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(54) METHOD AND APPARATUS FOR FORMING MOSAIC PANELS WITH JOINING PVC POINTS

VERFAHREN UND VORRICHTUNG ZUR FORMUNG VON MOSAIKTAFELN MIT VERBINDENDEN PVC-PUNKTEN

PROCÉDÉ ET APPAREIL DE FORMATION DE PANNEAUX EN MOSAÏQUE AVEC POINTS DE JONCTION PVC

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(56) References cited:

CN-A- 103 375 006

DE-A1- 2 832 928

US-A1- 2005 217 192

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Description

[0001] The present invention relates to the field of mosaic panels for coverings and floors, and more specifically, to that of systems for forming the aforesaid panels. More specifically, the invention relates to a new system for connecting the tiles to one another through PVC points to form the panel that represents an essential semifinished product in the practice of placing mosaics.

[0002] The aforementioned panels, as known, are compositions of tiles (made from glass, marble, ceramic or other materials), joined together in advance in order to facilitate and speed up application, at the same time obtaining a higher quality result, since the tiles are positioned and spaced with the maximum regularity. There are numerous techniques for forming the panels and apparatuses for the automated composition thereof.

[0003] As far as the present invention is concerned, attention will be focused on the systems for fixing together the tiles of a panel, after they have been supplied and arranged, also in terms of orientation, in the desired configuration in organised rows. The prior art includes different types of solution in this regard.

[0004] One of these, which is particularly common, provides for the use of a netting in fiberglass that is applied onto the back face of the tiles (i.e. the rough face that remains invisible when the mosaic is set) and glued to it by means of a cold-applied vinyl glue. The backing netting is flexible and offers consequent advantages in terms of the ability to manipulate the panels, also during application, in which the operator applying them can also recover possible small imprecisions in application, correcting the spacing of the tiles, within certain limits, which is not rigidly constrained by the support. The use of the vinyl glue that remains trapped in the masonry is, however, considered to be unsatisfactory for a few reasons, especially in some types and conditions of application and storage since the water-based glue can be subject to deterioration, especially if exposed to humidity or low temperatures. Moreover, in order for the vinyl glue to ensure adhesion it needs a backing netting with fine mesh that leaves a small surface exposed on the back faces of the tiles, which is not suitable for ensuring an optimal hold when the panel is applied.

[0005] An alternative solution, which is more specifically relevant to the present invention, and a competitive one with regard to the inert nature of the material and the surface exposed on the back faces, provides the use of points of plasticised PVC applied as a bridge between one tile and the next tile, normally one, two or more points for each facing side between the tiles. The glue points are applied at the base of the tiles lying with the back face on a layer of Teflon®-coated material (to prevent adhesions). The plasticised PVC has a substantially liquid consistency at the application temperature (room temperature) and must be hardened by heating.

[0006] The machinery required to implement the method at hand according to such system is intrinsically com-

plex given that it involves dispensing a significant number of points - up to more than 1000 for example, in the case of larger panels proposed by the market - with the best dimensional uniformity possible. The cost and overall bulk of the machinery are ultimately increased due to the presence of large curing ovens required to ensure a cooking of at least 15 minutes at about 180°, required to harden the PVC applied previously at points, as described above.

[0007] The curing with such operating specifications also implies a significant energy consumption and an increased cycle time. To this end, it is useful to note that since the PVC points are at the base of the tiles, and partly below them, the cooking heat must involve the whole mass of the base plate of the tiles, something which increases the complexity and energy demand of the operation. Again, the transport of the tiles from the grids in which they are ordered, to the Teflon®-coated plate may cause the correct spacing, and in general the evenness of the arrangement, to be lost, with the need for additional labour.

[0008] An apparatus according to the preamble of claim 1 is disclosed in patent publication CN103375006, according to which glue points join respective couples of mutually adjacent tiles on the side of the back faces of the same tiles, the apparatus comprising a stencil member adapted to become superimposed to the tiles in orderly pattern, so that respective glue points are set between the tiles, lying with the back faces upwards, through guide holes formed in the stencil member; glue distribution and scraping means distribute and scrape the glue over the stencil member to make the glue drip through the holes. Such system as described in the publication is however ineffective, in terms of a result of acceptable cleanliness and quality.

[0009] The object of the present invention is to provide a system for forming mosaic panels of the type generically ascribable to the one with PVC points, which, contrary to any application methodology actually in use, is at the same time affordable, quick, and nevertheless accurate.

[0010] According to the invention, such objects are attained by the method and apparatus for forming mosaic panels with joining PVC points according to the invention, which essential characteristics are defined by the respective accompanying independent claims. Further advantageous aspects of the invention are defined by the dependent claims.

