

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 April 2006 (20.04.2006)

(10) International Publication Number
WO 2006/042148 A2

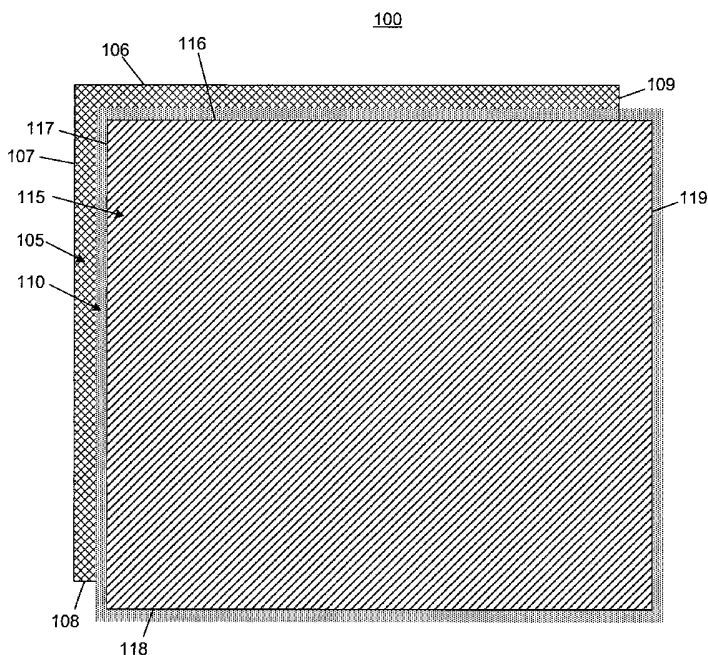
- (51) International Patent Classification:
E04F 15/00 (2006.01)
- (21) International Application Number:
PCT/US2005/036227
- (22) International Filing Date: 7 October 2005 (07.10.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/960,177 7 October 2004 (07.10.2004) US
- (71) Applicant (for all designated States except US): **MO-HAWK CARPET CORPORATION** [US/US]; 160 South Industrial Boulevard, Calhoun, GA 30701 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **CORNIA, Silvano** [US/US]; 6420 Lochridge Drive, Plano, TX 75093 (US).
- (74) Agents: **SCHNEIDER, Ryan, A.** et al.; 600 Peachtree, N.E., Suite 5200, Atlanta, GA 30308 (US).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: GROUTLESS TILE SYSTEM



(57) Abstract: The present invention is a tile system that does not require a grout or other material to be spread over the tiles during the installation process. Accordingly, the tile system includes tiles that carry a flange that attaches to adjacent tiles upon installation. The flange serves the function of the grout and eliminates the need for a separate grout compound. A tile in accordance with the present invention includes a primary tile component and a flange for attaching for other tiles.

WO 2006/042148 A2

GROUTLESS TILE SYSTEM

5 **FIELD OF THE INVENTION**

The present invention is directed generally toward floor and wall covering tiles. More particularly, it is directed towards a tile system that does not require a grout compound to be applied to the tiles after
10 installation.

BACKGROUND OF THE INVENTION

Ceramic tiles are widely used as a floor and wall covering in both
15 residential and commercial applications. Tile is very versatile, and has been in use as a floor and wall covering for centuries. Tiles are available in a nearly unlimited color palette and may be installed in an equally unlimited number of designs. Tile is often a top choice for floor and wall coverings because of its great durability and aesthetic qualities.

20 While many tiles are manufactured from ceramic compositions (baked clay), they may be made of a variety of natural or synthetic materials including, but not limited to, granite, quartz, marble, soapstone, plastic, wood, or any other suitable material.

Tile provides a durable surface and may be coated to be
25 substantially impervious to water and other liquids. When tiles are installed, they are generally laid side by side on a surface such as a floor or wall. Typically, an adhesive compound is used as a base to attach the tiles to a surface and then grout is spread over and between the tiles to

further bind the tiles to the surface and to fill spaces between adjacent tiles. While not impervious to water and moisture, the grout provides a barrier to reduce moisture between and behind the tiles. This step of grouting the tiles is labor intensive and represents a significant portion of the labor involved in a typical tile installation.

