



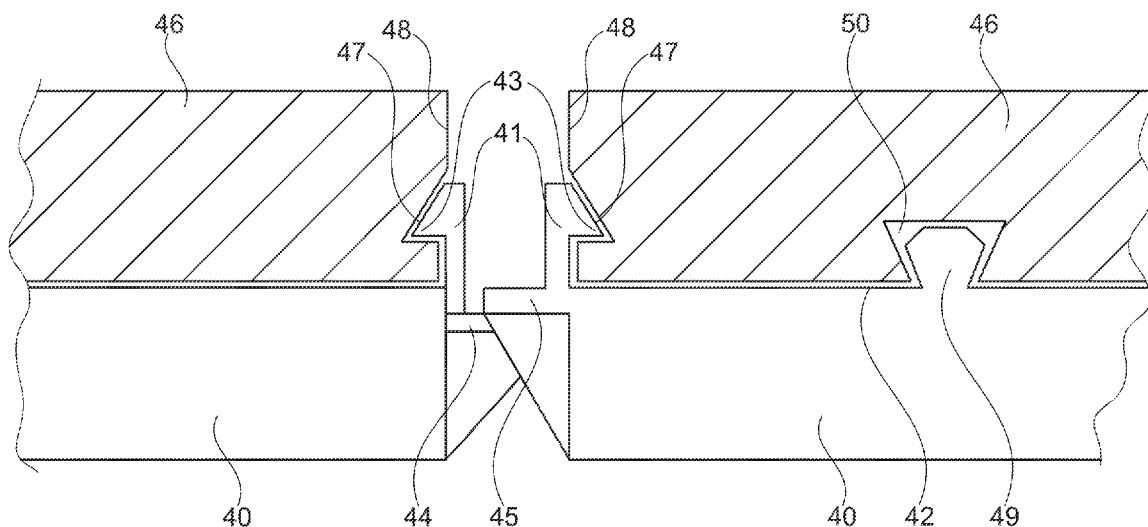
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(19) **United States**(12) **Patent Application Publication**
Bosman(10) **Pub. No.: US 2017/0298638 A1**(43) **Pub. Date: Oct. 19, 2017**(54) **SUPPORT TILE FOR A TILED TERRACE***E04F 15/08* (2006.01)*E04F 15/18* (2006.01)(71) Applicant: **B&R Solutions B.V.**, Best (NL)(52) **U.S. Cl.**(72) Inventor: **Lambertus Bernardus Maria Bosman**,
Didam (NL)CPC *E04F 15/02183* (2013.01); *E04F 15/187*
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ABSTRACT(22) Filed: **Apr. 12, 2017**(30) **Foreign Application Priority Data**Apr. 14, 2016 (EP) 16165291.2
May 26, 2016 (EP) 16171547.9**Publication Classification**(51) **Int. Cl.***E04F 15/02* (2006.01)*E04F 15/02* (2006.01)

The invention relates to a support tile for a tiled terrace, which support tile includes a body with a rectangular base surface, a top surface parallel to the base surface and a peripheral wall extending along the circumference of the base surface and between the base surface and the top surface, and support flanges extending from the peripheral wall and extending parallel to the top surface. The support flanges are arranged at either of two different distances from the top surface, such that the support flanges of adjacent support tiles can slide interlocking in a direction parallel to the top surface and provide a support in a direction perpendicular to the top surface.



