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(54) **A method for connecting ceramic tesserae**

(57) The method for connecting ceramic tesserae comprises stages of: depositing ceramic tesserae (2) on a rest surface (3) in a predetermined order in which the ceramic tesserae (2) are distanced from one another by space lines (4) of a predetermined width, and are positioned with a laying surface (2a) thereof facing upwards; depositing at least a point of grout (5) in at least an intermediate tract of each space line (4) between the tesserae (2); heating at least the points of grout (5) to a drying or firing temperature of the grout.

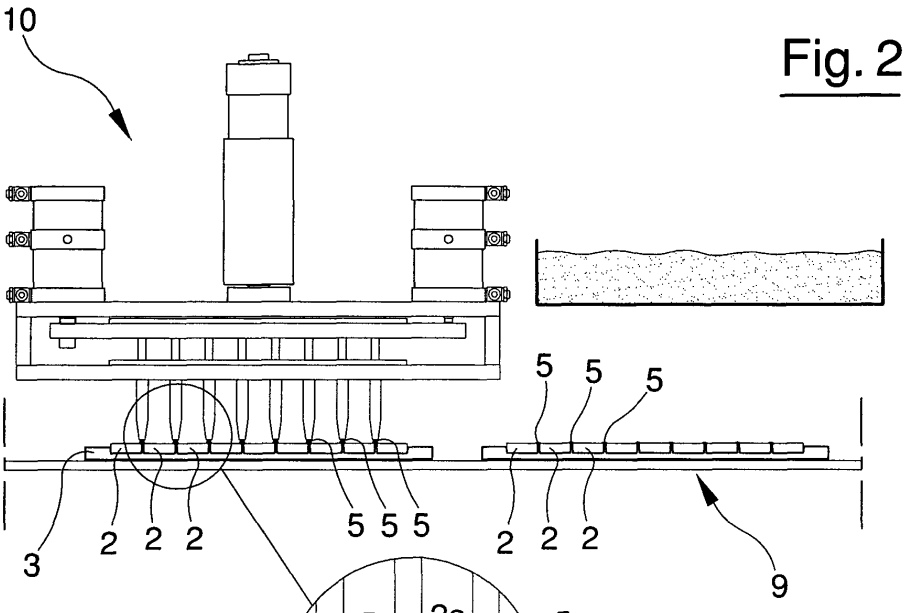

Fig. 2

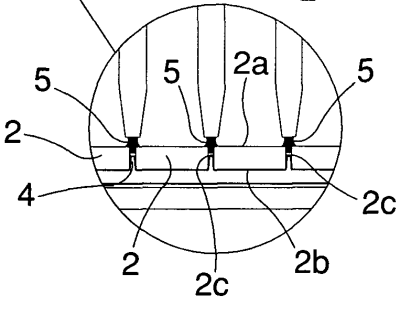

Fig. 3

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Description

Description.

[0001] The invention relates to a method for connecting ceramic tesserae.

[0002] The invention preferably relates to a method for realising ordered matrices of ceramic tesserae.

[0003] Ordered ceramic tesserae matrices are normally used for realising coverings having a mosaic effect. They comprise a certain number of ceramic tesserae arranged in an ordered fashion and distanced from one another by space lines of predetermined width, sometimes known as fugues. The tesserae are connected to one another by points of grout. In more detail, each point of grout is arranged partially internally of a space line between two side-by-side ceramic tesserae, and in part on the laying surfaces of two side-by-side tesserae.

[0004] The prior art includes a method for connecting ceramic tesserae which comprises the following stages.

[0005] The ceramic tesserae are first deposited in an ordered fashion on a first tray, resting on the laying surface. At the same time the points of grout for connecting the tesserae are deposited on a second tray. The ceramic tesserae are then transferred, in the same arrangement in which they were arranged on the first tray, such that the points of grout are in the position corresponding to the space lines. By effect of the weight of the ceramic tesserae, the points of grout insinuate partially into the space lines and adhere to the flanks of the ceramic tesserae. At this point the second tray is subjected to a heating process in order to dry or fire the points of grout (depending on the type of grout used), at the end of which process the connection between the tesserae is complete.

[0006] The above-described method includes some drawbacks.

[0007] Firstly, not infrequently, during the transfer from the first to the second tray and/or at the moment when the tesserae are deposited on the second tray, the tesserae can move by effect of impacts or vibrations, compromising the correct configuration of the final product. Further, the depositing of the tesserae on the laying surface means that any possible irregularities on the tesserae laying surface have a not-negligible effect on the regularity and planarity of the surface in view of the final product.

[0008] A further drawback is that at the end of the drying stage, or firing stage, of the points of grout, the ceramic tesserae are, in effect, glued also to the second tray. This leads to a necessary mechanical detaching operation of the tesserae, which is done using a tool. During the mechanical detachment it can occur that some tesserae detach from others, irreparably compromising the quality of the final product.

