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(54) **Support to use when placing floor tiles and method for placing floor tiles whereby such a support is applied**

(57) Support to be used when placing floor tiles, comprising a hollow tube with at least one open end, which is provided with a spacer formed of at least one arm or several arms extending in directions which converge in a single point which is situated centrally in relation to the edge of the hollow tube, whereby the arm or arms protrude(s) at least partly above the edge of the open end of the hollow tube and extend(s) over the opening of the open end of the hollow tube.

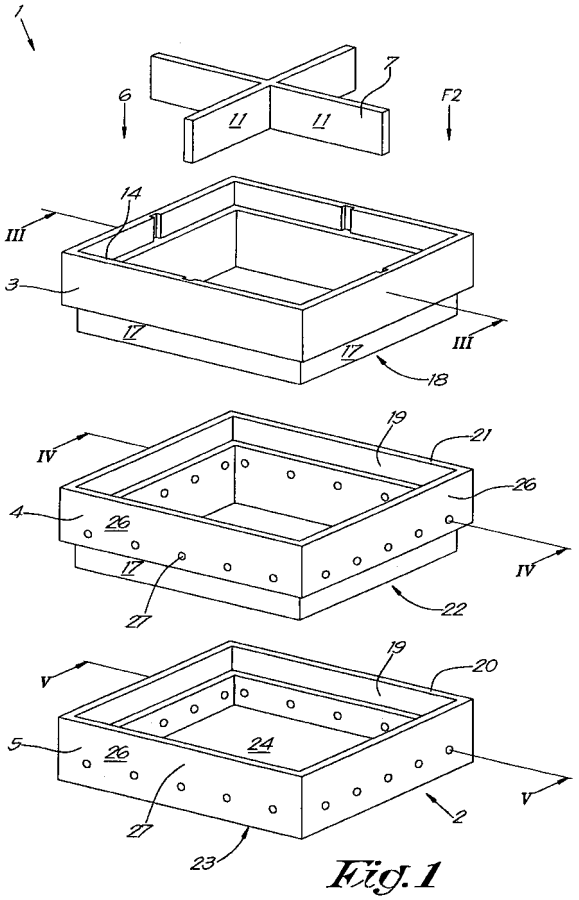

Fig. 1

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Description

[0001] The present invention concerns a support to use when placing floor tiles.

[0002] In particular, the invention concerns a support for paving floors whereby the support is to provide support for parts of floor tiles placed adjacent to one another which are separated by means of a joint.

[0003] Without restricting the invention thereto, such a support according to the invention will mainly be applied in tiled floors that need to be provided at a certain height above ground level, as is customary for example when paving a floor on a terrace or on an underlying roof covered with roofing or the like.

[0004] Supports for paving a floor at a certain height above ground level are already known.

[0005] A typical example of such a known support are the supports that are providing a foot on which a supporting element in the form of a tube or the like has been provided, which supporting element is provided in part with a bearing face on which the tiles must rest, and whereby this bearing face is usually adjustable in height in relation to the foot, for example by screwing in and out the part with the bearing face in relation to the foot.

[0006] A first major disadvantage of such known supports is that the height of the support must be set before the tiles are provided, since the part with the bearing face can no longer be screwed in or out in relation to the foot or only with great difficulty when the tiles are already lying on the bearing face.

[0007] Also, when installing a tiled floor with such supports, the tiles often have to be removed again from the support in order to correctly set the height of the support, which implies a lot of time loss and is often very laborious.

[0008] Also, the bearing face forms a flat surface on which the tiles are lying, as a result of which differences in thickness of the tiles cannot be compensated for.

[0009] In fact, with such known supports, the bottom sides of the tiles are aligned in relation to one another, whereas in fact the top surfaces of said tiles should be aligned.

[0010] Moreover, the adjustability of the height with such known supports is usually very limited.

[0011] Also, with tiled floors that must be provided at a certain height in relation to a ground level whereby this height strongly varies, different supports are often required which are each adjustable in height, but each in another range between a certain minimum height and a certain maximum height.

[0012] A disadvantage thereof is that it is often difficult to say beforehand what type of support should be used in which area of the floor, which makes it difficult to order the right number of different types of supports to pave a floor.

[0013] Moreover, the multitude of different parts implies that distributors must store large amounts of material.

[0014] According to another known method for supporting connecting parts of the tiles of a floor, bags filled with for example an overlay, mortar or sand or the like are often used.

[0015] The height of the tiles in relation to the ground level must hereby be set by pressing the tile so as to obtain a certain sagging of the bag where the support is situated.

[0016] A disadvantage of these known supports in the shape of a filled bag is that pressing a first tile resting on the bag also has an influence on the set height of the other tiles.

[0017] The reason why is that the volume in the bag is constant, such that a compression of the bag on one side results in a larger volume on another side of the bag and thus in another height of the bag in relation to the ground level in this place.

[0018] Another disadvantage of this supporting method is that the bag as such is not provided with means with which the joint width between the tiles can be determined as a matter of course.

[0019] Also, other means usually have to be provided to that end.

[0020] The invention also concerns a method for paving such a floor whereby a support according to the invention is used.

[0021] The present invention aims to remedy one or several of the above-mentioned and other disadvantages.

[0022] To this end, the present invention concerns a support to be used when placing floor tiles, whereby the support has to provide a support for parts of floor tiles put adjacent to one another and which are separated by a joint, and whereby the support comprises a hollow tube with at least one open end, onto which open end is provided a detachable spacer with which the parts of the tiles to be supported can be maintained at a certain distance from one another, whereby the spacer is formed of at least one arm or several arms extending in directions which converge in a single point which is situated centrally or practically centrally in relation to the edge of the hollow tube, whereby the arm or arms protrude(s) at least partially above the edge of the open end of the hollow tube and extend(s) over the opening of the open end of the hollow tube so as to divide this opening in separate compartments.

[0023] With such a support according to the invention, an overlay, mortar or the like can be provided through the open end of the hollow tube, which preferably bulges out somewhat over the edge of the hollow tube.

