(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 359 265 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.11.2003 Bulletin 2003/45

(51) Int Cl.[7]: **E04F 13/12**, E04F 15/02, E04F 15/06

(21) Application number: **03252731.9**

(22) Date of filing: **30.04.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(30) Priority: **04.05.2002 GB 0210336**

(71) Applicant: **Metex Flooring Systems Limited**
Shadsworth Business Park,
Blackburn, BB1 2PT (GB)

(72) Inventors:
- **Bentham, Paul**
  Abbey Village, Chorley PR6 8DL (GB)
- **Dobson, Jim**
  Over Hulton, Bolton BL5 1EN (GB)

(74) Representative: **Barker, Rosemary Anne et al**
Harrison Goddard Foote
Orlando House
11c Compstall Road
Marple Bridge
Stockport SK6 5HH (GB)

(54) Metal faced tile

(57) A base element (14), such as plywood, has a stainless steel plate (10) bonded to its upper surface with an overhang (15) allowing for application of a strip (20) of a sealing material therebelow to form a cavity sealed butt joint between tiles when they are laid side by side, usually as a floor surface. The base element (14) has tongues (17) and grooves (18) in respective edges to permit interengagement as expansion joints. A deformable, foamed plastics layer (22) may be bonded to the underside of the base (14) to allow for uneven substrate.

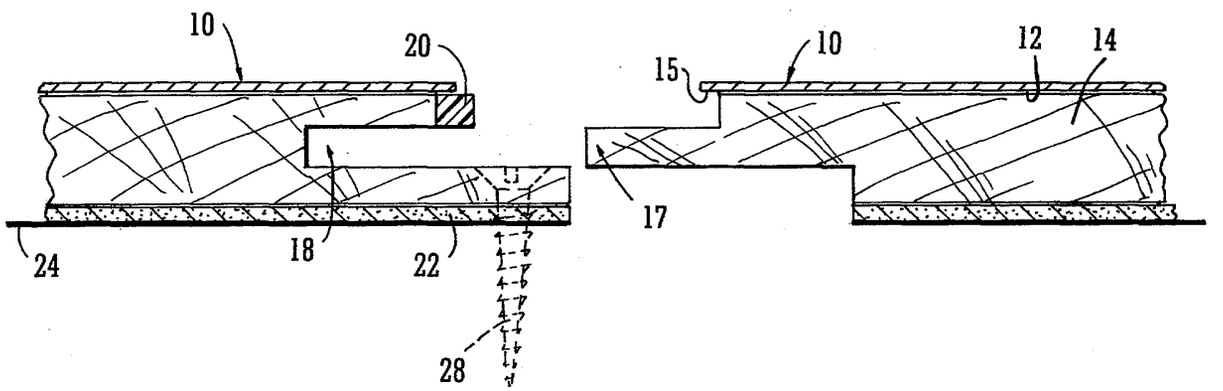

FIG. 1

EP 1 359 265 A2

Description

[0001] This invention relates to a metal faced tile, particularly but not exclusively a flooring tile having a stainless steel surface layer.

[0002] Metal tiles per se are known, including stainless steel tiles having a patterned surface which are durable, slip resistant, and easy to clean. Laying a floor of such tiles can be time consuming and difficult. An even underlying surface is essential and it is difficult to achieve a reliable seal between adjacent tiles without spoiling the tile surface at the joints.

[0003] Various floor panels are known, which are laminated and which interfit by means of tongue and groove joints, as described, for example in GB-A-2355025, GB1407655, EP-A-0161233 and W084/00785.

[0004] An object of the invention is to provide metal faced tiles which can be laid with greater ease than plain metal tiles and can be used to produce a floor having reliable waterproof and chemical resistant joints.

[0005] According to the invention a tile is provided comprising a substantially rectangular base element having an upper and a lower surface and a metal plate bonded to the upper surface, in which respect the base element is formed with tongues projecting from two of its sides and with corresponding grooves in the other two of its sides and the metal plate extends beyond side edges of the base element for a relatively short distance, sufficient to allow for application of a strip of sealing material therebelow when a plurality of such tiles are laid side by side with inter-engaging tongues and grooves and abutting metal plates.

[0006] The invention will be described further, by way of example, and by reference to various optional, but preferred, features, with reference to the accompanying drawings, in which:

Fig. 1 is a schematic, fragmentary side view showing how two tiles in accordance with the invention are fitted together and to an underlying substrate;

Fig. 2 is an exploded perspective view of a practical embodiment of a single tile in accordance with the invention; and

Fig. 3 is a comparable non-exploded view of the same tile, with a detail of one comer region.