[0009] The aim of the present invention is to provide a method for connecting ceramic tesserae which obviates the drawbacks of the prior-art methods.

[0010] An advantage of the method is that the ceramic tesserae do not have to undergo transfer between different supports.

[0011] A further advantage of the method is that it is not necessary to perform a mechanical detaching operation of the tesserae following drying or firing of the grout, or at least any necessary operation is of very limited entity.

[0012] Further characteristics and advantages of the method of the present invention will better emerge from the detailed description that follows, aided by the accompanying figures of the drawings, which are purely by way of non-limiting example, in which:

Figure 1 is a stage of the method according to the present invention;
Figure 2 is a subsequent stage of the method;
Figure 3 is an enlarged detail of figure 2;
Figure 4 is a product obtained by the method of the present invention.

[0013] The ceramic tesserae 2 illustrated in the figures exhibit a laying surface 2a, a surface in view 2b, parallel and opposite to the laying surface 2a, and lateral surfaces 2c which join the laying surface 2a to the in-view surface 2b. The laying surface 2a, which is not visible when the covering is laid, in substance constitutes the surface at which the tesserae are arranged on a support surface of the covering. The in-view surface 2b is visible after the covering has been laid.

[0014] The method of the present invention comprises a stage of positioning the ceramic tesserae 2 on a rest surface 3 in a predetermined order, in which the ceramic tesserae 2 are distanced from one another by space lines 4 (also known as fugues) which are of a predetermined width, and in which the tessarae are positioned with the laying surfaces 2a thereof facing upwards.

[0015] The rest surface 3 is preferably constituted by a tray provided with a plurality of cells for housing the ceramic tesserae. The positioning of the tesserae is preferably done in-lineby providing, on a tray conveyor line 9 for trays of the above-described type, a loading station at which the ceramic tesserae are positioned on the trays themselves. The positioning of the ceramic tesserae can be performed by means of a multiple-sucker gripper organ, of known type and not illustrated, which removes the tesserae from an ordering station, of known type and not illustrated, and transfers them onto trays.

[0016] The method further comprises a stage of depositing at least a point of grout 5 on at least an intermediate tract of each space line 4.

[0017] The stage of depositing at least a point of grout 5 in an intermediate tract of each space line 4 can be performed, for example, simply by depositing or releasing, by force of gravity, a drop of grout of a predetermined volume, or by injection of predetermined quantities of grout, so that each point of grout 5 is deposited in part on the laying surfaces 2a of two ceramic tesserae 2 lo-

cated side-by-side, and in part on the opposing lateral surfaces 2c of the side-by-side ceramic tesserae 2.

[0018] This stage too of depositing the points of grout can be performed in-line by means of a depositing device 10 which, at an operative station predisposed along the transport line, locates the points of grout directly on the tesserae housed on each tray transiting through the work station.

[0019] The method further comprises a stage of heating of at least the points of grout 5 to a grout drying or firing temperature. The heating-up of the points of grout can be obtained, for example, by providing a heating station on the conveyor line, which heating station heats the ceramic tesserae up together with the points of grout deposited on the trays.

[0020] The depositing of the points of grout according to the invention leads to a very important advantage. The correct positioning of each point of grout 5, i.e. the partial insinuation thereof into the space lines 4, or fugues, and the partial superposition of the laying surfaces 2a of two side-by-side tesserae 2, is done without there being any need for exploiting the weight of the tesserae 2, but by exploiting the ability of the single points to insert partially internally of the space lines 4. The quantity of grout 5 constituting each point is dosed in order to prevent the grout 5 from reaching the laying surface or the tray on which the in-view surfaces of the tesserae are located. In known-type methods, such as those illustrated in the introductory part of the present description, the points of grout 5 are first deposited on.a support tray on which the ceramic tesserae are subsequently deposited such that, by force of their own weight, they force the points of grout to insinuate internally of the space lines. This method can cause undesired relative displacements between the ceramic tesserae. In the method of the present invention, the correct positioning of the points of grout 5 is done directly on the laying surface 2a of the ceramic tiles, without the tesserae having to undergo any displacement. On the contrary, the ceramic tesserae remain in the same position on the rest surface 3 for the whole sequence of stages as described above.

