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(54) **Parking roof system**

(57) The invention relates to a parking roof system comprising:

- a plurality of adjacent tiles (16), which compose a drivable surface;
- a plurality of tile supports (10) for supporting the tiles;
- and

- connecting means for connection of at least two adjacent tiles, such that at least in the plane of the drivable surface a shape based connection is provided; wherein the contact surface between a tile and a tile support is substantially equal to the overlapping part of the tile and the tile support as seen perpendicular to the drivable surface.

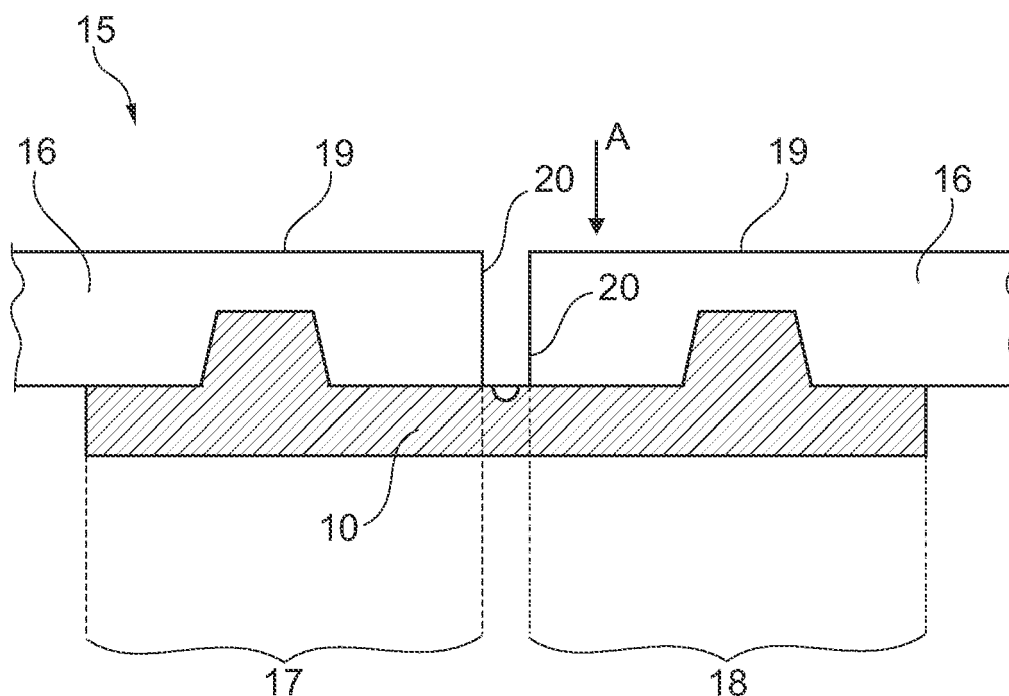


Fig. 3

Description

[0001] The invention relates to a parking roof system comprising:

- a plurality of adjacent tiles, which compose a drivable surface;
- a plurality of tile supports for supporting the tiles; and
- connecting means for connection of at least two adjacent tiles, such that at least in the plane of the drivable surface a shape based connection is provided.

[0002] In a shape based connection, the connection is achieved based on the shape of for example two connection parts, for example like in a dovetail connection. This is in contrast to a force based connection in which the connection is held together based on force, for example based on friction.

[0003] Such a parking roof system is known in the prior art. This prior art system has ribs on the tile supports for accounting to irregularities in for example the roof on which the system is arranged or to account for irregularities in the tiles. The known system also comprises protrusion on the sides of the tiles to keep the tiles at a predetermined distance.

[0004] This known parking roof system has however the disadvantage that when a vehicle drives over the tiles, the tiles will tilt a bit causing that the tiles could contact each other and therefore could cause undesired noise. This tilting is caused by the compression of the ribs on the tile support, which are intended for taking up the irregularities. In combination with the protrusions on the sides of the tiles, this could results in undesired noises.

[0005] Another system known in the prior art comprises a plurality of tiles arranged on tile supports. Expansion units are arranged between the tiles, which urge the tiles away from each other causing a pretension in the tile system. Such a pretensioned system has to be checked at regular time intervals, to ensure that the desired pretension is still present. If this pretension is not present, the tiles could shift relatively to each other such that they contact each other or even shift from the tile supports.

[0006] So, two types are known in the prior art: a pretensioned system and a system in which the tiles are connected to each other.

[0007] It is an object of the invention to provide a parking roof system according to the preamble in which the disadvantages are at least reduced.

