FLOOR MAT

There is provided a floor covering suitable for use at an entry to a building.

It is known to have scraper mats at the entrances of buildings which enable a person to remove mud or dirt from the underside of footwear prior to entry into the building. Such scraper mats may comprise bristles or may be rubber or PVC-based mats.

One known form of mat comprises multiple sets of pins, each set of pins being encircled by a surrounding and wherein the upwardly presented pin ends extend above the height of the surrounding and perform a scraping function. However it has been found that the pins are likely to break or become bent so that after extended use the scraping function of the mat is significantly decreased.

US-4,377,016 describes a mat having a plurality of spaced projections on a solid base layer, all projecting to substantially the same height.

GB-2 279 564A describes a mat comprising a solid base member having cleaning protrusions extending therefrom, and a plate member having apertures for receiving the protrusions.

The present invention concerns a novel form of scraper mat, which may optionally incorporate areas for inclusion of carpeting.

The scraper mat of the present invention comprises multiple sets of pins, each set of pins being located

within a surrounding formed by an array of shapes having spaces therebetween that extend through the mat, characterised in that the pins do not extend significantly beyond the highest point of the surrounding. Usually, the upper (free) ends of all of the pins within a surrounding will be level with or below the highest part of the surrounding. Advantageously, the upper (free) ends of the pins will be below the highest point of the surrounding.

Generally the mats of the present invention will be formed from materials such as rubber, plastics or thermoplastics. PVC or PVC-based materials are currently preferred, but alternative materials may be more environmentally acceptable.

The relative height of the pins and the surrounding is such that the upper ends of the pins do not protrude above the surrounding to any significant degree whilst still being of a sufficient height to aid removal of mud and dirt from the underneath of footwear. This has the advantage that the surrounding provides a degree of protection to the pins and reduces the vulnerability of the pins to breakage. The pins may be of a length chosen so that the upper (free) ends terminate at a substantially similar height to the surrounding or the upper (free) ends of the pins may terminate below the surrounding such that when a person steps onto the mat the weight of the person presses down on the surrounding and reduces the height of the surrounding by compressing or distorting it. Thus the ends of the pins are brought into contact with the lower surface of the person's footwear. Optionally the upper surface of the surrounding may be ridged or castellated.

The pins may extend from a shelf located in the base of the surrounding or otherwise in the lower portion of the mat. The presence of the shelf enables the length

of the pins to be reduced whilst still ensuring that the upper ends of the pins terminate as described above. Reducing the length of the pins increases pin strength and lowers the incidence of pin breakage.

The pins may be of any cross-sectional shape, but for ease of manufacture will normally have a generally circular cross-section. Advantageously the pins will be tapered towards or rounded at their upper (free) ends. Tapering the free ends of the pins will contribute to their overall strength.

The set of pins may include any suitable number of pins, for example may comprise 4, 5, 6, 7, 8, 9, 10, 11 or 12 pins although other numbers of pins are also possible and the present invention is not limited to any particular number of pins in a set.

The surrounding located about the set of pins may be of any shape. In the embodiments illustrated the surroundings are generally circular, but other shapes (for example oval, triangular, square, rectangular, pentagonal, hexagonal, septagonal, octagonal or other polygonal shapes) of surrounding are also possible. Additionally there may be a mixture of suitable shapes.

Optionally, the mat is provided with areas adapted for the receipt of strips of textile materials, eg carpeting. The inclusion of the textile material combines a scraping function together with the visual appearance of a carpet. The strips of textile material will be separated by sets of pins as described above. Advantageously, the upper surface of the textile material will be level with the upper surface of the pin surroundings so that the upper surface of the whole mat is generally flat.

Additionally since these areas are intended to be covered by textile material it is possible to include therein holes for screwing the mat into position or any other means of holding the mat in place which would normally be visible from above. Suitable textile materials are as described in WO-A-96/37645.

The textile material may be simply glued into place. Where the textile material is to be glued to the mat, the areas adapted for receipt of the strips of textile material may optionally have a non-smooth upper surface to provide a good surface to hold the glue.

Alternatively, if the textile material has a suitably hard backing, it may simply be snapped into the area of the mat. Optionally the area of the mat may be adapted to receive and hold a hard-backed section of textile material. For example the area may be provided with a lip which will lie over the top surface of the inserted hard-backed textile material, thereby retaining it in the mat.

Optionally, the mats of the present invention may be adapted to be releasably attached to similar mats. Thus, mats with textile portions may be attached to other forms of mats (for example mats without textile portions) in discrete units to form a combination of mats suitable for any particular location or purpose. This arrangement has the advantage of being extremely versatile. A tile mat edging system, for example as described in UK Registered Design No 2062315, may be present if desired.