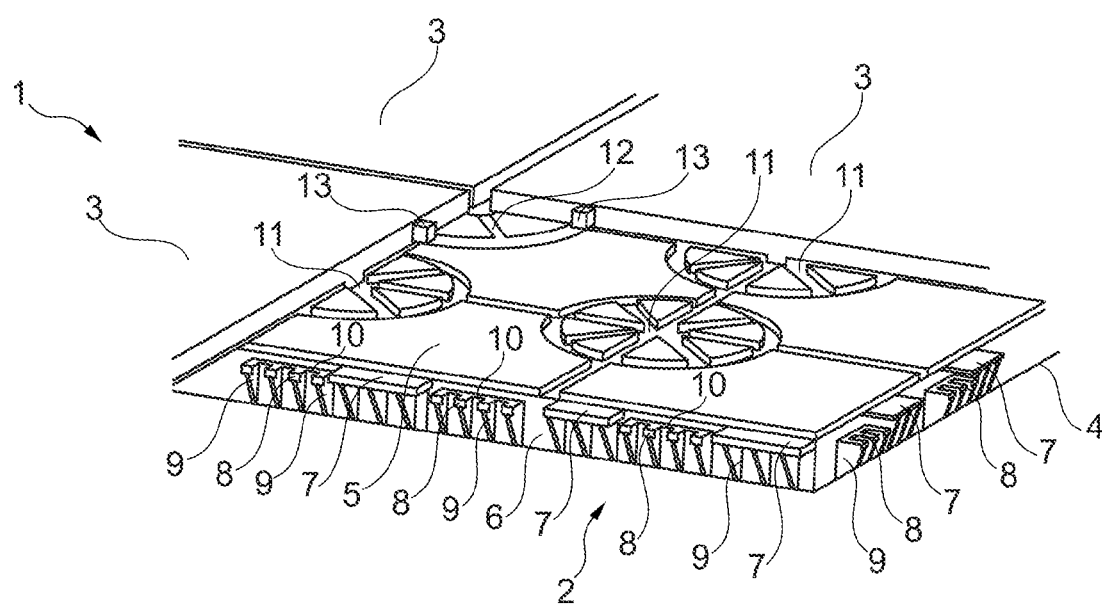


Fig. 1

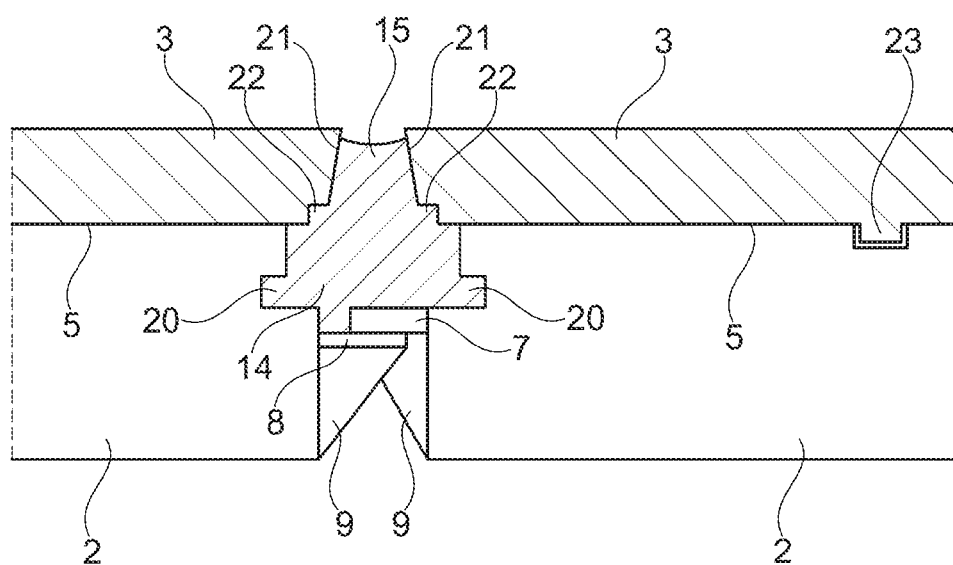


Fig. 2

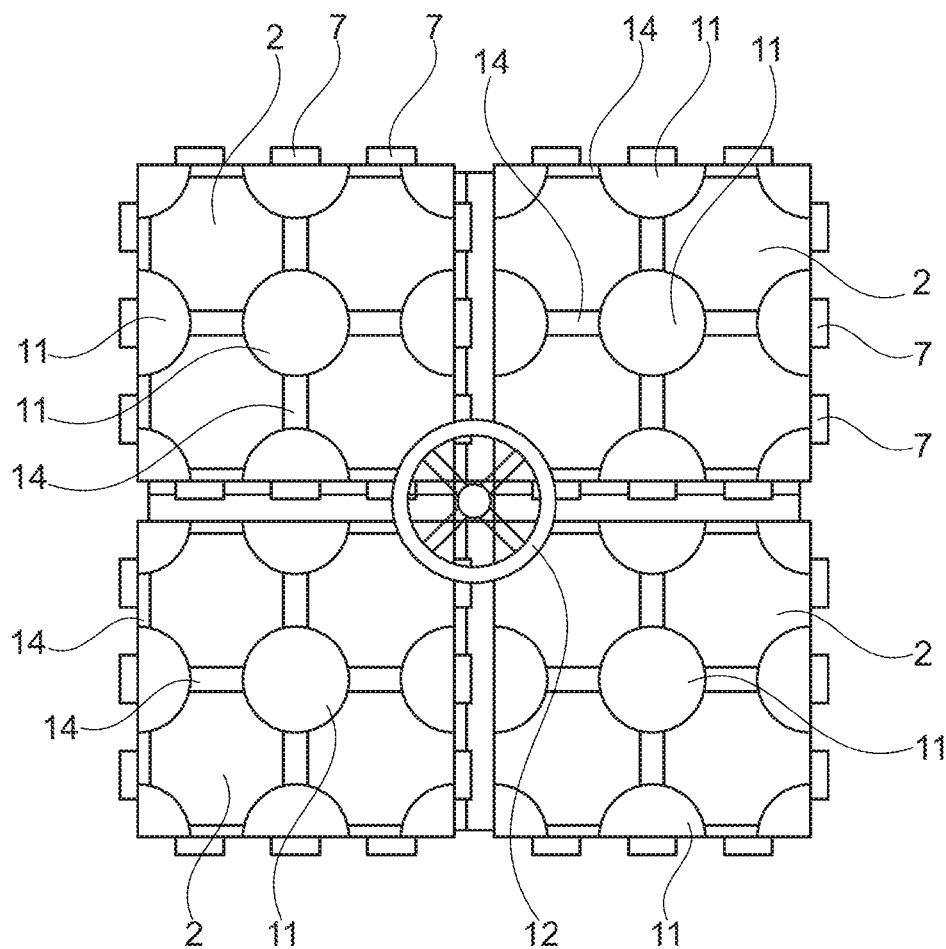


Fig. 3

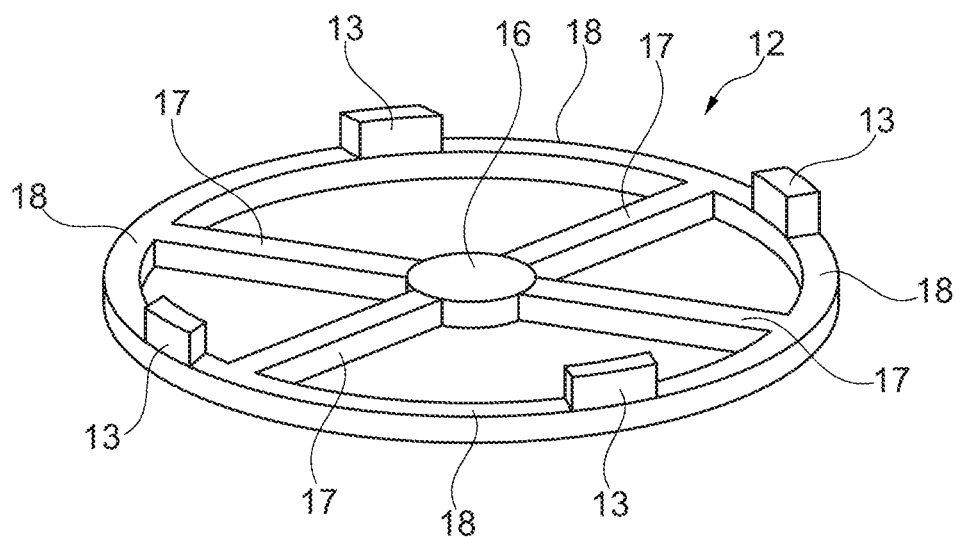


Fig. 4

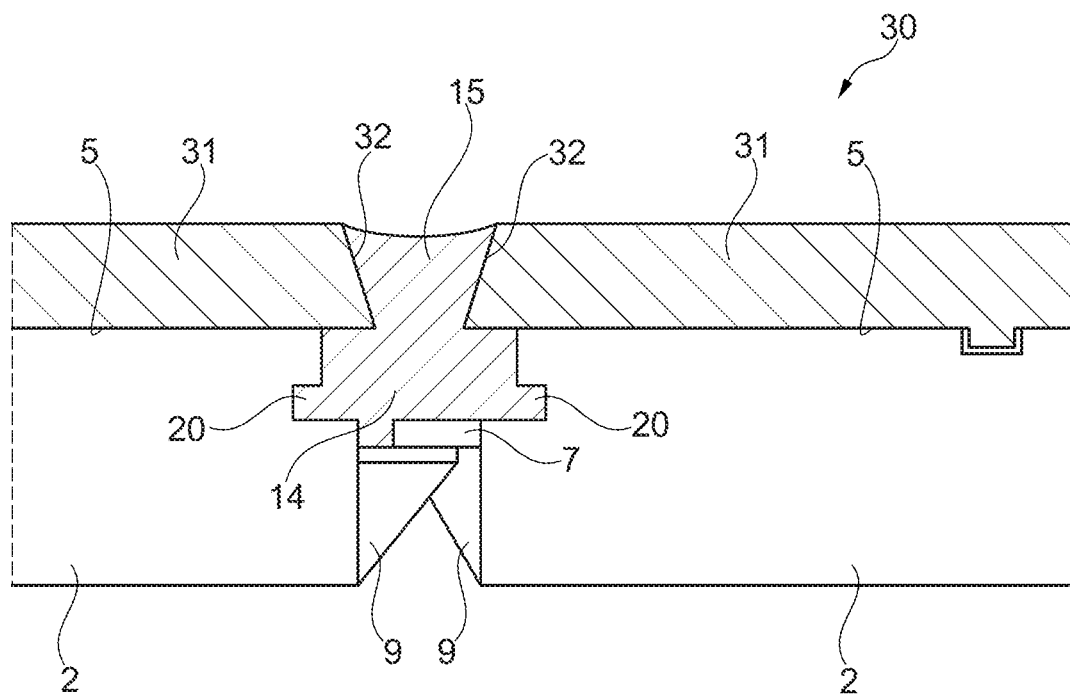


Fig. 5

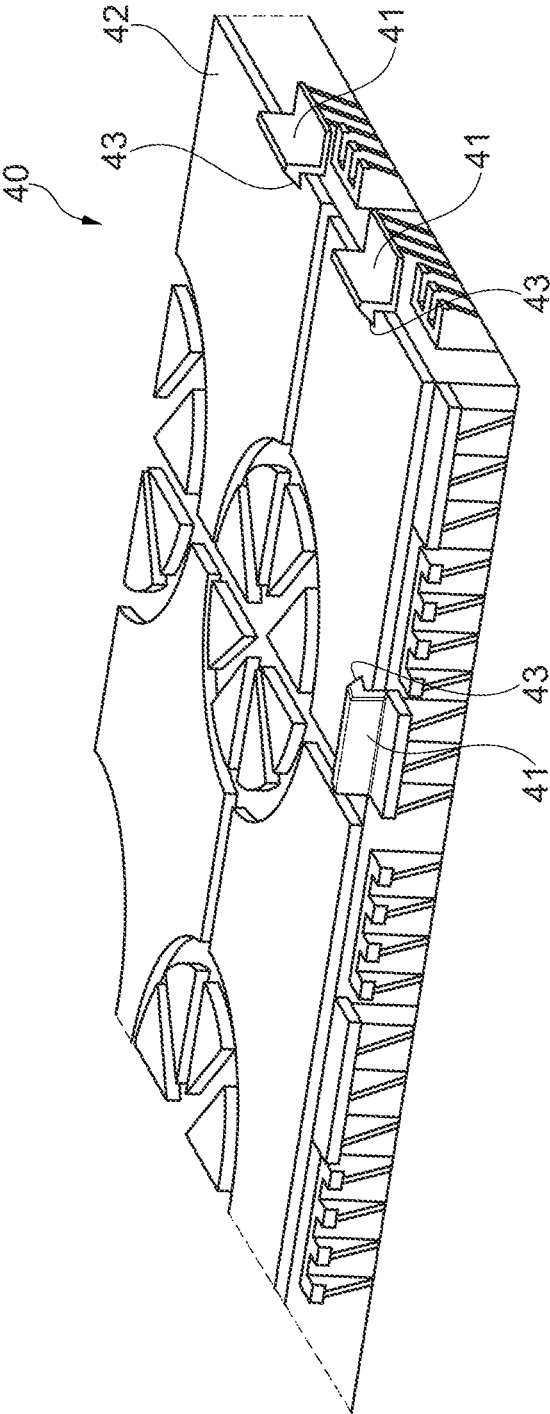


Fig. 6

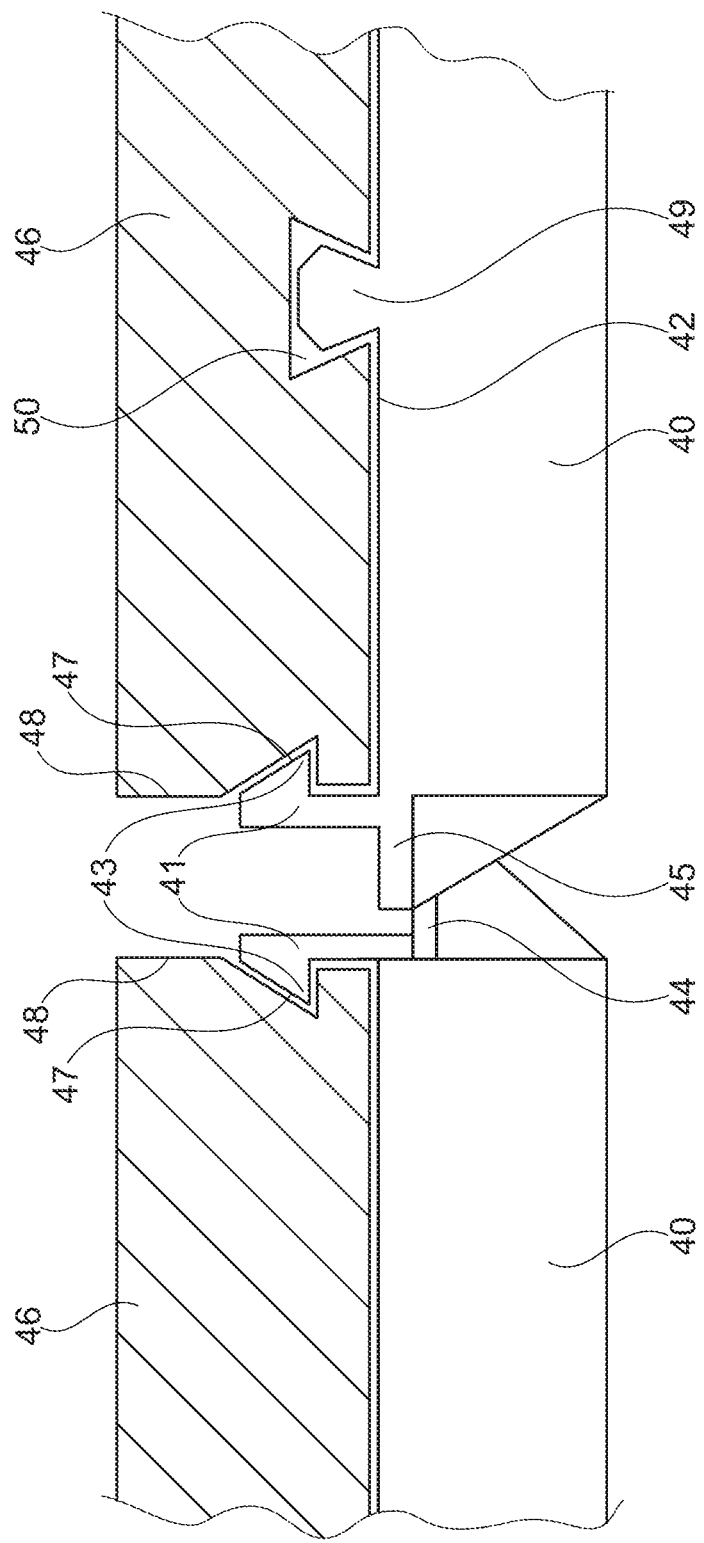


Fig. 7

SUPPORT TILE FOR A TILED TERRACE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to European Patent Application Nos. 16165291.2 and 16171547.9, filed Apr. 14, 2016 and May 26, 2016, respectively, the disclosures of which are hereby incorporated in their entirety by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The invention relates to a support tile for a tiled terrace, which support tile comprises a body with a rectangular base surface, a top surface parallel to the base surface and a peripheral wall extending along the circumference of the base surface and between the base surface and the top surface.

Description of Related Art

[0003] Support tiles are used to support a finishing layer of for example terrace tiles onto a base layer, such as a sand bed. For example FR 2691734 shows such support tiles, which are provided with separate feet. The feet are provided with protrusions at the top, such that the support tiles, can interlock with the feet and with the adjacent support tiles.