Due to the time and labor involved in tile installation, it is typically quite costly to have tile professionally installed. Accordingly, many homeowners desire to install tile in their own homes. Unfortunately, this is an extremely tedious process, and many homeowners do not wish to spend the time necessary for a satisfactory installation.

In recent years, manufactures have attempted to produce do-it-yourself tile solutions that are easier to install. One such attempt is described in United States published patent application number US 2004/0031226 entitled "Pre-glued Tongue and Groove Flooring" by Miller et al. Miller et al. describes a laminated "tile" that uses a pre-applied glue for fastening the tiles together. While this system is easier to install than traditional tiles, it still requires a separate grout to be applied and uses a laminate material rather than a solid tile. A laminate material, is not likely to be as durable as more traditional materials such as ceramic or stone tiles. Additionally, because the Miller et al. tile system makes use of a laminated structure that is susceptible to moisture damage, the installer is required to apply a messy grout composition to the tiles as part of the installation process.

A previous attempt to produce an easy to install tile is described in United States patent number 2,693,102 entitled "Interlocking Wall Tile" by Luster et al. Luster et al. describes a synthetic wall tile system that snaps together. Unfortunately, the Luster et al. tile is not practicable with substantially ridged materials, such as ceramic, granite, or marble. The

Luster et al. tiles are molded into a uniform structure of a single material and rigid materials could not be formed into an operable tab structure as taught in the patent. Such a limitation severely limits the aesthetic qualities available for the tiles and thereby reduces the marketability of the system.

Accordingly, there is a need in the art for a tile system that is simple to install.

Additionally, there is a need in the art for a tile system that does not require a grout or sealing compound to be applied to the tiles after installation.

Further, there is a need in the art for an easy to install tile system that makes use of durable tile materials.

Also, there is a need in the art for a tile system that primarily utilizes traditional tile materials, but eliminates the need for grout.

SUMMARY OF THE INVENTION

The present invention is directed toward a covering for a planar surface comprising a first tile having at least a first and second first tile sidewall carrying a first flange along the respective sidewalls, a second tile having at least a first and second tile sidewall carrying a second flange along the respective sidewalls, the first flange being matingly adapted for attachment to the second flange carried by the second tile.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more readily understood from a reading of the following specifications and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown and wherein:

Fig. 1 is a top view illustration of a tile in accordance with an exemplary embodiment of the present invention;

10 Fig. 2 is a plan view illustration of a tile in accordance with an exemplary embodiment of the present invention;

Fig. 3 is a plan view illustration of two adjacent tiles in accordance with an exemplary embodiment of the present invention;

15 Fig. 4 is a plan view illustration of two adjacent tiles in accordance with an exemplary embodiment of the present invention; and

Fig. 5 is a top view illustration of a tile in accordance with an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED

EMBODIMENTS

20 Referring now to the drawings, in which like numerals refer to like parts throughout the several views, Fig. 1 is a top view illustration of a tile 100 in accordance with an exemplary embodiment of the present invention.

The present invention is directed toward a tile system that does not require the use of a separate grout compound during installation of the tiles. Rather, the tile system incorporates tiles having a flange 110

attached to the perimeter of each tile 100 and is attached to an adjacent tile 100 during installation. In accordance with an exemplary embodiment of the present invention, a tile 100 comprises a primary tile component 115 and a flange 110. Typically, the primary tile component 115 may be a ceramic compound. Alternatively, the tile substrate 115 may be, but is not limited to, plastic, wood, stone, granite, marble, or any other suitable natural or synthetic material. Generically, the primary tile component 115 refers to an outer visible layer of the tile.

Typically, the primary tile component 115 has a substantially planar outer surface with depending sidewalls. Flange 110 may be a single cut out piece which is positioned around the tile perimeter abutting the tile's sidewalls. Preferably flange 110 in an exemplary embodiment of the present invention is applied to the primary tile component 115 using a rapid injection mold die. Alternatively, any suitable method for adhering the flange 110 to the primary tile component 115 may be employed. For instance flange 110 may comprise distinct components which are separately adhered to the perimeter of the primary tile component. Preferably, the sidewalls have a predetermined height and the flange abuts the sidewalls at a height at least up to the mid-point of the sidewalls. Also, the flange may abut the entire perimeter of the tile.

