TILE WITH INTERFITTING LEDGES AND RECESSES

Harry Bussey, Jr., 174 Lesley Lane, Middletown, N.J.

This invention is a continuation of my copending application for Tiling, Serial No. 74,648, now abandoned, which I filed on December 8, 1960. My invention relates to improvements in tiling and in methods of mold- ing the same.

It is an object of my invention to provide tiling which may be interconnected with ease and accuracy.

It is another object of my invention to provide tiling which may be interconnected with adjoining tiles in either an aligned or an offset manner to provide variations in the pattern of the tiling.

It is a further object of my invention to provide tiling which will interlock with similar tiling by cooperative over and under locking of recesses and ledges.

It is an additional object of my invention to provide tiling which is water resistant, fire resistant and light in weight; which is suitable for acoustical, thermal or electrical insulation; which can be readily painted or cleaned; and which can have ornamental designs molded thereon.

It is a still further object of my invention to provide a method of molding tiling having the characteristics recited above.

Other objects and features of my invention will become apparent from the following description and the accompanying drawings forming a part hereof in which:

FIGURE 1 is a plan view of a tile embodying my invention having an ornamental design upon the face surface thereof;

FIGURE 2 is a plan view of the back of the tile shown in FIGURE 1;

FIGURE 3 is a side elevation of the tile shown in FIGURE 1 in the direction of arrows 3—3 thereof;

FIGURE 4 is a side elevation of the tile shown in FIGURE 2 in the direction of arrows 4—4 thereof; and

FIGURE 5 is a fragmentary cross sectional view of a mold containing tiling material in which a recess has been formed by the temporary insertion of a plug.

Speaking generally, the tile of my invention comprises a body member having a face; a back; a first pair of sides of a predetermined thickness extending between the face and the back, each of the first pair of sides having a first ledge which extends outwardly therefrom along a portion of the length thereof and has a lower surface substantially coplanar with the back of the body member and a thickness less than said predetermined thickness; a second pair of sides extending between the back and the face, each of the second pair of sides having a second ledge which extends outwardly therefrom along a portion of the length thereof and is disposed between and spaced apart from the planes of the face and the back and which has a thickness less than said predetermined thickness; another portion of each of the first pair of sides having a recess thereon which has a surface extending inwardly from said side, said recess extending from the back of the body member to said surface of the recess and positioned to align with the ledge of a tile adjacent thereto corresponding to said first ledge, said surface of said recess being adapted to engage the upper surface of said corresponding first ledge.

My preferred method for making this tile comprises the steps of inserting tiling material into the first portion of a mold; inserting plug members of the second portion of the mold into the tiling material; solidifying the tiling material; withdrawing the plug members from the tiling material; and withdrawing the solidified tiling material from the first portion of the mold.

Referring to the drawings for a detailed description, FIGURE 1 is a plan view of a substantially square tile 7 embodying my invention having an ornamental design upon its face surface. In the preferred embodiment of my invention tile 7 is made of a processed thermoplastic material, such as polystyrene for example, which may be made as described in United States Letters Patent Nos. 2,744,291, 2,787,809 or 2,681,321. Tiling material made from such material is water resistant, fire resistant and light in weight, and is effective as acoustical, thermal and electrical insulation. Tiling made from such material can also have ornamental designs molded thereon, and can be readily painted or cleaned.

As shown in FIGURE 1, tile 7 comprises in part a body member having a face surface upon which there is an ornamental design, and two pairs of similar adjacent sides. A first ledge 9, 10 extends outwardly along a portion of the length of each of the first pair of adjacent sides, and a series of spaced apart second ledges 18, 19, 20, 21 extend outwardly along a portion of the length of each of the second pair of adjacent sides. FIGURE 2, a plan view of the back of the tile shown in FIGURE 1, also shows the first ledges extending outwardly from the first pair of adjacent sides, and the series of second ledges 18, 19, 20, 21 extending outwardly from the second pair of adjacent sides.

As shown in FIGURE 3, a side elevation of the tile shown in FIGURE 1 in the direction of arrows 3—3 thereof, and FIGURE 4, a side elevation of the tile shown in FIGURE 2 in the direction of arrows 4—4 thereof, each first ledge has a lower surface which is substantially coplanar with the back of the body of the tile and a thickness which is less than the thickness of the side of tile 7 from which it extends. Further, each second ledge is disposed between and spaced apart from the planes of the face and the back of tile 7, and has a thickness which is less than the thickness of the side of tile 7 from which it extends. The thickness of tile 7 is predetermined before the tile is made according to the characteristics desired in the finished tile, for example the desired degree of acoustical insulation.

FIGURES 1, 2, 3 and 4 also illustrate that portions of the first pair of sides have recesses 12, 13, 14 which have surfaces extending inwardly from the side, each recess extending from the back of the tile 7 to its respective surface. Recesses 12, 13, 14 are adapted to align with the ledge of a tile positioned adjacent to tile 7 corresponding to second ledge, and the said surfaces of recesses 12, 13, 14 are adapted to engage the surfaces of a tile positioned adjacent to tile 7 which correspond to upper surfaces of said ledges 19, 20, 21 of tile 7.