[0024] An advantage thereof is that, in this way, the height of every tile provided on the support can be separately adjusted by pressing the mortar, as a result of which a difference in thickness of the tiles resting on the support, i.e. on the overlay or mortar in the support, can be automatically absorbed.

[0025] The height can also be precisely adjusted after the tiles have been put in place, which, as mentioned above, is not so with most known supports.

[0026] Moreover, the arms of the spacer provide for a separation of the open end of the hollow tube, as a result of which pressing the overlay or mortar in a first compartment so as to set the height of a first tile has no effect whatsoever on the height adjustment of a tile provided on another compartment of the support.

[0027] For, due to the separation by means of the arm or arms, the overlay or mortar will tend to bulge out over the wall of the hollow tube rather than to another compartment.

[0028] For the same reason, the arms of the spacer preferably extend at least partially under the edge at the open end of the hollow tube according to the invention, as a result of which an even better partitioning is obtained and the pressing of overlay or mortar in one compartment has even less effect on the amount of overlay or mortar in another compartment.

[0029] Besides, it is not excluded according to the invention to entirely partition the hollow space up to the bottom of the tube.

[0030] According to a preferred support in correspondence with the invention, the spacer is cross-shaped.

[0031] Naturally, an advantage of such a support is that the angular points of four square tiles can be easily supported with such a cross-shaped spacer, whereby a precise joint width is obtained by applying the tiles up to the cross-shaped spacer.

[0032] Naturally, it is possible to apply spacers with another shape according to the invention, corresponding to other types of patterns that must be formed between the tiles, such as for example in the case of tiled floors with hexagonal tiles or the like or whereby the joints between the tiles of consecutive rows stagger in relation to one another over a certain distance.

[0033] In order to obtain the right joint width, the width of the arms of the spacer is preferably equal to or more or less equal to a joint width.

[0034] Naturally, according to the invention, the arm or arms of the spacer preferably protrude(s) above the edge of the open end over a height that is smaller than or equal to the tile thickness.

[0035] According to another preferred embodiment of a support for tiles in accordance with the invention, the hollow tube is preferably sealed on the far end opposite the open end with the spacer so as to form a bottom.

[0036] Such an embodiment is advantageous in that the supports, when the tiled floor is removed again, can be easily taken away from the ground level.

[0037] Such an embodiment is particularly advantageous to apply when installing a tiled floor on a roof with roofing, since the bottom prevents the overlay or mortar from adhering itself to the roofing.

[0038] According to an even more preferred embodiment of a support in accordance with the invention, the hollow tube is built of several tube parts that can be stacked on one another.

[0039] The successive, stackable tube parts of the hollow tube are hereby preferably provided with a tooth and a groove that can co-operate during the stacking.

[0040] Such an embodiment whereby the tube is formed of stackable tube parts is advantageous in that large differences in height can be easily bridged by simply adding or removing a tube part.

[0041] This also remedies the above-mentioned problem of ordering the known supports, since one does not have to make precise estimations beforehand with regard to all the various differences in height under the tiled floor to be provided.

[0042] One only has to order a sufficient number of tube parts to simply bridge various differences in height, by means of one and the same material, in this case one or several tube parts, either or not provided with a bottom.

[0043] According to another preferred embodiment of a support in accordance with the invention, the wall of one or several of the above-mentioned tube parts of the tube is preferably provided with perforations.

[0044] An advantage of this embodiment is that the perforations make it possible to discharge water from the tube.

[0045] The present invention also concerns a method to install a tiled floor, making use of a support according to the invention as described above.

[0046] Such a method preferably includes among others the following steps:

- putting one or several of the above-mentioned supports on a ground level with the open end of the hollow tube directed upward;
- applying an overlay or mortar in the hollow tube of the supports to such an extent that a part bulges out over the edge of the hollow tubes;
- placing a part of floor tiles to be supported on the overlay or mortar up to the protruding parts of the spacer; and,
- levelling the tops of parts of a tiled floor that are placed next to one another but that are separated by a joint by pressing the overlay or mortar so as to form an even surface.

[0047] When paving a floor whereby large differences in height must be bridged, the height of the support is preferably additionally adjusted with the method according to the invention by providing more or less of the tube parts as described above.

[0048] It is clear that, according to such an installation method, all the above-mentioned disadvantages of the known supports are remedied.

[0049] Indeed, the support makes it possible to separately adjust the height of the different tiles lying on said support without this having any effect on the other tiles.

[0050] The height can also be adjusted after the tiles have been applied.

[0051] By means of the spacer a correct joint width is automatically set.

[0052] In order to better explain the characteristics of the invention, the following preferred embodiments of a

support in accordance with the invention are described with reference to the accompanying drawings, in which:

figure 1 is a view in perspective of a preferred embodiment of a support in accordance with the invention as disassembled;
figure 2 is a top view indicated by means of the arrow FI of the support from figure 1;
figures 3 to 5 included are sections through the separate parts of the support, indicated respectively by the lines III-III to V-V;
figure 6 illustrates the use of the support in figure 1; and,
figures 7 to 9 are top views analogous to figure 2 for other embodiments of a support according to the invention;
figure 10 shows a variant of figure 1.

[0053] The support 1 represented in figures 1 to 6 is mainly built of a hollow tube 2, which in this case consists of three stackable tube parts 3, 4 and 5, namely a top tube part 3, a middle tube part 4 and a bottom tube part 5, whereby the tube 2 has one open end 6, onto which open end 6 is provided a spacer 7.

[0054] The support 1 is designed to be put under floor tiles 8, i.e. in this case under the angular points 9 of four square floor tiles 8 placed next to one another in a square, but separated by a joint 10.

[0055] The spacer 7 hereby serves to keep the floor tiles 8 at a joint width B from one another.

[0056] The joint 10 between the square floor tiles 8 in this case has the shape of a cross at the angular points 9.

[0057] Consequently, the spacer 7 is cross-shaped in this case.

[0058] The arms 11 of the cross-shaped spacer 7 are formed of lath-shaped elements 11, standing perpendicular in relation to one another in this case, and which extend over the entire open end 6 of the hollow tube 2.

