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(54) **Tiled floor with at least three tiles and a tile support**

(57) A tiled floor comprises at least three tiles (2) and at least one tile support (14). The tiles (2) each comprise an underside (8) and a top side (6), have a polygonal form in top view and are designed for outside use. The tiles (2) are separated from each other by an at least partially open joint (24) for the purpose of draining rain-water from above the tiled floor to below the tiles (2). Each of the tiles (2) comprises on its underside (8) and close to its said corner point an annular segment-like

protrusion and an annular segment-like fixing groove, which co-act respectively with a complementary annular fixing groove (10) in a top side of the tile support (14) or with a complementary fixing ring (16). The annular segment-like protrusions or the fixing ring (16) are at least partially received in respectively the annular fixing groove and the annular segment-like fixing grooves (10) for restricting the relative movement of the tiles (2) at least in a plane of the tiled floor.

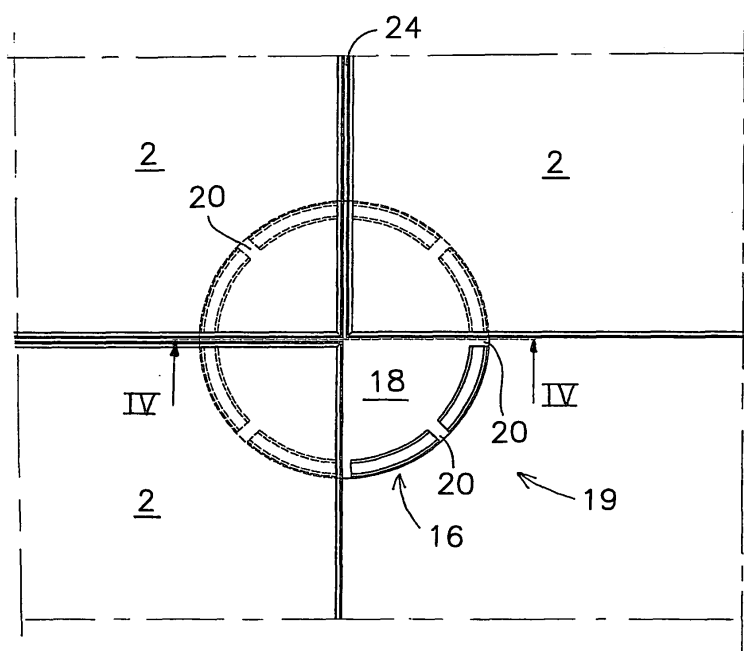


Fig 3

Description

[0001] The invention relates to a tiled floor, comprising at least three tiles and at least one tile support as according to the preamble of claim 1. Such a tiled floor is usually arranged on an easily damaged, per se impassable or irregular surface such as a roof of a building, or in situations where the tiled floor must be laid at a raised position relative to the surface. The tile support herein ensures that the weight of the tiles and possible objects present thereon are transmitted to the surface, and that some space is created between the underside of the tiles and the surface. Such a space is in any case intended for draining rainwater. Higher tile supports can also be applied in order to thus place the tiled floor at a desired height.

[0002] DE-A1 100.22.070 discloses a tiled floor with tiles of concrete, ceramic or a similar material. The tiles are provided on a tile support. The tiles are separated from each other by means of a join for the purpose of draining rainwater. Close to corner points conically formed protrusions are provided on an underside of the tiles. The conical protrusions engage in corresponding recesses in the tile supports. In this way the tiles are mutually fixed.

[0003] A drawback of the known tiled floor is that it is time-consuming to place the tiles with said conical protrusions in the openings of the tile support.

[0004] The present invention has for its object to at least partially obviate the above stated drawback, or to at least provide an alternative.

[0005] The present invention more particularly has the object of providing a tiled floor which can be laid more easily.

[0006] The invention achieves this objective by means of a tiled floor according to claim 1 and claim 7.

[0007] A tiled floor comprises at least three tiles and at least one tile support. The at least three tiles each comprise an underside and a top side, have a polygonal form in top view and are designed for outside use. The at least one tile support is provided on a surface so as to support the at least three tiles close to a corner point of each of the at least three tiles. The tiles are separated from each other by an at least partially open join for the purpose of draining rainwater from above the tiled floor to below the at least three tiles. Each of the at least three tiles comprises on its underside and close to its said corner point an annular segment-like protrusion, or an annular segment-like fixing groove, which co-act respectively with a complementary annular fixing groove in a top side of the at least one tile support, or with a complementary fixing ring. The annular segment-like protrusions and the fixing ring are at least partially received in respectively the annular fixing groove and the annular segment-like fixing grooves for restricting the relative movement of the tiles at least in a plane of the tiled floor.

