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(54) **A flooring material of sheet-shaped floor elements joined with joining members**

Fussbodenmaterial aus plattenförmigen Fussbodenelementen verbunden mit Verbindungselementen

Matériau de plancher comprenant des éléments de plancher joints par des éléments de liaison

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Description

[0001] The present invention relates to a flooring material comprising sheet-shaped floor elements which are joined by means of joining members.

[0002] Prefabricated floor boards provided with tongue and groove at the edges are quite common nowadays. These can be installed by the average handy man as they are very easy to install. Such floors can, for example, be constituted of solid wood, fibre board or particle board. These are most often provided with a surface layer such as lacquer, or some kind of laminate. The boards are most often installed by being glued via tongue and groove. The most common types of tongue and groove are however burdened with the disadvantage to form gaps of varying width between the floor boards in cases where the installer hasn't been thorough enough. Dirt will easily collect in such gaps. Moisture will furthermore enter the gaps which will cause the core to expand in cases where it is made of wood, fiber board or particle board, which usually is the case. The expansion will cause the surface layer to rise closest to the edges of the joint which radically reduces the useful life of the floor since the surface layer will be exposed to an exceptional wear. Different types of tensioning devices, forcing the floor boards together during installation can be used to avoid such gaps. This operation is however more or less awkward. It is therefore desirable to achieve a joint which is self-guiding and thereby automatically finds the correct position. Such a joint would also be possible to utilize in floors where no glue is to be used.

[0003] Such a joint is known through WO 94/26999 which deals with a system to join two floor boards. The floor boards are provided with a locking device at the rear sides. In one embodiment the floor boards are provided with profiles on the lower side at a first long side and short side. These profiles, which extends outside the floor board itself, is provided with an upwards directed lip which fits into grooves on the lower side of a corresponding floor board. These grooves are arranged on the second short side and long side of this floor board. The floor boards are furthermore provided with a traditional tongue and groove on the edges. The intentions are that the profiles shall bend downwards and then to snap back into the groove when assembled. The profiles are integrated with the floor boards through folding or alternatively, through gluing.

[0004] According to WO 94/26999, the floor boards may be joined by turning or prizing it into position with the long side edge as a pivot point. It is then necessary to slide the floor board longitudinally so that it snaps into the floor board previously installed in the same row. A play is essential in order to achieve that. This play seems to be marked A in the figures. A tolerance of 0.2mm is mentioned in the application. Such a play will naturally cause undesired gaps between the floor boards. Dirt and moisture can penetrate into these gaps.

[0005] WO 01/02669, published 11 January 2001, re-

lates to a panel and a fastening system for panels, especially for rectangular floor panels. Positive-fit profiles on the long edges of two panels form a common joint when laid that permits articulated movement of the two panels. One short edge of a panel has a first hook element and the opposite short edge of the panel has a hook element that complements the first hook element, the hook elements being provided with holding surfaces that, when assembled, hold the panels together in such a way that the surfaces of the panels abut at the short edges. In order to install such panels, the positive-fit profiles on the long edges of the panels are connected first. To this end, a panel is positioned at an angle and the projection of one long edge is inserted into the recess on the long edge of a laid panel. The panel is then held in the angled position and slid in the longitudinal direction until it hits the short edge of an adjacent panel. If the angled panel is now swung down, the overlapping hook elements engage. Snap elements in the form of bulges cooperate with recesses to maintain the short edges in a laid configuration.

[0006] It is also known through WO 97/47834 to manufacture a joint where the floor boards are joined by turning or prizing it into position with the long side edge as a pivot point. According to this invention a traditional tongue has been provided with heel on the lower side. The heel has a counterpart in a recess in the groove of the opposite side of the floor board. The lower cheek of the groove will be bent away during the assembly and will then snap back when the floor board is in the correct position. The snap-joining parts, i. e. the tongue and groove, is in opposite to the invention according to WO 94/26999 above, where they are constituted by separate parts, seems to be manufactured monolithically from the core of the floor board. WO 97/47834 does also show how the tongue and groove with heels and recesses according to the invention is tooled by means of cutting machining. This invention does also have the disadvantage that the best mode of joining floor boards includes longitudinal sliding for joining the short sides of the floor boards, which also here will require a play which will cause unwanted gaps between the floor boards. Dirt and moisture can penetrate into these gaps.

[0007] It is, through the present invention, made possible to solve the above mentioned problems whereby a floor element which can be assembled without having to be slid along already assembled floor elements has been achieved. It is thereby made possible to achieve tighter joints.

[0008] The invention is defined in the appended claims.

