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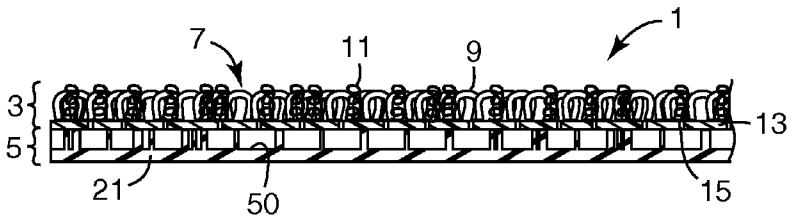

(57) Abstract: A mat/carpet (1) comprises an upper layer (3) having a soil-removing outer surface (7) for contacting traffic passing over the mat, and a lower layer (5) located below the upper layer. The upper layer comprises textile fibers (9, 11) and is water-permeable whereby water can drain from the upper layer (3) into the lower layer (5). The lower layer (5) is arranged to collect, for subsequent removal, water that is received from the upper layer (3), and may comprise channels (50) through which water can flow in a direction generally parallel to the soil-removing outer surface (7) of the mat.

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FLOOR MATTING/CARPETING

This application claims the benefit of Great Britain Patent Application No. GB0620907.6, filed October 20, 2006, and Great Britain Patent Application No. GB0702025.8, filed February 2, 2007, the disclosure of which is incorporated by reference herein in its entirety.

FIELD OF THE INVENTION

The present invention relates to floor matting/carpeting, more especially matting/carpeting that is suitable for use at the entrances of buildings or other locations.

BACKGROUND

Entrance mats are used to remove dirt and water (hereinafter referred to generally as "soil") from the shoes of pedestrians as they enter a building. In some locations, for example supermarket and airport buildings, entrance mats are also required to remove dirt and water from the wheels of trolleys or similar articles. Accordingly, reference herein to the removal of soil from the shoes of pedestrians should be considered to include the removal of soil from all traffic (pedestrian and wheeled) that passes over an entrance mat. It is recognized that an entrance mat that functions efficiently can greatly assist in the maintenance of a building by reducing the amount of cleaning that is required. In addition, the owners/occupiers of buildings are increasingly demanding entrance mats that will enhance the appearance of their premises.

Various forms of entrance mat are known and, depending on their construction and the materials from which they are formed, are placed immediately outside or inside a building. Some entrance mats are intended to be disposable (i.e. when they become dirty, they are taken up and thrown away and a new mat is put in place), and some are semi-disposable (i.e. when they become dirty, they are removed for cleaning, often by washing, and then re-used). Other mats are intended to be left in position for longer periods of time: they are typically harder-wearing and more-effective in removing soil from shoes, and have a greater capacity for trapping and storing the removed soil (so that it is not subsequently

carried into the building) without the appearance and effectiveness of the mat being adversely affected. A mat of that type can be installed in a recess well in a floor or laid directly on the floor as a drop-down mat and may be constructed so that dirt can fall through the mat onto the underlying surface: in that way, the surface of the mat remains clean and effective on the basis of minimal maintenance, it being necessary to take up or roll back the mat only periodically so that the underlying surface can be cleaned, following which the mat can be replaced. Any water that is removed and trapped by the mat is expected, in time, to evaporate.

Mats generally remove soil from shoes by a scraping and/or wiping action, depending on their construction and the materials from which they are formed. Mats that provide a scraper action typically have an upper, shoe-contacting, surface that comprises scraper edges or projections as described, for example, in US 4 497 858 (Dupont and Laurent); US 2004/0161988 (Yaw); WO 01/60218 (Milliken & Company); and WO 02/15765 (Construction Specialities (UK) Ltd.). Scraper mats that have proved to be both durable and effective in removing dirt from shoes etc. are available, under the trade names "Nomad™ Terra 8100" and "Nomad™ Terra 9100", from 3M Company of St. Paul, Minnesota, USA. Mats that provide a wiping action typically have an absorbent textile upper surface: they are often more aesthetically pleasing than scraper mats, and are available in a wide range of colors and designs and with differing characteristics depending on the textile fibers and textile constructions from which they are formed.