[0004] A disadvantage of this known tile support is that it is not well suited to accommodate for any changes in dimensions due to heat expansion, as the support tiles are all interlocked with each other. In addition, these known support tiles are only suitable for loose laying tiles. There is a gap between adjacent support tiles, such that any masonry joint material will flow through these gaps beneath the support tiles. It will therefore be impossible to provide a masonry joint between the terrace tiles arranged on the support tiles.

[0005] It is an object of the invention to reduce or even remove the above mentioned disadvantages.

SUMMARY OF THE INVENTION

[0006] This object is achieved with a support tile according to the preamble, which is characterized by support flanges extending from the peripheral wall and extending parallel to the top surface, wherein the support flanges are arranged at either of two different distances from the top surface, such that the support flanges of adjacent support tiles can slide interlocking in a direction parallel to the top surface and provide a support in a direction perpendicular to the top surface.

[0007] The support flanges ensure that the support tiles can be interlocked for forces directed perpendicular to the top surface. This allows for the support tiles to take up the loads exerted on the terrace tiles, which are arranged on the support tiles. The support flanges on the other hand allow for changes in dimensions due to heat expansion. If the support tiles would increase in length and width due to heat, such as the sun, the support flanges of adjacent support tiles will slide over each other compensating for the expansion.

[0008] The support flanges also provide a barrier in vertical direction between the support tiles, such that when masonry joint material is arranged between terrace tiles supported by the support tiles, the masonry joint material will be prevented from flowing past the support flanges. This

allows for providing a terrace with a support tile layer, which has the appearance of a terrace provided directly on a base layer.

[0009] In a preferred embodiment of the support tile according to the invention the flange nearest to the top surface has a bottom support surface, wherein the flange furthest from the top surface has a top support surface and wherein the top support surface and the bottom support surface extend in the same plane parallel to the top surface.

[0010] By providing the top support surface of the lower flanges in the same plane as the bottom support surface of the higher flanges, it is ensured that the support tiles, when arranged interlockingly next to each other will be fully locked in the direction perpendicular to the top surface. This ensures that the support tiles will not shift relative to each other when the terrace, supported by the support tiles, is loaded.

[0011] In a further preferred embodiment of the support tile according to the invention strengthening ribs are provided on the peripheral wall extending perpendicular from the support flanges and wherein recesses are provided in the flanges for accommodating strengthening ribs of adjacent support tiles, when the support tiles are in interlocking position.

[0012] The strengthening ribs ensure that the support tiles can withstand a higher load, without shifting in a direction perpendicular to the top surface.

[0013] In a further embodiment of the support tiles according to the invention the top surface comprises at least one recess and wherein the support tile comprises a spacer element arranged in the at least one recess, wherein the spacer element is provided with at least one rib extending perpendicular to the top surface to space apart two tiles supported by the support tile.