[0009] Accordingly, the invention relates to a flooring material comprising sheet-shaped floor elements with a mainly square or rectangular shape. The floor elements are provided with edges, a lower side and an upper decorative layer. The floor elements are intended to be joined by means of joining members. The floor elements are provided with male joining members on a first edge while a second, opposite, edge of the floor elements are pro-

vided with a female joining member. The male joining member is provided with a tongue and a lower side groove. The female joining member is provided with a groove and a cheek, the cheek being provided with a lip. The floor elements are intended to mainly be joined together by tilting the floor element to be joined with an already installed floor element or a row of already installed floor elements, with the male joining member of the floor element angled downwards and that the first edge is allowed to be mainly parallel to the second edge of the already installed floor element or elements. The tongue of the tilted floor element is then inserted into the groove of the female joining member of the already installed floor element or elements. The tilted floor element is then turned downwards, with its lower edge as a pivot axis, so that the lip eventually snaps into the lower side groove where the decorative upper layer of the floor elements are mainly parallel. The male and female vertical assembly joining members are provided with one or more snapping hooks with matching under cuts which, by being provided with mainly horizontal locking surfaces, limits the vertical movement between two joined adjacent floor elements. A lower side recess is formed at the fourth edge so that the bottom side of the female vertical assembly joining member is recessed from the lower side. Two adjacent edges of a floor element, at the same time, and in the same turning motion, can be joined with a floor element adjacent to the first edge and a floor element adjacent to the third or fourth edge.

[0010] The force needed to overcome the static friction along the joint between two completely assembled male and female joining members is preferably larger than 10N per meter of joint length, suitably larger than 100N per meter of joint length.

[0011] The joint between two joined floor elements suitably also comprises cavities.

[0012] According to one embodiment of the invention the snapping hook is constituted by a separate spring part which is placed in a cavity. Alternatively the undercut is constituted by a separate spring part which is placed in a cavity. The spring part is suitably constituted by an extruded thermoplastic profile, a profile of thermosetting resin or an extruded metal profile.

[0013] The flooring material including the floor boards and joining profiles above is most suited when installing floors where it isn't desired to use glue. It is, however, possible to use glue or twin-faced adhesive tape in order to make the installation irreversibly permanent. The glue or tape is then suitably applied on, or in connection to, possible cavities or faces below the upper mating surfaces.

[0014] The invention is described further in connection to enclosed figures showing different embodiments of a flooring material whereby,

- figure 1 shows, in cross-section, a first and a second edge 2^I and 2^{II} respectively, during joining;
- figure 2 shows, in cross-section, a second embodi-

ment of a first and a second edge 2^I and 2^{II} respectively, during joining;

- figure 3 shows, in cross-section, a third embodiment of a first and a second edge 2^I and 2^{II} respectively, during joining;
- figure 4 shows, in cross-section, a fourth embodiment of a first and a second edge 2^I and 2^{II} respectively, during joining;
- figure 5 shows, in cross-section, a third and a fourth edge 2^{III} and 2^{IV} respectively, of an embodiment according to the invention during joining;
- figure 6 shows, in cross-section, a second embodiment of a third and a fourth edge 2^{III} and 2^{IV} respectively, during joining;
- figure 7 shows, in cross-section, a further embodiment of a third and a fourth edge 2^{III} and 2^{IV} respectively, according to the invention during joining; and
- figure 8 shows, in cross-section, a fourth embodiment of a third and a fourth edge 2^{III} and 2^{IV} respectively and a vertical assembly joining profile 30, during joining.

[0015] Accordingly figure 1 shows, in cross-section, a first and a second edge 2^I and 2^{II} respectively, during assembly. The figure shows parts of a flooring material comprising sheet-shaped floor elements 1 with a mainly square or rectangular shape. The floor elements 1 are provided with edges 2, a lower side 5 and an upper decorative layer 3. The floor elements 1 are intended to be joined by means of joining members 10. The floor elements 1 are provided with male joining members 10^I on a first edge 2^I while a second edge 2^{II} of the floor elements 1 are provided with a female joining member 10^{II}. The second edge 2^{II} is arranged on a side opposite to the first edge 2^I. The male joining member 10^I is provided with a tongue 11 and a lower side 5 groove 12. The female joining member 10^{II} is provided with a groove 13 and a cheek 14, the cheek 14 being provided with a lip 15. The floor elements 1 are intended to mainly be joined together by tilting the floor element 1 to be joined with an already installed floor element 1 or a row of already installed floor elements 1, with the male joining member 10^I of the floor element 1 angled downwards and that the first edge 2^I is allowed to be mainly parallel to the second edge 2^{II} of the already installed floor element 1 or elements 1. The tongue 11 of the tilted floor element 1 is then inserted into the groove 13 of the female joining member 10^{II} of the already installed floor element 1 or elements 1, whereby the tilted floor element 1 is turned downwards, with its lower edge as a pivot axis, so that the lip 15 eventually falls into the lower side 5 groove 12 where the decorative upper layer 3 of the floor elements 1 are mainly parallel.

[0016] The embodiment shown in figure 2 corresponds mainly with the one shown in figure 1. The lip 15 and lower side 5 groove 12 are, however, provided with a cam 16 and a cam groove 17 which provides a snap action locking.

[0017] The embodiment shown in figure 3 corresponds mainly with the one shown in figure 1 and 2 above. The lip 15 and lower side 5 groove 12 are, however, provided with a cam 16 and a cam groove 17 which provides a snap action locking.