Some entrance mats have an operative surface that provides both wiping and scraping actions. US 4 820 566 (Heine and Tharpe), for example, describes a tufted textile mat comprising fine denier fibers that provide a wiping action, and stiff, crimped, coarse denier fibers that provide a scraping action and also form an open structure in the mat capable of receiving and obscuring dirt. Examples of mats that comprise fine and coarse fibers are those available, under the trade name "Nomad™ Aqua", from 3M Company of St. Paul, Minnesota, USA. In those mats, the fine and coarse fibers are tufted into a primary backing which is then provided with a secondary backing formed, for example, from vinyl or a non-woven fleece.

Other entrance mats are available in which the surface of the mat is divided into distinct components having different cleaning functions. Examples of mats of that type are the profile mats available, under the trade name "Nomad™ Optima", from 3M Company of St. Paul, Minnesota, USA. Those mats comprise a plurality of parallel aluminum profiles that are linked together, each profile containing an infill of the above-mentioned "Nomad™ Aqua" matting material. The infill material provides a wiping and a scraping action, the latter being supplemented by the scraping action of the profiles. In addition, soil removed from the soles of shoes is efficiently retained by the mat, either by the infill material or by falling between the profiles into the recess well in which the mat is installed.

SUMMARY

There is a demand from consumers for continued improvement in the performance of entrance mats. They generally appreciate the ability of some existing entrance mats to remove dirt from shoes, to maintain their appearance during use and to be easy to clean and wish to see those properties retained. They also continue to expect entrance mats to be aesthetically pleasing, and to be available in a wide range of designs and colors to complement the building or facility in which they are used. However, consumers are now additionally looking for mats that provide improved performance in terms of removing water from the shoes of pedestrians, especially under bad weather conditions, coupled with an enhanced ability to retain the water and eliminate what is known as "re-tracking" (i.e. the possibility that water removed from shoes during one passage over the mat will be picked up during a subsequent passage over the mat and carried into the building or facility that the mat is intended to protect). Re-tracking not only detracts from the appearance of the building or facility but can also result in floors becoming slippery to the extent that they present a safety hazard. At present, consumers who encounter this problem are usually obliged to spend time and money in arranging for the delivery of additional mats to supplement or replace those that have become saturated. In extreme conditions, they may even consider the installation of permanent drains beneath their entrance mats. The present invention has been made with those issues in mind.

In some spaces, such as small entrance lobbies in public transport vehicles (e.g. train carriages) as well as in buildings, carpeting is required that will perform the same function as an entrance mat. Accordingly, reference herein to a mat and/or matting should be considered, where applicable, to include carpet and/or carpeting and vice versa.

Outside the field of entrance matting, it is known to use water-collecting/drainage layers under surfaces such as artificial turf or artificial ski slopes to address the problem of removing excess water. Examples of such water collecting/drainage layers can be found in US-A-2006/0068157 and EP-A-0 452 529.

The present invention provides a mat/carpet comprising an upper layer having a soil-removing outer surface for contacting traffic passing over the mat/carpet, and a lower layer located below the upper layer, the upper layer comprising textile fibers; wherein the upper layer is water-permeable whereby water can drain from the upper layer into the lower layer; and the lower layer is arranged to collect, for subsequent removal, water that is received from the upper layer.

The mat/carpet may comprise a water-impermeable base layer to contain water within the mat/carpet. For example, the lower layer may have a water-impermeable lower surface for containing water that collects in the lower layer.