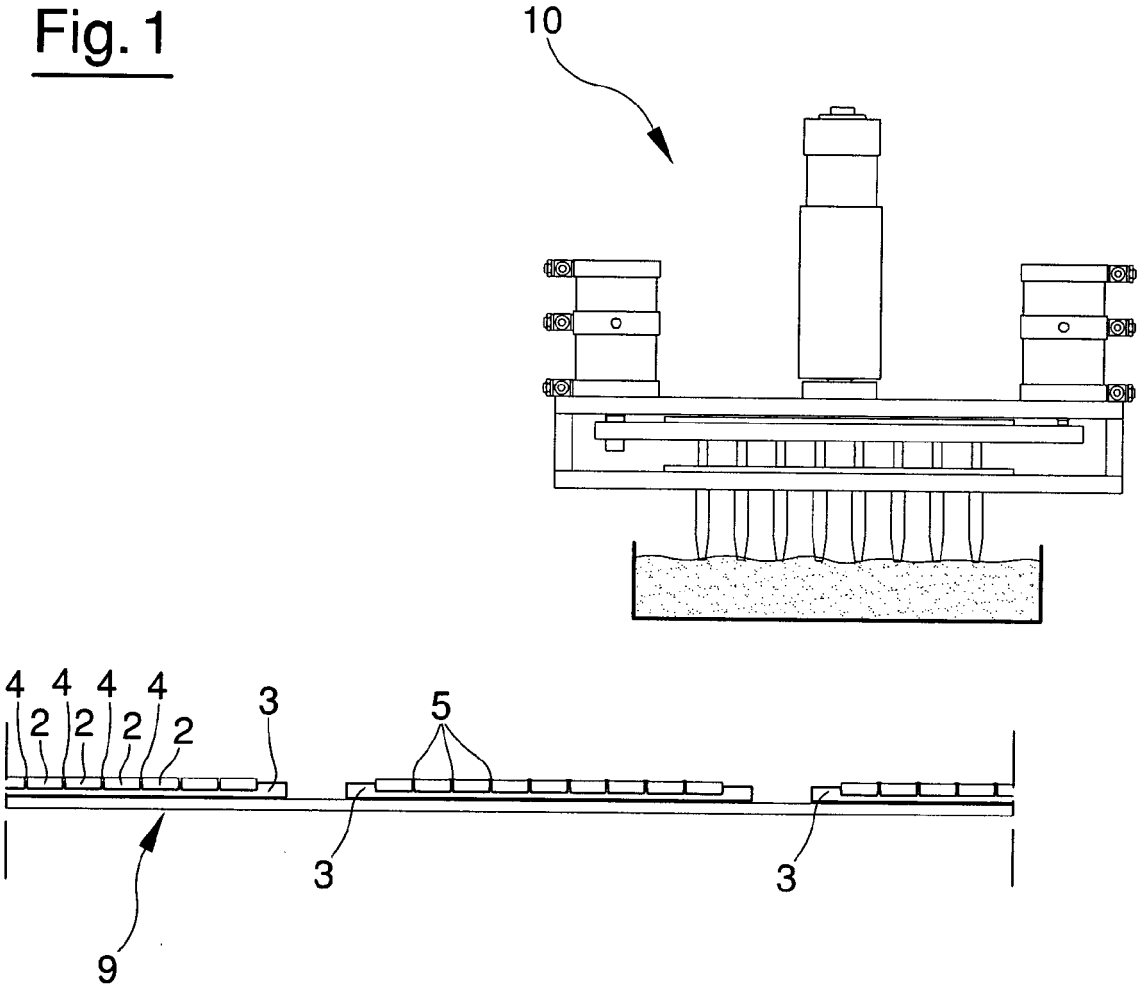
[0021] A further important advantage of the invention is constituted by the fact that, as the ceramic tesserae 2 are arranged resting on the in-view surface 2b which normally exhibits excellent planarity characteristics, any irregularities in the laying surfaces 2a are compensated for by the deformability of the points of grout 5, such that in the final product the in-view surfaces 2b of the ceramic tesserae are substantially co-planar to one another. In other words, any irregularities in the laying surfaces 2a have no influence on the coplanarity of the in-view surfaces 2b, which coplanarity is determined only by the planarity of the single in-view surfaces 2b and by the planarity of the rest surfaces 3.

Claims

1. A method for connecting ceramic tesserae, comprising stages of: depositing ceramic tesserae (2) on a rest surface (3) in a predetermined order in which the ceramic tesserae (2) are distanced from one another by space lines (4) of a predetermined width, and are positioned with a laying surface (2a) thereof facing upwards; depositing at least a point of grout (5) in at least an intermediate tract of each space line (4) between the tesserae (2); heating at least the points of grout (5) to a drying or firing temperature of the grout.

2. The method of claim 1, wherein the stage of depositing at least a point of grout (5) at the at least an intermediate tract of each space line (4) is performed by injecting predetermined quantities of grout in such a way that each of the points of grout (5) deposits partly on the laying surfaces (2a) of two ceramic tesserae (2) located side-by-side, and in part on lateral surfaces (2c) of the ceramic tesserae (2) located side-by-side.

