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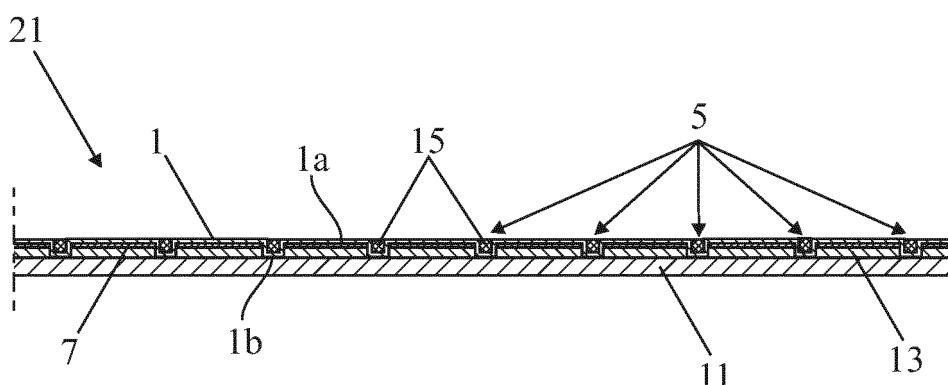
(54) **PROCESS FOR THE PRODUCTION OF A MOSAIC PANEL, AS WELL AS MOSAIC PANEL**

(57) A tile structure and a groove pattern are formed from a transparent plastic sheet 1 by means of thermo moulding. A transparent plastic sheet 1 is started from which is inserted between two mould parts and subsequently heated inductively. Subsequently, the two mould parts are brought together where the softened plastic sheet 1 is deformed while a tile structure and a groove pattern are formed in the plastic sheet.

A print is then applied to the rear side 1b of this trans-

parent plastic sheet 1 after which the plastic sheet 1 is glued with the printed side to a reinforcement sheet 11 by means of an adhesive paste 13.

The glued panel showing the grooves on the visible side 1a is finally pointed with a flexible pointing agent 15. The final result is a mosaic panel 21 having a photo print or graphical pattern built up from ostensibly loose mosaic glass stones which as a whole are similar to a mosaic glass structure.



**FIG. 6**

## Description

### Field of the invention

[0001] The invention relates to a method for manufacturing a mosaic panel.

### State of the art

[0002] It is a known fact that loose mosaic tiles are stuck to a gauze mat and the thus formed tile mats are applied to a wall or floor and subsequently pointed. This is a relatively laborious and thus expensive method.

### Summary of the invention

[0003] It is an object of the invention to provide a method for manufacturing in a relatively cost-effective manner a mosaic panel by which a mosaic tile structure can be applied to a wall or floor in a more cost-effective manner than with the known tile mats. For this purpose the method according to the invention is characterized in that the method comprises the steps of:

- applying a structure of mosaic tiles and between them a pattern of grooves in a transparent plastic sheet, which sheet has a visible side and a rear side; and
- subsequently applying a print to the rear side of the transparent plastic sheet.

[0004] By building up the mosaic panel not from individual mosaic tiles but from a plastic sheet and providing the latter with a structure such that the appearance is similar to a panel made up from loose tiles, a mosaic panel may be manufactured in a relatively cost-effective manner.

[0005] An embodiment of the method according to the invention is characterized in that applying the tile structure and the groove pattern is effected by thermo moulding of the plastic sheet such that channels are formed at small distances from each other, while the interchannel spaces form the mosaic tiles and the channels form the grooves. Thermo moulding is a relatively cost-effective process which is particularly advantageous for moulding a relatively thin plastic sheet.

[0006] Another embodiment of the method according to the invention is characterized in that applying the tile structure and the groove pattern is effected by 3D printing raised parts on the plastic sheet at small distances from each other where the spaces between the raised parts form the grooves and the raised parts form the mosaic tiles. When 3D printing is employed it is possible for each tile to be given a different appearance so that an even more true-to-nature end result can be obtained.

[0007] Yet another embodiment of the method according to the invention is characterized in that applying the tile structure and the groove pattern is effected by sub-

jecting the visible side of the plastic plate to a surface treatment so that glass mosaic is imitated and simultaneously or subsequent thereto grooves are milled or lasered in this visible side. With this method too it is possible to give each tile a different appearance, so that a true-to-nature end result can be obtained.