The upper layer of a mat/carpet in accordance with the invention may, for example, comprise a textile pile layer that provides the soil-removing outer surface. The lower layer may comprise channels through which water can flow in a direction generally parallel to the soil-removing outer surface of the mat. Those channels may be provided by, for example, extruded polymeric material or by a layer of non-woven material or coiled web material. The water-impermeable base layer, when present, may be a rubber or plastic sheet, or a rubber or plastic coating on the lower surface of the lower layer.

BRIEF DESCRIPTION OF THE DRAWINGS

By way of example, mats/carpets in accordance with the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic cross-section of an entrance mat in accordance with the invention;

Fig. 2 is a diagrammatic plan view of one component of the mat of Fig. 1;

Fig. 3 is a diagrammatic perspective view of another component of the mat of Fig. 1;

Fig. 4 is a diagrammatic cross-section of a modified form of the component shown in Fig. 2;

Fig. 5 is a diagrammatic cross-section of another entrance mat in accordance with the invention;

Fig. 6 is a diagrammatic perspective view of one component of the mat of Fig. 5; and

Fig. 7 is a diagrammatic cross-section of a modified form of the component shown in Fig. 6.

DETAILED DESCRIPTION

The entrance mat 1 shown in diagrammatic cross-section in Fig. 1 comprises an upper layer 3 and a lower layer 5. As described in greater detail below, the upper layer 3 comprises a textile floor covering and the lower layer 5 is a water-receiving layer. The upper surface of the lower layer 5 is permanently bonded to the lower surface of the upper layer 3 as will also be described in greater detail below.

The outer surface 7 of the upper layer 3 of the mat 1 is the surface that comes into contact with the shoes of pedestrians who walk over the mat when it is located at the entrance of a building or other facility, or the wheels of trolleys or similar objects that pass over the mat. The upper layer 3 is intended to remove soil (dirt and water) from that pedestrian or wheeled traffic, and to prevent the soil from being carried further into the building.

The upper layer 3, which is shown separately in Fig. 3, has the form of a tufted loop-pile carpet, in which some of the looped tufts (shown diagrammatically, and indicated by the reference numeral 9) are formed from fine denier fibers (not shown individually) and the

others (also shown diagrammatically, and indicated by the reference numeral 11) are formed from coarse denier fibers that are textured (i.e. crimped). The looped tufts 9, 11 are formed in known manner in a primary backing, to which a secondary backing is subsequently applied to anchor the tufts in position. In Fig. 1, the primary and secondary backings are shown for simplicity as a single backing layer 13. The coarse and fine fibre tufts 9, 11 may be randomly interspersed with one another or they may be arranged in regular discrete areas to form, for example, a checkerboard pattern or a pattern of alternating stripes. The looped tufts 9, 11 have a height typically in the range of from 9 to 15 mm, with the fine denier fibers of the tufts 9 having a denier per filament in the range of about 15 to 50 and the coarse denier fibers of the tufts 11 having a denier per filament, before texturization, in the range of about 150 to 500. A preferred material for the fibers is polyamide, a preferred material for the primary backing is a polyester/polyamide non-woven material, and a preferred material for the secondary backing is polyvinyl chloride (PVC), although other suitable materials could be used (including polypropylene for the fibers and rubber or latex, or a non-woven material for the secondary backing).

Carpet materials of the type shown in Fig. 3, and variations thereof, are described in US-A-4 820 566 and US-A-5 055 333. In the case in which the backing 13 is impervious, it is perforated to provide a plurality of apertures 15 that extend through the whole thickness of the backing. The purpose of the apertures 15 will be described below.