In a further embodiment the present invention provides a set of floor coverings comprising a first floor covering, a second floor covering and a third floor

covering; wherein the first floor covering is a mat according to the invention, the second floor covering is a mat according to the invention and having strips of textile material incorporated therein and the third floor covering is a textile floor covering (eg a carpet). Desirably the textile portion(s) of the second floor covering are identical to or co-ordinate with the third floor covering. Generally the set of floor coverings is so placed that a person entering a building will first walk over the first floor covering, then the second floor covering and finally the third floor covering which will usually be chosen to co-ordinate with, or to match, the carpet of the room entered.

In more detail, the mat of the present invention may comprise a lower layer being formed from a repeating array of shapes, an upper layer being formed from a repeating array of shapes; wherein the arrays of the lower and upper layers overlap and are not super-imposed; and wherein the pins protrude from the upper surface of the lower layer and are located within a surrounding formed by the array of shapes of the upper layer. In a preferred embodiment the upper and lower layers both comprise arrays of circles; however other shapes are also contemplated. Additionally, it is not necessary for both layers to have the same shape(s) within their array.

Optionally, linking members may be present to span the spaces between the shapes forming the arrays of both the upper and lower layers. The linking members prevent high heeled footwear becoming wedged in the spaces and also perform a strengthening role. Advantageously, the linking members may be arranged perpendicularly to at least some of the neighbouring

linking members.

The present invention will now be further described with reference to the accompanying drawings in which:

Figure 1A is a known scraper mat viewed from above;

Figure 1B is a side view of the known scraper mat shown in Figure 1A;

Figure 2A is a mat according to the present invention having areas adapted for receipt of carpet interspersed between sets of pins;

Figure 2B is a side view of the mat shown in Figure 2A when viewed along the line BB.

Figure 3A is a schematic drawing of a corner of a mat according to the invention when viewed from above;

Figure 3B is a side view of the mat shown in Figure 3A when viewed from arrow C.

Figure 4A is a schematic drawing of a corner of a mat according to the invention when viewed from above and including edging strengthening pieces;

Figure 4B is a side view of the mat shown in Figure 4A when viewed from arrow D.

In more detail, Figure 1A shows a view from above of a known scraper mat 1 which comprises multiple sets of pins 2. Each set of pins 2 is formed from eight pins 3 enclosed by a substantially circular surrounding 4. The pins 3 are mounted on a support 6 and extend upwardly therefrom. As viewed from the side in

Figure 1B the unattached or free, upper ends 5 of pins 3 extend beyond surrounding 4 and are readily available for scraping the underneath of footwear.

As is best seen in Figure 1A, the scraper mat is formed from a lower layer 11 formed from an array of circles and upper layer 12 also formed from an array of circles. These layers 11,12 are arranged so the centre of each circle in the upper layer 12 sits over the approximately square shaped motif 14 formed between neighbouring circles in the lower layer 11. The pins 3 are located on the portions of the four lower layer circles which together form the approximately square shaped motif 14. Consequently, each set of pins 2 is located within the centre of an upper layer circle which forms the surrounding 4 for that set 2.

In Figure 2A the lower layer 11 is again formed from an array of circles but the upper layer 12 is partially comprised of circles arranged generally as shown in Figure 1A interspersed by areas 7 adapted for receipt of strips of textile floor covering, eg carpet. Areas 7 may be of any size or shape required. One convenient size is 14.3cm x 3.8cm (55/8 x 11/2inches). These areas 7 are shown with a pattern on the upper surface thereof, the pattern being intended to facilitate bonding of the carpet to areas 7. Also shown are holes 8 which aid removal of glued carpet and screw holes 8' for fastening the mat 1 firmly to the floor.

The mat 1 shown in Figure 2A includes linking members 9, 10 located in the approximately square shaped motif 14 by the meeting of four circles in the lower layer 11 and also in the similarly shaped motif 13 formed at the junction of four circles in the upper layer 12. As shown in Figure 2A, the lower layer

linking members 9 and the upper layer linking members 10 are alternately aligned in the general direction of the major axes of the mat.

The mat 1 may be of any desired thickness, but conveniently may be approximately 1.6cm (5/8 inches), for example 1.3cm (1/2 inches).

With reference to Figure 2B, it can be seen that the ends 5 of pins 3 terminate below the upper surface of surrounding 4. Consequently, the pins 3 are protected by the surrounding 4 until a person walks upon the mat 1 depressing the surrounding 4 to expose the ends 5 of pins 3 which then perform the intended scraping function. As illustrated in Figure 2B the pins 3 are located on a shelf 16 which reduces the length of the pin body required. This reduces the incidence of pin breakage.

Figure 3A schematically depicts a corner of a mat according to the present invention, with upper layer 12 being shown partially removed for the purpose of clarity. Figure 3B shows a side view of the mat 1 depicted in Figure 3A viewed in the direction of arrow C.

As previously described, mat 1 as shown in Figure 3A comprises a lower layer 11 formed from an array of circles and an upper layer 12 also formed from an array of circles. Upper layer 12 is aligned over lower layer 11 so that each circle of upper layer 12 is positioned over a square-shaped motif 14 formed at the junction between four neighbouring circles of the lower layer 11. On each motif 14 is located a set of pins 2, there being eight pins 3 per set 2. The circle of the upper layer within which the set 2 is located thus acts as a

surrounding 4 for that set 2.