[0011] The features and advantages of the method and the apparatus for forming mosaic panels with PVC joining points, and the panels thus obtained according to the present invention, shall be apparent from the description below of an embodiment thereof, made by way of a non-limiting example, with reference to the accompanying drawings in which:

- figure 1 shows an axonometric view of a diagrammatic depiction of a module of apparatus according

to the invention, with a group of tiles being processed;

- figure 2 is a similar depiction to the one in figure 1, with an exploded view of the module;
- figure 3 shows a top view of the module of the preceding figures;
- figure 4 is a section view of the module according to the plane identified by arrows IV-IV of figure 3; and
- figure 5 shows an enlarged view of the portion enclosed by the circle V of figure 4.

[0012] With reference to the above figures, according to the invention it is provided to supply a grid 1 made of elastic, soft material, preferably made of silicone, provided with cells 11 spaced apart, each to house, with the back face facing upwards, a relative tile T of the mosaic panel to be joined, typically with a square profile. Therefore, the cells 11 will be separated by ridges 12, the thickness of which defines the distance (or "joint") between the tiles in the panel formed, and the height of which, that is the development orthogonal to the cell bottom 11 on which the "front face" is supported is, for reasons to be better understood hereafter, comprised between a half and 3/4 of the thickness of the tile, even more preferably about 2/3.

[0013] Over the grid 1 a sheet plate 2 is arranged, substantially having shape and sizes according to those of the grid, and therefore of the panel to be formed, having an arrangement of holes 21 each indicatively circular, of width and positioning such as to replicate the ones desired for the glue points with which to join the tiles T below in the finished panel. The plate 2 thus carries out a function of stencil member for the correct deposit of the glue points, the holes 21 being in correspondence of the ridges 12, involving all the couples of adjacent tiles, that is relative reciprocally facing sides, of preference substantially flush with the average point of the side. The width is particularly such as to expose a small part of the back face, something which is indicatively achieved in a typical circumstance with a width equal to about 1/4 of the length of the side of the tile, being it understood that such value may undergo variations according to the specifications of the panel being processed (among which mainly measurement of the tiles and thickness of the joints). The size of the plate 2 in the direction of the thickness also is a parameter that affects the sizes of the glue point, and that therefore may undergo variations and adaptations based on the circumstances.

[0014] As mentioned, the plate 2 is spaced apart from the grid 1 so as to leave the space for the tiles T, thus ensuring that some clearance remains between the upward face, that as mentioned is the back/rough face, and the plate itself. Such a clearance is in particular functional for the mutual positioning, being it clearly necessary to first arrange the tiles T on the grid, and then to obtain the superimposing between the plate and the grid-tiles set. This result can be achieved in various equivalent manners, according to what in itself is obvious to the expert,

for example with a vertically movable plate support system or also with a fixed plate under which the grid is caused to slide by means of a horizontal conveyor system.

[0015] A module of apparatus according to the invention is completed by a head 3 for glue distribution (PVC) arranged above the plate 2 and adapted to dispense the glue so as to cause it to drip through the holes 21. According to a preferred embodiment, the head 3 is movable horizontally above the plate, thus taking on for example, as in the depicted embodiment, the shape of a slider 31 elongated according to a longitudinal axis Y, which extends between the two opposite sides of the plate and moves in reciprocating fashion in a direction X, orthogonal to the axis Y of the slider, to sweep over the whole surface of the plate.

[0016] As shown in particular in figure 5, the slider has a cup-shaped cross-section (that is, a section carried out over a plane orthogonal to the plate and to the axis Y) defining a collection and distribution channel 32 in which there is fed, through an upper manifold 33, the glue (mass indicated with C in such figure 5) intended to fill the holes 21 and to be deposited through them in joining points between the tiles. The distributor channel 32 is between two laminar spatulas 34 that make contact with the plate 2 at the free end edges 34a and thereby are adapted to perform functions of scraping elements, or doctor blades, thus ensuring that the glue is spread and pushed to drip through the holes 22 with the reciprocating movement of the slider in the direction X. To this end, the end edges 34a of the spatulas 34 advantageously may have an appropriate shaping, such as the rounded one of the example illustrated.

[0017] The feeding of the glue to the manifold 33 occurs through pumping systems related to known knowledge or obviously inferable therefrom, and therefore is not shown or described in detail. Also the actuation and control of the movement of the slider can be easily managed with obvious systems, such as tracks, pneumatic linear actuation means, etc., they also not shown. Obviously, embodiments other than the elongated slider will in any case have as preferable and advantageous significant feature the presence of a collection chamber of the glue between scraping means equivalent to the spatulas 34.

[0018] If the methods for applying the glue according to the invention (as said, PVC having similar characteristics to the ones of known systems) are already clear from what is described above, it is important to add and emphasize the resulting advantageous characteristics at the successive hardening step of the PVC. Indeed, the fact that according to the invention, accurately sized PVC points remain exposed on the upper side once the grid 1 with the tiles T is released from the plate 2 (typically, but not necessarily, for the advancement of the grid with the same conveyor system that brought it into the plate area) allows the use of less powerful cooking systems with respect to the traditional system. In particular, given that it is not necessary to bring to temperature the whole

mass of the tiles and of the relative support, infrared lamps (of the type already known for drying the PVC in other contexts) may be effectively used, capable of providing the heat required, moreover with a reduced action time. The structure of the apparatus is thus simplified and more compact, in addition to having lower energy consumption.