[0008] Owing to the annular form the tiles can in many cases be placed more easily on the tile supports than in

the prior art. A relative rotation between the annular grooves and the fixing ring, or annular protrusions, is after all not important, whereby it is not necessary to place the tile support in a precise orientation before a tile is placed thereon. Where it could be necessary in the prior art to lift a tile a number of times in order to rotate the tile support, this need now no longer be necessary owing to the invention.

[0009] AU-580899-B2 provides a tiled floor for pedestrians, comprising tiles and a tile support. A cross-shaped groove is arranged in the centre of the top side of the round tile support. A circular groove is arranged round the cross-shaped groove. The circular groove receives standing edges of the tiles. In the cross-shaped groove is arranged an elongate cross-shaped protrusion which protrudes above the tile support in order to hold the tiles at a mutual distance.

[0010] The tile support according to the present invention does not comprise a spacer. No parts of the tile support protrude between side walls of the tiles in order to hold these spaced apart. Nor do any parts which are connected fixedly or removably to the tile support protrude between the side walls of the tiles. The tiles are held spaced apart by the annular segment-like grooves and rings. The tiles can herein rotate relative to the fixing ring of the tile support. The tiles are thus easy to position and to rotate over the tile support as described above. Owing to the absence of a separate spacer on the tile support a tiled floor can be laid more quickly since the tiles can be rotated relative to the tile supports.

[0011] Advantageous embodiments are stated in the sub-claims.

[0012] In an embodiment an imaginary centre point of the annular fixing groove and of the complimentary fixing ring lies outside a contour of the respective at least three tiles for the purpose of forming the at least partially open join. The location of the centre point of the annular form ensures that the join can be created between the tiles.

[0013] The fixing ring is advantageously provided on a plate-like element. This can increase the stiffness of the fixing ring. The fixing ring can moreover be placed together with the plate-like element on the tile support. Owing to the releasable plate-like element with the fixing ring thereon, a tile support can be made suitable for a plurality of tiles by arranging the appropriate plate-like element.

[0014] The plate-like element is particularly provided along a peripheral rim with an edge, this edge extending at least partially around the tile support. The fixing ring can hereby be positioned in simple manner on the tile support, and this reduces the chance of the fixing ring becoming detached from the tile support.

[0015] In an embodiment the fixing ring is provided with at least one draining opening for discharging water. At least less rainwater will hereby be able to remain on the tile support.

[0016] The invention also relates to a system for forming a tiled floor in accordance with the relevant independ-

ent claim.

[0017] The present invention will be further elucidated on the basis of an exemplary embodiment in the accompanying drawing, in which:

- fig. 1 shows a tile in top view;
- fig. 2 shows a side view of the tile of fig. 1;
- fig. 3 shows a top view of a tile support provided with three tiles; and
- fig. 4 shows a section IV-IV of fig. 3.

[0018] A tile according to the invention is designated in fig. 1 and 2 as a whole with reference numeral 2. Tile 2 is formed in this exemplary embodiment from concrete. Concrete is understood to mean cement-based concrete as well as polyester concrete. A tiled floor which is assembled from tiles 2, as shown partially in fig. 3, is suitable for walking on, and optionally even for driving on. In the latter case the tiled floor can be used as parking roof. The tiles are durable, i.e. in normal outside use they have a lifespan of at least 10 years.

[0019] Tile 2 is in this example substantially square, i.e. quadrangular. Tile 2 has four corner points 4, a top side 6 and an underside 8. Provided in the underside close to each of the corner points 4 is a groove 10 having the form of a circle segment. Tile 2 is further provided along its upper peripheral edge with a facet edge 12.

[0020] Fig. 3 shows three concrete tiles 2 provided on a tile support 14, in this exemplary embodiment in the form of a rubber disc. Tile supports 14 rest on a surface 15, for instance a roof or a gallery. The rubber tile supports 14 herein provide for a dampening of sound and vibrations caused by users of the tiled floor.