[0008] This object according to the invention is achieved with a system according to the preamble, which is characterized in that the contact surface between a tile and a tile support is substantially equal to the overlapping part of the tile and the tile support as seen perpendicular to the drivable surface.

[0009] Because the overlapping part of the tile and the tile support is substantially the contact surface, there is no rib or small protrusion, which will be depressed first when a tile is loaded by the weight of a passing vehicle.

So the full overlapping part will be loaded resulting in a substantially smaller compression of the tile support and thus in a substantially smaller tilting of the tiles.

[0010] In a preferred embodiment of the parking roof system according to the invention, the tile support comprises a standing rib, which standing rib projects between two adjacent tiles. This rib provides a cushion between two adjacent tiles preventing direct contact of the tiles, which generally causes the noise with the prior art systems.

[0011] In another embodiment of the parking roof system according to the invention, the rib is arranged to a base plate and the base plate is arranged in a pocket of the tile support, such that the flange can be removed from the tile support.

[0012] The ability to remove the rib from the tile support is of advantage when transporting a number of tile supports. These tile supports can be stacked while the ribs are packed separately. By arranging the ribs in a pocket of the tile support, it is ensured that a flat contact surface is provided and that the overlapping part of the tile and tile support form the contact surface.

[0013] In another preferred embodiment of the parking roof system according to the invention the connecting means comprise a protrusion arranged to the tile support and a saving is provided in the bottom of the tile, which saving corresponds to the protrusion. Preferably the protrusion is a truncated cone.

[0014] These connecting means, in particular the truncated cone provide for a reliable positioning of the tile in relation to the tile support and thus to the adjacent tile. As a result a reliable spacing is provided between the tiles. As the contact surface between the tiles and the tile support is substantially flat, the tilting of the tiles when loaded by for example a vehicle is substantially reduced, such that the chance of the tiles making direct contact is almost null.

[0015] In yet another embodiment of a parking roof system according to the invention the tiles comprise a bottom surface, a surrounding surface extending from the periphery of the bottom surface and a top surface parallel to the bottom surface, which top surface is part of the drivable surface.

[0016] So preferably the tiles according to the invention have a simple shape like a basic tile without any protrusions or stepped surfaces. This ensures a reliable spacing of the tiles when connected by the connecting means arranged on the tile supports.

[0017] In the preferred embodiment of connecting means comprising truncated cone shaped protrusions, the basic shaped tiles have pockets at the bottom side. As these pockets are not interfering with the side surfaces of the tiles a more reliable positioning and spacing of the tiles can be achieved resulting in a substantially reduced chance on contact between the tiles and thus noise.

[0018] These and other features of the invention will be elucidated in conjunction with the accompanying drawings.

Figure 1A and 1B show an embodiment according to the prior art.

Figure 2 shows a tile support of a first embodiment of the invention.

Figure 3 shows the first embodiment in cross sectional view.

Figure 4 shows a tile support of a second embodiment of the invention.

Figure 5 shows a cross sectional view of the second embodiment.

Figures 1A and 1B show a part of a parking roof system 1 according to the prior art. This prior art parking roof system 1 has a number of tile supports 2 on which tiles 3 are supported with an edge. The tile support 2 has two concentric ribs 4, 5 on which the tile 3 rests. Furthermore alignment ribs 7 are arranged between the concentric ribs 4, 5.

[0019] The tile supports 2 are furthermore provided with truncated cone shaped projections 6. The tile 3 has at the bottom corresponding savings, in which the projections 6 are arranged. These projections 6 and savings in the tile provide connecting means, which prevent the tiles 3 from shifting relatively to each other in the plane of the tiles 3.

[0020] The disadvantage of this prior art system 1 is that the tiles 3 are supported on a substantially small supporting surface provided by the two concentric ribs 4, 5. When the tiles 3 are loaded, for example by a vehicle driving over the tiles 3, the load will be concentrated on the two concentric ribs 4, 5, causing the tiles 3 to tilt.

[0021] As the prior art tiles 3 are also provided with protrusions 6 on the sides, the chance on contact between the tiles 3 is considerable when a vehicle drives over the tiles 3.

[0022] Figure 2 shows a tile support 10 of a parking roof system according to the invention. This tile support 10 is substantially disc shaped without any ribs, providing a large contact surface 11 for the tiles. On the contact surface 11 four truncated cone-shaped protrusions 12 are provided, which provide, together with suitably shaped savings in the bottom of a tile, connecting means.