The lower layer 5 of the entrance mat 1, which is shown separately in Fig. 2, is an open, three-dimensional structure comprising a series of straight, parallel, vertical walls 17 spaced apart by undulating vertical walls 19. The upper edges of the undulating walls 19 are level with those edges of the straight walls 17 whereas the lower edges of the undulating walls are located slightly above those of the straight walls. The walls 17, 19 may be formed by extrusion and are preferably formed from the same material as the lower surface of the upper layer 3 (PVC in this case), although other suitable materials could be used. The layer 5 is provided with a water-impermeable bottom surface, indicated at 21 in Fig. 1. In this case, the bottom surface 21 is formed from the same material as the walls 17, 19. Suitable alternative materials for the walls 17, 19 and the bottom surface 21 include butyl rubber, neoprene [polychloroprene] rubber, nitrile

[acrylonitrile-butadiene] rubber, natural rubber, synthetic polyisoprene rubber, polyurethane, polyamide, and polyolefine.

It will be appreciated that the lower edges of the straight walls 17 of the lower layer 5 are located on the bottom surface 21 but that the lower edges of the undulating walls 19 are located slightly above that surface, whereby the straight walls 17 define a series of parallel channels 50 extending over the surface.

Structures of the type shown in Fig. 2, variations thereof, and their manufacture are described in US-A-4 631 215.

The entrance mat 1 is assembled by bonding the lower surface of the upper layer 3 to the upper surface of the lower layer 5 (i.e. to the tops of the vertical walls 17, 19). The bonding can be effected in any suitable way, for example using an adhesive. Preferred adhesives are hot melt adhesives, applied in discrete locations on the lower layer 5 to avoid the formation of an impermeable layer at the interface between the two layers 3, 5.

In one specific example, the upper layer 3 of the entrance mat 1 is a matting material available, under the trade designation "3M™ Nomad™ Aqua 8500", from 3M Company of St. Paul, Minnesota, USA (the backing of which has been perforated to provide the apertures 15) and the lower layer 5 is a matting material available, from 3M Company, under the trade designation "3M™ Nomad™ Terra 6250". The layers are bonded together using a polyurethane hot melt adhesive available, from 3M Company, under the trade designation "3M™ Scotch-Weld™ Polyurethane Reactive Adhesive TE100". The adhesive is applied in discrete locations on the top of the layer 5 using an applicator gun available, from 3M Company, under the trade designation "3M™ Jet-Weld™ Adhesive Applicator".

The mat 1 is intended to be used as a drop-down mat. The upper layer 3 functions to remove both dirt and water from the shoes of pedestrians etc. passing over the mat. More specifically, the coarse fibers of the tufts 11 of layer 3 remove dirt through a scraping action and the fine fibers of the tufts 9 remove water through a wiping action. The

removed dirt falls into the tufts, where it is hidden and retained thereby ensuring that the upper surface of the entrance mat 1 presents a generally clean appearance and that the dirt is not subsequently picked up and tracked into the building. Under normal weather conditions, the removed water is trapped by the fine fibers of the tufts 9 and subsequently evaporates. Under extremely wet weather conditions, when the upper layer 3 becomes saturated, the excess water drains through the apertures 15 in the backing 13 and passes into the lower layer 5 where it is collected on the bottom surface 21. The channels 50 that are defined, on the bottom surface 21, by the vertical walls 17 of the lower layer 5, allow the water to flow and spread out over the surface 21, rather than accumulate in one area, thereby promoting subsequent removal of the water by evaporation when the ambient conditions permit. Alternatively, the channels 50 can facilitate positive removal of the water if preferred, as described below.

Another form of entrance mat 31 is shown in diagrammatic cross-section in Fig. 5. This mat also comprises an upper, textile matting, layer 33 bonded to a lower, water-receiving, layer 35.

The upper layer 33 of the mat 31 is a tufted, cut-pile carpet in which the fibers of the tufts 37 are all of one type. The tufts 37 are formed in known manner in a primary backing, to which a secondary backing is subsequently applied to anchor the tufts in position. In Fig. 5, the primary and secondary backings are shown for simplicity as a single backing layer 39. The tufts 37 typically have a height of about 5 mm, and the weight of the pile is typically in the range of from 550 to 600 g/m^2. A preferred material for the fibers of the tufts 37 is polypropylene, a preferred material for the primary backing is polyester, and a preferred material for the secondary backing is polyvinyl chloride (PVC), although other suitable materials could be used (including natural materials, or other polymeric materials for the fibers and rubber for the secondary backing). The fibers used for the tufts 37 need not all be of the same type but could, for example, comprise a mixture of coarse and fine fibers. Cut-pile carpet materials of this type are well-known and widely-available. In the case in which the carpet backing 39 is impervious, it is perforated to form a plurality of apertures 41 that extend through the whole thickness of the material.