[0018] The embodiment shown in figure 4 corresponds mainly with the one shown in figure 1 above. The lip 15 and cheek 14 is however shaped as a thin resilient section which provides a snap action locking.

[0019] Figure 5 shows, in cross-section, a third and a fourth edge 2^{III} and 2^{IV} respectively, of a floor element 1 according to any of the figures 1 to 4. The floor elements 1 are provided with a male vertical assembly joining member 10^{III} on a third edge 2^{III} while a fourth edge 2^{IV} is provided with a female vertical assembly joining member 10^{IV}. The fourth edge 2^{IV} is placed on a side opposite to the third edge 2^{III}.

[0020] The male vertical assembly joining members 10^{III} are provided with mainly vertical lower cheek surfaces 21 arranged parallel to the closest edge 2. The lower cheek surfaces 21 are intended to interact with mainly vertical upper cheek surfaces 22 arranged on the female vertical assembly joining members 10^{IV} so that two joined adjacent floor elements 1 are locked against each other in a horizontal direction. The male vertical assembly joining members 10^{III} are moreover provided with two snapping hooks 23 while the female vertical assembly joining members 10^{IV} are provided with matching undercuts 24, which by being provided with mainly horizontal locking surfaces limits the vertical movement between two joined adjacent floor elements 1.

[0021] The joint between a third and a fourth edge 2^{III} and 2^{IV} respectively of two joined floor elements 1 further comprises contact surfaces which are constituted by the horizontal locking surfaces of the undercuts 24 and hooks 23, the mainly vertical upper cheek surfaces 22 lower cheek surfaces as well as upper mating surfaces 25.

[0022] The joint between two joined floor elements 1 also comprises cavities 6.

[0023] The embodiment shown in figure 6, which is not in accordance with the present invention, corresponds in the main with the one shown in figure 5. The male vertical assembly joining members 10^{III} are, however, provided with only one snapping hook 23 while the female vertical assembly joining members 10^{IV} are provided with a matching undercut 24, which by being provided with mainly horizontal locking surfaces limits vertical movement between two joined adjacent floor boards 1.

[0024] The embodiment shown in figure 7 corresponds in the main with the one shown in figure 6. The snapping hook 23 on the male vertical assembly joining member 10^{III} is, however, moved somewhat inwards in the floor element 1 whereby a guiding angle is formed above the undercut 24 of the female vertical joining member 10^{IV}.

[0025] The embodiment shown in figure 8, which is not in accordance with the present invention, corresponds mainly with the one shown in figure 7. Both the third and the fourth edges 2^{III} and 2^{IV} respectively are, however,

provided with male vertical assembly joining members 10^{III}. A vertical assembly joining profile 30, provided with a female vertical assembly joining profile 10^{IV} on both sides of a vertical symmetry line, is used for joining the two floor elements 1.

[0026] The female vertical assembly joining members 10^{IV} of the vertical assembly joining profile 30 are equipped similar to the female vertical assembly joining members 10^{IV} in figure 7 above.

[0027] Two adjacent edges 2 of a floor element 1 can at the same time, and in the same turning motion, be joined with a floor element 1 adjacent to the first edge 2^I and a floor element 1 adjacent to the third or fourth edge 2^{III} and 2^{IV} respectively, when assembling floor elements 1 according to the above described embodiments.

[0028] The floor elements 1 according to the present invention most often comprises a core. The core is most often comprised of particles or fiber of wood bonded with resin or glue. It is advantageous to coat the surface closest to the joint in cases where the floor will be exposed to high levels of moisture since the cellulose based material is sensitive to moisture. This coating may suitably incorporate resin, wax or some kind of lacquer. It is not necessary to coat the joint when it is to be glued since the glue itself will protect from moisture penetration. The upper decorative layer 3 is constituted of a decorative paper impregnated with melamine-formaldehyde resin. One or more so called overlay sheets of a-cellulose, impregnated with melamine-formaldehyde resin may possibly be placed on top of the decorative layer. The abrasion resistance may be improved by sprinkling one or more of the sheets with hard particles of for example alpha-aluminum oxide, silicon carbide or silicon oxide. The lower side 5 may suitably be coated with lacquer or a layer of paper and resin.

[0029] The invention is not limited by the embodiments shown since they can be varied within the scope of the invention as defined by the appended claims.

Claims

1. Flooring material comprising sheet-shaped floor elements (1) with a mainly square or rectangular shape, which floor elements (1) are provided with edges (2), a lower side (5) and an upper decorative layer (3), whereby the floor elements (1) are intended to be joined by means of joining members (10), **characterized in that**

- the floor elements (1) are provided with male joining members (10^I) on a first edge (2^I), while a second edge (2^{II}) of the floor elements (1) is provided with a female joining member (10^{II}), whereby the male joining member (10^I) is provided with a tongue (11) and a lower side (5) groove (12) while the female joining member (10^{II}) is provided with a groove (13) and a cheek