[0059] In this way, this open end 6 of the hollow tube is actually divided in four compartments 12.

[0060] The arms 11 protrude with one part 13 above the edge 14 of the hollow tube 2, whereas another countersunk part 15 of the spacer extends over this edge 14 of the hollow tube 2.

[0061] Naturally, the protruding part 13 of the spacer serves to keep the floor tiles 8 separated from one another by a joint width B.

[0062] Naturally, that is why, according to the invention, the width B' of the laths 11 forming the arms is preferably equal to or possibly somewhat smaller than the desired joint width B.

[0063] Moreover, the height H over which the laths 11 of the spacer 7 protrude above the edge 14 is preferably smaller than or maximally equal to a tile thickness D.

[0064] The countersunk part 15 of the spacer preferably extends over a sufficiently large depth H' in the tube 2 as of the edge 14 to make sure that there is a sufficient partition between the above-mentioned compartments 12 in the hollow tube 2.

[0065] In this way, after the tube 2 has been excessively filled with an overlay or mortar 16, any pressing of excess overlay or mortar 16 in a first compartment 12 will have no effect whatsoever on the amount of overlay or mortar 16 present in the other compartments 12.

[0066] For, in case of a sufficiently large depth H' of the laths 11, the excess overlay or mortar 16, when being pressed, will preferably flow off over the edge 14 and not into another compartment 12.

[0067] According to a preferred embodiment of a support 1 in accordance with the invention, the spacer 7 is detachable from the hollow tube 2.

[0068] This can for example be easily realised by making the far ends of the laths 11 fit in grooves provided in the edge 14 of the tube 2, but many variants are possible as well.

[0069] For, with such detachable spacers 7 it is possible to first apply overlay or mortar 16 through the open end 6 in the tube 2 and to only provide the spacer 7 afterwards.

[0070] In this way, the spacer 7 does not hinder the application of the overlay or mortar 16 in any way, and the work can be carried out in a cleaner manner.

[0071] Also the detachable spacer allows to use only one of the two arms, in case only two instead of four tiles need to be separated.

[0072] The detachable spacer can also be removed entirely in case the support is used in the middle of large tile, or in a corner of the surface to be tiled.

[0073] In order to be able to easily stack the successive tube parts 3 to 5, the tube parts 3 to 5 are each provided with a groove and/or a tooth working in conjunction while being stacked.

[0074] In particular, the top tube part 3 is in this case merely provided with a tooth 17 on the edge 18 opposite the edge 14 with the spacer 7.

[0075] The bottom tube part 5 is in this case merely provided with a groove 19 on the edge 20, with which said tube part 5 is to be connected to the middle tube part 4.

[0076] Since the middle tube part 4 in this case serves to be provided between both above-mentioned tube parts 3 and 5, it is provided with a groove 19 on the edge 21 working in conjunction with the tooth 17 of the top tube part 3 and with a tooth 17 on the edge 22 which can work in conjunction with the groove 19 of the bottom tube part 5.

[0077] Naturally, in order to simplify the stacking of the tube parts 3 to 5, many other means in other shapes can be applied.

[0078] Preferably however, it is made sure that several middle tube parts 4 can also be mutually stacked, which was obtained in this way by providing a groove 19 on one edge 21 and a tooth 17 on the other edge 22 which can work in conjunction with this groove 19.

[0079] For, in cases where a large supporting height is required, a support 1 with several middle tube parts 4

will have to be built.

[0080] Preferably even, the top tube part 3 is made entirely identical to the middle tube part 4, whereby the spacer in said tube part can be introduced separately in the top tube part 3 after several such identical tube parts have been stacked.

[0081] In the same way, by an appropriate selection of the above-mentioned means, it is preferably made sure that the top tube part 3 can be stacked directly on the bottom tube part 5.

[0082] Naturally, the reason therefore is that, in case of smaller supporting heights to be bridged, a support 1 can be built whereby the middle tube part 4 has been omitted.

[0083] It is clear that, in spite of the above-mentioned restrictions, many other alternatives are possible.

[0084] By providing the middle tube part 4 with a smaller height H", one can make sure that the total supporting height of the support 1 can be exactly adjusted by merely adding and removing middle tube parts 4.

[0085] Nor is it excluded according to the invention to apply middle tube parts 4 with different heights H", whereby the higher middle tube parts can be used for example when a larger total supporting height is required.

[0086] Such a working method is still more advantageous than the known methods, whereby the entire support usually has to be replaced by another type of support when the total supporting heights strongly vary.

[0087] With a support 1 according to the invention, one only has to replace the middle tube parts 4, but even this is not strictly necessary if one chooses to just apply several middle tube parts 4.

[0088] The hollow tube 2 is sealed at the far end 23 opposite the open end 6 with the spacer 7 so as to form a bottom 24.

[0089] The bottom tube part 5 is in this case provided with such a bottom 24 to that end.

[0090] This bottom 24 makes sure that overlay or mortar provided in the tube 2 cannot adhere to the ground level 24 on which the support 1 has been placed.

[0091] Moreover, with such a bottom 24 is obtained a good distribution over said ground level 25 of the load which is carried by the support 1.

[0092] Besides, it is not excluded to equip the bottom tube part 5 with a widened foot or the like for that reason.

[0093] The bottom tube part can also be made slantingly, in other words less high on one side than on the opposite side, to thus level the tube in case of a sloping ground level or roof, so that no separate means are required to level the tubes.

[0094] In the given embodiment of figures 1 to 6, the wall 26 of the tube parts 4 and 5 of the tube 2 is provided with perforations 27.

[0095] These perforations 27 make it possible to drain off water from the tube 2, for example rain water or water from the overlay or mortar 16, to the underlying ground level 25.

[0096] The use of a support 1 in accordance with the invention is simple and will be explained by means of figure 6.

[0097] In the given example, the aim is to pave a floor with square floor tiles 8, whereby the joint 10 continues in all directions and, consequently, the floor tiles 8 do not stagger every row.

[0098] According to the invention, with a method for paving such a floor by means of the supports 1 as discussed above, one starts by placing the supports 1 at a distance from one another on an ground level 25.