The lower layer 35 of the entrance mat 31, which is shown separately in Fig. 6, is an open, three-dimensional structure comprising coils of continuous, polymeric filaments 43 that loop and overlap one another in a random manner, and are bonded to one another at their points of contact. The lower layer 35 may be an extruded component, and is preferably formed from the same material as the lower surface of the backing 39 of the upper layer 33 (PVC in this case), although other suitable materials could be used.

Structures of the type shown in Fig. 6, and their manufacture, are described in US-A-3 837 988.

The entrance mat 31 of Fig. 5 is assembled by bonding the backing 39 of the upper layer 33 to the upper surface of the lower layer 35 (i.e. to the tops of some of the filament loops). The bonding can be effected in any suitable way, for example using an adhesive. Preferred adhesives are hot melt adhesives, applied in discrete locations on the lower layer 35 to avoid the formation of an impermeable layer at the interface between the two layers 33, 35.

In one specific example, the upper layer 33 of the entrance mat 31 is a matting material available, under the trade designation "Duet" from Rinos of Genemuiden, Netherlands, and the lower layer 5 is a matting material available, from 3M Company, under the trade designation "3M™ Nomad™ Terra 8100". The layers are bonded together using a polyurethane hot melt adhesive available, from 3M Company, under the trade designation "3M™ Scotch-Weld™ Polyurethane Reactive Adhesive TE100". The adhesive is applied in discrete locations on the top of the layer 5 using an applicator gun available, from 3M Company, under the trade designation "3M™ Jet-Weld™ Adhesive Applicator".

The entrance mat 31 is intended to be placed in a recess well for use. The upper layer 33 functions to remove both dirt and water from the shoes of pedestrians etc. passing over the mat. The removed dirt and water is retained by the tufts 37 and, under normal weather conditions, the removed water subsequently evaporates. Under extremely wet weather conditions, when the upper layer 33 becomes saturated, the excess water drains through the apertures 41 in the backing 39 and passes into the lower layer 35 where it is collected

in the bottom of the recess well and contained. The open construction of the lower layer 35 provides channels that permit the drained water to spread across the recess well, rather than accumulate in one area, thereby promoting subsequent removal of the water by evaporation when the ambient conditions permit. Alternatively, the channels provided by the lower layer 35 can facilitate positive removal of the water if preferred, as described below.

It will be appreciated that the upper layers 3, 33 of the mats 1, 31 could be interchanged to provide alternative entrance mats in which the upper layer 3 of Fig. 1 would be combined with the lower layer 35 of Fig. 5, and the upper layer 33 of Fig. 5 would be combined with the lower layer 5 of Fig. 1. It will also be appreciated that the closed bottom surface 21 of the lower layer 5 of Fig. 1 could be omitted (as shown in Fig. 4) when the entrance mat is for use in a recess well, and that a closed bottom surface 45 could be added to the lower layer 35 of Fig. 5 (as shown in Fig. 7) to provide a drop-down mat.

As a further alternative, a tufted pile carpet material of the type comprising a water-permeable primary backing and a fleece secondary backing could be used to form a drop-down mat by providing a water-impermeable base layer on the lower surface of the secondary backing. It will be understood that, in this context, the term "fleece" means a non-woven material of a type known to be suitable for use as a carpet secondary backing and includes felt materials. In such a construction, the tufted pile and primary backing constitute the upper layer of the mat and the fleece secondary backing constitutes the lower layer.