[0019] Another particularly meaningful advantage is associated with the gluing and the drying with the tiles firmly inserted in the grid. Accordingly, there is the guarantee of a perfect alignment between the tiles and the certainty that they do not move during the whole process, therefore with maximum quality performance. To this end, it is also to be noted how the ridges 12, which on the grid determine the joints between the tiles, act as stop for the pouring of the glue, at proper height determined as seen from an appropriate height of the ridges, thus preventing the PVC from penetrating the whole joint, thus being visible on the front face.

[0020] Again, the grid of a material with elastic and nonstick properties, e.g. silicone, allows compensating for any slight differences in calibration between one tile and the next tile, and in any case obtaining the desired closure of the joint.

[0021] It is therefore understood how according to the invention, the preset goals are completely achieved, thus achieving a result that combines, with surprising effectiveness, simplification of the production system, reduction of the consumption and a quality result. Although the most typical application of the invention is the one of tile panels or square tiles, its useful use also in contexts of different shapes cannot be excluded.

[0022] The glue used, that is PVC (more exactly, particles of PVC suspended in a plasticizer such as a phthalic resin), corresponds to the known system. Although to date no alternative glues have been identified that can be applied with similar overall effectiveness, the characteristics of the glue do not in themselves represent a limiting characteristic of the invention, and the PVC may be replaced with different glues, so long as equivalent.

[0023] The present invention was described hereto with reference to a possible illustrative embodiment thereof. It is intended that other embodiments may exist which fall within the scope of protection of the claims indicated below.

Claims

1. An apparatus for obtaining a panel product of mosaic tiles arranged in an orderly pattern and mutually joined in an irreversible fashion to form the panel through PVC glue points that join respective couples of mutually adjacent tiles, on the side of the back faces of the same tiles, the apparatus comprising at least one stencil member (2) adapted to become superimposed to, and in close proximity of the back face of, said tiles in said orderly pattern, said stencil

member (2) comprising an arrangement of guide holes (12) for the deposition of respective glue points between the tiles in correspondence with the holes, and glue distribution and scraping means (3) adapted to distribute and scrape the glue over the stencil member to make the glue drip through said holes (12) deposit between the sides of said tiles, **characterized in that** it comprises one or more grids (1) made of an elastic, soft and nonstick material, such as silicone, adapted to form said orderly pattern of the tiles, wherein each grid comprises a number of cells (11) the bottom of which is adapted to support the front face of each tile, the cells being separated by ridges (12) adapted to stop the pouring of the glue dripping through said holes at a determined height.

2. The apparatus according to claim 1, wherein said stencil member comprises at least one plate (2), said arrangement of holes comprising a plurality of holes (12) adapted to result in correspondence with couples of two mutually facing sides belonging to different tiles

3. The apparatus according to claim 2, wherein, having said tiles a substantially square shape, said holes (21) are adapted to be positioned in correspondence with the median points of all the couples of two mutually facing sides belonging to different tiles.

4. The apparatus according to claim 3, wherein said holes (21) are circular, with a width of 1/4 of a side length of the cell.

5. The apparatus according to any of the claims from 2 to 4, wherein said glue distribution means (3) comprise at least one slider (31) movable on said plate over a plane parallel therewith, the slider having a cup-shaped section defining a glue collection and distribution chamber (32), between laminar spatula means (34) that make contact with the plate at free end edges (34a), whereby the spatulas are adapted to carry out the function of scraping elements as the slider moves, the apparatus further comprising glue feeding means for feeding glue to said chamber (32) and means for powering and controlling the movement of said slider (31) over said plate (2).

6. The apparatus according to claim 5, wherein said slider (31) is elongated according to a longitudinal axis (Y) extending between two opposite peripheral sides of the plate (2), and is movable in reciprocating fashion along a direction (X) orthogonal with said axis (Y) of the slider, to sweep over a substantial portion of the plate comprised between said peripheral sides, said glue collection and distribution chamber (32) between said spatulas being in turn elongated according to said longitudinal axis (Y).