[0099] Since the supports in this case end up under the angular points 9 of four floor tiles 8 situated next to one another in a square, said distance between the successive centres of the tubes 2 of the supports 1 must correspond with the size of the tiles.

[0100] The supports 1 are hereby composed of a bottom tube part 5 and a top tube part 3 in between which one or several middle tube parts 4 are placed.

[0101] Naturally, the open end 6 of the hollow tube 2 is directed upward.

[0102] In a following step can then be provided an overlay or mortar 16 in the hollow tube 2 through the open end 6, and preferably to such an extent that a part of the overlay or mortar 16 bulges out over the edge 14 of the hollow tube 2.

[0103] In the case of supports 1 equipped with detachable spacers 7, this spacer 7 is preferably not provided at first, but only after the overlay or mortar 16 has been poured in the hollow tube 2.

[0104] Next, the part 9 of the floor tiles 8 to be supported, in this case in particular an angular point 9 of the floor tiles 8, is provided on the overlay or mortar 16, whereby the floor tile concerned is shifted up to the protruding parts 13 of the laths 11 of the spacer 7.

[0105] On each compartment 12 of the hollow tube 2 is thus provided a floor tile 8, either or not by means of a supporting plate made of rubber or the like which is pressed in the overlay and on which the floor tile 8 rests.

[0106] Finally, the tops 28 of parts 9 of the floor tiles 8 that are placed next to one another but with a joint 18 in between can be levelled by simply pressing the overlay or mortar 16.

[0107] In this way can be obtained a tiled floor with an even surface, even if the floor tiles do not all have exactly the same thickness, which is often the case due to varying production tolerances or the like.

[0108] As already mentioned above, it is of course possible to apply less or more middle tube parts 4 in order to adjust the supporting height of the support.

[0109] That is why such supports 1 in accordance with the invention can be easily applied on ground levels 25 whereby the required supporting height may strongly vary over the surface of the tiled floor.

[0110] In the given example of figures 1 to 6, it was assumed that the tiled floor was composed of square floor tiles 8, whereby the joint 10 between the tiles 8 continues in each direction.

[0111] That is why the spacer 7 is made cross-shaped

in this example.

[0112] However, figures 7 to 10 represent other possible embodiments of a support 1 according to the invention.

[0113] In particular, in case of the support 1 of figure 7, the spacer is made for example of only one arm 11 provided crosswise over the open end 6.

[0114] Such a support could for example be used to support two floor tiles 8 lying next to one another, for example to additionally support them in the middle if they have large dimensions.

[0115] In figure 8, however, the support 1 has arms 11 which are arranged in a T-shape.

[0116] It is clear that a support with such a spacer 7 could for example be applied if square floor tiles are arranged in a pattern whereby the joints 10 between the different rows of tiles stagger, as in the joint pattern of a brick wall.

[0117] Figure 9 shows a support 1 whereby the hollow tube 2 is cylindrical and not beam-shaped as in the preceding cases.

[0118] Moreover, the spacer 7 is in this case formed of three arms extending in directions that are rotated 120° in relation to one another.

[0119] Such a support 1 could for example be used to support the angular points 9 between hexagonal tiles 8.

[0120] More generally, the spacer 7 could be formed of several arms 11 extending in directions which converge in a single point 29 which is situated centrally or practically centrally in relation to the edge 14 of the hollow tube 2.

[0121] Figure 10 shows a variant of the embodiment shown in figure 1, whereby the spacer is composed of two interlockable spacer elements 31,32, on top of stacked tube parts 33,34,35 that have rounded corners, and have guiding bars 36 instead of grooves to hold the spacer elements 31 and 32.

[0122] A different shape of drainage holes 37 is shown whereby only 2 drainage holes per side of the stackable tube part are used the successive stackable tube parts (3-5) of the hollow tube are provided with a protrusion (38) and/or a notch (39) which can co-operate with the stackable tube part below to ensure a snug fit.

[0123] The bottom stackable element 35 is closed at the bottom by a bottom panel 40, and cannot be fitted on another stackable element below it. It does have guiding bars 36 to accommodate the spacer elements, in case one wishes to use only the bottom stackable tube part.

[0124] The invention is by no means restricted to the embodiments of a support 1 in accordance with the invention as described in the text and as represented in the drawings; on the contrary, such supports 1 can be realised in many other ways while still remaining within the scope of the invention.

[0125] Also, the present invention is not restricted to the method described in the text whereby such a support 1 in accordance with the invention is applied; also other methods can be applied while still remaining within the scope of the invention.

Claims

1. Support (1) to be used when placing floor tiles (8), whereby the support (1) has to provide a support for parts (9) of floor tiles (8) put next to one another and which are separated by a joint (10), **characterised in that** the support (1) comprises a hollow tube (2) with at least one open end (6), onto which open end (6) is provided a detachable spacer (7) with which the parts (9) of the tiles (8) to be supported can be maintained at a certain distance (B) from one another, whereby the spacer (7) is formed of at least one arm (11) or several arms (11) extending in directions which converge in a single point (29) which is situated centrally or practically centrally in relation to the edge (14) of the hollow tube (2), whereby the arm (11) or arms (11) protrude(s) with at least one part (13) above the edge (14) of the open end (6) of the hollow tube (2) and extend(s) over the opening of the open end (6) of the hollow tube (2) so as to divide this opening in separate compartments (12).

2. Support (1) according to claim 1, **characterised in that** the arms (11) of the spacer (7) extend with at least one part (15) under the edge (14) at the open end (6) of the hollow tube (2).

3. Support (1) according to claim 1 or 2, **characterised in that** the spacer (7) is cross-shaped.

4. Support (1) according to any one of the preceding claims, **characterised in that** the width (B') of the arms (11) is smaller than or equal to a joint width (B).

5. Support (1) according to any one of the preceding claims, **characterised in that** the arm (11) or arms (11) protrude(s) above the edge (14) of the open end over a height (H) which is smaller than or equal to the thickness of a tile.