One specific example of a mat of that construction comprises a matting material available, from 3M Company, under the trade designation "3M Nomad™ Aqua™ 9500 to the lower surface of which is bonded a PVC sheet having a weight of 3 kg/m^2. The layers are bonded together using a polyurethane hot melt adhesive available, from 3M Company, under the trade designation "3M™ Scotch-Weld™ Polyurethane Reactive Adhesive TE100". The adhesive is applied in discrete locations on the top of the layer of the PVC sheet using an applicator gun available, from 3M Company, under the trade designation "3M™ Jet-Weld™ Adhesive Applicator". It is also possible to laminate the matting

material to an extruded layer of PVC, while the PVC is still hot and tacky, thereby eliminating the need for adhesive.

As an alternative, for a mat of that construction, the tufted pile and primary backing forming the upper layer could be provided separately in so-called "greige good" form and bonded to a selected fleece layer. The water impermeable base layer may be applied to the lower surface of the fleece layer either before or after the fleece layer is bonded to the upper layer. The non-woven web that is used for the fleece layer can be composed of various materials for example polyester or polyamide, or a mixture of both: these materials may be of recycled type. The non-woven should be in a form that is easy to handle and process, for example one that is stabilized by needle-punching, hydroentangling, sewing or heat welding. Typical web thicknesses are in the range of from 1 to 10 mm, with a typical basis weight being in the range of from 100 to 1000 g/m^2. One suitable web is a spunbond, needle-punched web formed from polyester fibers and having a thickness of 3.2mm and a basis weight of 300 g/m^2, commercially available under the trade name VALBOND GEO GAT VRE/5172 from ORV Manufacturing (Peruzzo group) of Carmignano (PD) Italy.

It will be understood that other constructions are possible for both the upper and lower layers of an entrance mat in accordance with the invention.

As regards the upper layer, any textile floor covering (or similar) material that offers the required soil-removing characteristics can be considered, provided it is in a form capable of being secured to the selected lower layer of the mat. The material need not be of tufted construction but could, for example, be of needle-punched, flocked, or woven construction. If the material comprises a pile layer, the pile fibers can be of any suitable material(s), both natural and synthetic, and of any suitable denier and length, and may be texturized or otherwise treated as required. Any backing materials known to be suitable for textile floor covering materials can be used, including woven and non-woven backings formed from natural or synthetic materials, provided that the backing is either inherently water-permeable or is perforated in some way to allow water to pass through it. Although, as described above, the backing for a tufted pile material will typically comprise both a

primary and a secondary backing, the latter can (as already indicated) be omitted provided that the textile is sufficiently stable to be handled without it.

Generally, the use of a textile floor covering material in the upper layer of a mat in accordance with the invention provides a wide degree of choice in the appearance of the mat and its functional characteristics. For example, a wide range of colors and surface patterns can be made available through selection of the pile fibers and the carpet construction, and use of finishing operations such as printing and embossing. Likewise, a wide range of functional characteristics can be made available through selection of the pile fibers and the carpet construction, and use of surface treatments to enhance performance. The presence of the lower, water-receiving layer means that the ability of the upper layer to retain water removed from the soles of shoes becomes less significant to the performance of the mat, which also increases the degree of choice in the appearance of the upper layer and the materials from which it is constructed.

Examples of textile floor covering materials from which the upper layer of a mat in accordance with the invention could be selected are described in US-A-4 045 605 (Breens et al); WO 95/30040 (Kleentex Industries, Inc.); WO 01/90471 (Walk Off Mats Limited); WO 96/35836 (Minnesota Mining and Manufacturing Company); and US-A-5 662 980 (E.I Du Pont de Nemours and Company).