(14), the cheek (14) being provided with a lip (15), whereby the floor elements (1) are intended to mainly be joined together by tilting the floor element (1) to be joined with an already installed floor element (1) or a row of already installed floor elements (1), with the male joining member (10^I) of the floor element (1) angled downwards, and that the first edge (2^I) is allowed to be mainly parallel to the second edge (2^{II}) of the already installed floor element (1) or elements (1), whereby the tongue (11) of the tilted floor element (1) is inserted into the groove (13) of the female joining member (10^{II}) of the already installed floor element (1) or elements (1), whereby the tilted floor element (1) is turned downwards, with its lower edge as a pivot axis, so that the lip (15) eventually snaps or falls into the lower side (5) groove (12) where the decorative upper layer (3) of the floor elements (1) are mainly parallel;

- the floor elements (1), on a third edge (2^{III}), are provided with a male vertical assembly joining member (10^{III}), while a fourth edge (2^{IV}) is provided with female vertical assembly joining member (10^{IV}), the fourth edge (2^{IV}) being arranged on a side opposite to the third edge (2^{III}), wherein the male vertical assembly joining members (10^{III}) are provided with mainly vertical lower cheek surfaces (21) arranged parallel to the closest edge (2), which lower cheek surfaces (21) are intended to interact with mainly vertical upper cheek surfaces (22) arranged on the female vertical assembly joining members so that two joined adjacent floor elements (1) are locked against each other in a horizontal direction, **characterized in that** said male and female vertical assembly joining members (10^{III} and 10^{IV} respectively) are provided with one or more snapping hooks (23) with matching under cuts (24) which, by being provided with mainly horizontal locking surfaces, limits the vertical movement between two joined adjacent floor elements (1), and a lower side (5) recess is formed at said fourth edge (2^{IV}) so that the bottom side of said female vertical assembly joining member (10^{IV}) is recessed from said lower side (5); and
- two adjacent edges (2) of a floor element (1), at the same time, and in the same turning motion, can be joined with a floor element (1) adjacent to the first edge (2^I) and a floor element adjacent to the third or fourth edge (2^{III} and 2^{IV}, respectively).

2. Floor material according to claim 1, **characterized in that** said floor elements comprise a core material and that said hooks (23) and undercuts (24) are formed in the material of the core.

3. Floor material according to claim 1 or 2, **characterized in that** either said hook (23) or undercut (24) is constituted by a separate spring part which is placed in a cavity (6) available between joined floor elements (1).

4. Floor material according to any of the preceding claims, **characterized in that** said recess extends underneath said upper cheek surfaces (22) and lower cheek surfaces (21).

5. Flooring material according to any of the preceding claims, **characterized in that** the force needed to overcome the static friction along the joint between two completely assembled male and female joining members (10^I and 10^{II} respectively) is larger than 10N per meter of joint length, preferably larger than 100N per meter of joint length.

6. Flooring material according to any of the preceding claims, **characterized in that** the floor elements (1) have a core comprised of particles or fiber of wood bonded with resin or glue.

Patentansprüche

1. Bodenbelagsmaterial, das plattenförmige Bodenelemente (1) mit einer hauptsächlich quadratischen oder rechteckigen Form umfasst, wobei die Bodenelemente (1) mit Kanten (2), einer Unterseite (5) und einer oberen dekorativen Schicht (3) versehen sind, wobei die Bodenelemente (1) dazu bestimmt sind, mittels Verbindungsgliedern (10) verbunden zu werden, **dadurch gekennzeichnet, dass**

- die Bodenelemente (1) an einer ersten Kante (2^I) mit männlichen Verbindungsgliedern (10^I) versehen sind, während eine zweite Kante (2^{II}) der Bodenelemente (1) mit einem weiblichen Verbindungsglied (10^{II}) versehen ist, wobei das männliche Verbindungsglied (10^I) mit einer Feder (11) und einer unterseitigen (5) Nut (12) versehen ist, während das weibliche Verbindungsglied (10^{II}) mit einer Nut (13) und einer Wange (14) versehen ist, wobei die Wange (14) mit einer Lippe (15) versehen ist, wobei die Bodenelemente (1) dazu bestimmt sind, hauptsächlich durch Kippen des Bodenelements (1), das mit einem bereits installierten Bodenelement (1) oder einer Reihe von bereits installierten Bodenelementen (1) zu verbinden ist, miteinander verbunden zu werden, mit dem männlichen Verbindungsglied (10^I) des Bodenelements (1) nach unten abgewinkelt, und dass der ersten Kante (2^I) erlaubt ist, hauptsächlich parallel zur zweiten Kante (2^{II}) des bereits installierten Bodenelements (1) oder der bereits installierten Ele-

mente (1) zu sein, wobei die Feder (11) des gekippten Bodenelements (1) in die Nut (13) des weiblichen Verbindungsglieds (10^{II}) des bereits installierten Bodenelements (1) oder der bereits installierten Elemente (1) eingesetzt wird, wobei das gekippte Bodenelement (1) mit seiner unteren Kante als eine Drehachse nach unten gedreht wird, sodass die Lippe (15) schließlich in die unterseitige (5) Nut (12) einrastet oder fällt, wo die dekorative oberen Schicht (3) der Bodenelemente (1) hauptsächlich parallel ist;