Similarly, as shown most clearly in FIGURE 4, portions of each of the second pair of sides 16, 17 also have recesses with surfaces extending inwardly from the side, each recess extending from the back of the tile 7 to its respective surface. These recesses are positioned to align with the ledge of a tile positioned adjacent to tile 7 which cor-
respond to first ledges 9, 10, and the said surfaces of these recesses are adapted to engage the surfaces of a tile positioned adjacent to tile 7 which correspond to upper surfaces of first ledges 9, 10. As a result of the configuration and positioning of the aforementioned ledges and recesses, when tiles corresponding to tile 7 are disposed adjacent to one another recesses 12, 13, 14 in the first pair of sides are adapted to receive ledges corresponding to second ledges 19, 20, 21, and the recesses in the second pair of sides 16, 17 are adapted to receive ledges corresponding to first ledges 9, 10. Similarly, second ledges 18, 19, 20, 21 are adapted to enter recesses corresponding to recesses 12, 13, 14 shown in the first pair of sides to tile 7, and first ledges 9, 10 are adapted to enter recesses corresponding to the recesses shown in the second pair of sides 16, 17 of tile 7. In this way adjacent tiles may be interlocked in a coplanar relationship to one another. Also, the relative dimensions and positions of the various ledges and recesses are such that adjacent tiles may be placed either in an aligned or in a halfway offset relation to one another, second ledges 19, 20, 21 fitting loosely into the recesses of the first pair of sides extending between the face and the back, each of the first pair of sides being coplanar with the back of the body member and a thickness less than the thickness of said first pair of sides; a second pair of sides 16, 17 extending between the back and the face, each of the second pair of sides being coplanar with the back of the body member and a thickness less than the thickness of said second pair of sides having recesses 12, 13, 14 therein which has a surface extending perpendicularly inward from said side which is substantially coplanar with the upper surfaces of said second ledges 18, 19, 20, 21, said recess extending from the back of the body member to said surface of the recess by means of openings 25 in the back of the tile opposite the recesses 12, 13, 14, and another portion of each of the second pair of sides having a recess 22, 23 therein which has a surface extending perpendicularly inward from said side which is substantially coplanar with the bottom surfaces of said second ledges 18, 19, 20, 21, said recess extending from the back of the body member to said surface of the recess. It will be noted that all of the recesses in the first pair of sides and the second pair of sides which were described above are open on two sides. Thus, instead of relying upon the insertion of a tongue into a slot having five closed sides and one open side, I employ recesses having at least two and in some cases three open sides and rely upon complementary over and under locking of ledges and recesses to hold adjoining tiles together. As is clear from the drawings, first ledges 9, 10 lie in a different plane from second ledges 18, 19, 20, 21 and the recesses 12, 13, 14 in the first pair of sides lie in a different plane from the recesses in the second pair of sides 16, 17.

More specifically, when adjacent tiles are joined together the bottom surfaces of first ledges 9, 10 are substantially coplanar with the back of the adjoining tile, the top surfaces of first ledges 9, 10 engage the surfaces of the adjoining tile corresponding to the surfaces of the recesses in the second pair of sides which extend inwardly from those sides of the tile, and the latter surfaces are substantially coplanar with the surfaces of the adjoining tile corresponding to the bottom surfaces of second ledges 18, 19, 20, 21. Also, the surfaces of the recesses in the first pair of sides which extend inwardly from those sides of the tile engage the top surfaces of the ledges of the adjoining tile which correspond to second ledges 18, 19, 20, 21. In this way, complementary over and under locking is provided to lock adjoining tiles in a coplanar relationship.

In FIGURE 2 openings 25 are shown in the back of tile 7 opposite the recesses in the first pair of sides. These openings correspond in size to that of recesses 12, 13, 14 and result from the disposition of plug members through each of the openings during the molding of tile 7. These plug members form the recesses in the first pair of sides by preventing the tilting material from flowing into the recess spaces while the tile is being molded. Once the tile is molded the plug members are withdrawn, and the tile is then withdrawn from the remainder of the mold. The use of such plug members is illustrated in FIGURE 3, which is in plan view of recesses of the back of the body member containing tiling material in which a recess has been formed by the temporary insertion of plug member 26. These plug members may be separate units or they may all be integrally united. If the latter method of molding is used, the contour of tile 7 may be wholly determined by a two-piece mold. In any case, the plug members are used only during the molding process and are removed before tile 7 is locked to adjoining tiles.

It is seen that by practicing my invention in the manner described it is possible to provide tiling which may be interconnected with ease and accuracy by means of a cooperating form of over and under locking, adjoining tiles being either aligned or offset with respect to one another. It is also seen that by practicing my invention in the manners described it is possible to provide such tiling which is water resistant, fire resistant, light in weight, inexpensive for acoustical, thermal or electrical insulation, which can have ornamental designs molded thereon and which can also be readily painted or cleaned.