In an exemplary embodiment of the present invention, the flange 110, may be of polymeric material and preferably is a polyurethane material, such as ELASTOCASTr70654 by BASF®. ELASTOCASTr70654 is an unpigmented, 77 to 79 Shore D urethane elastomer designed for cross-sections up to three inches which has some inherent tackiness. This system is based on the ELASTOCAST7073 system.

The following data may be helpful in producing the material used in a flange 110 in accordance with an exemplary embodiment of the present invention. This data is provided for example only, and is not intended to limited the scope of the invention. Other compositions may
 5 be used to fabricate the flange 110.

Mix Ratio @ 105 index:	100 parts of ELASTOCASTr7065R Resin 771. parts of WUC 3192T ISOCYANATE
Specific Gravity:	Resin 1/048 f/cc, 8.72 lbs./gal. @ 77 °F Iso 1.22 g/cc, 10.2 lbs./gal. @ 77 °F
Viscosity:	Resin 1120 cps @ 77 °F Iso 200 cps @ 77 °F
Typical Reactivity:	Hand mixed at 86 °F at 105 index Gel time: 180 to 240 seconds
Recommended processing conditions:	Component temperatures: Resin 75 - 95 °F Iso 75 - 95 °F Mold temperature: 130 - 160 °F Demold time: 10 - 20 minutes

Alternatively, other polymer variations, such as polyamides, vinyl polymers and polyolefins may be used. Preferably, the flange 110 may
 10 be made, but is not so limited, from a material that is chemical resistant, stain resistant, non-porous, and formable to within sufficient precision. Additionally, it may be desirable for the flange 110 to have sealing qualities so as to impede the intrusion of moisture between and behind the tiles and adherence qualities so as to minimize or prevent movement
 15 or displacement of the tiles.

The flange 110 may take a variety of forms. In an exemplary embodiment of the present invention, the flange 110 may be a dovetail configuration for matably engaging a correlated dovetail pattern on a second tile 100. In such an arrangement, the two tiles 100 lock together
 20 to form a lock-joint. In addition to dovetail joints, any alternative

locking joint may be used such as, but not limited to a tongue and groove joint. In another exemplary embodiment of the present invention, the flange 110 may lock two tiles 100 together using adhesive properties in the flange material. In such an arrangement, the flange 110 may be
5 designed to provide sufficient tack so as to lock the tiles together through adhesion. In such an arrangement, it may be desirable to provide a removable backing strip on the exposed tacky surfaces of the flange 110 so that it will not collect dust and other particles prior to installation. Accordingly, the removable strip may be removed at the time of tile
10 installation.

The tile 100 may also include a base substrate 105. The base substrate 105 may provide a base upon which the remainder of the tile elements are constructed. The base substrate 105 may also provide additional strength for the tile 100. Because the base substrate 105 is
15 covered by the primary tile component 115, the appearance of the base substrate 105 may not be critical. Thus, it may be desirable to use a scrap tile material, or other inexpensive material, for the base substrate 105 to minimize costs. In an exemplary embodiment of the present invention, the primary tile component 115 is attached above the base substrate 105
20 using an adhesive component 112. The adhesive component 112 may be the same polyurethane used for the flange 110. Alternatively, the adhesive component 112 may be any adhesive suitable for binding the primary tile component 115 to the base substrate 105.

The primary tile component 115 may be disposed in an offset
25 configuration as shown in Figs. 1 and 2. Fig. 2 illustrates a plan view of a tile 100 in accordance with an exemplary embodiment of the present invention. In such a configuration, a portion of the top surface of the base substrate 105 adjacent two of its side edges 106, 107 is exposed

adjacent two side edges 116, 117 of the primary tile component.

Additionally, two side edges 118, 119 of the primary tile component 115 hang over two of the side edges 108, 109 of the base substrate 105. This configuration allows adjacent tiles 100 to overlap partially when installed on a floor or wall in a typical abutting arrangement.

As shown in Fig. 2, adhesive 112 may be integral and of the same material as flange 110. Adhesive 112 may be partially exposed on the upper surface of base substrate 105 enabling attachment of a second tile 100 as shown in Fig. 3.

For some installations, it may be desirable to include an underlayment 205 that acts as a moisture or sound barrier. Additionally, the underlayment 205 may serve a surface leveling function. Further, the underlayment 205 may serve as an adhesive for attaching the tiles to an installation surface, such as a floor or a wall.