[0023] The disc shaped tile support is provided with two perpendicular grooves 13, 14 which provide indicator lines to align adjacent tile supports 10.

[0024] Figure 3 shows a cross sectional view of a parking roof system 15 according to the invention. In this system 15 tiles 16 are supported by tile supports 10 as shown in figure 2. As shown in the figure the contact surface between a tile 16 and the tile support 10 is substantially equal to the overlapping part 17, 18 of the tile 16 and the tile support 10 as seen perpendicular (as indicated by arrow A) to the drivable surface 19.

[0025] As the tiles 16 have smooth side surfaces 20, without any protrusions and due to the large contact surface, the chance on the tiles getting in to contact is substantially reduced compared to the prior art system 1.

[0026] Figure 4 shows a tile support 30 of a parking

system according to the invention. This tile support 30 also has a disc shaped body with truncated cone shaped projections 31. At the center of the tile support 30 a pocket 32 is arranged in which a base plate 33 with two perpendicular upright ribs 34 is placed.

[0027] Grooves 37 are provided as indicator lines to align adjacent tile supports 30.

[0028] As shown in figure 5, the base plate 33 is arranged such in the pocket 32, that the upper surface of the base plate 33 is level with the contact surface 35 between the tile support 30 and the tiles 36.

[0029] The ribs 34 project between the tiles 36 and ensure that tiles 36 will never get into contact with each other. As a result an easy parking roof system is provided with the invention, in which the tilting of tiles is prevented and contact between tiles with resulting noise is substantially reduced.

Claims

1. Parking roof system comprising:

- a plurality of adjacent tiles, which compose a drivable surface;
- a plurality of tile supports for supporting the tiles; and
- connecting means for connection of at least two adjacent tiles, such that at least in the plane of the drivable surface a shape based connection is provided;

characterized in that

the contact surface between a tile and a tile support is substantially equal to the overlapping part of the tile and the tile support as seen perpendicular to the drivable surface.

2. Parking roof system according to claim 1, wherein the tile support comprises a standing rib, which standing rib projects between two adjacent tiles.

3. Parking roof system according to claim 2, wherein the rib is arranged to a base plate and wherein the base plate is arranged in a pocket of the tile support, such that the flange can be removed from the tile support.

4. Parking roof system according to any of the preceding claims, wherein the connecting means comprise a protrusion arranged to the tile support and wherein a saving is provided in the bottom of the tile, which saving corresponds to the protrusion.

5. Parking roof system according to claim 4, wherein the protrusion is a truncated cone.

6. Parking roof system according to any of the preceding claims, wherein the tiles comprise a bottom sur-

face, a surrounding surface extending from the periphery of the bottom surface and a top surface parallel to the bottom surface, which top surface is part of the drivable surface.