[0008] A further embodiment of the method according to the invention is characterized in that applying the print to the rear side of the transparent plastic sheet is effected by printing the rear side with a printer or applying a pre-printed foil to the rear side of the sheet. Preferably, a flat bed printer is used for the latter operation or a self-adhesive foil.

[0009] Still a further embodiment of the method according to the invention is characterized in that subsequently, the grooves are pointed which are present in the visible side of the sheet. In lieu of manufacturing pointed mosaic panels and applying them to a wall or a floor, it is also possible for non-pointed mosaic panels to be applied and pointing them afterwards.

[0010] Again a further embodiment of the method according to the invention is characterized in that previous to or subsequent to the pointing operation the rear side of the plastic sheet is fixed to a reinforcement sheet. The fixing operation is preferably effected by bonding with an adhesive paste or by using a double-sided adhesive foil. The mosaic panel either or not fixed to a reinforcement sheet may then be applied (glued) to the surface of the final wall that is to be provided with the mosaic design.

[0011] The grooves are preferably applied in a grid pattern and the print is preferably digitally built up from pixels which are similar to the formed mosaic tiles in terms of shape and size.

[0012] The invention also relates to a mosaic panel to be applied to a wall or a floor or other foundation, comprising a transparent plastic sheet provided with a rear side to which a print is applied and a visible side in which a mosaic tile structure is formed and where pointed grooves are present between the mosaic tiles.

[0013] An embodiment of the mosaic panel according to the invention is characterized in that the mosaic panel further includes a reinforcement sheet which is fitted to the rear side of the plastic sheet.

[0014] The grooves are preferably present in a grid pattern and the print is preferably built up in a digital version from pixels that are similar to the mosaic tiles in terms of shape and size.

### Brief description of the drawings

[0015] The invention will be described below in more detail based on examples of embodiment of the method and the mosaic panel according to the invention represented in the drawing figures., in which:

Fig. 1 represents a first step in a first embodiment of the method according to the invention in which a plastic sheet is inserted between two mould sections

and is heated inductively;

Fig. 2 represents a second step of the method in which a tile structure and a groove pattern are formed in the plastic sheet by means of thermo moulding;

Fig. 3 represents a semi-finished product obtained after the second step;

Fig. 4 represents a third step of the method in which a print is applied;

Fig. 5 represents a fourth step of the method in which a reinforcement sheet is applied;

Fig. 6 represents a fifth step of the method in which the grooves are pointed;

Fig. 7 represents a first step in a second embodiment of the method according to the invention in which tiles are printed on a plastic sheet;

Fig. 8 represents a second step of the method in which a print is applied and the grooves are pointed;

Fig. 9 represents a first step in a third embodiment of the method according to the invention in which a surface treatment is executed;

Fig. 10 represents a second step of this method in which grooves are applied;

Fig. 11 represents a third step of the method in which a print is applied and the grooves are pointed;

Fig. 12 represents a semi-finished product of the mosaic panel in which the grooves are not pointed; and

Fig. 13 represents the mosaic panel with pointed grooves present against a foundation.

### Detailed description of the drawings

**[0016]** Figs 1 to 6 represent in a diagrammatic manner the various steps of a first embodiment of the method according to the invention, or worded differently, the result subsequent to the steps of the method for manufacturing and applying a mosaic. In this method a tile structure and a groove pattern are formed by means of thermo moulding. A transparent plastic sheet 1 is taken as a basis which in a first step (see Fig. 1) is fitted between a mould 17 and a counter mould 19 and thereafter heated inductively.

**[0017]** Then, in step 2 represented in Fig. 2, the two moulds 17 and 19 are brought together while the softened plastic sheet 1 adopts the shape of the moulds. In this step both a tile structure and a groove pattern are simultaneously formed in the plastic sheet. Fig. 3 represents the semi-finished product obtained after the second step in the form of a transparent plastic sheet 1 having a visible side 1a and a rear side 1b and provided with a tile structure and grooves 5.

