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(72) Inventor: **Bevis, Ian
Richamond, Surrey TW9 4HF (GB)**

(74) Representative: **Perry, Robert Edward
GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH (GB)**

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(71) Applicant: **Bevis, Ian
Richamond, Surrey TW9 4HF (GB)**

(54) **Cushioned tile spacer system**

(57) A spacing device for use in forming an array of tiles mounted on a substrate is described. The spacing device is made of an elastomeric material and has a base part of substantially uniform thickness on which

there are radially extending fins. The corners of the tiles fit between these fins. The device allows tiles to be evenly laid on indoor floor without the use of plywood or adhesive.

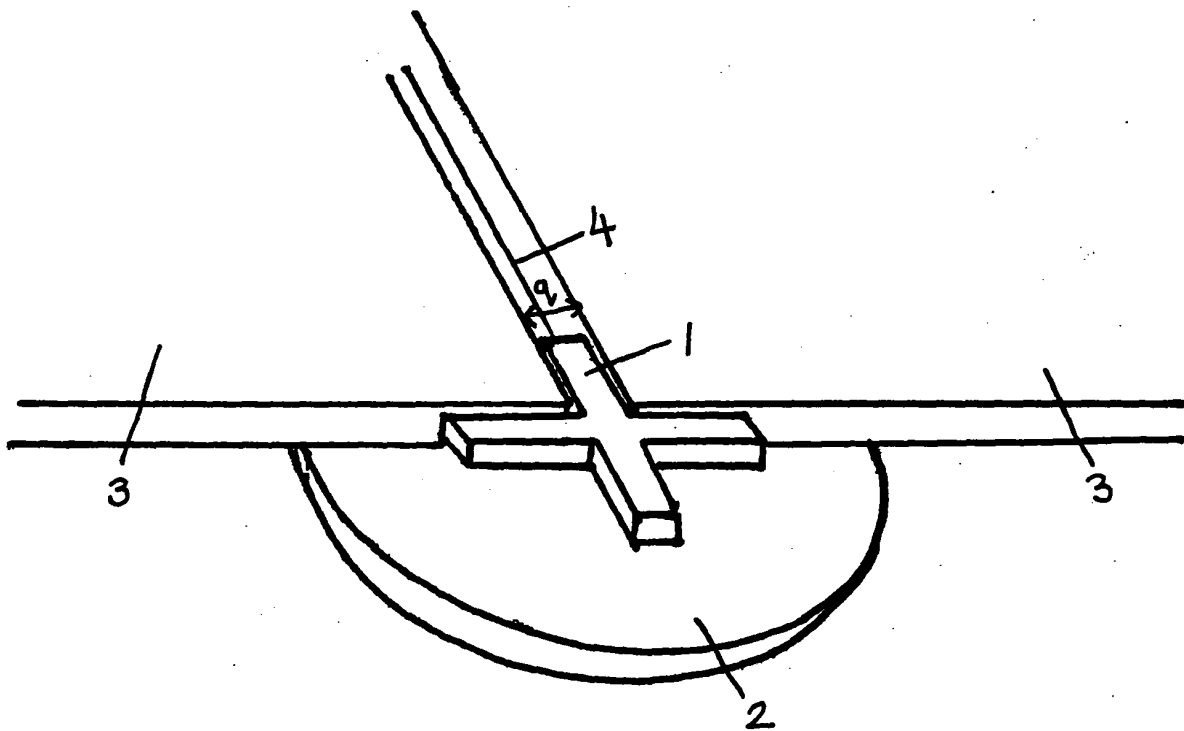


FIG. 1

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Description

Field of the Invention

[0001] The present invention relates to a spacing device for use in forming an array of tiles mounted on a substrate, to an array of tiles including such devices and to a method used in creating this array. The invention is particularly concerned with the laying of ceramic floor tiles without the use of hard adhesives.

Background of the Invention

[0002] Conventionally, floor tiles are laid on a level, flat substrate prepared from either plywood or concrete. The tiles are positioned by applying adhesive to the substrate or back of the tile and pressing the tile down onto the substrate. Many problems arise from this simple method in practice. It is firstly very difficult to achieve even spacing between adjacent tiles, and when the spacing is uneven the final array is less aesthetically pleasing. It is also very difficult to ensure that all tiles are positioned at the same height above the substrate, as tiles may get accidentally depressed when the adhesive is setting. In addition, if the tiles are mounted directly onto floorboards, and the floorboards move, the hard adhesive may crack, lifting the tiles. This is usually prevented by screwing 18 mm plywood to the floorboards in a preliminary step before tiling. The tiles are then secured to the plywood with adhesive and the plywood counterbalances any movement of the floorboards, which would otherwise cause the adhesive to crack and lift the floor tiles. The use of hard adhesive makes it difficult to replace broken tiles.