Fig. 3 shows an excerpt of a plan view of two adjacent tiles 100 in accordance with an exemplary embodiment of the present invention. As shown in Fig. 3, two adjacent tiles (tile A and tile B) overlap when installed beside each other. The leading edge of the primary tile component 115a of tile A extends over the base substrate 105b of tile B. As shown in this figure, flange 110b which is attached to primary tile component 115b is utilized for abutting a sidewall of primary tile component 115a. This illustrates that while the preferred embodiment utilizes flange 110 around the entire perimeter of primary tile component 115, some configurations may be had wherein, flange 110 is selectively located on certain predetermined sidewalls of primary tile component 115 such as only three sides or two sides.

Alternatively, the base substrate 105 and the primary tile component 115 may be manufactured as a single piece. This combined

piece may have a profile such that the overlapping configuration shown in Figs. 1-3 is duplicated without the use of separate base substrates 105 and primary tile components 115. Further, the primary tile component 115 may be used alone without a base substrate 110. In such an embodiment, adjacent tiles 100 would not overlap and the flange 110 of a first tile 100 would abut the flange 110 of a second tile 100.

Fig. 4 shows an excerpt of a plan view of two adjacent tiles 100 (tile A and tile B) in accordance with an exemplary embodiment of the present invention, wherein the primary tile component 415 is not disposed above a base substrate 105. As is shown in Fig. 4, two primary tile components 415a and 415b lie adjacent one another and the flange 410a of tile A abuts the flange 410b of tile B. In such an arrangement, it may be desirable for the two flanges 410a and 410b to attach adhesively. Alternatively, the two flanges 410 may interlock as described above in a dovetail or other locking arrangement.

Fig. 5 shows a top view of a tile 100 in accordance with an exemplary embodiment of the present invention. As shown in Fig. 5, the flange 110 may be formed with a plurality of dovetail connections to allow a locking joint with adjacent tiles. In such a configuration, a male dovetail member 505 may be inserted into a female dovetail member 510 during installation. Preferably, the dovetail components 505, 510 provide a tight fit so that minimal movement is allowed between tiles.

Although various embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.

I CLAIM:

1. A tile comprising:
a substantially rigid primary tile portion having an upper surface
5 and a first side edge, and a second side edge;
a flange adjacent at least said first and second side edges of said
substantially rigid primary tile portion; and
said flange being manufactured from material more resilient than
said substantially rigid primary tile portion.
- 10 2. The tile of claim 1 wherein said flange is manufactured from
polymeric material.
3. The tile of claim 1 wherein said primary tile component is
ceramic.
4. The tile of claim 1, wherein said first tile sidewalls have a
15 predetermined height and said first flange extends at least up to the
midpoint of said sidewall.
5. The tile of claim 1, wherein said first tile has a perimeter and
said first flange abuts the entire perimeter.
6. The tile of claim 1, wherein said first flange is made from a
20 material different than said ceramic tile.
7. The tile of claim 1, wherein said first flange is a
polyurethane based material.
8. The tile of claim 1, wherein said first flange is
ELACTOCASTr70654.

9. A covering for a planar surface comprising:
a first tile having at least a first and second first tile sidewall
carrying a first flange along said respective sidewalls,
a second tile having at least a first and second tile sidewall
5 carrying a second flange along said respective sidewalls;
said first flange being matingly adapted for attachment to said
second flange carried by said second tile.
10. The covering for a planar surface of claim 1, wherein said
first tile sidewalls have a predetermined height and said first flange
10 extends at least up to the midpoint of said sidewall.
11. The covering for a planar surface of claim 1, wherein said
first tile has a perimeter and said first flange abuts the entire perimeter,
and said second tile has a perimeter and said second flange abuts the
entire perimeter.
- 15 12. The covering for a planar surface of claim 1, wherein said
first tile is a ceramic tile.
13. The covering for a planar surface of claim 4, wherein said
first flange is made from a material different than said ceramic tile.
14. The covering for a planar surface of claim 1, wherein said
20 first flange is a polyurethane based material.
15. The covering for a planar surface of claim 1, wherein said
first flange is ELACTOCASTr70654.
16. The covering for a planar surface of claim 1, wherein said
first flange further comprises a first interlocking structure that is
25 operative to interlock with said second flange on said second tile.
17. The covering for a planar surface of claim 8, wherein said
first interlocking structure is a dovetail.