6. Support (1) according to any one of the preceding claims, **characterised in that** the spacer (7) is detachable from the hollow tube (2) .

7. Support (1) according to any one of the preceding claims, **characterised in that** the hollow tube (2) is sealed on the far end (23) opposite the open end (6) with the spacer (7) so as to form a bottom (24).

8. Support (1) according to any one of the preceding claims, **characterised in that** the hollow tube (2) is built of several stackable tube parts (3-5).

9. Support (1) according to claim 8, **characterised in that** the successive stackable tube parts (3-5) of the

hollow tube (2) are provided with a groove (19) and/or a tooth (17) which can co-operate while being stacked.

10. Support (1) according to any one of claims 8 or 9, **characterised in that** the wall (26) of one or several of the above-mentioned tube parts (3,4) of the tube (2) is provided with perforations (27).

11. Support (1) according to claim 8, **characterised in that** the successive stackable tube parts (3-5) of the hollow tube (2) are provided with a protrusion (38) and/or a notch (39) which can co-operate with the stackable tube part below to ensure a snug fit.

12. Method for placing floor tiles (8) whereby use is made of a support (1) according to any one of the preceding claims, **characterised in that** it consists among others in putting one or several of the above-mentioned supports (1) on an ground level (25) with the open end (6) of the hollow tube (2) directed towards the floor to be tiled; in applying an overlay or mortar (16) in the hollow tube (2) of the supports to such an extent that a part bulges out over the edge (14) of the hollow tubes (2); in providing a part (9) of floor tiles (8) to be supported on the overlay or mortar (16) up to the protruding parts (13) of the spacer (7); and in levelling the tops (28) of parts (9) of the floor tiles (8) placed next to one another but separated by a joint (10) by pressing the overlay or mortar (16) so as to form an even surface.

13. Method according to claim 11, **characterised in that** supports (1) are first provided without a spacer (7), which spacer (7) is only provided after the overlay or mortar (16) has been applied.

14. Method according to claim 11 or 12, **characterised in that**, additionally, in order to adjust the height of the support (1), more or less tube parts (3-5) according to claim 8 are applied.

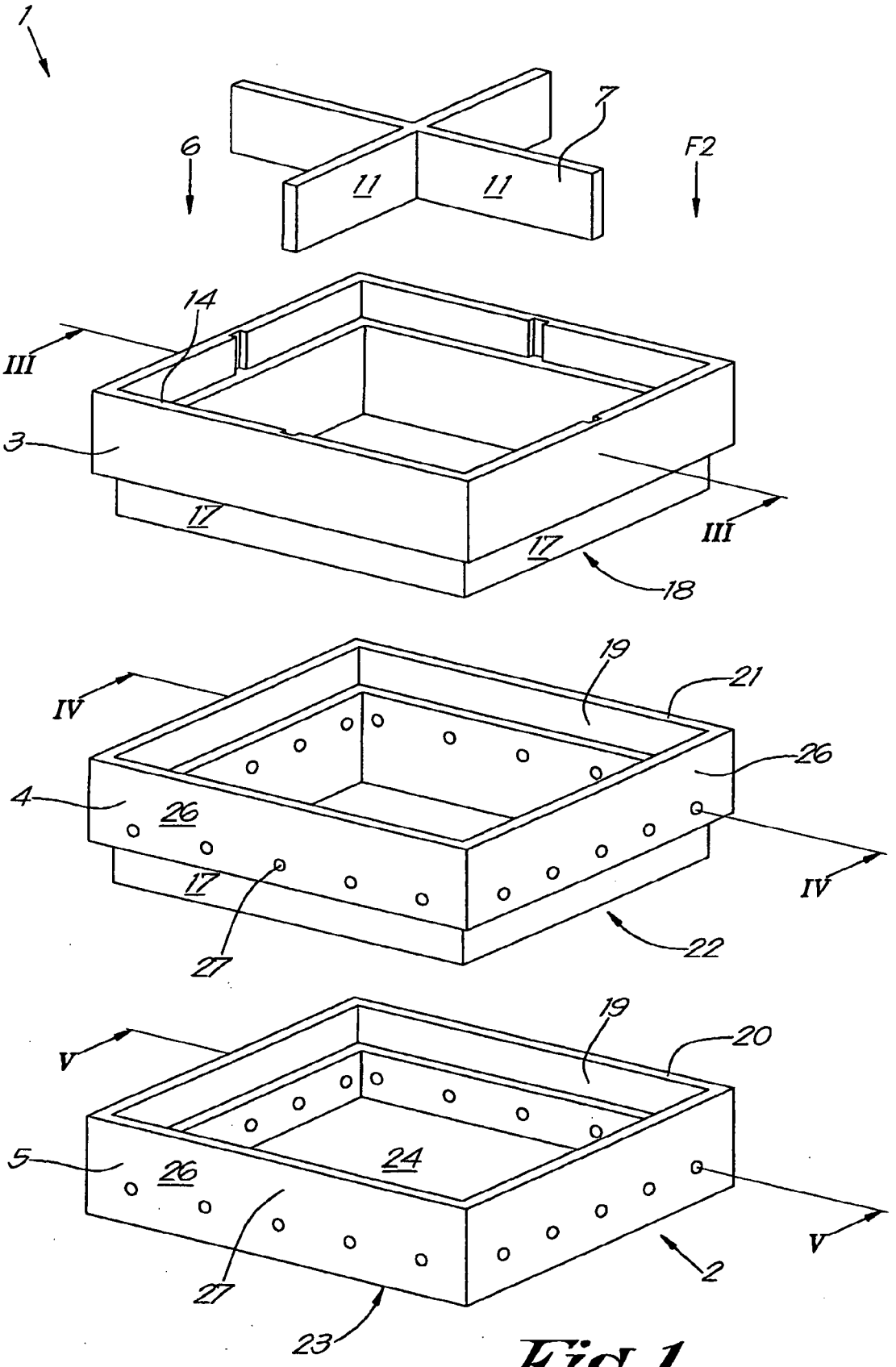
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Fig. 1