7. The apparatus according to claim 6, wherein said free end edges (34a) of said spatulas have a rounded shaping.
8. The apparatus according to any of the previous claims, comprising conveyor means adapted to support said tiles (T) lying on the front face in said orderly pattern, and to transport them towards said stencil member (2) and then away from it, the stencil member being fixed or vertically liftable.
9. The apparatus according to any of the previous claims, comprising glue cooking means arranged downstream of said stencil member.
10. The apparatus according to claim 9, wherein said cooking means comprise one or more infrared lamps.
11. A method for obtaining a panel product of mosaic tiles (T) arranged in an orderly pattern and mutually joined in an irreversible fashion to form the panel, the method comprising:
- arranging said tiles (T) according to said orderly pattern, lying on the front face and with the back face exposed upwards;
 - superimposing to said tiles (T), in close proximity to said back faces, a stencil member (2) comprising an arrangement of guide holes (12) for the deposition of respective glue points between the tiles;
 - distributing said glue over said stencil member (2), making it drip through said holes (12) to form said glue points that affect partially said back faces;
 - clearing said tiles from said stencil member (2) keeping them in the orderly panel arrangement;
 - applying a thermal cooking treatment to said panel with said tiles (T) joined by said glue points,
- the method being **characterized in that** said orderly pattern of the tiles is formed on a grid (1) made of an elastic, soft and nonstick material, such as silicone, wherein each grid comprises a number of cells (11) the bottom of which is adapted to support the front face of each tile, the cells being separated by ridges (12) adapted to stop the pouring of the glue dripping through said holes at a determined height.
12. The method according to claim 11, wherein said holes (21) are positioned in correspondence with couples of two mutually facing sides belonging to different tiles.
13. The method according to claim 12, wherein, having the tiles a square shape, said holes (21) are posi-

tioned in correspondence with the median points of all the couples of two mutually facing sides belonging to different tiles.

- 5 14. The method according to any of the claims from 11 to 13, wherein said glue distribution provides scraping the glue over said stencil member (2) through a reciprocating motion of one or more laminar spatulas (34).
- 10 15. The method according to any of the claims from 11 to 14, wherein said tiles (T) in said orderly pattern are conveyed towards said stencil member (2) and then away from it.
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Patentansprüche

