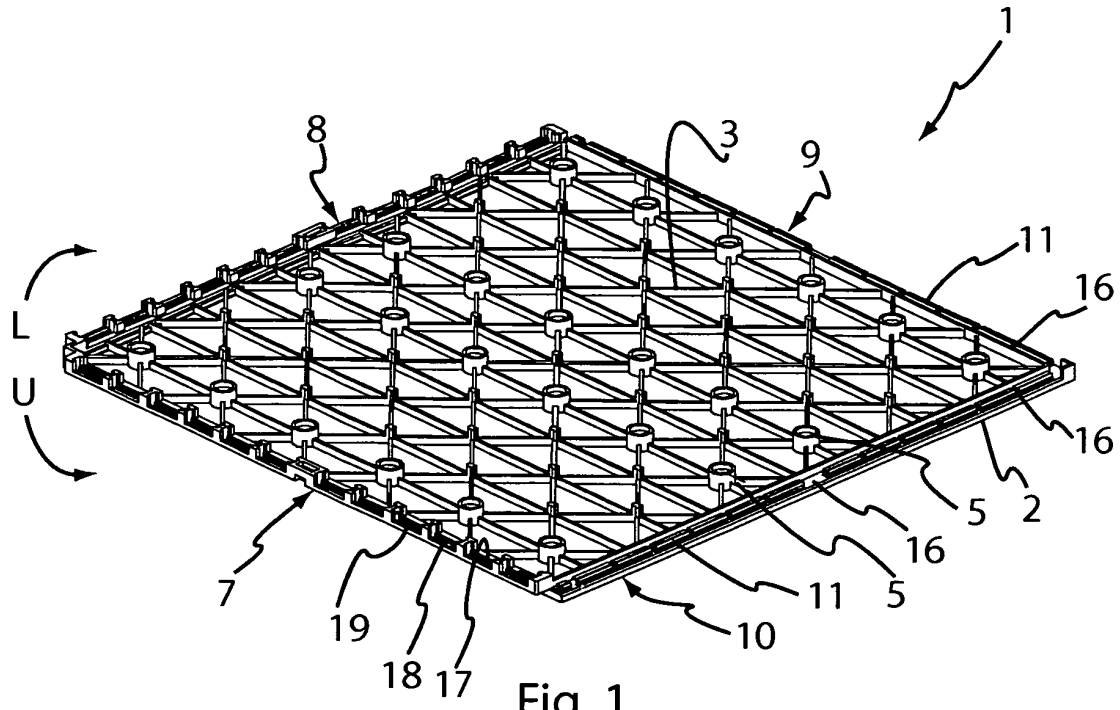

1
8
3
9
11
16
L
U
16
5
2
16
7
19
18
17
11
5
10

Fig. 1

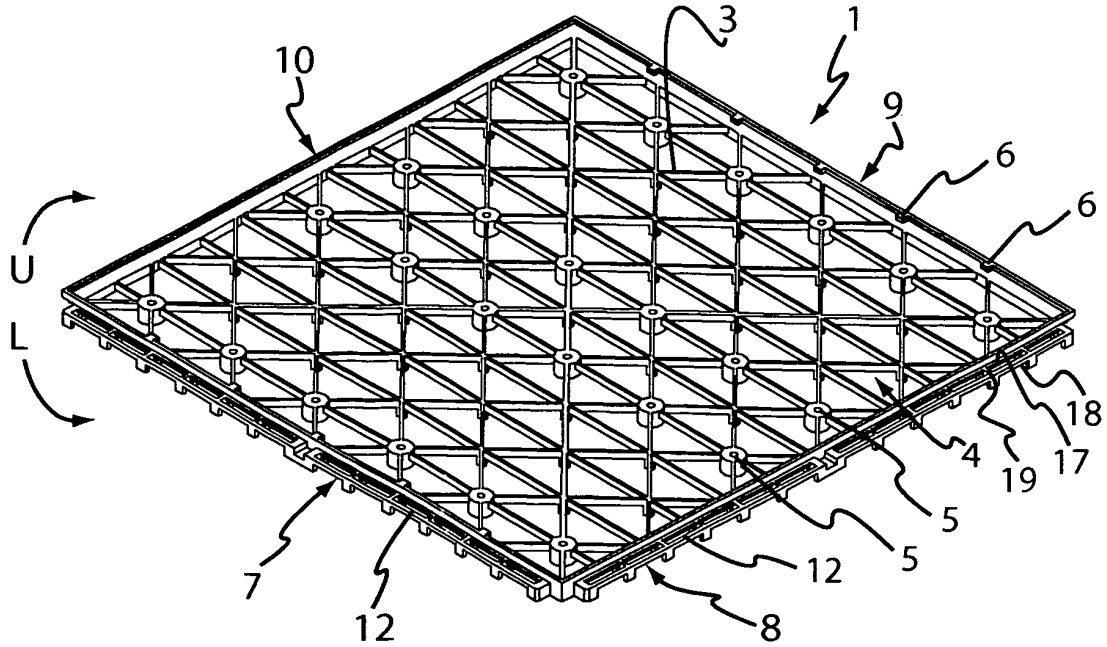

3
1
10
9
6
6
U
L
18
4
19
17
5
5
12
7
12
8

Fig. 2