In the embodiment illustrated each circle of the upper layer 12, and thus each surrounding 4, is castellated. There are four equi-distant castellations 15 per surrounding 4 shown, but other arrangements are of course possible. The free ends 5 of pins 3 are desirably of a height mid-way between the height of the castellation 15 and the height of the surrounding 4 on which the castellation 15 is based. Thus, a person stepping onto the mat would depress the castellations 15 underfoot, thus bringing the sole of their footwear into contact with the upper ends 5 of pins 3, which are then able to perform the intended scraping function.

The arrangement shown at edges 19,20 of mat 1 illustrate how a number of mats or floor coverings having edges of these types can be joined together. Essentially a peg 24 located underneath and extending downwardly for each of motifs 17 along edge 19 co-operates with the members 18 of the type shown along edge 20.

Of course it is not essential (although it may be convenient) for one mat to have both pegs 24 and motifs 17 and members 18. All that is required for two mats or floor coverings to be joined is for one mat or floor covering to comprise motifs 17 (including peg 24) along the edge to be joined and for the other mat or floor covering to have members 18 along the edge to be joined. It is of course also possible for an edge to include both motifs 17 (including peg 24) and members 18 (for example in an alternating arrangement) provided that any mat or floor covering to be joined thereto has an opposite arrangement such that the two edges can co-operate.

In more detail, edge 19 is formed by lower layer 11 terminating with a solid edging motif 17 of the same general shape as motifs 13, 14. Motif 17 includes a set of pins 3' which are arranged in a generally similar manner to the arrangement on motif 14. The upper layer 12 terminates at the mid-point of the line of circles. Extending downwardly from motif 17 and located off-centre there is a peg 24 (not shown in Fig 3A, but shown in Figs 3B and 2B). Peg 24 is of a shape designed to snap into edging member 18.

Edge 20 is formed with a line of edging members 18, of a shape designed to co-operate with peg 24 and to hold peg 24 in a snap-fit arrangement. Again upper layer 12 terminates at the mid-point of the line of circles. Thus, when peg 24 is located in edging member 18, motif 17 is located within a surrounding formed by two half circles.

Figure 4A schematically depicts a corner of a mat according to the present invention, with upper layer 12 being shown partially removed for the purpose of clarity. Figure 4B shows a side view of the mat 1 depicted in Figure 4A viewed in the direction of arrow D.

Figures 4A and 4B depict a mat 1 which differs to that shown in Figures 3A and 3B only in the detail of edges 19 and 20. Thus in the embodiment illustrated in Figures 4A and 4B strengthening members 23, 21 and 22 are shown along edge 19, at the corner, and along edge 20 respectively. These strengthening members, in addition to providing greater structural support, also help prevent high heels becoming lodged in the spaces of the mat.

Claims

1. A mat having multiple sets of pins, each set of pins being located within a surrounding formed by an array of shapes having spaces therebetween that extend through the mat, characterised in that the pins do not extend significantly beyond the highest point of the surrounding.

2. A mat as claimed in Claim 1 wherein the length of at least some of the pins is less than the depth of the mat.

3. A mat as claimed in either one of Claims 1 and 2 wherein the height of at least some of the pins is below the height of the surrounding for those pin(s).

4. A mat as claimed in any one of Claims 1 to 3 wherein at least some of the pins are tapered or rounded at their free ends.

5. A mat as claimed in any one of Claims 1 to 4 wherein the surrounding of a set of pins is ridged or castellated.

6. A mat as claimed in any one of Claims 1 to 5 having 6 to 8 pins per set.

7. A mat as claimed in any one of Claims 1 to 6 comprising a lower layer being formed from a repeating array of shapes, an upper layer being formed from a repeating array of shapes; wherein the arrays of the lower and upper layers overlap and are not super-imposed; and wherein the pins protrude from the upper surface of the lower layer and are located within a surrounding formed by the

array of shapes of the upper layer.

8. A mat as claimed in Claim 7 having linking members present to span the spaces between the shapes in the arrays of both the upper and lower layers.

9. A mat as claimed in any one of Claims 1 to 8 further including areas adapted for receipt of textile materials.

10. A mat as claimed in Claim 9 wherein the textile material is a hard-backed carpet and wherein the areas of the mat adapted for its location include a lip to provide a snap-fit with the textile material.

11. A mat as claimed in Claim 9 wherein the textile material is glued to the upper surface of said area.

12. A set of floor coverings comprising a first floor covering, a second floor covering and a third floor covering; wherein the first floor covering is a mat as claimed in any one of Claims 1 to 8, the second floor covering is a mat having strips of textile material incorporated therein as claimed in any one of Claims 9 to 11 and the third floor covering is a textile floor covering.