[0003] A device is already known from US2031684 which is used to space adjacent tiles at a constant separation from each other. This device is in the form of a cross and is fitted into the interstices at the adjacent corners of four tiles to create a fixed gap between the tiles. The device does not control the height of adjacent tiles above the level of the substrate, however. GB2334731 discloses a tile spacer which enables tiles to be fixed with adhesive evenly spaced from one another and also evenly spaced from a substrate to which the tiles are fixed. The spacer consists of a front portion, preferably in the shape of a cross and a back portion on which the four front portions are mounted. The front portion controls the separation of adjacent tiles and the depth of the back portion controls the height of the tiles above a substrate.

[0004] US5363560 discloses a device that spaces the corners of adjacent tiles and maintains them at an equal level over the adhesive and substrate. Both this and the spacer disclosed in GB2343731 are designed to be used with adhesive.

[0005] A spacer disk for the laying of construction plates without adhesive is described in US3861098. The plates are laid loosely on the spacer disks, which facili-

tates their easy replacement. The plates are preferably used to cover terraces, balconies and walkable flat roofs, and have grooves which facilitate the drainage of water which passes between the plate and through the centre of the disks.

Summary of the Invention

[0006] According to the present invention, an array of tiles is mounted on a substrate wherein the tiles are supported by spacing devices located at positions in the array where the corners of adjacent tiles meet, each spacing device being made of an elastomeric material and having a base part of substantially uniform thickness on which there are radially extending fins, wherein the corners fit between the fins and whereby a gap is defined between adjacent tiles and adjacent spacing devices and wherein this gap is filled with a sealant material.

[0007] The invention is also a spacing device to be used in the array of tiles as defined above.

[0008] The present invention is further a method of forming an array of tiles, the array being as defined above, including the steps of positioning the spacing devices on the substrate at appropriate positions in the array, mounting the tiles by lodging their corners in between the fins of said spacing devices and then filling the gaps created between the tiles with a sealant material.

[0009] The device for spacing tiles may be used in indoor floor coverings such as kitchen, bathroom and conservatory floors and may be used to mount tiles without the need for plywood or adhesive. This results in improved aesthetic appearance, increases the speed of the tiling procedure and ultimately reduces the cost involved.

[0010] The finished array may comprise a top surface in which the tiles and sealant are substantially flush. The fins may also form part of that surface, if not covered by sealant.

Brief Description of the Drawings

[0011]

Fig. 1 is a perspective view of part of an array which has a spacing device with a circular base part and four radially extending fins forming the shape of a cross. The drawing shows two tiles lodged in between the fins.

Figs. 2A, 2B and 2C are respectively an elevation, a top plan and a further perspective view of the spacing device in Fig. 1.

Detailed Description of Preferred Embodiments

[0012] The invention will now be described by way of example only with reference to the accompanying drawings.

[0013] Figure 1 shows a spacing device according to a particular embodiment of the present invention which has a base part 2 and radially extending fins 1. Two tiles are lodged in the spacing device.

[0014] Each fin 1 preferably has the same width (q) so that the gap 4 between all tiles is constant. Preferably, the width of each fin is in the range of 2-5mm. Figure 2A shows an elevation view of the spacing device in Figure 1. The thickness (x) of the base part 2 controls the height of the tiles 3 above the substrate. It is preferable that the base part is of substantially uniform thickness to ensure that on a level substrate, all tiles are at the same distance from the substrate. Preferably, the thickness of the base part is in the range 2-5mm.

[0015] In a preferred embodiment of the present invention, the base part of the spacing device is substantially solid.

[0016] The base part of the spacing device of the present invention may take various forms, such as a square or triangular shape, but in a preferred embodiment the base part is circular in shape. Figures 1, 2A, 2B and 2C show a spacing device according to this embodiment. In this case, the radius of the base part is preferably greater than the radii of the radially extending fins. In a particularly preferred embodiment, the radius (y) of the back part is in the range 20-40mm and the radius (z) of each fin is in the range 10-15mm.