18. The covering for a planar surface of claim 8, wherein said first interlocking structure is a groove.

19. The covering for a planar surface of claim 8, wherein said second flange further comprises a second interlocking structure that is operative to interlock with said first flange.

20. The covering for a planar surface of claim 11, wherein said second interlocking structure is a protrusion.

21. The covering for a planar surface of claim 1 further including a base substrate carrying said first tile.

22. A tile comprising:

a base substrate having an upper surface, a lower surface, a first side edge, and a second side edge;

a primary tile portion having an upper surface, a lower surface, a first side edge, and a second side edge, wherein said primary tile portion is carried by said base substrate and offset such that a portion of the upper surface of said base substrate adjacent the first side edge of the base substrate protrudes beyond the first side edge of the primary tile portion, and a portion of the lower surface of said primary tile portion adjacent the second side edge of the primary tile portion protrudes beyond the second side edge of the base substrate; and

a first flange adjacent the first side edge of said primary tile portion.

23. The tile of claim 22, wherein said base substrate is a ceramic tile.

24. The tile of claim 22, wherein said primary tile portion is a ceramic tile.

25. The tile of claim 22, wherein said first flange is manufactured from a polymeric based material.

26. The tile of claim 22, wherein said first flange is manufactured from ELACTOCASTR70654.

5 27. The tile of claim 22, further comprising:
a first adhesive component between the base substrate and the primary tile portion for adhering the base substrate to the primary tile portion.

10 28. The tile of claim 22, wherein an exposed portion of said adhesive component extends beyond the first side edge of the flange.