[0021] Provided on tile support 14 is a fixing ring 16 which in this exemplary embodiment is fixedly connected to a plate-like element, or plate, in this case a circular plate 18. In this exemplary embodiment fixing ring 16 is injection moulded with circular plate 18 as one piece of plastic. Fixing ring 16 and circular plate 18 can together be deemed a tile pedestal 19 with standing edge. Circular plate 18 imparts extra stiffness to fixing ring 16 and facilitates placing of fixing ring 16 on tile support 14. In this exemplary embodiment fixing ring 16 is interrupted at multiple, in this case eight, locations for drainage openings 20.

[0022] An imaginary centre point 22 of fixing ring 16 lies outside the contours of tiles 2. It is noted here that the imaginary centre point 22 is situated here at a distance of more than half a join width from the respective corner points of tiles 2. In other words, the imaginary centre point 22 of fixing ring 16 falls within a join 24 provided between tiles 2. The imaginary centre point is particularly situated at an intersection of central axes of the joins. To put it yet another way, the annular segment-like grooves 10 are slightly smaller in radial direction than a full quarter-circular groove. The distance of these circle segment-like grooves 10 from the closest corner point 4 is therefore slightly smaller than the radius of fixing ring

16.

[0023] Because the imaginary centre point 22 of fixing ring 16 lies outside the contours of tiles 2, the join 24 is automatically created when tiles 2 are placed on fixing ring 16. Rainwater falling onto tiles 2 can for instance be discharged downward via this join 24. Water falling onto tile support 14, in this case onto circular plate 18, can further be discharged via drainage openings 20.

[0024] An edge 19 extends along a peripheral rim of circular plate 18. Edge 19 extends in this example substantially at right angles to circular plate 18, but can also extend at an obtuse or acute angle relative to circular plate 18. Edge 19 extends around tile support 14 for the purpose of fixing the fixing ring 16 with circular plate 18 relative to tile support 14.

[0025] Many variants are possible within the scope of the invention. Other stone-like materials, including ceramic and natural stone, can be chosen as material for the tile. Plastic materials are also suitable to the extent that they are sufficiently weather-resistant and have load-bearing capacity for use outside as tile deck.

[0026] In a variant the tile support is a height-adjustable tile support, for instance for the purpose of forming a gallery elevation, or for levelling a sloping or irregular surface.

[0027] The fixing ring can be integrated with the tile support. The fixing ring could also be provided in the form of annular segment-like protrusions under the tiles themselves. In an exemplary embodiment with four tiles, four almost quarter-circular protrusions of four tiles resting on a tile support could then together form a fixing ring. This jointly formed fixing ring could come into an annular groove of a tile support.

[0028] A tile pedestal with standing edge can be provided with drainage openings. These can be situated in the fixing ring as described above, but also in the plate-like element.

[0029] The joins between the tiles do not have to be wholly open. The tiles could for instance be slightly larger locally, whereby the join is closed over a relatively short distance.

[0030] Tiles could further have a different number of corners. In the case of triangular tiles corner points of six tiles at a time will come together on a tile support. In the case of hexagonal tiles, corner points of three tiles at a time will come together on a tile support.

Claims

1. Tiled floor, comprising at least three tiles (2) and at least one tile support (14),

which at least three tiles (2) each comprise an underside (8) and a top side (6), have a polygonal form in top view and are designed for outside use,

which at least one tile support (14) is provided

on a surface (15) so as to support the at least three tiles (2) close to a corner point of each of the at least three tiles (2),

wherein the tiles (2) are separated from each other by an at least partially open join (24) for the purpose of draining rainwater from above the tiled floor to below the at least three tiles (2),

characterized in that

each of the at least three tiles (2) comprises on its underside (8) and close to its said corner point an annular segment-like fixing groove (10), the annular segment-like fixing grooves (10) co-act with a complementary fixing ring (16) on a top side of the at least one tile support (14), and the annular segment-like fixing ring (16) is at least partially received in the annular segment-like fixing grooves (10) for restricting the relative movement of the tiles at least in a plane of the tiled floor.