- die Bodenelemente (1) an einer dritten Kante (2^{III}) mit einem männlichen Vertikalzusammenbauverbindungsglied (10^{III}) versehen sind, während eine vierte Kante (2^{IV}) mit einem weiblichen Vertikalzusammenbauverbindungsglied (10^{IV}) versehen ist, wobei die vierte Kante (2^{IV}) auf einer der dritten Kante (2^{III}) gegenüberliegenden Seite angeordnet ist, wobei die männlichen Vertikalzusammenbauverbindungsglieder (10^{III}) mit hauptsächlich vertikalen unteren Wangenoberflächen (21) versehen sind, die parallel zu der nächstliegenden Kante (2) angeordnet sind, wobei die unteren Wangenoberflächen (21) dazu bestimmt sind, mit hauptsächlich vertikalen oberen Wangenoberflächen (22) zu interagieren, die an den weiblichen Vertikalzusammenbauverbindungsgliedern angeordnet sind, sodass zwei verbundene angrenzende Bodenelemente (1) in einer horizontalen Richtung gegeneinander verriegelt sind, **dadurch gekennzeichnet, dass**

die männlichen und weiblichen Vertikalzusammenbauverbindungsglieder (10^{III} bzw. 10^{IV}) mit einem oder mehreren Rasthaken (23) mit passenden Unterschneidungen (24) versehen sind, die, indem sie mit hauptsächlich horizontalen Verriegelungsflächen versehen sind, die vertikale Bewegung zwischen zwei verbundenen angrenzenden Bodenelementen (1) begrenzen, und eine unterseitige (5) Aussparung an der vierten Kante (2^{IV}) gebildet ist, sodass die Bodenseite des weiblichen Vertikalzusammenbauverbindungsglieds (10^{IV}) von der Unterseite (5) her ausgespart ist; und

- zwei angrenzende Kanten (2) eines Bodenelements (1) gleichzeitig und in der gleichen Drehbewegung mit einem Bodenelement (1) angrenzend an die erste Kante (2^I) und einem Bodenelement angrenzend an die dritte oder vierte Kante (2^{III} bzw. 2^{IV}) verbunden werden können.

2. Bodenmaterial nach Anspruch 1, **dadurch gekennzeichnet, dass** die Bodenelemente ein Kernmaterial umfassen und dass die Haken (23) und Unterschneidungen (24) in dem Material des Kerns gebildet sind.

3. Bodenmaterial nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** entweder der Haken (23) oder die Unterschneidung (24) durch ein separates Federteil ausgebildet ist, das in einem Hohlraum (6) platziert ist, der zwischen verbundenen Bodenelementen (1) verfügbar ist.

4. Bodenmaterial nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** sich die Aussparung unterhalb der oberen Wangenoberflächen (22) und unteren Wangenoberflächen (21) erstreckt.

5. Bodenbelagsmaterial nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Kraft, die notwendig ist, um die statische Reibung entlang der Verbindung zwischen zwei vollständig zusammengebauten männlichen und weiblichen Verbindungselementen (10^I bzw. 10^{II}) zu überwinden, größer als 10 N pro Meter Verbindungslänge ist, vorzugsweise größer als 100 N pro Meter Verbindungslänge.

6. Bodenbelagsmaterial nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bodenelemente (1) einen Kern aufweisen, der Partikel oder Fasern von Holz umfasst, die mit Harz oder Klebstoff gebunden sind.

Revendications

1. Matériau de revêtement de sol comprenant des éléments de sol (1) possédant une configuration en forme de feuille avec une configuration principalement de forme carrée ou rectangulaire, lesdits éléments de sol (1) étant munis de bords (2), d'un côté inférieur (5) et d'une couche décorative supérieure (3) ; dans lequel les éléments de sol (1) sont destinés à être joints au moyen d'éléments de jonction (10), **caractérisé en ce que**

- les éléments de sol (1) sont équipés d'éléments de jonction mâles (10^I) sur un premier bord (2^I), tandis qu'un second bord (2^{II}) des éléments de sol (1) est équipé d'un élément de jonction femelle (10^{II}) ; dans lequel l'élément de jonction mâle (10^I) est muni d'une languette (11) et d'une rainure (12) du côté inférieur (5), tandis que l'élément de jonction femelle (10^{II}) est muni d'une rainure (13) et d'une joue (14), la joue (14) étant munie d'une lèvre (15) ; dans lequel les éléments de sol (1) sont destinés à être joints principalement les uns aux autres en inclinant l'élément de sol (1) qui doit être joint à un élément de sol déjà installé (1) ou à une rangée d'éléments de sol déjà installés (1), l'élément de jonction mâle (10^I) de l'élément de sol (1) formant