**[0018]** On the rear side 1b of this transparent plastic sheet 1 a print is then applied in a third step (see Fig. 4) by directly full-colour printing this side by means of a printer. The image will be digitally built up from pixels which are similar to the formed mosaic tiles 3 in terms of shape and size.

**[0019]** The processed and printed plastic sheet 1 is then, in a fourth step (see Fig. 5), glued in its entirety with

the printed side to a reinforcement sheet 11 by means of an adhesive paste 13.

**[0020]** The glued panel (having the grooves on the visible side 1a) is finally pointed in a fifth step (see Fig. 6) as a "normal" mosaic tile wall by means of a flexible pointing agent 15. The final result is a mosaic panel 21 having a photoprint or graphical pattern built up from ostensibly loose mosaic glass stones which in their entirety look like a mosaic tile structure.

**[0021]** In Fig. 7 is represented in a diagrammatic manner a first step of a second embodiment of the method according to the invention. In this method mosaic tiles 3 are applied to the visible side 1a of a plastic sheet 1 by means of a 3D printer 23.

**[0022]** Subsequently, a print 7 is applied to the plastic sheet 1 by directly full-colour printing the rear side 1b of it by means of a flat bed printer. Finally, the grooves are pointed with a flexible pointing agent 15. The mosaic panel 25 obtained in this manner is represented in Fig. 8.

**[0023]** In Figs. 9, 10 and 11 are represented in a diagrammatic manner the results after various steps of a third embodiment of the method according to the invention. Again a transparent plastic sheet 1 is taken as a basis which, in a first step (see Fig. 9), is subjected to a surface treatment on one side where the treated layer 27 has the appearance of a "genuine" glass mosaic and is scratch resistant.

**[0024]** Subsequently, in a second step (this could also be executed simultaneously with the first step) (see Fig. 10), on the same side of this plastic sheet 1 it is provided with grooves 5 in a fixed pattern for example by means of milling or lasering. In this example this groove pattern is a grid having square shapes between the grooves.

**[0025]** Subsequently, in a third step (see Fig. 11), a print is applied to the untreated rear side 1b of this transparent plastic sheet 1 by applying a printed self-adhesive foil 9 to this side. The image will be digitally built up from pixels which are similar to the formed mosaic tiles 3 in terms of shape and size. Subsequently, in a fourth step, the processed and printed plastic sheet 1 is glued in its entirety with the printed rear side 1b to a reinforcement sheet 11 by means of a double-sided adhesive foil 28.

**[0026]** The result is a photoprint or graphical pattern built up from ostensibly loose mosaic glass stones, which in their entirety look like a mosaic tile structure (see Fig. 12).

**[0027]** The thus formed panels can be applied to a foundation 31 at the final destination and be pointed as a "normal" mosaic tile wall by means of a flexible pointing agent 15.

**[0028]** Albeit the invention has been described in the foregoing based on the drawings, it should be observed that the invention is not by any manner or means restricted to the embodiments shown in the drawings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the scope defined by the claims.