- 20 1. Vorrichtung zum Erhalten eines Panelproduktes aus Mosaikkacheln, die in einem geordneten Muster angeordnet und gegenseitig auf eine irreversible Weise verbunden sind, um das Panel durch PVC-Klebspunkte zu bilden, die jeweilige Paare von gegenseitig benachbarten Fliesen auf der Seite der Rückseiten derselben Kacheln verbinden, wobei die Vorrichtung enthält mindestens ein Schablonenelement (2), das ausgelegt ist, um über und in unmittelbarer Nähe der Rückseite der Kacheln in dem geordneten Muster überlagert zu werden, wobei das Schablonenelement (2) eine Anordnung von Führungslöchern (12) zum Aufbringen entsprechender Leimpunkte zwischen den Kacheln entsprechend den Löchern enthält, und Leimverteilungs- und -abstreifeinrichtungen (3), die ausgelegt sind, um den Leim über dem Schablonenelement zu verteilen und abzukratzen, um den Leim zu veranlassen, sich durch die Löcher (12) tropfend zwischen den Seiten der Kacheln aufgebracht zu werden, **dadurch gekennzeichnet, dass** sie ein oder mehrere Gitter (1) enthält, die aus einem elastischen, weichen und nicht klebenden Material, wie Silikon, hergestellt sind, ausgelegt, um das geordnete Muster der Kacheln zu bilden, wobei jedes Gitter eine Anzahl von Zellen (11) enthält, deren Boden ausgelegt ist, um die Vorderseite jeder Kachel zu tragen, wobei die Zellen durch Rippen (12) getrennt sind, sie ausgelegt sind, um das Einfüllen des durch die Löcher tropfenden Leims in einer bestimmten Höhe zu stoppen.
- 25 2. Vorrichtung nach Anspruch 1, wobei das Schablonenelement mindestens eine Platte (2) enthält, wobei die Anordnung von Löchern eine Vielzahl von Löchern (12) enthält, die ausgelegt sind, um entsprechend Paaren von zwei einander zugewandten Seiten aufzutreten, die zu unterschiedlichen Kacheln gehören.
- 30 3. Vorrichtung nach Anspruch 2, wobei, wenn die Ka-
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- cheln im Wesentlichen quadratische Form haben, die Löcher (21) ausgelegt sind, um entsprechend den Mittelpunkten aller Paare von zwei einander zugewandten Seiten positioniert werden zu können, die zu unterschiedlichen Kacheln gehören.
4. Vorrichtung nach Anspruch 3, wobei die Löcher (21) kreisförmig sind, mit einer Breite von etwa 1/4 der Seitenlänge der Zelle.
5. Vorrichtung nach einem der Ansprüche 2 bis 4, wobei die Leimverteilungseinrichtungen (3) wenigstens einen Schieber (31) enthalten, der auf der Platte über eine dazu parallele Ebene bewegbar ist, wobei der Gleiter einen becherförmigen Abschnitt hat, der eine Leimsammel- und -verteilungskammer (32) zwischen laminaren Spachtel­einrichtungen (34) definiert, die die Platte an freien Endrändern (34a) berühren, wobei die Spachtel ausgelegt sind, um die Funktion von Schabelementen zu erfüllen, wenn sich der Schieber bewegt, wobei die Vorrichtung ferner Leimzuführeinrichtung zum Zuführen von Leim zu der Kammer (32) und Einrichtungen zum Antreiben und Steuern der Bewegung des Schiebers (31) über die Platte (2) enthält.
6. Vorrichtung nach Anspruch 5, wobei sich der Schieber (31) entsprechend einer sich zwischen zwei entgegengesetzten Umfangsseiten der Platte (2) erstreckenden Längsachse (Y) ausdehnt und in einer hin- und her gehenden Weise längs einer Richtung (X) bewegbar ist, die orthogonal zu der Achse (Y) des Schiebers ist, um über einen wesentlichen Teil der Platte zu streichen, der zwischen den Umfangsseiten enthalten ist, wobei sich die Klebstoffsammel- und -verteilungskammer (32) zwischen den Spachteln wiederum entsprechend der Längsachse (Y) ausdehnt.
7. Vorrichtung nach Anspruch 6, wobei die freien Endränder (34a) der Spachtel eine abgerundete Formgebung haben.
8. Vorrichtung nach einem der vorhergehenden Ansprüche, enthaltend Fördereinrichtungen, die ausgelegt sind, um die in dem geordneten Muster auf der Vorderseite liegenden Kacheln (T) zu tragen und sie zu dem Schablonenelement (2) und dann davon weg zu transportieren, wobei das Schablonenelement fest oder vertikal anhebbar ist.
9. Vorrichtung nach einem der vorhergehenden Ansprüche, enthaltend Leimkocheinrichtungen, die stromabwärts von dem Schablonenelement angeordnet sind.
10. Vorrichtung nach Anspruch 9, wobei die Kocheinrichtungen eine oder mehrere Infrarotlampe(n) enthalten.
- halten.
11. Verfahren zum Erhalten eines Panelproduktes aus Mosaikkacheln (T), die in einem geordneten Muster angeordnet und miteinander in einer irreversiblen Weise verbunden sind, um das Panel Platte zu bilden, wobei das Verfahren enthält:
- Anordnen der Kacheln (T) entsprechend dem geordneten Muster auf der Vorderseite liegend und mit der nach oben freiliegenden Rückseite;
 - Überlagern der Kacheln (T) in unmittelbarer Nähe der Rückseiten mit einem Schablonenelement (2), das eine Anordnung von Führungslöchern (12) zum Aufbringen jeweiliger Klebepunkte zwischen den Kacheln enthält;
 - Verteilen des Klebers über das Schablonenelement (2), wobei man ihn durch die Löcher (12) tropfen lässt, um die Kleberpunkte zu bilden, die teilweise die Rückseiten beeinflussen;
 - Entfernen der Kacheln von dem Schablonenelement (2), wobei sie in der geordneten Panelanordnung gehalten werden;
 - Anwenden einer thermischen Kochbehandlung auf das Panel, wobei die Kacheln (T) durch die Klebepunkte verbunden sind,
- wobei das Verfahren **dadurch gekennzeichnet ist, dass** das geordnete Muster der Kacheln auf einem Gitter (1) gebildet wird, das aus einem elastischen, weichen und nicht klebenden Material, wie Silikon, hergestellt ist, wobei jedes Gitter eine Anzahl von Zellen (11) enthält, deren Boden ausgelegt ist, um die Vorderseite jeder Kachel zu tragen, wobei die Zellen durch Rippen (12) getrennt sind, die ausgelegt sind, um das Einfüllen des durch die Löcher tropfenden Leims in einer bestimmten Höhe zu stoppen.
12. Verfahren nach Anspruch 11, wobei die Löcher (21) entsprechend Paaren von zwei einander zugewandten Seiten positioniert werden, die zu unterschiedlichen Kacheln gehören.
13. Verfahren nach Anspruch 12, wobei, wenn die Kacheln quadratische Form haben, die Löcher (21) entsprechend den Mittelpunkten aller Paare von zwei einander zugewandten Seiten positioniert werden, die zu unterschiedlichen Kacheln gehören.
14. Verfahren nach einem der Ansprüche 11 bis 13, wobei die Leimverteilung ein Schaben des Leims über das Schablonenelement (2) durch eine hin- und hergehende Bewegung einer oder mehrerer laminaren/-r Spachtel(n) (34) bereitstellt.
15. Verfahren nach einem der Ansprüche 11 bis 14, wobei die Kacheln (T) in dem geordneten Muster zu dem Schablonenelement (2) und dann von diesem

weg befördert werden.