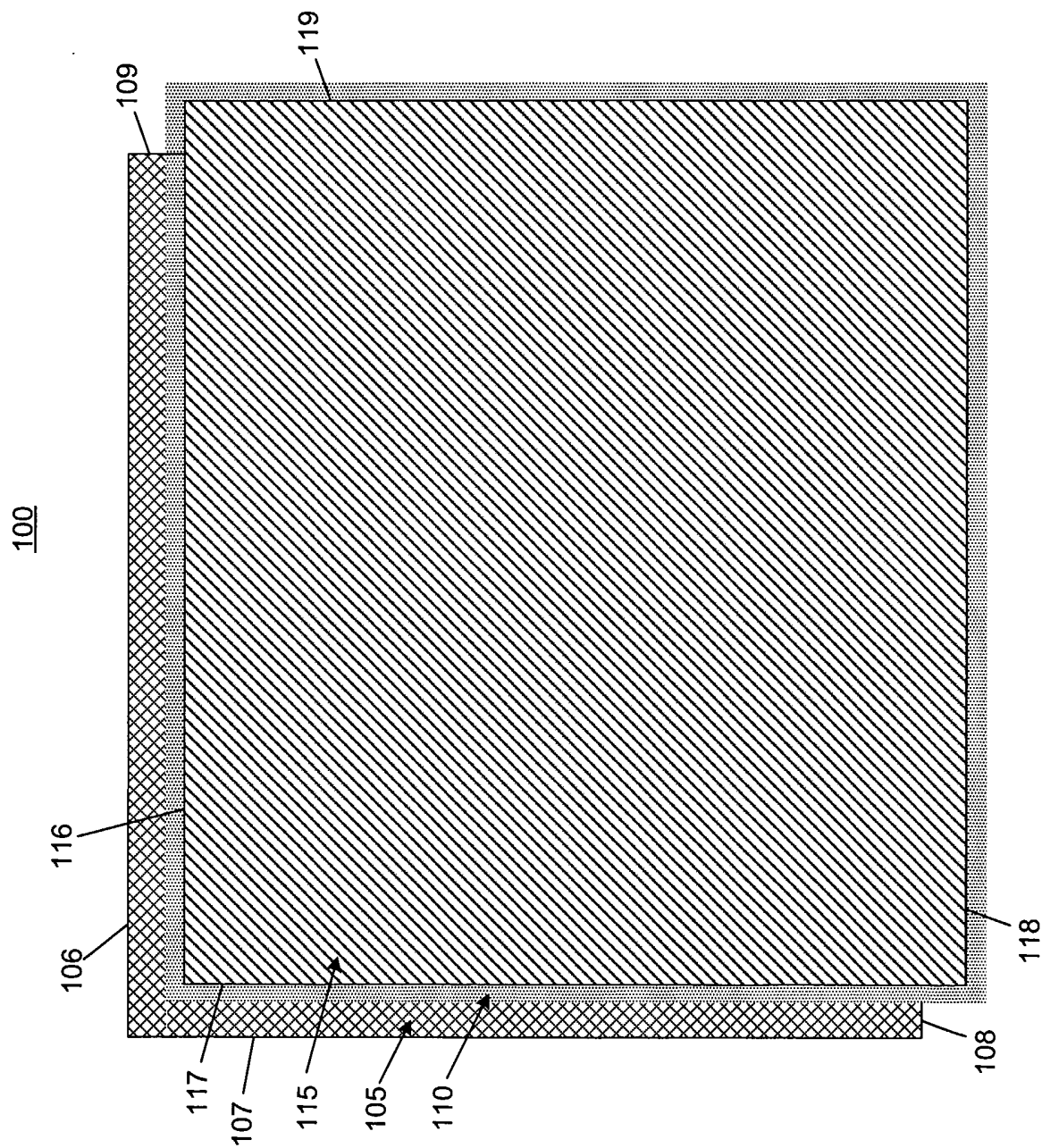


Fig. 1

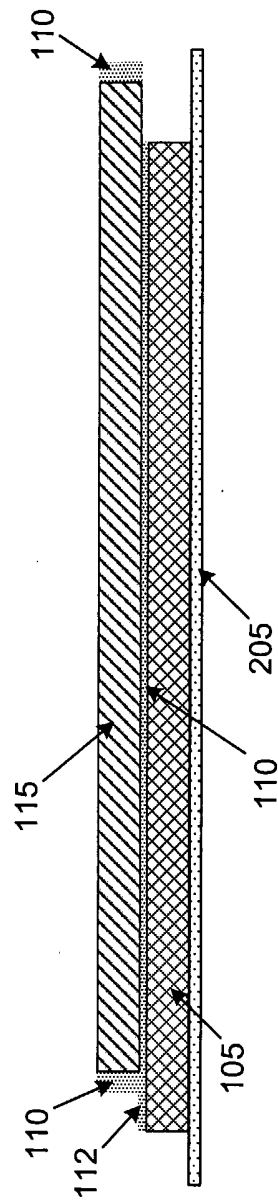


Fig. 2

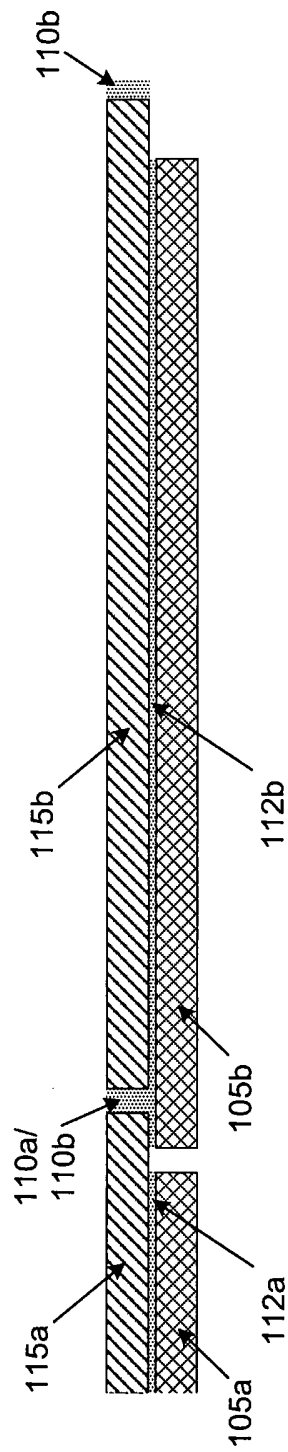