[0014] The spacer element provides a spacing between adjacent terrace tiles when supported by the support tiles. The spacer element also ensures that the terrace tiles cannot displace relative to the support tiles, as the spacer element provides a boundary for the terrace tiles. Preferably at least four space elements are provided around each tile.

[0015] In another embodiment of the support tile according to the invention a number of recesses is provided in the top surface at a fixed pitch in both length and width direction.

[0016] A ceramic tile, such as typically used for terraces, has typically a length and width dimension being a multiple of 15 centimeters. By providing recesses with a pitch of 15 centimeters, the spacer elements can always be positioned on position on the support tile, corresponding with the dimensions of the used ceramic tiles. The size of the support tiles no longer needs to correspond with the size of the used tiles.

[0017] In yet another preferred embodiment of the support tile according to the invention the spacer element comprises a center part, spoke parts extending radially from the center part and a rim part connecting the free ends of the spoke parts, wherein the at least one rib is arranged on the rim part.

[0018] The wheel-like construction of the spacer element allows for an easy positioning of the spacer element in the recess. It also allows for a relative large structure, with a minimal amount of plastic material, while being able to position the ribs on the rim part as far as possible.

[0019] Preferably, at least one rib is arranged on the rim part between two adjacent spoke parts. This allows for some

deformation of the rim part, due to forces on the rib, without these forces directly being transferred to the support tile, which could cause deformation or even damage of the support tiles.

[0020] In yet another embodiment of the support tile according to the invention straight channels are arranged in the top surface, which straight channels connect the recesses in the top surface.

[0021] The straight channels allow for additional height of a masonry joint between tiles, but also allows for a non-releasing cross-section of a resulting joint.

[0022] A further preferred embodiment of the support tile according to the invention comprises further at least two lips arranged on opposite edges of the top surface, wherein the at least two lips extend substantially perpendicular to the top surface and wherein the free end of each lip is provided with a protrusion for protruding into a circumferential groove of a tile, which protrusions extend over the top surface.

[0023] This embodiment of the support tile allows for a ceramic tile to be securely attached to the support tile. There is no need for any adhesive between the support tile and the ceramic tile, as the protrusions extending into the groove of the ceramic tile will ensure that the ceramic tile remains attached to the support tile.

[0024] The lips are arranged substantially perpendicular to the top surface, which means in the context of this patent that the position of the lips could vary a few degrees from the true perpendicular position. Preferably, the lips tilt a few degrees, for example 3°, towards the top surface, such that a ceramic tile is clamped between the lips.

[0025] Preferably, the lips are resilient and are distributed along the circumference of the top surface. Although only two lips arranged on opposite edges of the top surface will ensure that the ceramic tile is attached to the support tile, it is preferred if more than two lips are arranged to the support tile and distributed along the circumference. There could for example be four lips each arranged on a side of the top surface. To be able to attach a ceramic tile to the support tile, the lips must be resilient to bend outward and for the protrusions to snap back into the recesses or circumferential groove of the ceramic tile.

[0026] The invention also relates to a combination of:

[0027] a support tile according to the invention comprising at least two lips; and

[0028] a ceramic tile, wherein the ceramic tile comprises in the circumferential side wall at least a number of recesses; and wherein the protrusions of the lips protrude into the recesses of the ceramic tile.

[0029] In a preferred embodiment of the combination according to the invention the recesses are provided by a circumferential groove arranged in and extending along the circumferential side wall.

[0030] The invention relates further to a combination of:

[0031] a number of support tiles according to the invention, wherein the support tiles are arranged interlocking and next to each other to provide a support surface,

[0032] a number of ceramic tiles arranged on the support surface provided by the number of support tiles.

[0033] In a preferred embodiment of the combination according to the invention, in which spacer elements are provided on the support tile, the ceramic tiles are arranged abutting the ribs of the spacer elements.

[0034] Another preferred embodiment of the combination according to the invention, in which support tiles having

straight channels are used comprises masonry joints arranged between adjacent ceramic tiles, wherein the masonry joints extend into the straight channels and preferably extend under the ceramic tiles to provide a masonry joint with a non-releasing cross-section.

[0035] It is furthermore possible to provide a pressure sensor in the support tiles, to detect when the tiles are walked on, for example by an intruder. This allows for an alarm system to be triggered. If a multiple of pressure sensors are arranged in a terrace, then even an exact location can be determined.

[0036] It is also possible to integrate electrical lines and for example a heating element in the support tiles. Each tile can be provided with connector contacts to connect with adjacent tiles and to link the electrical lines to each other. This allows for heating the support tiles and the supported tiles which prevents freezing of the terrace or coverage by snow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] These and other features of the invention will be elucidated in conjunction with the accompanying drawings.

[0038] FIG. 1 shows a perspective view of an embodiment of the combination according to the invention.