[0007] The basic components of a practical example of the tile of the invention, as shown in all the Figures, are a stainless steel plate 10 fixed by adhesive 12 to the surface of a plywood base element 14. Both the steel plate 10 and the plywood base 14 are substantially rectangular.

[0008] The steel plate 10 is cold rolled and formed with a three-dimensional surface pattern, a pattern of raised polygons 11 being shown in the illustrated example. This type of surface is slip resistant, easy to clean, and any dents and scratches tend not to be visible, so it is durable and resistant to vandalism. This type of floor surface is highly desirable for such diverse situations as dance floors and operating theatres. The corners and edges of each steel plate 10 are radiused slightly, as indicated at 16 in the Fig. 3 detail, to avoid injuries as the tiles are laid.

[0009] The plywood base element 14 is preferably of birch, suitably between 12 and 20mm thick, and is preferably sealed against ingress of moisture and bacteria. Along two adjacent edges, i.e. at 90° to each other, it is formed with tongues 17, while along the other two edges, also at 90° to each other, it is formed with grooves 18. Thus adjacent tiles are laid with adjoining steel plate surfaces by the tongues 17 being inserted into respective grooves 18 to provide tongue and groove expansion joints, as are well known.

[0010] The adhesive 12 which fixes the steel plate 10 to the plywood 14 is preferably an epoxy adhesive which is resistant to chemicals, such as acids and strong alkalis. A specific example of a suitable adhesive type is that sold under the name "Keralastic" by an Italian Company called Mapei.

[0011] An important feature is the overhang of the steel plate 12 beyond all the edges of the birch plywood 14, as shown most clearly at 15 in Fig. 1. This overhang 15 may suitably be between 1 and 3mm beyond the plywood edges. Its purpose is to allow for the application of a polymer sealing strip 20 around all the edges of the tile, but below the steel surface, so as to form chemical and water resistant sealed expansion joints, which are essential to the function, durability and aesthetic appeal of such tiled floors.

[0012] Suitable material for the seal 20, which is capable of being applied as a strip of paste consistency from a mastic gun or the like, is a sealant sold by the British Company, Loctite Limited, under the designation MS 5065.

[0013] A layer of deformable material in the form of a foamed plastics sheet 22 is secured, again by suitable adhesive, to the underside of the plywood base element 14. This is suitably a cross-linked polyethylene extruded foam material, such as sold under the trade name "Acoustalay". It allows the tiles to be fixed to a slightly uneven substrate surface and still achieve a substantially level floor.

[0014] A sheet of substantially impermeable plastics material 24 may be bonded to the underside of the aforesaid foamed plastics layer 22 to prevent ingress of dampness from the underlying substrate. This is preferably a condensation-proof membrane.

[0015] Apertures 26 are formed in a lower layer or lower layers of the plywood base 14 adjacent the groove 18 and in the foam layer 22 and impermeable sheet to allow the tiles to be permanently secured to the underlying substrate by means of screws 28.

[0016] In use, the tiles are laid onto a substantially level floor, which should have any major unevenness re-

moved, e.g. by screeding beforehand. The first tile is fixed to the floor by means of the screws 28 along two edges. The polymer sealing material is then applied around all four edges, below the overhang 15 of the metal plate 10. The next tiles are then slid into position with their tongues 17 engaging into the grooves 18 and overlying the fixing screws. These tiles are then, in turn, secured to the floor below by further fixing screws 28. This procedure is repeated until a floor of the desired dimensions is achieved.

[0017] The edges of the stainless steel plates 10 of the adjacent tiles are butt-jointed and the margins 15 thereof which overhang the plywood allow for the cavity sealing therebelow, as already described. In this way both the abutting metal plates and the adjacent plywood edges should be sealingly connected.

[0018] The screw fixing and apertures therefor are optional, as the tile flooring could be laid free floating upon the substrate floor.

[0019] The foregoing is only illustrative of the invention and many variations in detail are possible within the scope of the appended claims. In particular, although the tiles are specifically described as being for production of a floor, they could also be used for fixing to walls and other surfaces, if so required. Also, the tongues and grooves could be formed at opposing sides (instead of adjacent sides) and in a different configuration to those shown as examples. The precise materials used for the components of the tile may, of course, vary.