2. Tiled floor as claimed in claim 1, wherein the fixing ring (16) is provided on a plate-like element (18) arranged on the tile support (14).
3. Tiled floor as claimed in claim 2, wherein the plate-like element (18) is provided along a peripheral rim with an edge (19), this edge (19) extending at least partially around the tile support (14).
4. Tiled floor as claimed in claim 2 or 3, wherein the fixing ring (16) is formed integrally with the plate-like element (18), wherein the plate-like element (18) is arranged releasably on the tile support (14).
5. Tiled floor as claimed in any of the foregoing claims, wherein the fixing ring (16) is provided with at least one drainage opening (20) for discharging water.
6. Tiled floor as claimed in any of the foregoing claims, wherein the at least one fixing ring (16) has a radius greater than the distance of the annular segment-like fixing groove (10) from the respective corner point.
7. Tiled floor, comprising at least three tiles (2) and at least one tile support (14),

which at least three tiles (2) each comprise an underside (8) and a top side (6), have a polygonal form in top view and are designed for outside use, which at least one tile support (14) is provided on a surface (15) so as to support the at least three tiles (2) close to a corner point of each of the at least three tiles (2),

wherein the tiles (2) are separated from each other by an at least partially open join (24) for the purpose

of draining rainwater from above the tiled floor to below the at least three tiles (2), **characterized in that**

each of the at least three tiles (2) comprises on its underside (8) and close to its said corner point an annular segment-like protrusion, or an annular segment-like fixing groove (10),

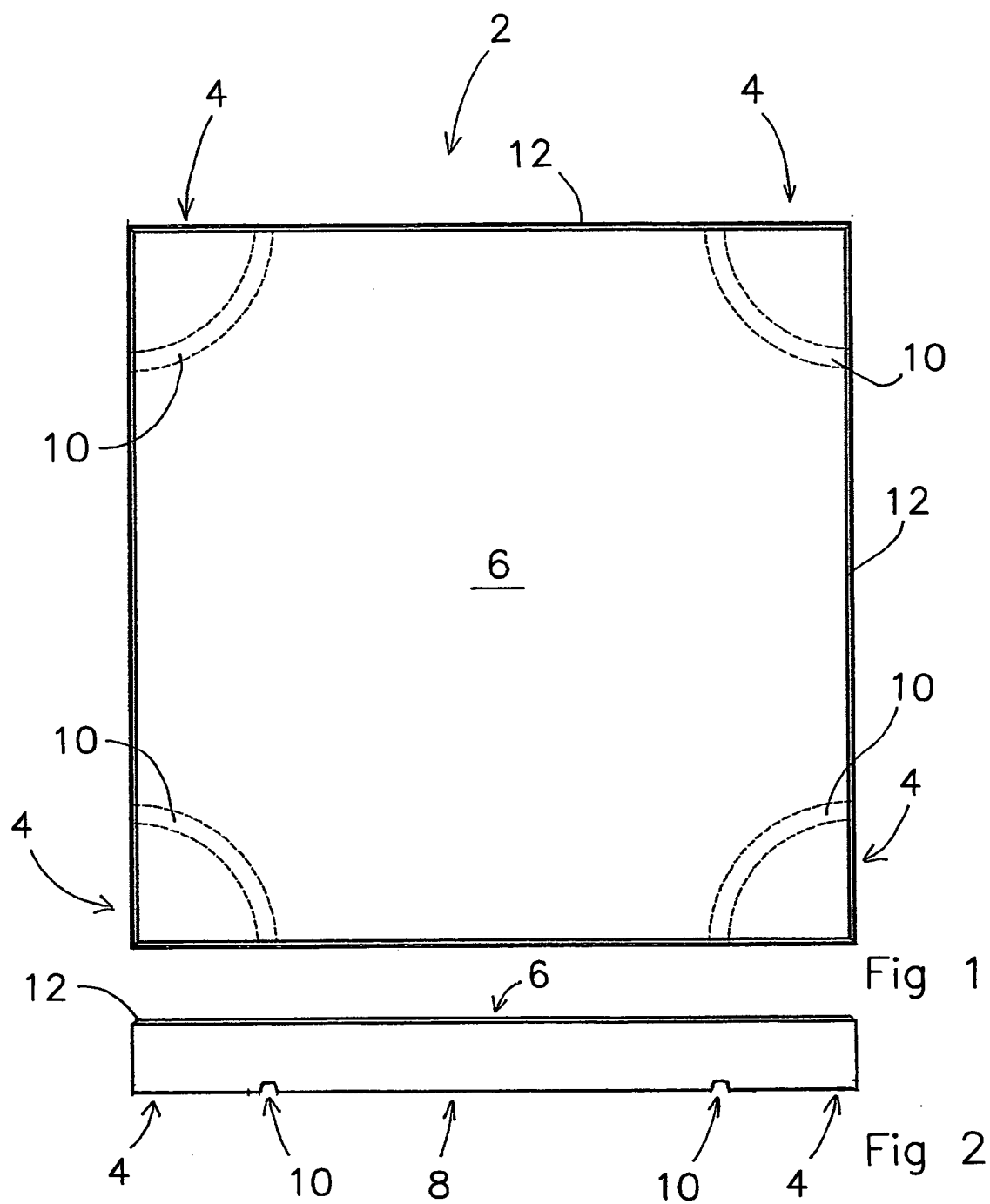
which co-act respectively with a complementary annular fixing groove in a top side of the at least one tile support (14), or with a complementary fixing ring (16), wherein