un angle orienté vers le bas ; et **en ce qu'il** est fait en sorte que le premier bord (2^I) s'étende principalement parallèlement au second bord (2^{II}) de l'élément de sol (1) ou des éléments de sol (1) déjà installé(s) ; dans lequel la languette (11) de l'élément de sol (1) incliné est insérée dans la rainure (13) de l'élément de jonction femelle (10^{II}) de l'élément de sol (1) ou des éléments de sol (1) déjà installé(s) ; dans lequel l'élément de sol (1) incliné est soumis à une rotation vers le bas, son bord inférieur faisant office d'axe de pivotement, d'une manière telle que la lèvre (15) vient s'insérer par la suite par encliquetage ou tombe en définitive dans la rainure (12) du côté inférieur (5) à l'endroit où les couches supérieures décoratives (3) des éléments de sol (1) sont principalement parallèles ; - les éléments de sol (1), sur un troisième bord (2^{III}) sont munis d'un élément de jonction mâle du type à assemblage vertical (10^{III}), tandis qu'un quatrième bord (2^{IV}) est muni d'un élément de jonction femelle du type à assemblage vertical (10^{IV}), le quatrième bord (2^{IV}) étant disposé sur un côté opposé au troisième bord (2^{III}) ; dans lequel les éléments de jonction mâles du type à assemblage vertical (10^{III}) sont munis de surfaces de joues inférieures principalement verticales (21) disposées parallèlement au bord le plus proche (2), lesdites surfaces de joues inférieures (21) étant destinées à entrer en interaction avec des surfaces de joues supérieures principalement verticales (22) disposées sur les éléments de jonction femelles du type à assemblage vertical, d'une manière telle que deux éléments de sol adjacents joints (1) sont verrouillés l'un par rapport à l'autre dans une direction horizontale ; **caractérisé en ce que** lesdits éléments de jonction mâle et femelle du type à un assemblage vertical (10^{III} et 10^{IV}, respectivement) sont munis d'un ou de plusieurs crochets d'encliquetage (23) comprenant des contre-dépouilles correspondantes (24) qui, par le fait qu'elles sont munies de surfaces de verrouillage principalement horizontales, limitent le mouvement vertical entre deux éléments de sols adjacents joints (1), et un évidement dans le côté inférieur (5) est formé audit quatrième bord (2^{IV}) d'une manière telle que le côté inférieur dudit élément de jonction femelle du type à assemblage vertical (10^{IV}) est évidé à partir dudit côté inférieur (5) ; et - deux bords adjacents (2) d'un élément de sol (1), dans le même temps et dans le même mouvement de rotation peuvent être joints à un élément de sol (1) adjacent au premier bord (2^I) et à un élément de sol adjacent au troisième ou au quatrième bord (2^{III} et 2^{IV}, respectivement).

2. Matériau de revêtement de sol selon la revendication 1, **caractérisé en ce que** lesdits éléments de sol comprennent une matière de partie centrale et **en ce que** lesdits crochets (23) et lesdites contre-dépouilles (24) sont réalisés dans la matière de la partie centrale.
3. Matériau de revêtement de sol selon la revendication 1 ou 2, **caractérisé en ce que**, soit ledit crochet (23), soit ladite contre-dépouille (24) est constitué par une partie séparée faisant ressort qui est placée dans une cavité (6) disponible entre des éléments de sol joints (1).
4. Matériau de revêtement de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit évidement s'étend en dessous desdites surfaces de joues supérieures (22) et desdites surfaces de joues inférieures (21).
5. Matériau de revêtement de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la force requise pour vaincre la friction statique le long du joint entre deux éléments de jonction mâle et femelle complètement assemblés (10^I et 10^{II}, respectivement) est supérieure à 10 N par mètre de longueur de joint, de préférence supérieure à 100 N par mètre de longueur de joint.
6. Matériau de revêtement de sol selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les éléments de sol (1) possèdent une partie centrale qui comprend des particules ou des fibres de bois liées avec une résine ou avec de la colle.