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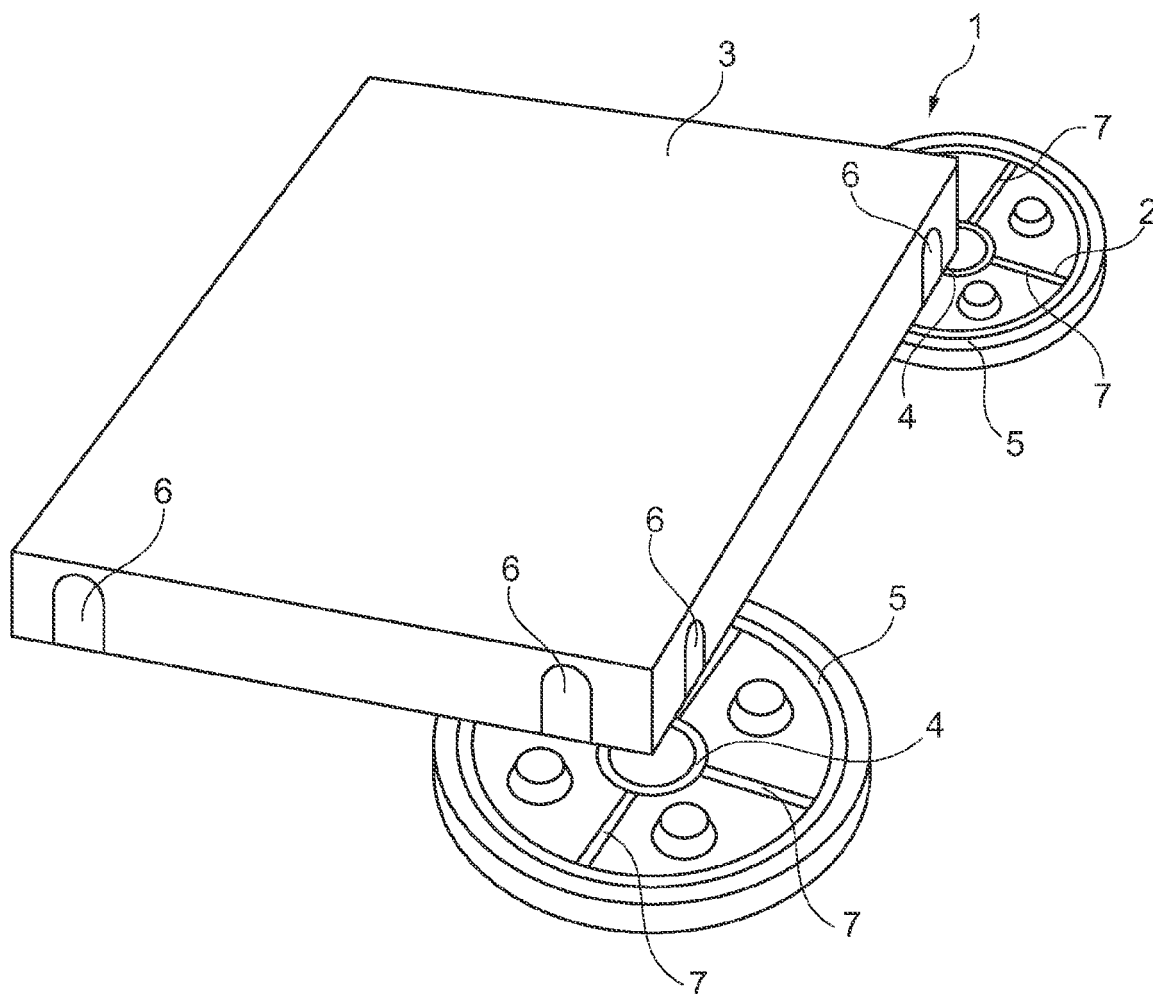