[0039] FIG. 2 shows a cross-section of the embodiment of FIG. 1.

[0040] FIG. 3 shows a schematic top view of a combination of support tiles.

[0041] FIG. 4 shows an embodiment of a spacer element for the combination according to the invention.

[0042] FIG. 5 shows a cross-section of a second embodiment of a combination according to the invention.

[0043] FIG. 6 shows a perspective view of a second embodiment of a support tile according to the invention.

[0044] FIG. 7 shows a cross-sectional view of a support tile of FIG. 6 with a ceramic tile.

DESCRIPTION OF THE INVENTION

[0045] FIG. 1 shows a perspective view of an embodiment of the combination 1 according to the invention. The combination 1 has a number of support tiles 2 on which ceramic terrace tiles 3 are arranged.

[0046] Each support tile 2 has a rectangular base surface 4, a top surface 5 parallel to the base surface 4 and a peripheral wall 6 extending along the circumference of the base surface 4 and between the base surface 4 and the top surface 5.

[0047] Along the peripheral a number of support flanges 7, 8 are arranged. The support flanges 7, 8 are alternating positioned at a distance closer to the top surface 5 (support flanges 7) and at a distance further away from the top surface 5 (support flanges 8). Each of the support flanges 7, 8 is provided with strengthening ribs 9. The lower support flanges 8 are provided with recesses 10 for accommodating the strengthening ribs 9 of the higher support flanges 7, when two adjacent support tiles 2 are interlocked (see also FIG. 2).

[0048] The top surface 5 is furthermore provided with recesses 11, in which a spacer element 12 (see also FIG. 4) can be positioned. Each spacer element 12 has ribs 13 extending perpendicular from the top surface 2 and provide a spacing between the terrace tiles 3.

[0049] FIG. 2 shows a cross-section of the embodiment 1 of FIG. 1. Two adjacent support tiles 2 are interlocked by the support flanges 7, 8 being slid over each other in horizontal direction. This ensures that in vertical direction, the support flanges 7, 8 can transfer a load onto each other, while the support flanges 7, 8 can still slide freely in horizontal direction to accommodate for any heat expansion.

[0050] The top surface 5 on which the terrace tiles 3 are supported are provided with a straight channel 14, which is formed in this part by the edges of both support tiles 2. This allows for a masonry joint material 15 to fill the space between the terrace tiles 3 and to have a non-releasing cross-section, in this case an inverted T-shape. The straight channel 14 has side grooves 20, which contribute to the non-releasing cross-section and which prevent the joint material 15 to break loose from the support tiles 2. Also the tiles 3 are provided with a slanting sides 21 and cutouts 22 which furthermore contribute to a firm attachment of the joint material 15 to the tiles 3 and the support tiles 2.

[0051] Preferably the bottom of each tile 3 is provided with ridges 23, which are housed in the straight channels 14.

[0052] FIG. 3 shows a schematic top view of a combination of support tiles 2. Each support tile 2 is provided with a number of recesses 11 in which a spacer element 12 can be positioned dependent on the size of the terrace tiles used.

[0053] Each recess 11 is connected with a straight channel 14 allowing for a masonry joint with a non-releasing cross-section to be provided between the terrace tiles.

[0054] FIG. 4 shows an embodiment of a spacer element 12 for the combination 1 according to the invention. The spacer element 12 has a center part 16, spoke parts 17 extending radially from the center part 16 and a rim part 18 connecting the free ends of the spoke parts 17. On the rim part 18, between the spoke parts 17, the ribs 13 are arranged to provide a spacing between the terrace tiles 3.

[0055] Because the ribs 13 are arranged on the rim part 18 between two spoke parts 17, the rim part 18 can deform slightly, when a force is exerted on a rib 13, without transferring all forces onto the center part 16 and onto the support tile 2.

[0056] FIG. 5 shows a second embodiment 30 of the combination according to the invention, which corresponds largely with the embodiment 1 according to FIG. 1.

[0057] The tiles 31 are supported on support tiles 2. The tiles 31 have sides 32, which diverge in upward direction, such that the joint material 15 provides a lock of the tiles 32 to the support tiles 2, especially when the straight channels 14 are provided with side grooves 20, which lock the masonry joint material 15 to the support tiles 2.

[0058] FIG. 6 shows a perspective view of a second embodiment of a support tile 40 according to the invention. The support tile 40 corresponds largely with the support tile 2 as shown in FIG. 1. The support tile 40 has additionally a number of resilient lips 41 arranged along the edge of the top surface 42. The resilient lips 41 extend perpendicular to the top surface 42 and have a protrusion 43, which extend over the top surface 42.

[0059] FIG. 7 shows a cross-sectional view of two support tiles 40 arranged next to each other and with support flanges 44, interlocking with each other such that vertical forces are evenly distributed over both support tiles 40 and that horizontal expansion can easily be compensated for.