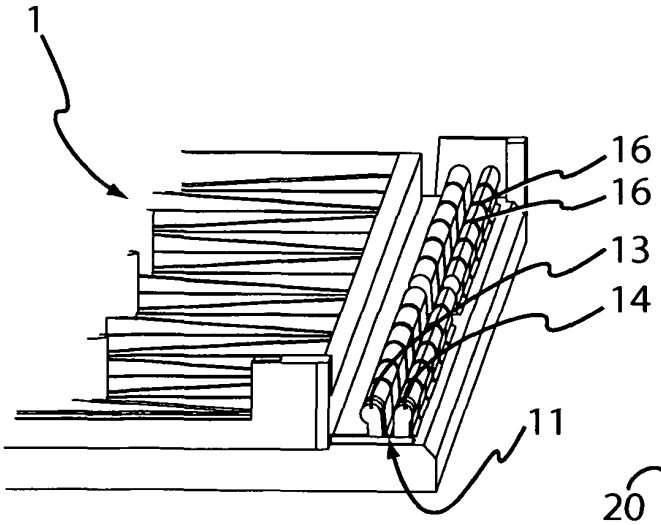


Fig. 3

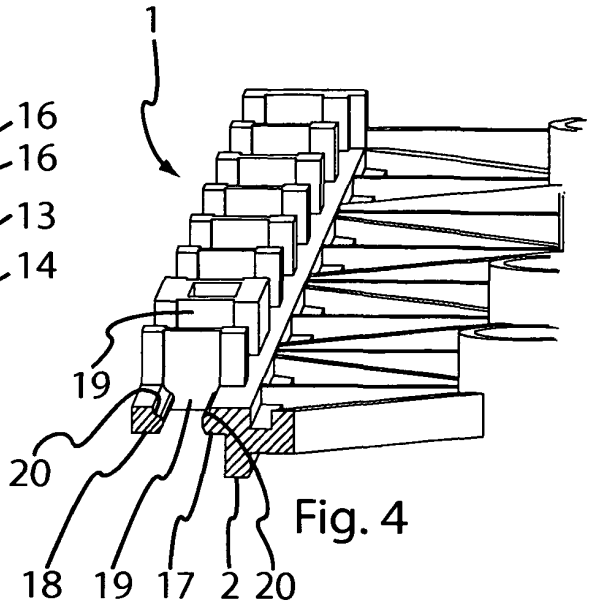


Fig. 4

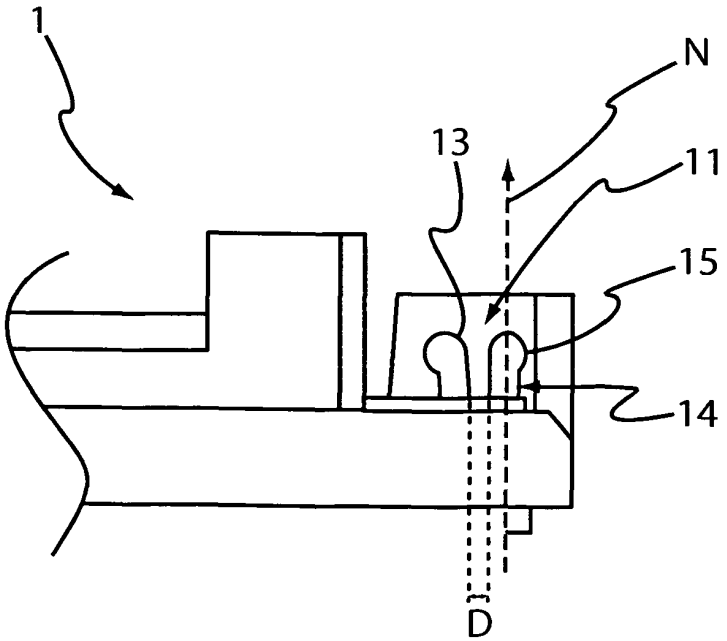


Fig. 5

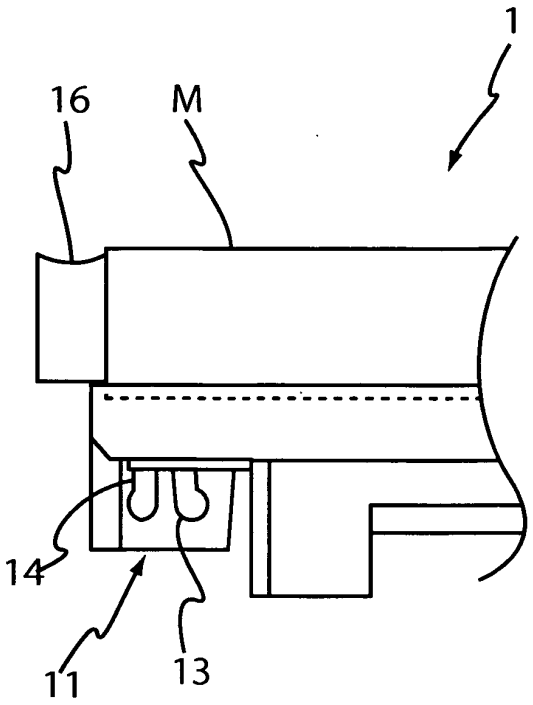


Fig. 6