Fig. 1A
PRIOR ART

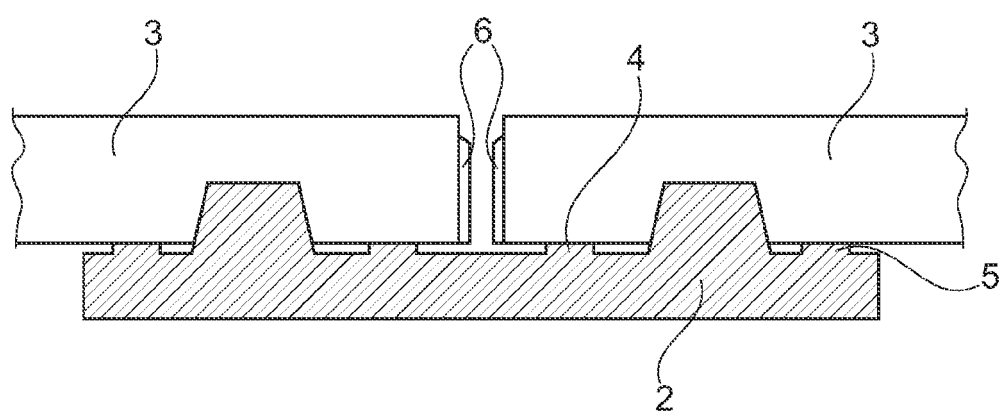


Fig. 1B
PRIOR ART

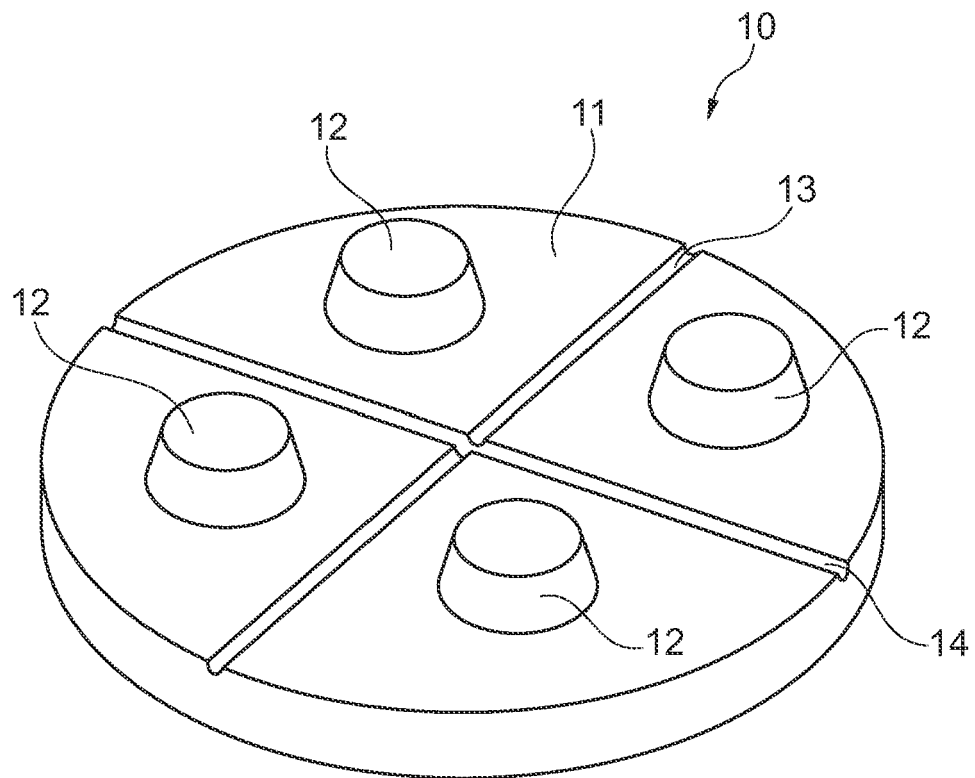


Fig. 2

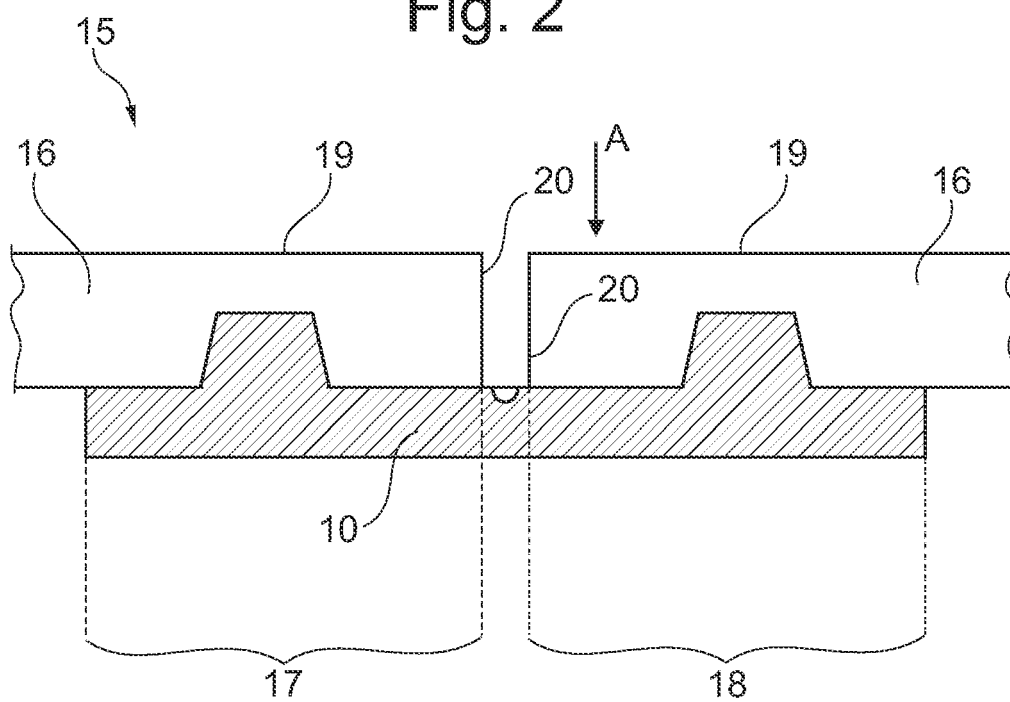


Fig. 3

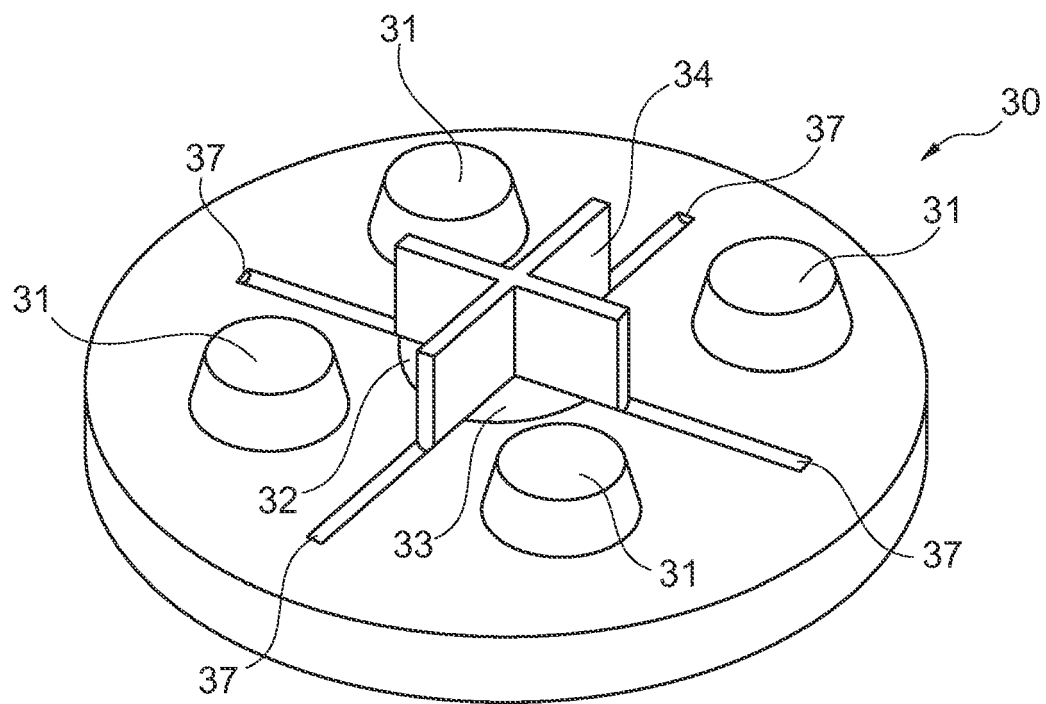


Fig. 4

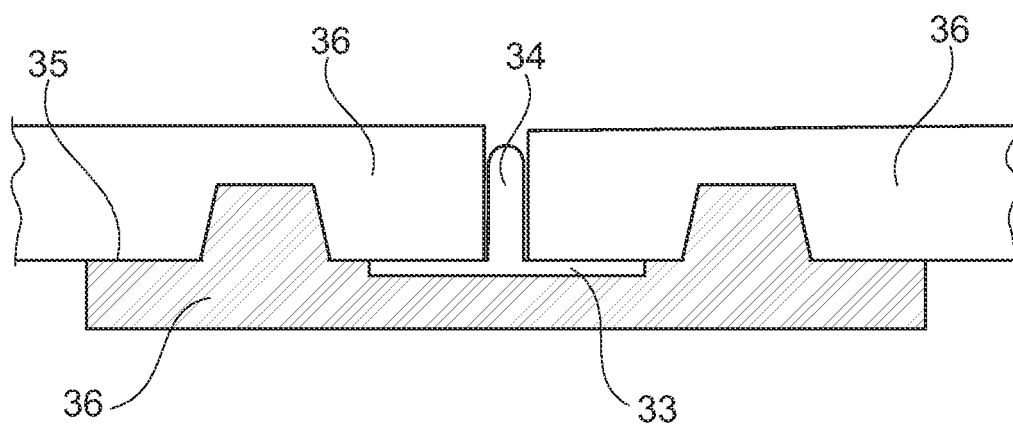


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 0972

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	EP 1 143 083 A (M. LANGE) 10 October 2001 (2001-10-10)	1,4-6	INV. E04D11/00 E04H6/10
A	* paragraph [0030] - paragraph [0036]; figures 1-10 *	2,3	

X	EP 1 911 904 A (ZOONTJENS BETON BV) 16 April 2008 (2008-04-16)	1,4,6	
A	* paragraph [0018] - paragraph [0028]; figures *	2,5	

X	FR 2 111 685 A (CONTINENTAL AG) 9 June 1972 (1972-06-09)	1,2,6	
A	* page 3, line 18 - page 4, line 24; figures *	3	

A	AU 580 899 B2 (CHADWICK IND.) 2 February 1989 (1989-02-02)	1	
	* abstract; figures *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E04H
Place of search		Date of completion of the search	Examiner
The Hague		22 November 2010	Righetti, Roberto
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 10 16 0972

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-11-2010

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