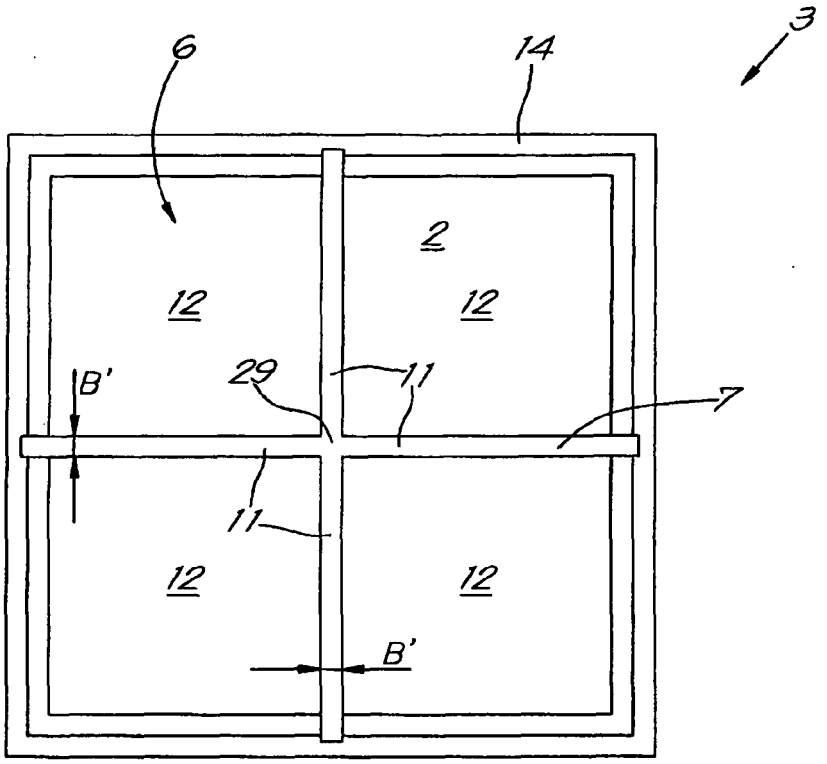

Fig.2

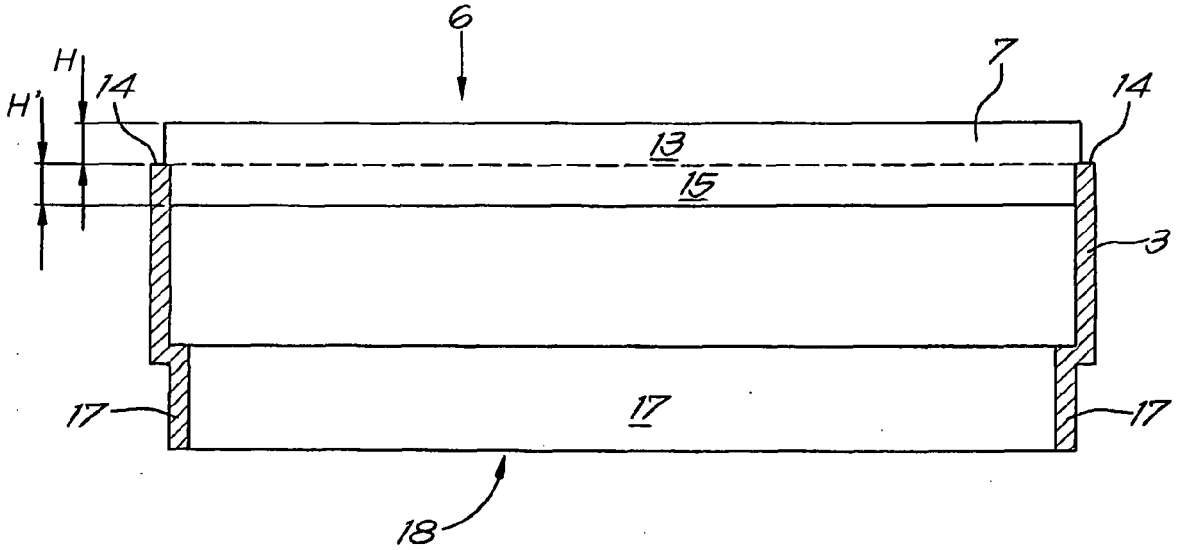

Fig.3

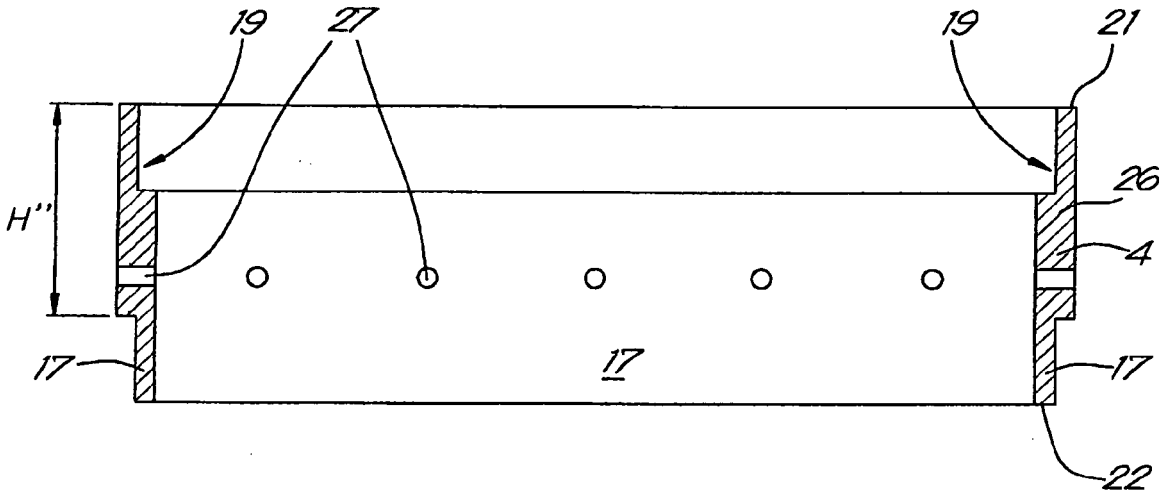

Fig.4

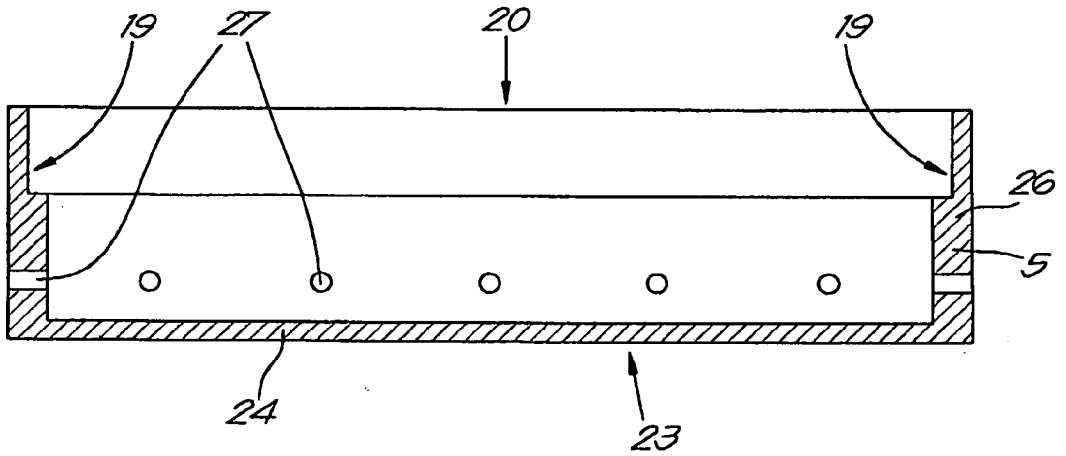

Fig.5

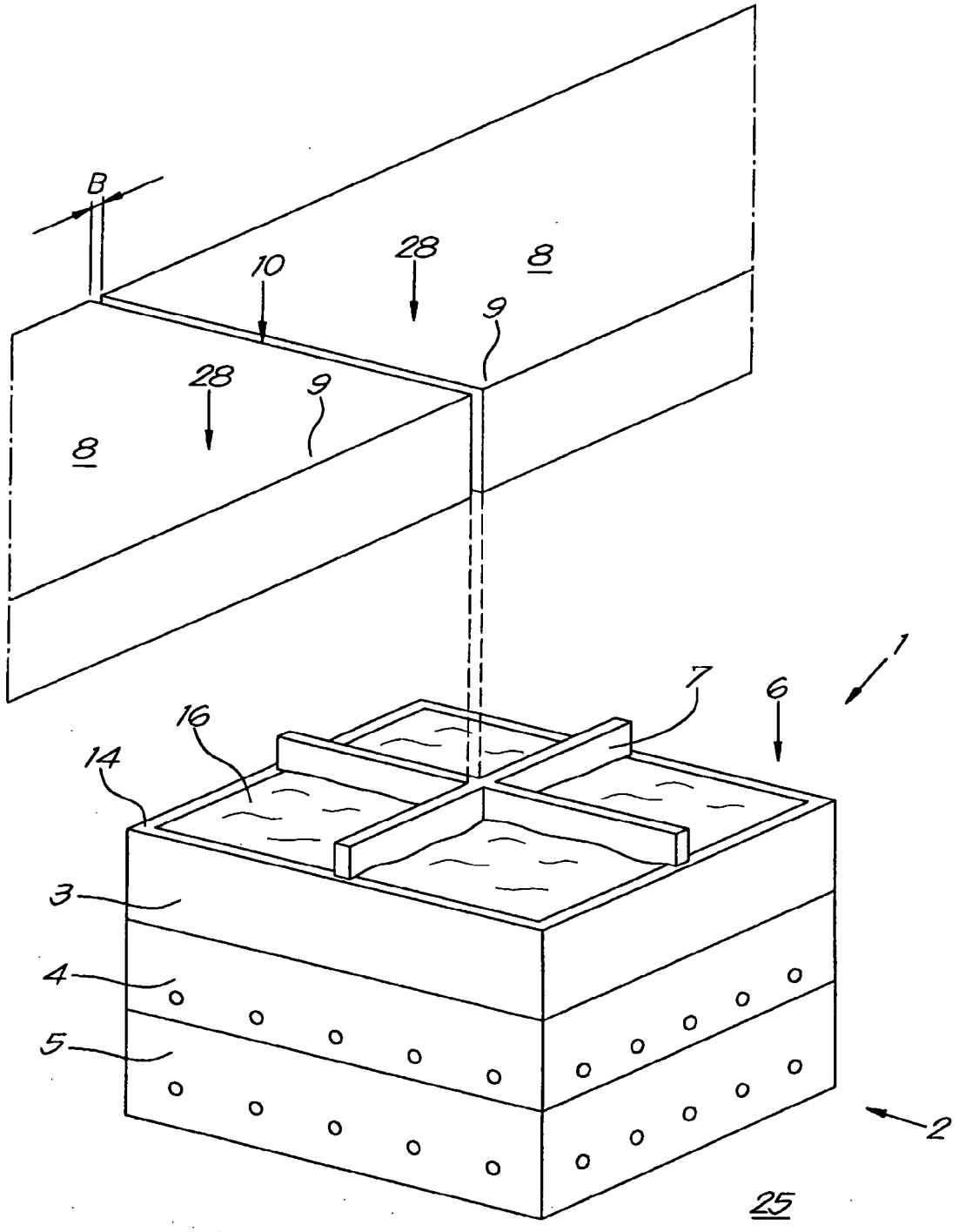

Fig.6

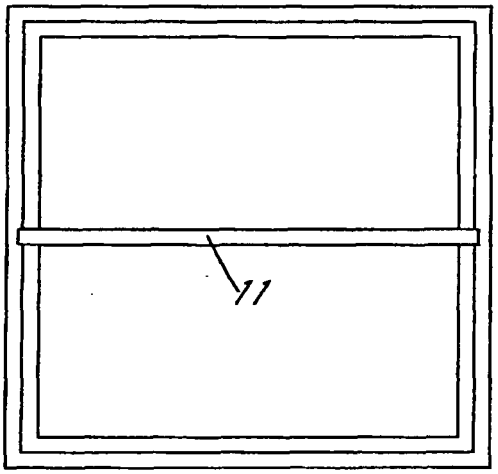