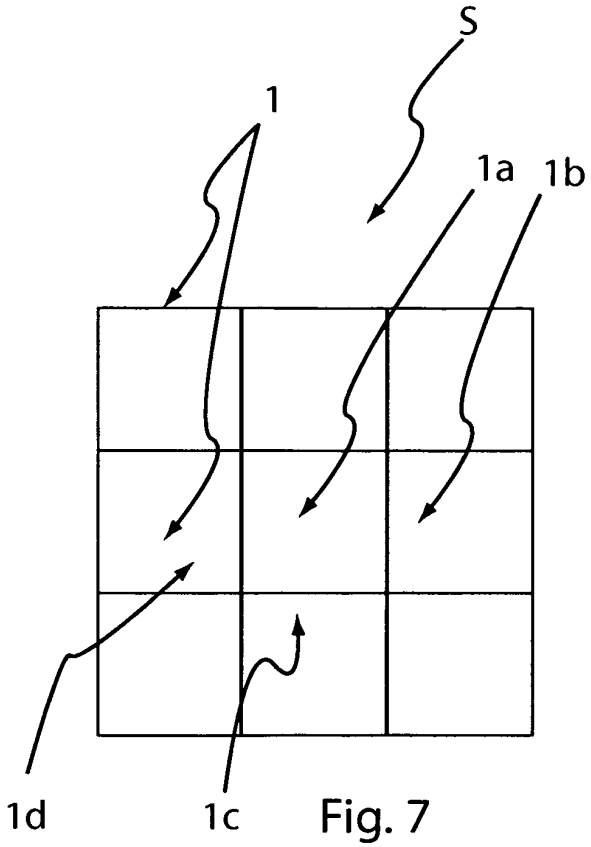


Fig. 7

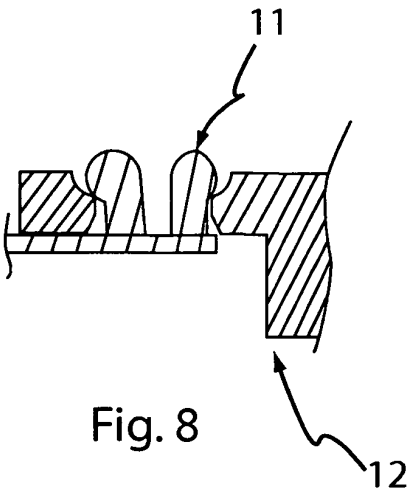


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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