Revendications

1. Un appareil pour obtenir un panneau de carreaux de mosaïque disposés selon un motif ordonné et reliés mutuellement de manière irréversible pour former le panneau au moyen de points de colle PVC qui joignent des couples respectifs de carreaux mutuellement adjacents, sur le côté des faces arrière de ces mêmes carreaux, l'appareil comprenant au moins un élément masque (2) adapté pour venir se superposer aux carreaux, et à proximité immédiate de la face arrière desdits carreaux, selon ledit motif ordonné, ledit élément masque (2) comprenant un agencement d'orifices guides (21) pour le dépôt de points de colle respectifs entre les carreaux en correspondance avec les orifices, et des moyens de distribution et de raclage de colle (3) adaptés pour distribuer et racler la colle sur l'élément masque pour faire couler la colle à travers lesdits orifices (21) entre les côtés desdits carreaux, **caractérisé en ce qu'il** comprend une ou plusieurs grilles (1) en un matériau élastique, souple et antiadhésif, tel que du silicone, adaptées pour former ledit motif ordonné des carreaux, dans lequel chaque grille comprend un nombre de cellules (11) dont le fond est adapté pour supporter la face avant de chaque carreau, les cellules étant séparées par des arêtes (12) adaptées pour arrêter l'écoulement de la colle s'égouttant au travers des orifices, à une hauteur déterminée.
2. L'appareil selon la revendication 1, dans lequel ledit élément masque comprend au moins une plaque (2), ledit agencement d'orifices comprenant une pluralité d'orifices (21) adaptés pour aboutir en correspondance avec des couples de deux côtés se faisant mutuellement face appartenant à différents carreaux.
3. L'appareil selon la revendication 2, dans lequel, lesdites carreaux ayant une forme sensiblement carrée, lesdits orifices (21) sont adaptés pour être positionnés en correspondance avec les points médians de tous les couples de deux côtés se faisant mutuellement face appartenant à différents carreaux.
4. L'appareil selon la revendication 3, dans lequel lesdits orifices (21) sont circulaires, avec une largeur égale à 1/4 de la longueur latérale de l'alvéole.
5. L'appareil selon l'une quelconque des revendications 2 à 4, dans lequel lesdits moyens de distribution de colle (3) comprennent au moins un coulisseau (31) mobile sur ladite plaque dans un plan parallèle à celle-ci, le coulisseau ayant une section en forme de coupelle définissant une chambre de collecte et de distribution de colle (32), entre des moyens de spatule laminaire (34) qui entrent en contact avec la plaque au niveau des bords d'extrémité libres (34a), les spatules étant adaptées pour remplir la fonction d'éléments de raclage lorsque le coulisseau se déplace, l'appareil comprenant en outre des moyens d'alimentation en colle pour alimenter en colle ladite chambre (32) et des moyens pour produire et contrôler le mouvement dudit coulisseau (31) sur ladite plaque (2).
6. L'appareil selon la revendication 5, dans lequel ledit coulisseau (31) est allongé selon un axe longitudinal (Y) s'étendant entre deux côtés périphériques opposés de la plaque (2), et est mobile en va-et-vient le long d'une direction (X) orthogonale au dit axe (Y) du coulisseau, pour balayer une partie substantielle de la plaque comprise entre lesdits côtés périphériques, ladite chambre de collecte et de distribution de colle (32) entre lesdites spatules étant à son tour allongée selon ledit axe longitudinal (Y).
7. L'appareil selon la revendication 6, dans lequel lesdits bords d'extrémité libres (34a) desdites spatules ont une forme arrondie.
8. L'appareil selon l'une quelconque des revendications précédentes, comprenant des moyens convoyeurs adaptés pour supporter lesdits carreaux (T) se trouvant sur la face avant dans ledit motif ordonné, et pour les déplacer vers ledit élément masque (2) puis les éloigner de celui-ci, l'élément masque étant fixe ou relevable verticalement.
9. L'appareil selon l'une quelconque des revendications précédentes, comprenant des moyens de chauffage de colle disposés en aval dudit élément masque.
10. L'appareil selon la revendication 9, dans lequel lesdits moyens de chauffage comprennent une ou plusieurs lampes infrarouges.
11. Un procédé pour obtenir un panneau de carreaux de mosaïque (T) disposés selon un motif ordonné et assemblés mutuellement de manière irréversible pour former le panneau, le procédé consistant à :
 - disposer lesdits carreaux (T) selon ledit motif ordonné, en les posant sur la face avant et avec la face arrière exposée vers le haut ;
 - superposer auxdits carreaux (T), à proximité immédiate desdites faces arrière, un élément masque (2) comprenant un agencement de orifices guides (21) pour le dépôt de points de colle respectifs entre les carreaux ;
 - répartir ladite colle sur ledit élément masque (2), en la faisant couler à travers lesdits orifices

(21) pour former lesdits points de colle qui affectent partiellement lesdites faces arrière ;

- dégager lesdits carreaux dudit élément masque (2) en les maintenant dans l'agencement de panneau ordonné ;

- appliquer un traitement thermique de chauffage audit panneau avec lesdits carreaux (T) réunis par lesdits points de colle,

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le procédé étant **caractérisé en ce que** ledit motif ordonné des carreaux est formé sur une grille (1) faite en un matériau élastique, souple et antiadhésif, tel que du silicone, la grille comprenant un certain nombre de cellules (11) dont le fond est adapté pour supporter la face avant de chaque carreau, les cellules étant séparées par des arêtes (12) adaptées pour arrêter l'écoulement de la colle s'égouttant au travers des orifices, à une hauteur déterminée.