Fig. 1

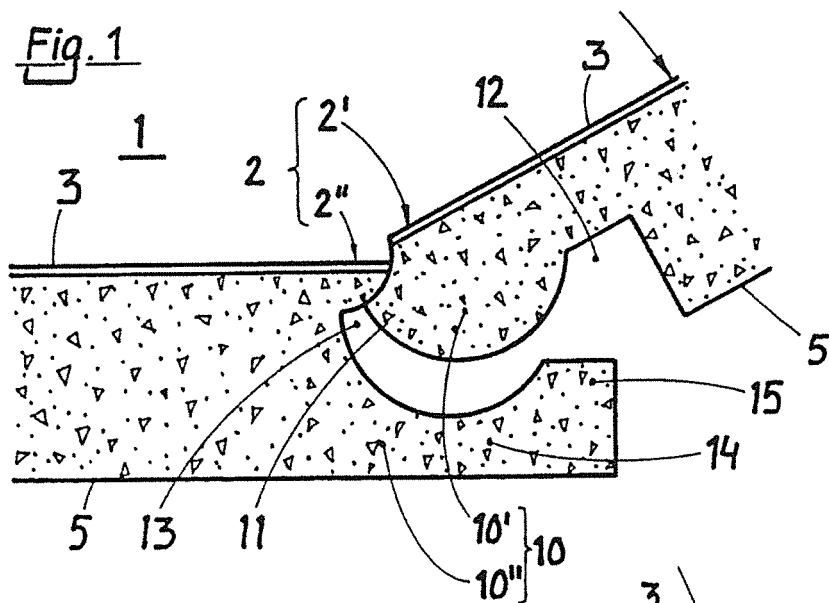


Fig. 2

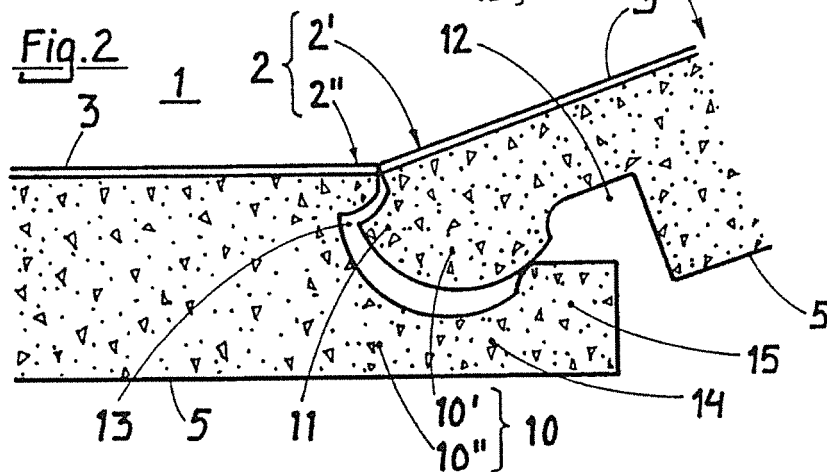


Fig. 3

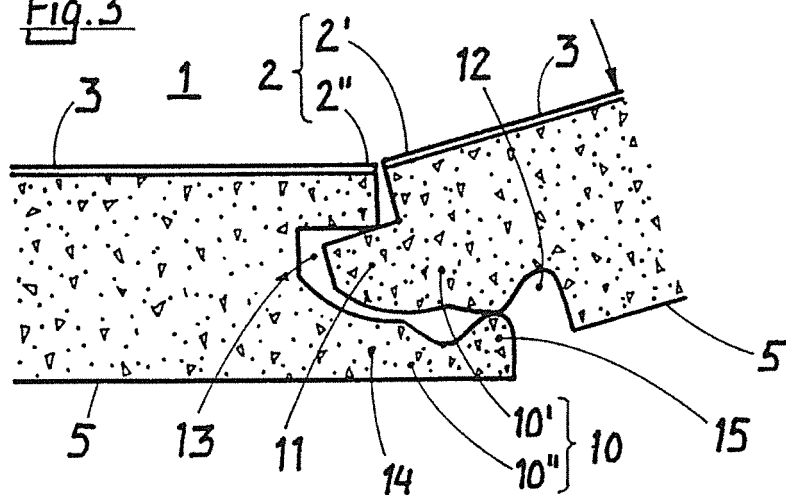


Fig. 4

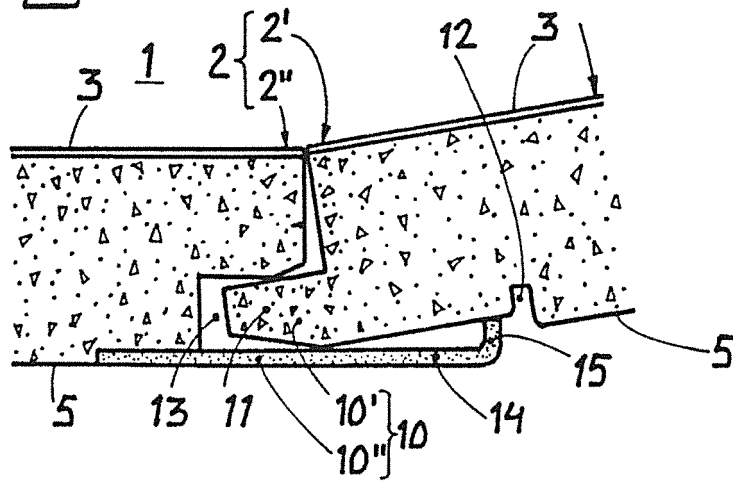


Fig. 5

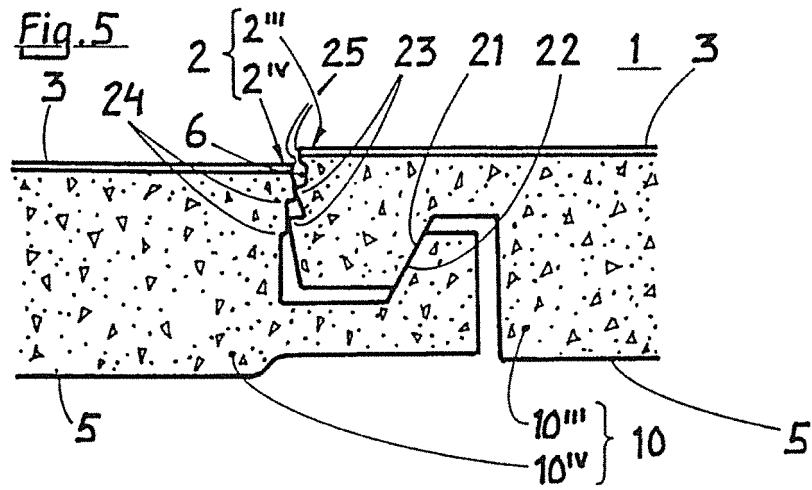