## Claims

1. A method for manufacturing a mosaic panel (21; 25; 29) comprising:
  - applying a structure of mosaic tiles (3) and between them a pattern of grooves (5) in a transparent plastic sheet (1), which sheet has a visible side (1a) and a rear side (1b); and
  - subsequently applying a print (7) to the rear side of the transparent plastic sheet (1).
2. A method as claimed in claim 1, **characterized in that** applying the tile structure and the groove pattern is effected by thermo moulding of the plastic sheet (1) such that channels are formed at a small distance from each other, while the interchannel spaces form the mosaic tiles (3) and the channels form the grooves (5).
3. A method as claimed in claim 1, **characterized in that** applying the tile structure and the groove pattern is effected by 3D printing raised parts on the plastic sheet at a small distance from each other where the spaces between the raised parts form the grooves and the raised parts form the mosaic tiles.
4. A method as claimed in claim 1, **characterized in that** applying the tile structure and the groove pattern is effected by subjecting the visible side (1a) of the plastic plate (1) to a surface treatment so that glass mosaic is imitated and simultaneously or subsequent thereto grooves (5) are milled or lasered in this visible side.
5. A method as claimed in any one of the preceding claims, **characterized in that** applying the print (7) to the rear side of the transparent plastic sheet (1) is effected by printing the rear side (1b) with a printer or applying a preprinted foil (9) to the rear side (1b) of the sheet (1).
6. A method as claimed in any one of the preceding claims, **characterized in that** subsequently the grooves (5) are pointed which are present in the visible side (1a) of the sheet (1).
7. A method as claimed in claim 6, **characterized in that** previous to or subsequent to the pointing operation the rear side (1b) of the plastic sheet (1) is fixed to a reinforcement sheet (11).
8. A method as claimed in any one of the preceding claims, **characterized in that** the grooves (5) are applied in a grid pattern.
9. A method as claimed in any one of the preceding claims, **characterized in that** the print is digitally built up from pixels which are similar to the formed mosaic tiles (3) in terms of shape and size.
10. A mosaic panel (21; 25; 29) to be applied to a wall or other foundation (11), comprising a transparent plastic sheet (1) provided with a rear side (1b) to which a print (7) is applied and a visible side (1a) in which a mosaic structure is formed and where pointed grooves (5) are present between the mosaic tiles (3).
11. A mosaic panel (21; 25; 29) as claimed in claim 10, **characterized in that** the mosaic panel further includes a reinforcement sheet (11) which is fitted to the rear side (1b) of the plastic sheet (1).
12. A mosaic panel (21; 25; 29) as claimed in claim 10 or 11, **characterized in that** the grooves (5) are present in a grid pattern.
13. A mosaic panel (21; 25; 29) as claimed in claim 10, 11 or 12, **characterized in that** the print (7) is built up digitally from pixels which are similar to the mosaic tiles (3) in terms of shape and size.