Although specific embodiments of my invention have been described and shown, variations in structural detail and method steps within the scope of the appended claims are possible and are contemplated. For example, a design may be made on both the face and the back of a tile making it reversible, and/or a moldable material other than a processed thermoplastic material such as polyethylene might be used. There is therefore no intention of limitation to the exact structures and methods herein set forth.

I claim:

1. A tile comprising a body member having
   (1) a face;
   (2) a back;
   (3) a first pair of sides of a predetermined thickness extending between the face and the back; each of the first pair of sides having
      (a) a first ledge which
      (i) extends outwardly therefrom along a portion of the length thereof,
      (ii) has a lower surface substantially coplanar with the back of the body member, and
      (iii) has a thickness less than said predetermined thickness;
   (4) a second pair of sides extending between the face and the back; each of the second pair of sides having
(a) a plurality of spaced apart second ledges, each of which
(i) extends outwardly therefrom along a portion of the length thereof,
(ii) is disposed between and spaced apart from the planes of the face and the back, and
(iii) has a thickness less than said predetermined thickness;
(5) each of the first pair of sides also having a plurality of recesses therein, each of which
(a) has a surface extending inwardly from its respective side,
(b) extends from the back of the body member to said surface and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to said second ledge; and
(6) each of the second pair of sides also having a recess therein which
(a) has a surface extending inwardly from said side,
(b) extends from the back of the body member to said surface and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to said first ledge.

2. A tile comprising a body member having
(1) a face;
(2) a planar back;
(3) a first pair of adjoining sides of a predetermined thickness extending between the face and the back; each of the first pair of sides having
(a) a first ledge which
(i) extends outwardly therefrom along the length thereof,
(ii) has a lower surface substantially coplanar with the back of the body member, and
(iii) has a thickness less than said predetermined thickness;
(4) a second pair of adjoining sides extending between the face and the back; each of the second pair of sides having
(a) a plurality of spaced apart second ledges, each of which
(i) extends outwardly therefrom along a portion of the length thereof,
(ii) is disposed between and spaced apart from the planes of the face and the back, and
(iii) has a thickness less than said predetermined thickness;
(5) each of the first pair of sides also having a plurality of recesses therein, each of which
(a) has a surface extending inwardly from its respective side,
(b) extends from the back of the body member to said surface and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to said second ledge; and
(6) each of the second pair of sides also having a recess therein which
(a) has a surface extending inwardly from its respective side which is substantially coplanar with the upper surfaces of said first ledges,
(b) extends from the back of the body member to said surface of the recess, and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to a said second ledge.

3. A tile comprising a body member having
(1) a face;
(2) a back;
(3) a first pair of sides extending between the face and the back, each of the first pair of sides having
(a) a first ledge which
(i) extends outwardly therefrom along a portion of the length thereof,
(ii) has a lower surface substantially coplanar with the back of the body member, and
(iii) has a thickness less than the thickness of said first pair of sides;
(4) a second pair of sides extending between the face and the back; each of the second pair of sides having
(a) a plurality of spaced apart second ledges, each of which
(i) extends outwardly therefrom along a portion of the length thereof,
(ii) is disposed between and spaced apart from the planes of the face and the back, and
(iii) has a lower surface substantially coplanar with the upper surfaces of said first ledges;
(5) each of the first pair of sides also having a plurality of recesses therein, each of which
(a) being perpendicular to the face and the back, and each
(b) having a first ledge which
(i) extends perpendicularly outward therefrom along a portion of the length thereof,
(ii) has a lower surface substantially coplanar with the back of the body member, and
(iii) a thickness less than the thickness of said first pair of sides;
(4) a second pair of sides extending between the back and the face, each of the second pair of sides
(a) being perpendicular to the face and the back, and each
(b) having a plurality of spaced apart second ledges, each of which
(i) extends perpendicularly outward therefrom along a portion of the length thereof,
(ii) is disposed between and spaced apart from the planes of the face and the back, and
(iii) has a lower surface substantially coplanar with the upper surfaces of said first ledges;
(5) each of the first pair of sides also having a plurality of recesses therein, each of which
(a) has a surface extending perpendicularly inward from said side which is substantially coplanar with the upper surfaces of said second ledges,
(b) extends from the back of the body member to said surface of the recess, and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to said second ledge; and
(6) each of the second pair of sides also having a recess therein which
(a) has a surface extending perpendicularly inward from said side which is substantially coplanar with the bottom surfaces of said second ledges,
(b) extends from the back of the body member to said surface of the recess, and
(c) is positioned to align with and receive a ledge of a tile adjacent thereto corresponding to said first ledge.

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FRANK L. ABBOTT, Primary Examiner.

JACOB L. NACKENOFF, Examiner.

A. C. PERHAM, Assistant Examiner.