Claims

1. A tile comprising a substantially rectangular base element (14) having an upper and a lower surface and a metal plate (10) bonded to the upper surface, in which respect the base element (14) is formed with tongues (17) projecting from two of its sides and with corresponding grooves (18) in the other two of its sides and the metal plate (10) extends beyond side edges of the base element (14) for a relatively short distance, sufficient to allow for application of a strip of sealing material (20) therebelow when a plurality of such tiles are laid side by side with inter-engaging tongues and grooves (17, 18) and abutting metal plates (10).

2. A tile according to claim 1 further comprising a layer (22) of deformable material bonded to the lower surface of the base element (14).

3. A tile according to claim 2 wherein the deformable material (22) is foamed plastics material.

4. A tile according to claim 2 or 3 further comprising a sheet of substantially impermeable plastics material (24) bonded to the underside of the deformable material (22).

5. A tile according to any preceding claim wherein the base element (14) is of wood.

6. A tile according to any preceding claim wherein apertures (16) are provided in the base element (14) to enable it to be fastened by screws (28) or the like to an underlying substrate.

7. A tile according to any preceding claim wherein the metal plate (10) is of stainless steel.

8. A tile according to any preceding claim wherein the metal plate (10) has a three dimensional surface pattern of projections (11) and/or indentations.

9. A floor when produced from a plurality of tiles according to any preceding claim which are laid side by side so as to have inter-engaging tongues and grooves (17, 18), abutting metal plates (10) and a strip of sealing material (20) applied below the edges (15) of the metal plates so as sealingly to connect the respective tiles.

10. A method of laying a floor using a plurality of tiles which each comprises a substantially rectangular base element having an upper and a lower surface and a method plate bonded to the upper surface, said base element being formed with tongues projecting from two of its sides and with corresponding grooves in its other two sides, and said metal plate having overhanging edges which extend beyond side edges of the base element for a relatively short distance, in which respect a first tile is laid upon a substrate floor, and is optionally secured thereto, a strip of polymer sealing material is applied below at least one of the overhanging edges of its metal plate and protruding therefrom, and a further tile is slid into adjacent position where one of its tongues engages into one of the grooves of the first tile or, respectively, one of its grooves fits over one of the tongues of the first tile, and one edge of its metal plate buts up against that edge of the metal plate of the first tile where the sealing strip has been applied and is thereby sealingly connected thereto.