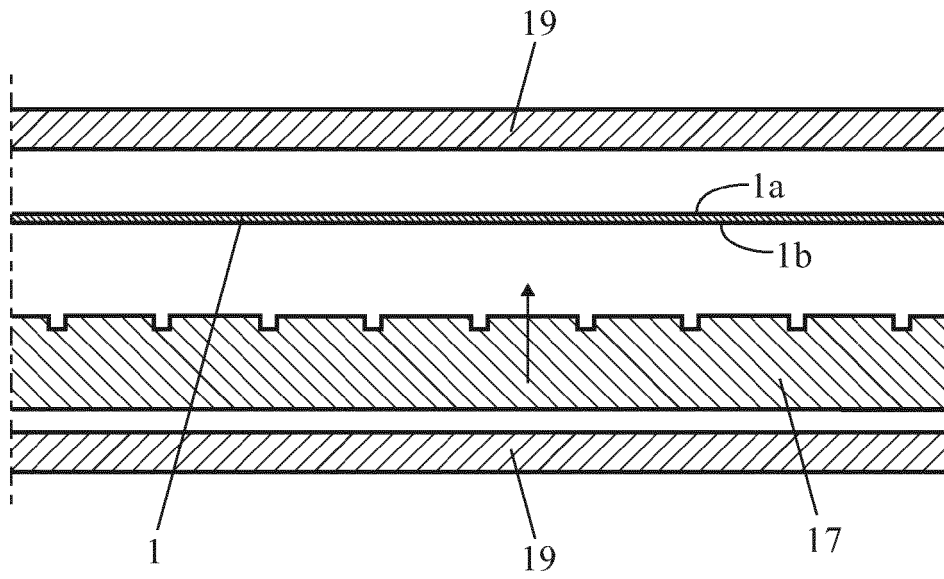


FIG. 1

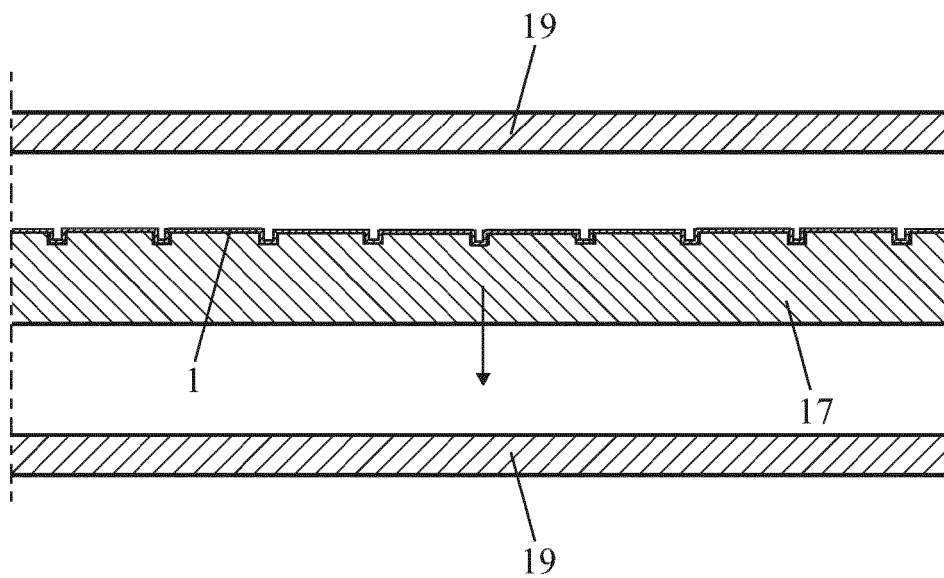


FIG. 2

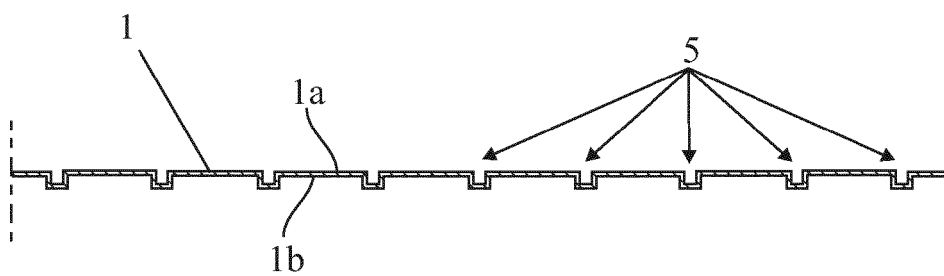


FIG. 3

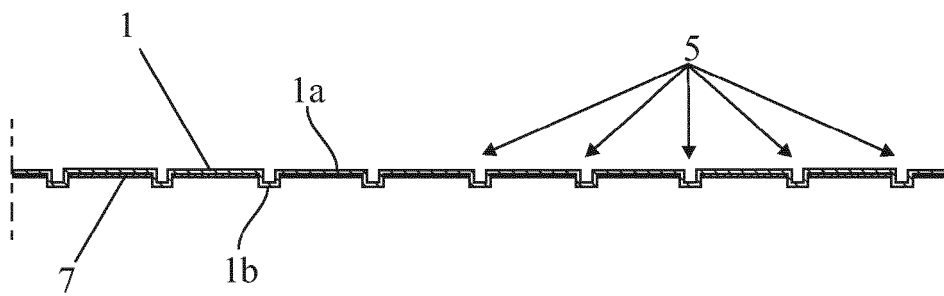


FIG. 4

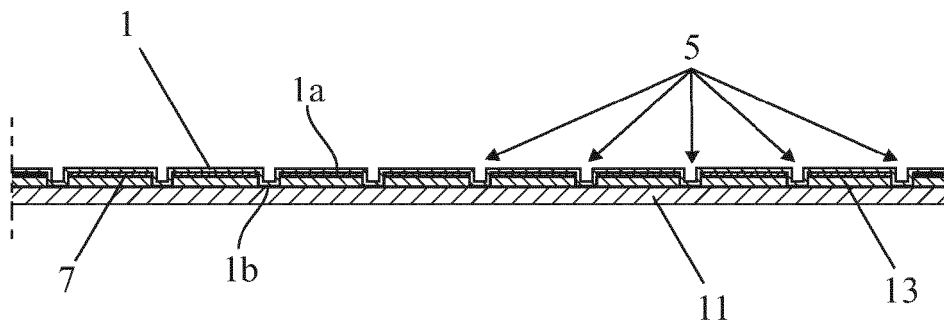


FIG. 5

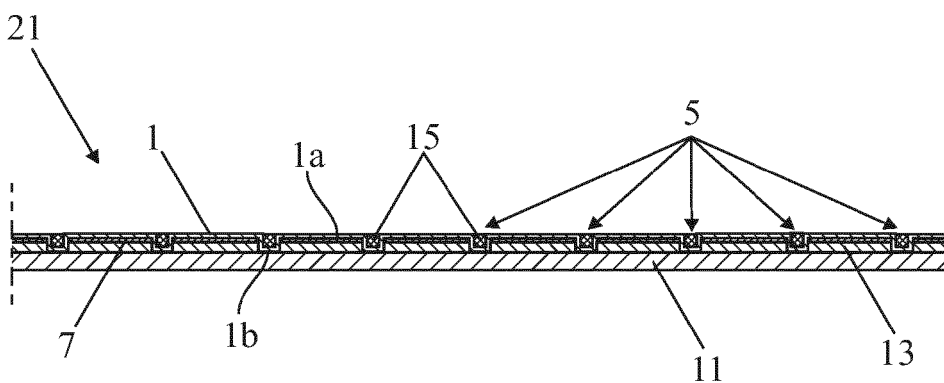


FIG. 6

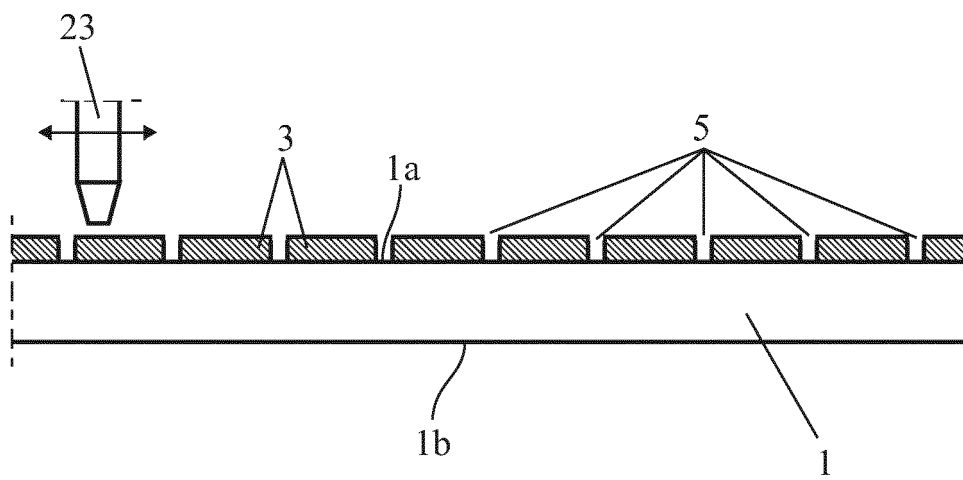


FIG. 7

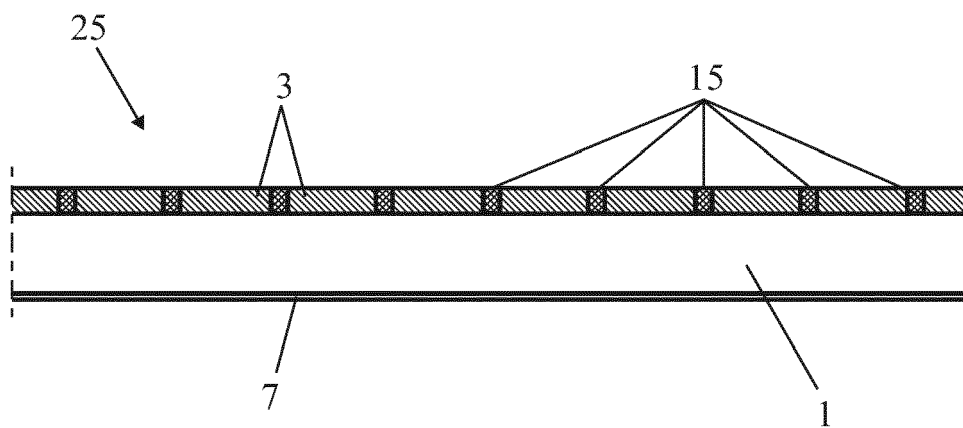


FIG. 8

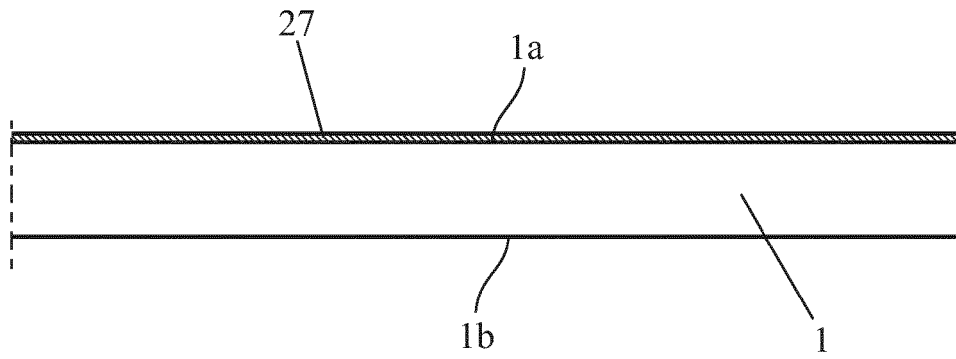