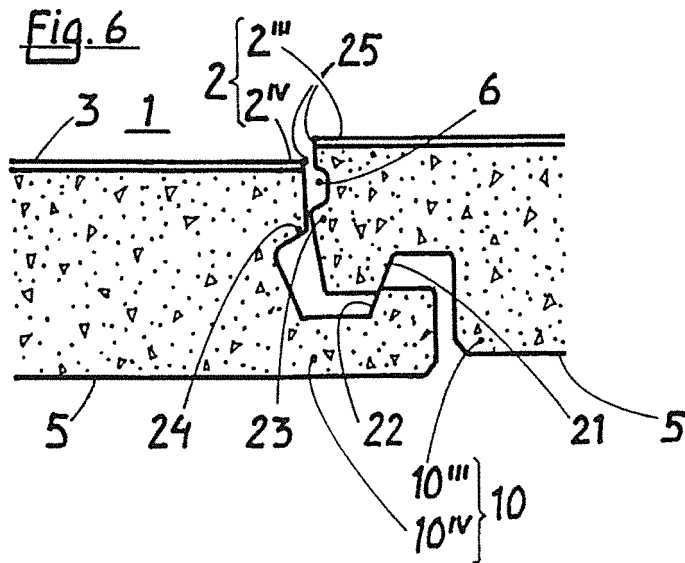
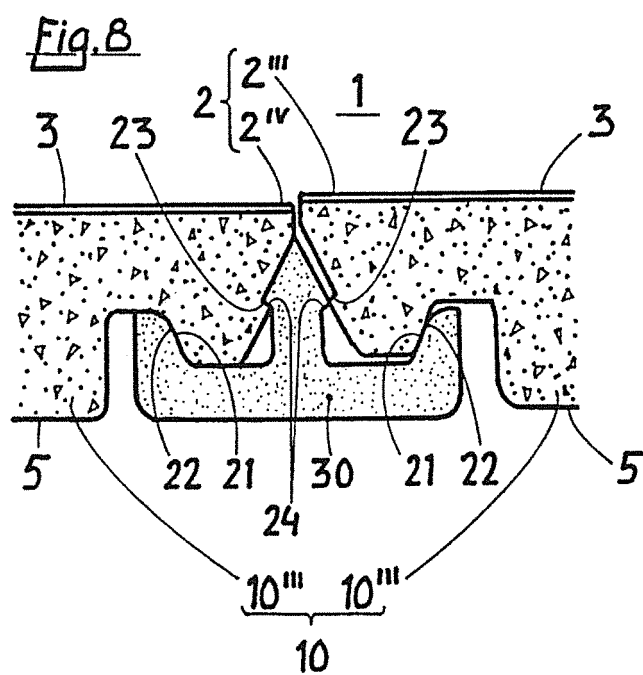
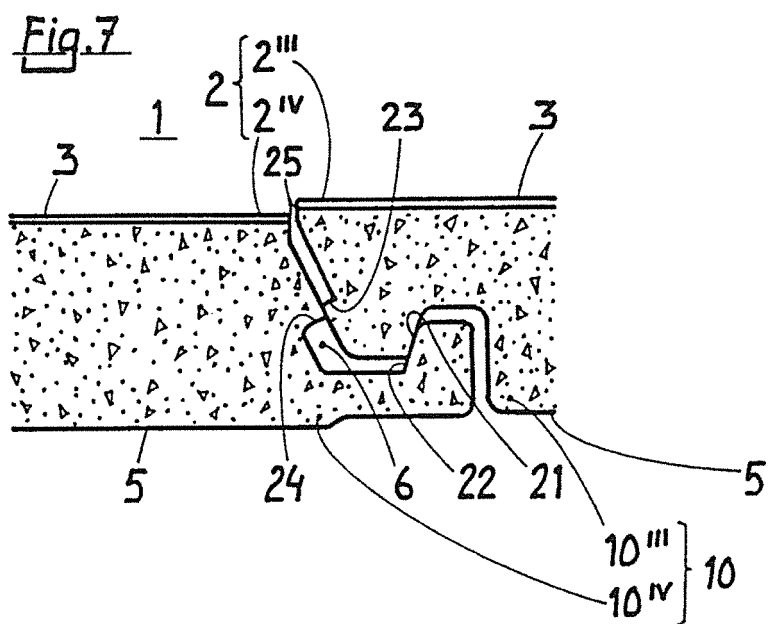


Fig. 6





REFERENCES CITED IN THE DESCRIPTION

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