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12. Le procédé selon la revendication 11, dans lequel lesdits orifices (21) sont positionnés en correspondance avec des couples de deux côtés se faisant mutuellement face appartenant à différents carreaux.

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13. Le procédé selon la revendication 12, dans lequel, les carreaux étant de forme carrée, lesdits orifices (21) sont positionnés en correspondance avec les points médians de tous les couples de deux côtés se faisant mutuellement face appartenant à différents carreaux.

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14. Le procédé selon l'une quelconque des revendications 11 à 13, dans lequel ladite distribution de colle permet de racler la colle sur ledit élément masque (2) par un mouvement de va-et-vient d'une ou plusieurs spatules laminaires (34).

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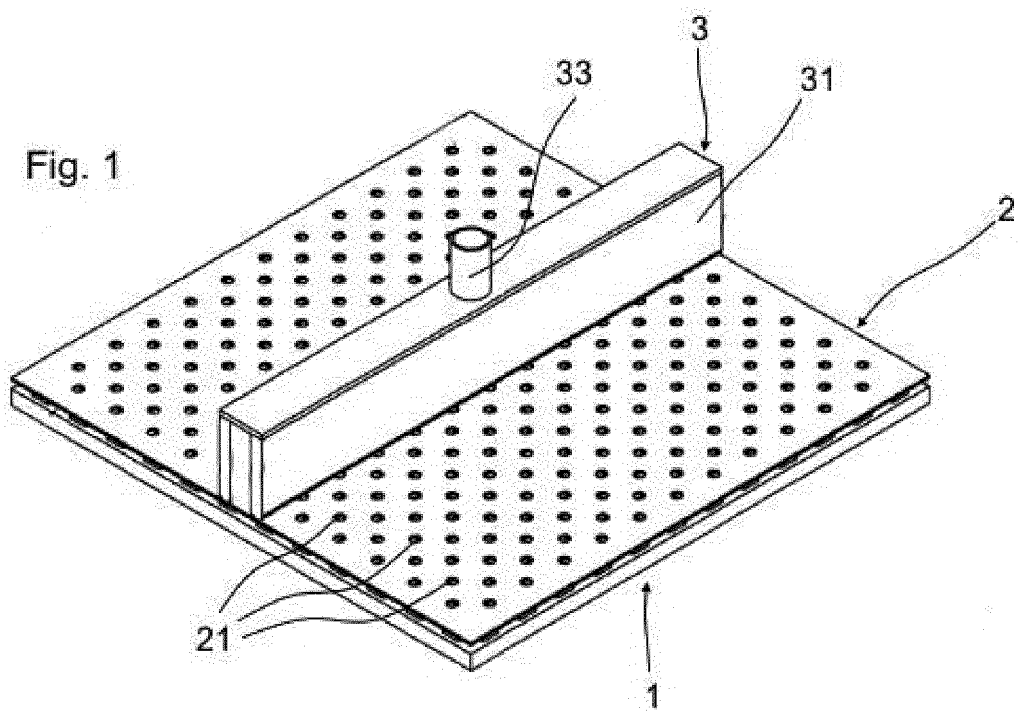
15. Le procédé selon l'une quelconque des revendications 11 à 14, dans lequel lesdits carreaux (T) selon ledit motif ordonné sont transportés vers ledit élément masque (2) puis éloignés de celui-ci.