Fig. 1



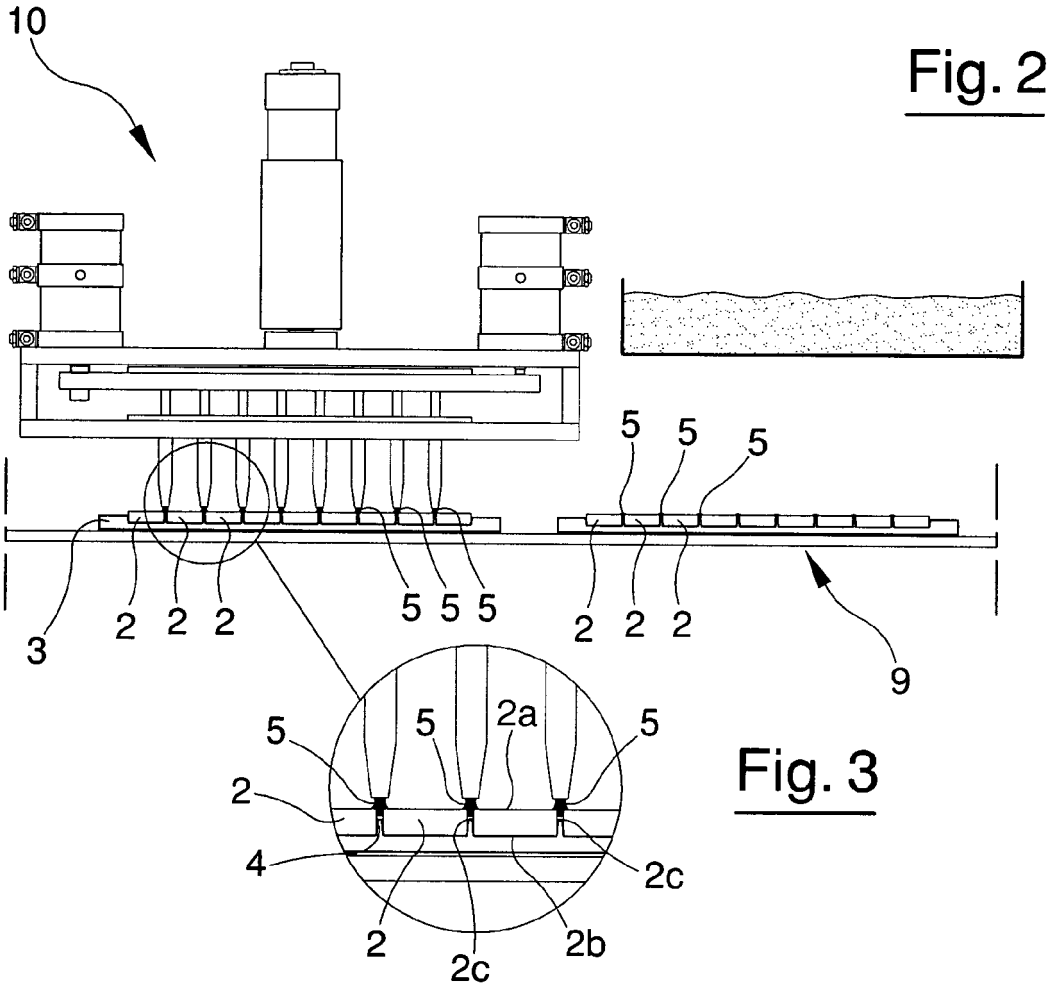


Fig. 2

Fig. 3

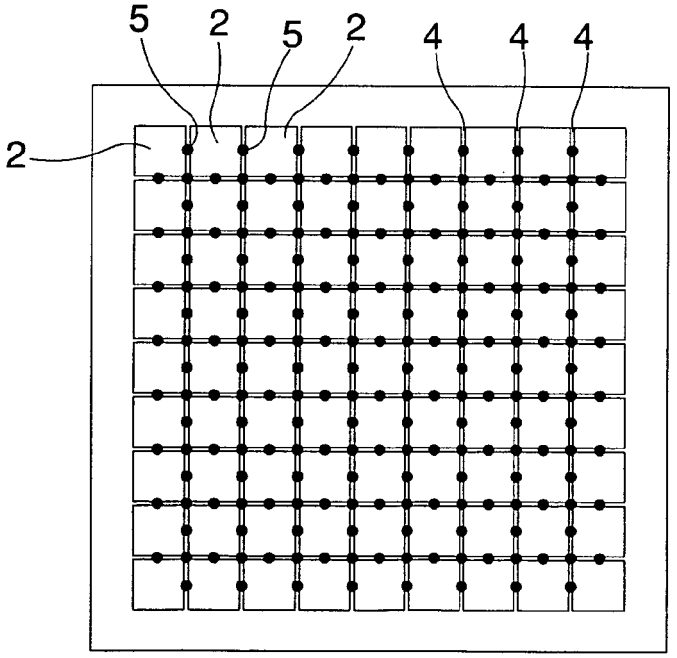


Fig. 4