[0017] The angle between each radially extending fin (θ) on the base part is preferably the same, and is chosen in order that the corner of a tile to be laid may be lodged therein. When square or rectangular tiles are to be laid in the array, for example, the spacing device preferably has four radially extending fins forming the shape of a cross. Figure 2B shows a spacing device with the radially extending fins arranged in the shape of a cross. In this case, the angle between the fins, θ , is 90° . In the case of hexagonal tiles, the spacing device preferably has three identical radially extending fins with an angle of 120° between adjacent fins. In the case of equilateral triangular tiles, the spacing device should have 6 identical radially extending fins with an angle of 60° between adjacent fins.

[0018] Figure 2C shows a perspective view of the spacing device in Figure 1. From Figure 2C the projection of the fins above the base part can clearly be seen. The height of each radially extending fin (w), defined as the perpendicular extension of each fin above the base part, should be sufficient to lodge the corners of the tiles in position but should not be so high that the fin cannot be concealed when the gap between adjacent tiles and adjacent spacing devices is filled with a sealant material. Preferably, the height of each radially extending fin is in the range 2-7mm.

[0019] The spacing devices may be applied to the substrate using adhesive or simply laid loosely on the substrate to facilitate easy replacement and removal.

[0020] In a preferred embodiment of the present invention, the array of tiles is mounted over a floor surface.

In a further preferred embodiment, the tiles are ceramic tiles.

[0021] The spacing device of the present invention is made of an elastomeric material, preferably rubber, e. g. high nitrile rubber, to allow the device to act as a shock absorber. This is essential when the device is to be used directly on floorboards, where movement of the floorboards must be counterbalanced to prevent the tiles from moving and cracking when pressure is applied. Furthermore, the array of tiles according to the present invention imparts a cushioning effect, which provides an improved walking sensation when compared to a rigid floor surface.

[0022] Each spacing device may be made by a process such as injection moulding.

[0023] The array of tiles in accordance with the present invention is substantially flush and forms an even, unbroken surface above the substrate. This is important when the tiles are mounted on a floor since one is less likely to stumble on a uniform surface. Such an array is also aesthetically pleasing. The array of the present invention will find particular use in any situation wherein the substrate needs to be protected from water. Thus it is envisaged that the array will be commonly used on kitchen and bathroom floors.

[0024] The tiles forming the array of the present invention are not fixed to the substrate with adhesive. This means the tiles are easily exchangeable and the substrate is easily accessible without hindrance. Furthermore, since no adhesive is used to fix the tiles to the substrate, and the tiles are mounted on spacing devices, there exists a hollow space between the substrate and the undersurface of the tiles. The size of this space may be increased by increasing the thickness of the base part of the spacing device. The space may be used to accommodate, for example, an underfloor heating system laid on the substrate. Unlike in conventional systems where the heating system would be covered with tile adhesive and then the tiles laid, the device of the present invention allows the tiles to be laid without adhesive, thus facilitating easy access to the heating system should it need to be replaced or repaired.

[0025] Usually the array of the present invention will comprise an array of ceramic floor tiles fixed on a horizontal ground substrate. However, the array may comprise tiles made from other materials, such as stone, slate, mosaic and marble.

[0026] The tile spacers may be supplied separately from the tiles to be used in the array and accordingly the present invention provides a spacing device to be used in the array of tiles as defined above.

[0027] The spacing device of the present invention may easily be broken into halves or quarters to provide spacing devices for use at the corner or edges of the array. In the embodiment of the present invention wherein the radially extending fins are in the shape of a cross, a corner spacing device would comprise one quarter of the back part and two adjacent radially ex-

tending fins (of one-half their normal width) and an edge spacing device would comprise one half of the back part and one half of the cross, wherein two opposed radially extending fins (of one-half their normal width) lie on the straight, broken edge.

[0028] When the tiles are to be laid above an under-floor heating system, the method for forming the array of tiles of the present invention further includes the initial step of laying down the underfloor heating system before the spacing devices are positioned.