[0060] Ceramic tiles 46 are positioned on top of the support tiles 40. Each ceramic tile 46 has a circumferential

groove 47 in the side surface 48. The protrusions 43 of the lips 41 protrude into the circumferential groove 47 such that the ceramic tile 46 can be attached to the support tile 40 without the need for any adhesive.

[0061] The top surface 42 can be provided with wall plug like protrusions 49, which extend into dove-tail shaped holes 50 in the ceramic tile 46 to further clamp and attach the ceramic tile 46 to the support tile 40.

1. A support tile for a tiled terrace, which support tile comprises a body with a rectangular base surface, a top surface parallel to the base surface and a peripheral wall extending along the circumference of the base surface and between the base surface and the top surface,

further comprising support flanges extending from the peripheral wall and extending parallel to the top surface, wherein the support flanges are arranged at either of two different distances from the top surface, such that the support flanges of adjacent support tiles can slide interlocking in a direction parallel to the top surface and provide a support in a direction perpendicular to the top surface.

2. The support tile according to claim 1, wherein the flange nearest to the top surface has a bottom support surface, wherein the flange furthest from the top surface has a top support surface and wherein the top support surface and the bottom support surface extend in the same plane parallel to the top surface.

3. The support tile according to claim 1, wherein strengthening ribs are provided on the peripheral wall extending perpendicular from the support flanges and wherein recesses are provided in the flanges for accommodating strengthening ribs of adjacent support tiles, when the support tiles are in an interlocking position.

4. The support tile according to claim 1, wherein the top surface comprises at least one recess and wherein the support tile comprises a spacer element arranged in the at least one recess, wherein the spacer element is provided with at least one rib extending perpendicular to the top surface to space apart two tiles supported by the support tile.

5. The support tile according to claim 4, wherein a number of recesses are provided in the top surface at a fixed pitch in both length and width direction.

6. The support tile according to claim 4, wherein the spacer element comprises a center part, spoke parts extending radially from the center part and a rim part connecting free ends of the spoke parts, wherein the at least one rib is arranged on the rim part.

7. The support tile according to claim 4, wherein at least one rib is arranged on the rim part between two adjacent spoke parts.

8. The support tile according to claim 4, wherein straight channels are arranged in the top surface, which straight channels connect the recesses in the top surface.

9. The support tile according to claim 1, further comprising at least two lips arranged on opposite edges of the top surface, wherein the at least two lips extend substantially perpendicular to the top surface and wherein the free end of each lip is provided with a protrusion for protruding into a circumferential groove of a tile, which protrusions extend over the top surface.

10. The support tile according to claim 9, wherein the lips are resilient and are distributed along the circumference of the top surface.

11. A combination comprising:

- a support tile according to claim 9; and
- a ceramic tile, wherein the ceramic tile comprises in the circumferential side wall at least a number of recesses; and

wherein the protrusions of the lips protrude in the recesses of the ceramic tile.

12. The combination according to claim 11, wherein the recesses are provided by a circumferential groove arranged in and extending along the circumferential side wall.

13. A combination comprising:

- a number of support tiles according to claim 1, wherein the support tiles are arranged interlocking and next to each other to provide a support surface,
- a number of ceramic tiles arranged on the support surface provided by the number of support tiles.

14. The combination according to claim 13, wherein the top surface comprises at least one recess and wherein the support tile comprises a spacer element arranged in the at least one recess, wherein the spacer element is provided with at least one rib extending perpendicular to the top surface to space apart two tiles supported by the support tile, wherein the ceramic tiles are arranged abutting the ribs of the spacer elements.

15. The combination according to claim 13, wherein straight channels are arranged in the top surface, which straight channels connect the recesses in the top surface, further comprising masonry joints arranged between adjacent ceramic tiles, wherein the masonry joints extend into

the straight channels and preferably extend under the ceramic tiles to provide a masonry joint with a non-releasing cross-section.

16. The support tile according to claim 2, wherein strengthening ribs are provided on the peripheral wall extending perpendicular from the support flanges and wherein recesses are provided in the flanges for accommodating strengthening ribs of adjacent support tiles, when the support tiles are in an interlocking position.

17. The support tile according to claim 2, wherein the top surface comprises at least one recess and wherein the support tile comprises a spacer element arranged in the at least one recess, wherein the spacer element is provided with at least one rib extending perpendicular to the top surface to space apart two tiles supported by the support tile.

18. The support tile according to claim 3, wherein the top surface comprises at least one recess and wherein the support tile comprises a spacer element arranged in the at least one recess, wherein the spacer element is provided with at least one rib extending perpendicular to the top surface to space apart two tiles supported by the support tile.

19. The support tile according to claim 5, wherein the spacer element comprises a center part, spoke parts extending radially from the center part and a rim part connecting free ends of the spoke parts, wherein the at least one rib is arranged on the rim part.

20. The support tile according to claim 5, wherein at least one rib is arranged on the rim part between two adjacent spoke parts.

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