Fig.7

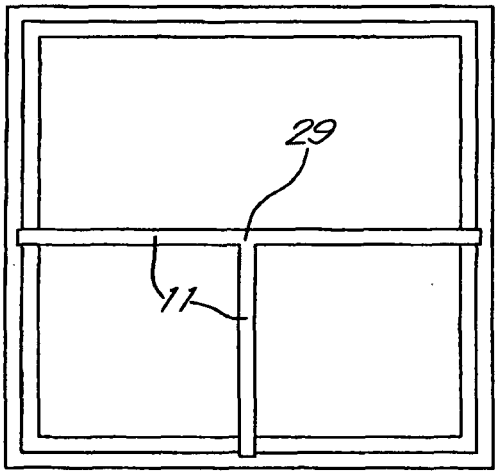

Fig.8

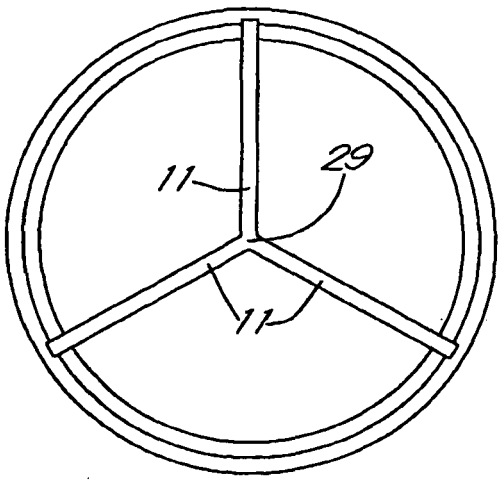

Fig.9

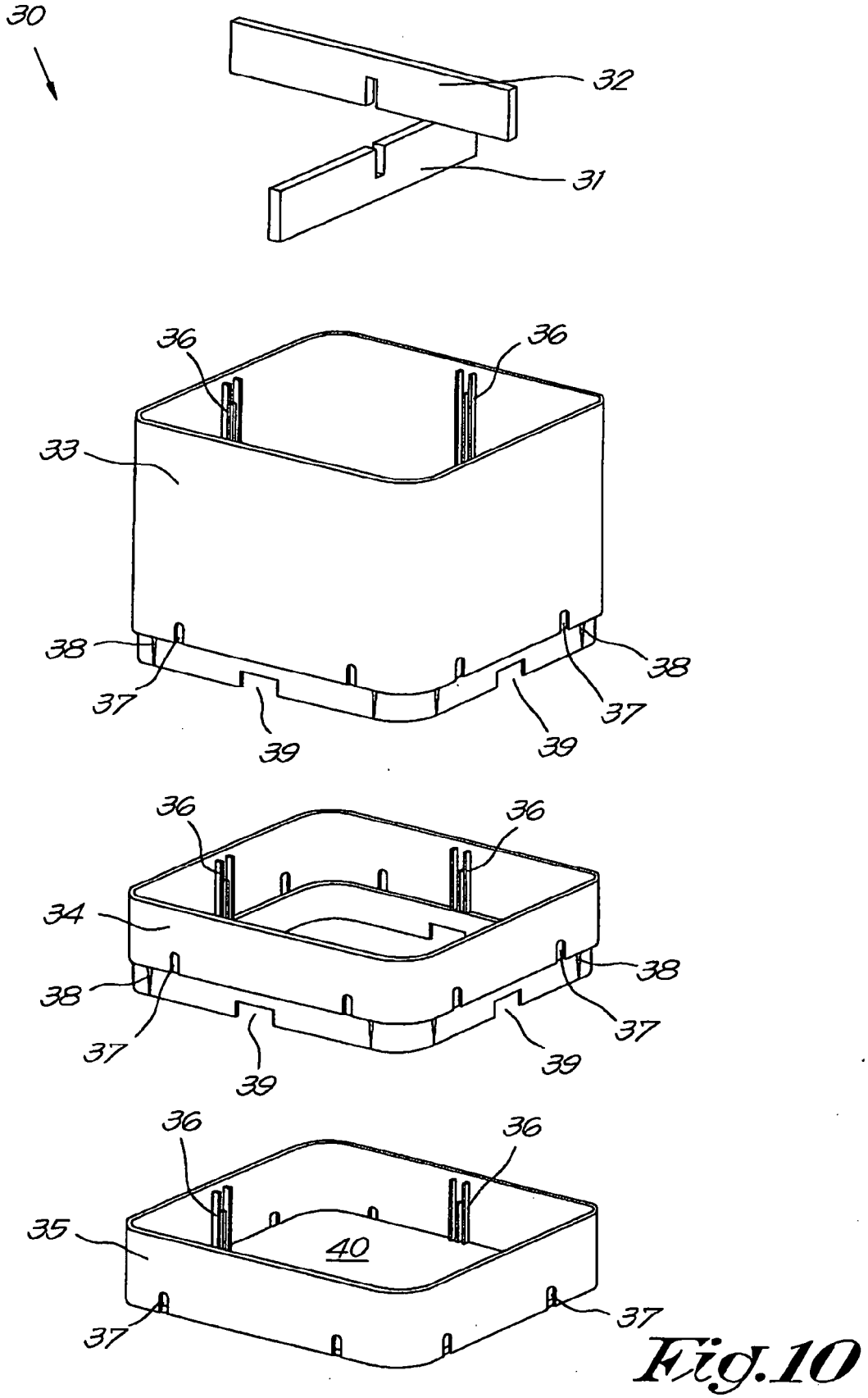
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Fig.10

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EUROPEAN SEARCH REPORT

Application Number
EP 09 44 7053

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Place of search	Date of completion of the search	Examiner
The Hague	23 February 2010	Severens, Gert

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