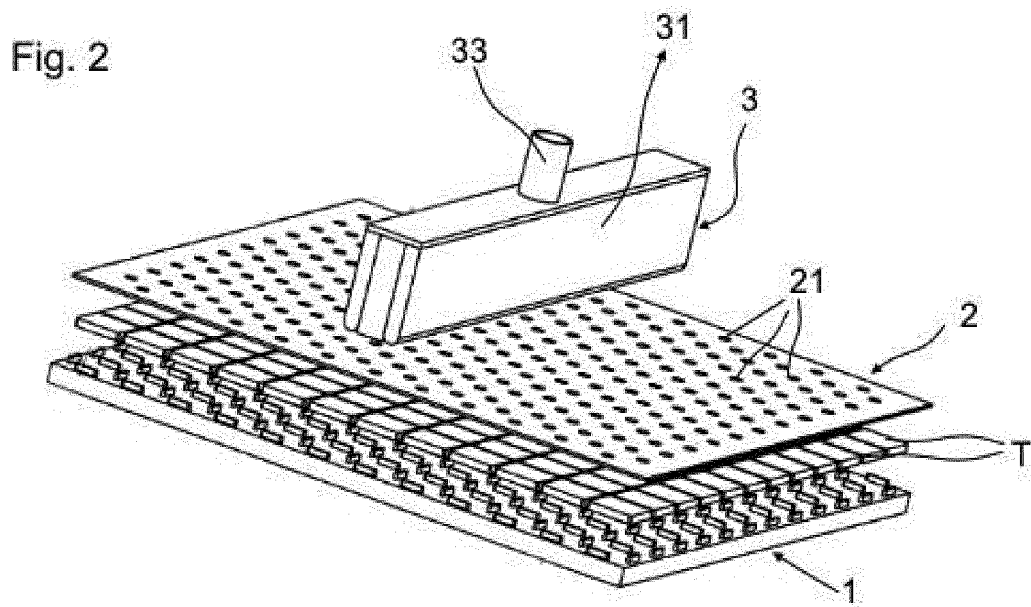
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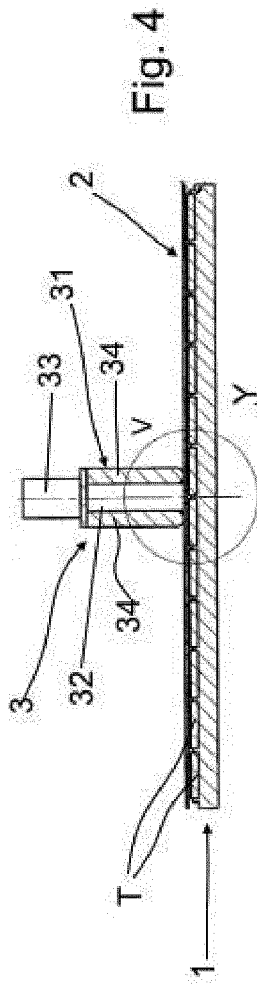


Fig. 4

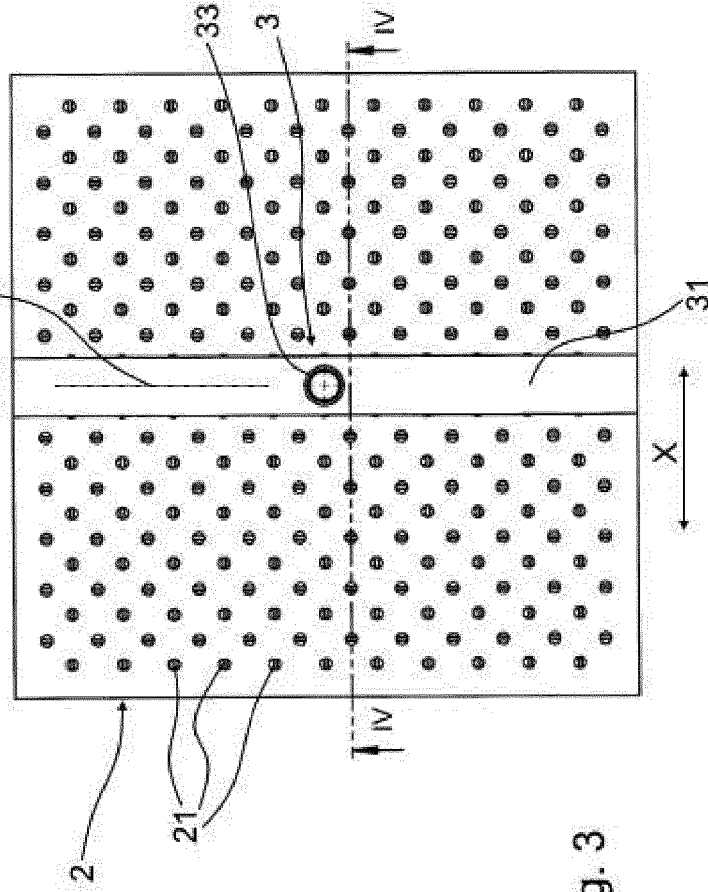


Fig. 3

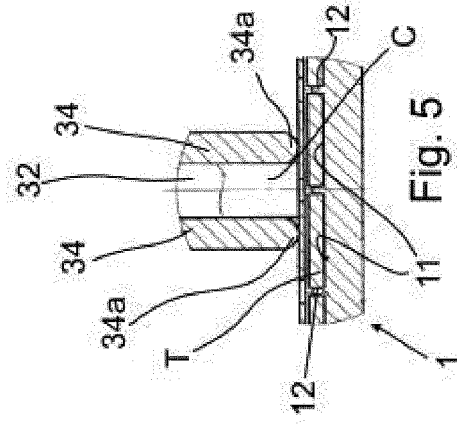


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 103375006 [0008]