Claims

1. An array of tiles mounted on a substrate wherein the tiles are supported by spacing devices located at positions in the array where the corners of adjacent tiles meet, each spacing device being made of an elastomeric material and having a base part of substantially uniform thickness on which there are radially extending fins, wherein the corners fit between the fins and whereby a gap is defined between adjacent tiles and adjacent spacing devices, and wherein this gap is filled with a sealant material. 25
2. An array according to claim 1, in which the base part is circular.
3. An array according to claim 2, in which the radius of the base part is greater than the radius of each fin. 30
4. An array according to claim 2 or claim 3, wherein the radius of the base part is 20-40 mm.
5. An array according to any preceding claim, in which the thickness of the base part is 2-5 mm. 35
6. An array according to any preceding claim, in which the width of each fin is 2-5 mm. 40
7. An array according to any preceding claim, in which the radius of each fin is 10-15 mm.
8. An array according to any preceding claim, in which the height of each fin is 2-7 mm. 45
9. An array according to any preceding claim, in which there are four radially symmetric fins.
10. An array according to any preceding claim, in which the base part is solid. 50
11. An array according to any preceding claim, in which the tiles are ceramic tiles. 55
12. An array according to any preceding claim, in which the tiles are floor tiles.
13. An array according to claim 12, mounted above a heating system laid on the substrate.
14. An array according to any preceding claim, in which the surfaces of the tiles, fins and sealant material, and optionally also the fins, are substantially flush.
15. A spacing device as defined in any preceding claim.
16. A method of forming an array of tiles according to any of claims 1-14, including the steps of positioning the spacing devices on the substrate at appropriate positions in the array, mounting the tiles by lodging their corners in between the fins of said spacing devices and then filling the gaps created between the tiles with a sealant material.
17. A method according to claim 16 which includes an initial step of laying down an underfloor heating system before the spacing devices are positioned.

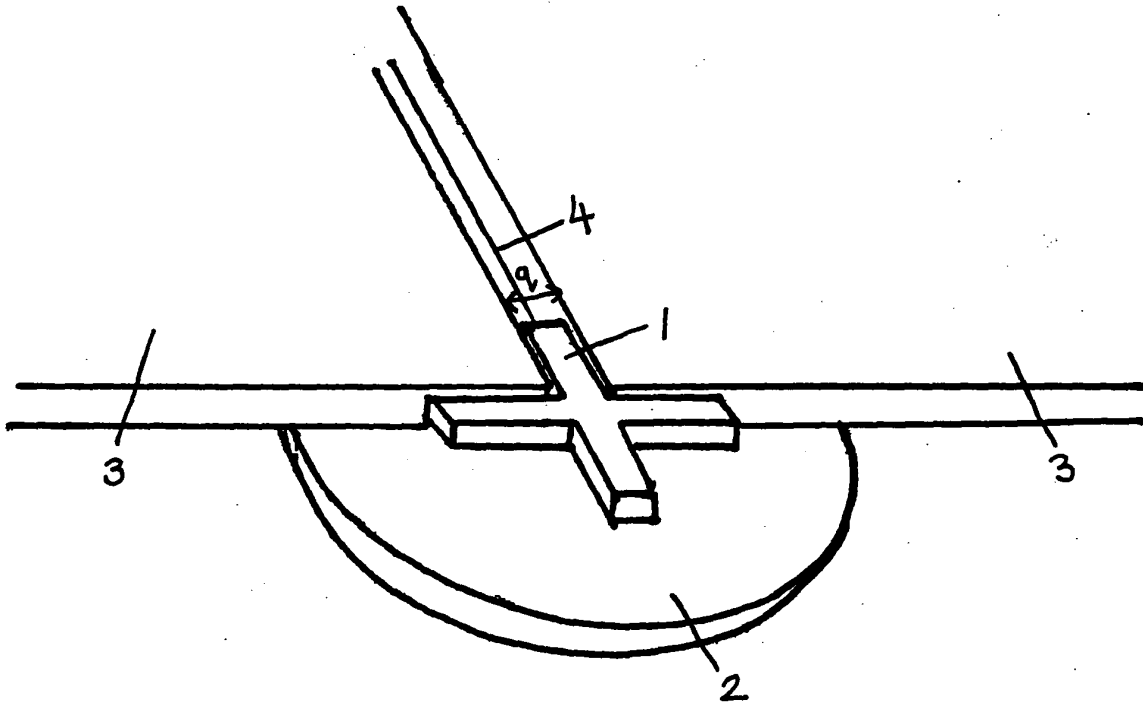


FIG. 1