FIG. 9

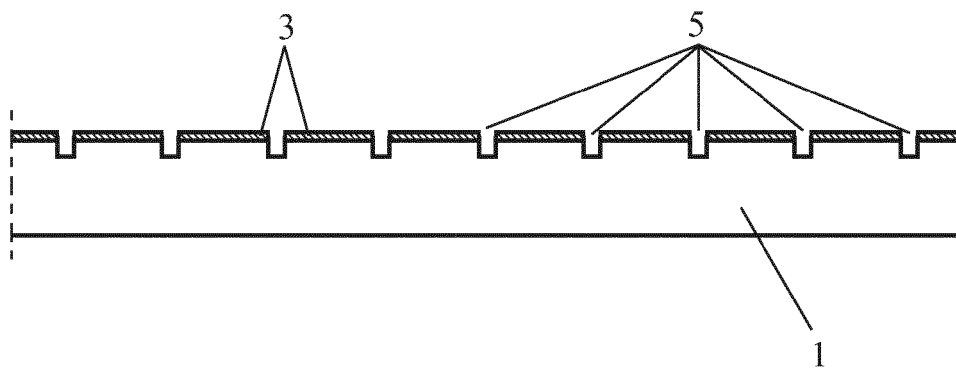


FIG. 10

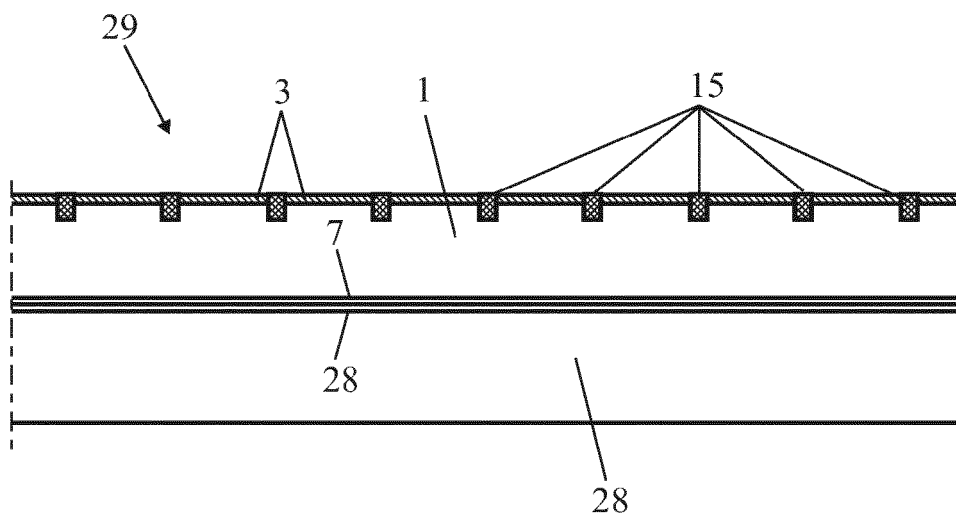


FIG. 11



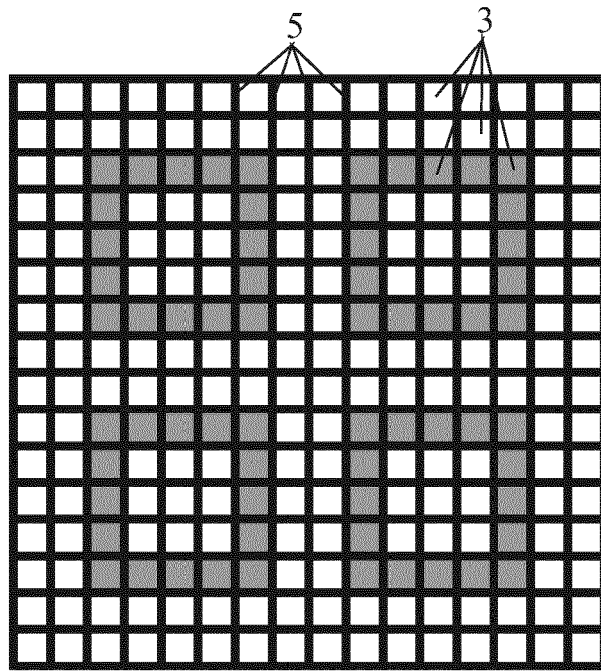


FIG. 12

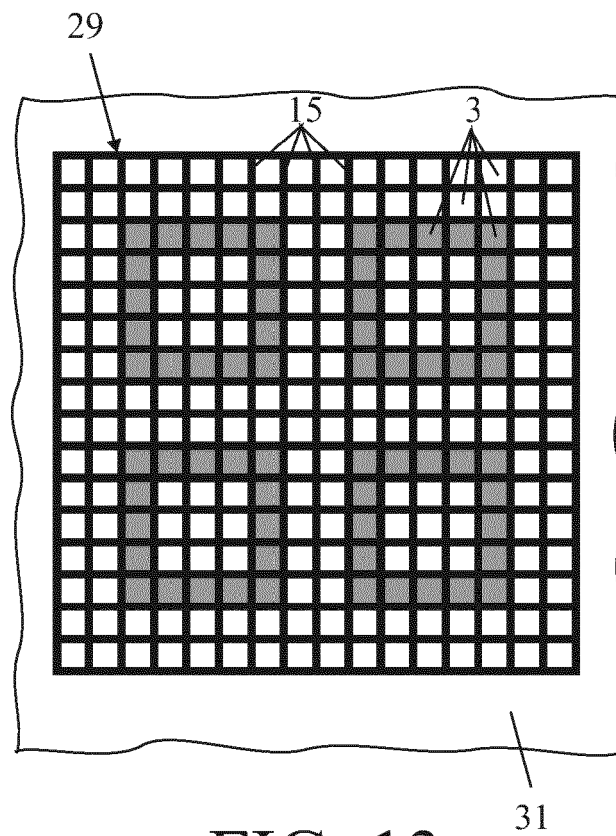


FIG. 13



## EUROPEAN SEARCH REPORT

Application Number  
EP 15 17 2991

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2008/117316 A1 (STONE ITALIANA SPA [IT]; DALLA VALLE ROBERTO [IT]) 2 October 2008 (2008-10-02) * abstract; figures 1-6 * * page 1, line 29 - line 33 * * page 6, line 2 - line 26 * -----	1-13	INV. B44F11/04  ADD. B29C51/00 B29C67/00 B33Y10/00
A	LU 34 380 A (SERVAIS-WERKE AG) 22 May 1956 (1956-05-22) * claim 1; figures * * page 5, last paragraph * -----	1-13	
A	FR 1 546 816 A (VIEUX) 22 November 1968 (1968-11-22) * the whole document * * -----	1-13	
A	DE 10 2009 056238 A1 (ARTHOR S IMPERIAL DESIGN S GBR VERTRETUNGSBERCHTIG [DE]) 15 September 2011 (2011-09-15) * abstract; figure 1 * * paragraph [0048] - paragraph [0056] * -----	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			B44F B44C B29C
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>3 November 2015</b>	Examiner <b>Lanaspeze, Jean</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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03-11-2015

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