the annular segment-like protrusions and the fixing ring (16) are at least partially received in respectively the annular fixing groove and the annular segment-like fixing grooves (10) for restricting the relative movement of the tiles (2) at least in a plane of the tiled floor,

characterized in that

there is no spacer connected to the tile support for the purpose of mutually separating the tiles on the tile support.

8. Tiled floor as claimed in any of the foregoing claims, wherein an imaginary centre point (22) of the annular fixing groove and of the complimentary fixing ring (16) lies outside a contour of the respective at least three tiles (2) for the purpose of forming the at least partially open join (24).
9. Tiled floor as claimed in any of the foregoing claims, wherein the tiles (2) are formed from concrete.
10. System for forming a tiled floor as claimed in any of the foregoing claims, comprising
 - at least three polygonal tiles (2),
 - at least one tile support (14), and
 - at least one fixing ring (16),
 - wherein the at least three tiles (2) are each provided close to at least one corner point with an annular segment-like fixing groove (10), and
 - wherein the at least one fixing ring (16) has a radius greater than the distance of the annular segment-like fixing groove (10) from the respective corner point.



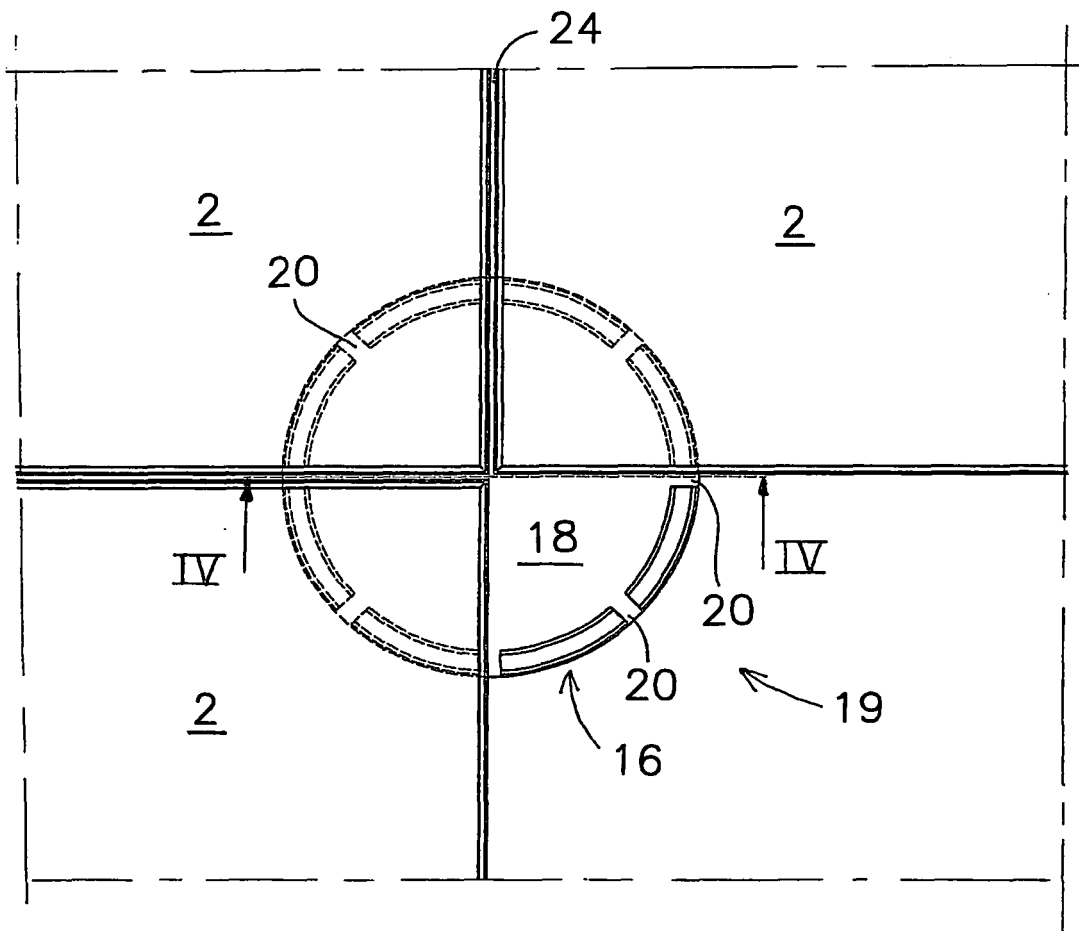
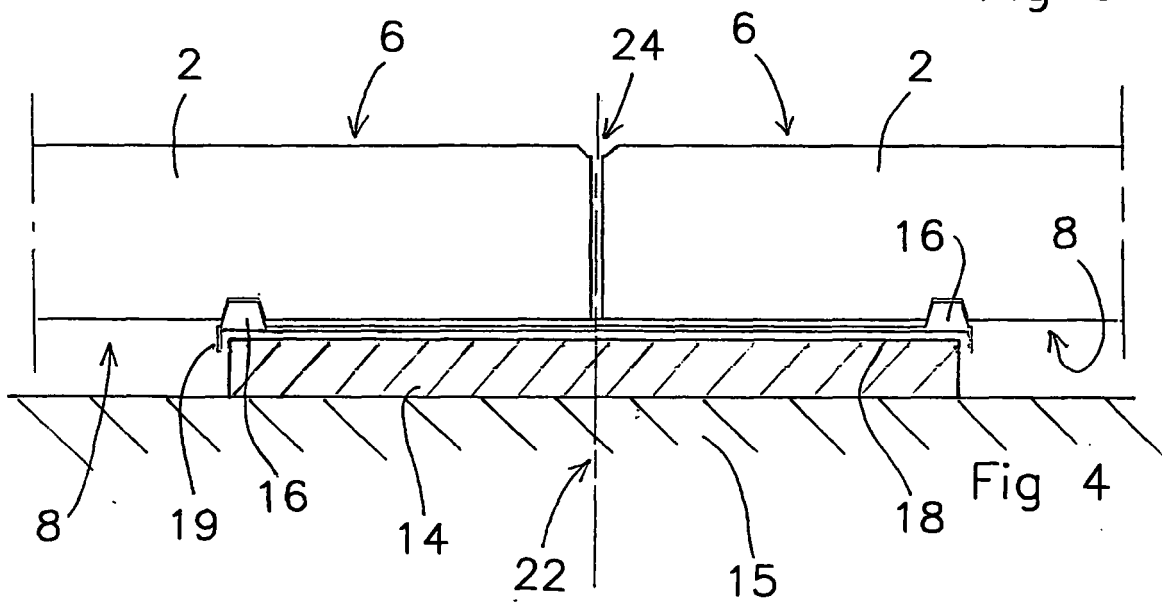


Fig 3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 07 5894

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	AU 580 899 B2 (CHADWICK IND PTY LIMITED) 2 February 1989 (1989-02-02) * page 3, last line - page 4, line 2; figures * * page 6, line 11 - line 14 *	1-10	INV. E04D11/00
A	US 2002/121583 A1 (JONES NIGEL A S [US] ET AL JONES NIGEL A S [US] ET AL) 5 September 2002 (2002-09-05) * paragraph [0020]; figure 1 * * paragraph [0022] *	1,7,10	
A	DE 21 16 407 A1 (RHEINSTAHL AG) 12 October 1972 (1972-10-12) * page 2, paragraph 2 * * page 8, line 10 - line 21; figures 1,2 *	2-4	
A	EP 0 329 859 A (ANJAP NV [NL]) 30 August 1989 (1989-08-30) * figure 3 *	2-4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) E04D E04F
Place of search The Hague		Date of completion of the search 28 January 2008	Examiner Demeester, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 07 5894

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28-01-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
AU 580899	B2	02-02-1989	NONE	
US 2002121583	A1	05-09-2002	NONE	
DE 2116407	A1	12-10-1972	NONE	
EP 0329859	A	30-08-1989	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 10022070 A1 [0002]
- AU 580899 B2 [0009]