Fig. 3

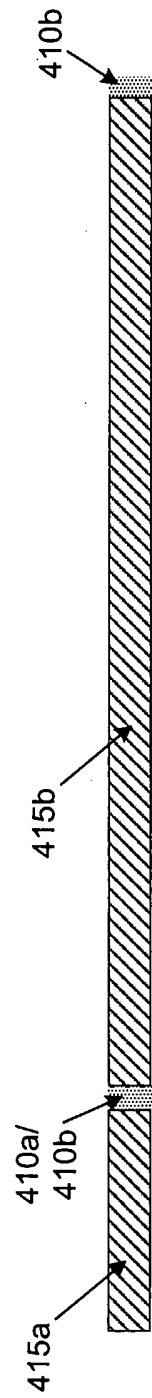


Fig. 4

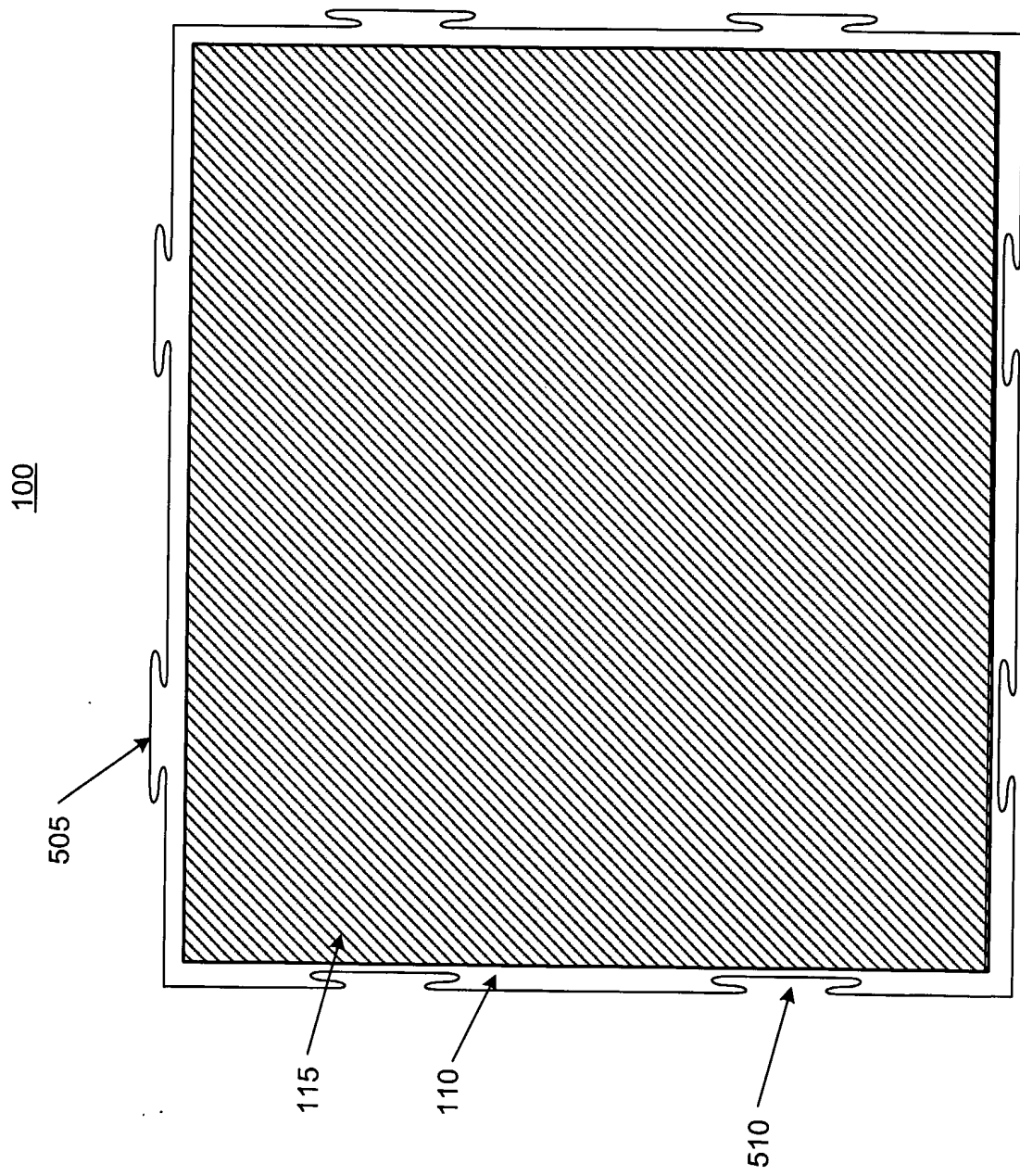


Fig. 5