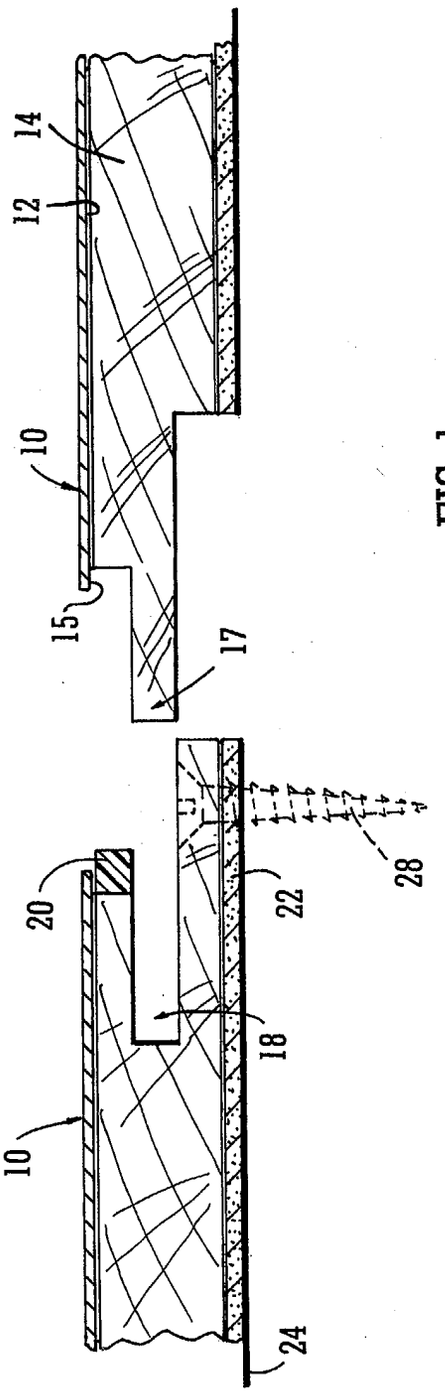

FIG. 1

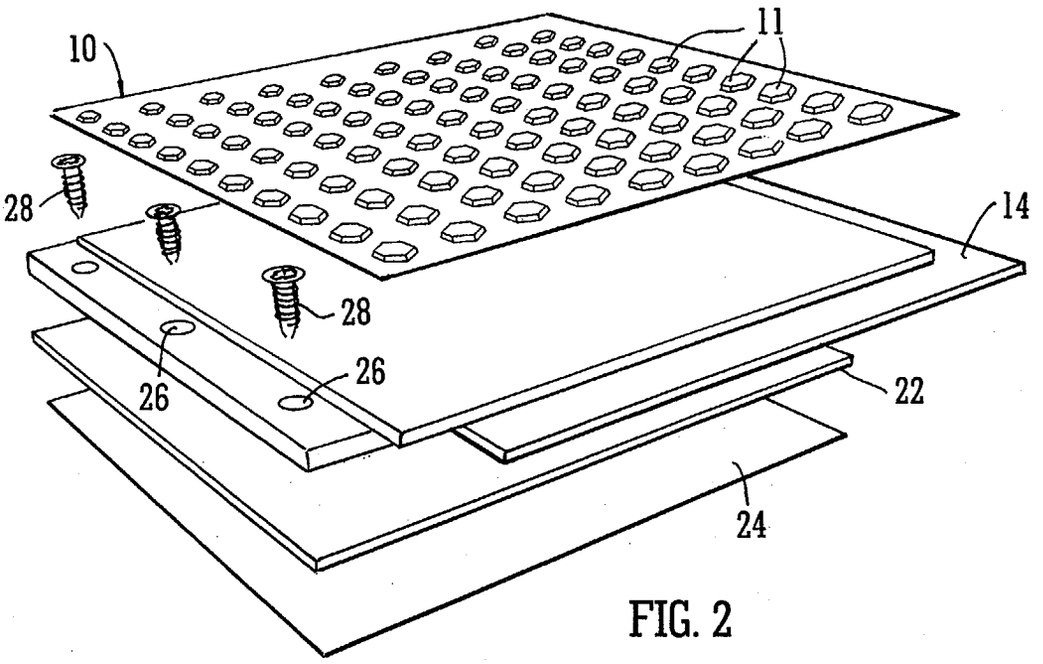

FIG. 2

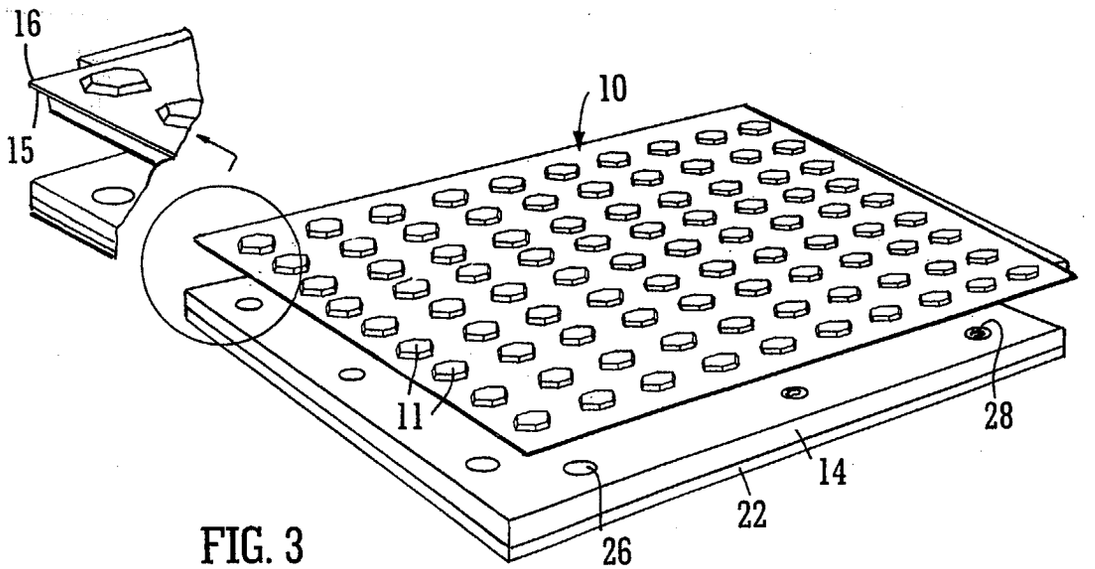

FIG. 3