As regards the lower layer of an entrance mat in accordance with the invention, any web material that offers the required water-receiving characteristics can be considered, provided it is in a form capable of being secured to the selected upper layer of the mat. In some situations, it may be sufficient that the lower layer simply enables water that drains into it from the upper layer to be collected but, in other situations, it may be preferred that the lower layer is structured to direct the collected water to one or more sides of the mat so that it can be removed. Other characteristics of the lower layer, for example its resilience, may also affect the overall characteristics of the entrance mat. If required, more than one such lower layer may be provided to increase the water-collecting capacity. The lower layer may be an extruded structure but alternative forms are possible including, for example, woven, molded, embossed or corrugated structures.

Examples of alternative web materials from which the lower layer of a mat in accordance with the invention could be selected are described in US-A-4 177 312; 4 212 692; 4 252 590 and 4 342 807 (Akzona). Specific examples of alternative materials are those available, under the trade names "ENKAMAT" and "ENKADRAIN" from Colbond Geosynthetics Company of St. Denis la Plaine, 93128 France.

Alternative materials suitable for the water-impermeable bottom surface of a drop-down mat in accordance with the invention include water-impermeable foams (for example an SBR [styrene-butadiene rubber] foam) and durable synthetic carpet underlay materials (for example an underlay material made of recycled rubber granules agglomerated and bound with polyurethane, commercially available in thicknesses of 5 and 10 mm from 3M Company under the trade designation "3M™ Nomad™ Recessed Well Underlay"). Depending on its nature, the bottom surface may be attached to the layer above by adhesive or by reclosable fasteners, or it may be applied by coating or spraying techniques. In the case of a drop-down mat, the floor-contacting surface of the bottom surface advantageously has anti-slip characteristics.

Alternative methods can also be used for securing together the upper and lower layers of a mat in accordance with the invention, provided that they permit water to drain from the upper layer into the lower layer. For example, a permeable adhesive web in the form of a film or a non-woven material could be located between the upper and lower layers to bond them together. Alternatively, depending on the materials present in the layers, it may be possible to bond the layers together simply by applying heat to soften them. As a further alternative (for example, in the case in which the upper and lower layers are both woven structures) it may be possible to form the two layers together.

As a further alternative, the upper layer may be removably-secured to the lower layer using, for example, some form of reclosable fastener system such as a hook-and-loop fastener system, or through the provision of hooks or similar features only on the lower layer. In that case, the upper layer can be replaced by another for cleaning purposes (e.g. for washing), or simply to change the appearance of the mat. As yet a further alternative,

the upper layer could simply be laid on top of the lower layer provided that there is sufficient friction between the layers to prevent them from moving relative to one another.

A drop-down mat in accordance with the invention can be provided, if required, with an edging of any suitable type that takes account of the water-receiving function of the lower layer of the mat. The edging may serve to contain water that collects in the lower layer. Suitable mat edgings include those available, from 3M Company, for use with 3M™ Nomad™ Terra matting and 3M™ Nomad™ Aqua matting. In some cases, the edging alone could serve to secure the upper layer of the mat to the lower layer.

As indicated above, the water that is received in the lower layer of a mat in accordance with the invention is contained for subsequent removal, either because the mat is installed in a recess well in the floor, or because the mat is provided with an impermeable lower surface and, if appropriate, a suitable edging. If the amount of water is not large, it may simply evaporate when the weather conditions have improved, this being encouraged by the provision of channels in the lower layer that permit the water to spread out over the area of the mat. In the case of a drop-down mat, evaporation may be encouraged by the provision of some form of ventilation in the edging.

If required, however, the water can be deliberately removed from the lower layer. This can be achieved in several ways, depending on the construction of the mat. In the case of a mat with an edging, for example, the edging could be designed to permit the water to be removed by the application of suction. In the case of a mat in which the upper layer is removable, access to the lower layer can readily be gained to permit the water to be removed, either by suction or in any other suitable way. Alternatively, water may be removed from the top surface of the mat using a widely available vacuum cleaner of the type that is suitable for removing water. If desired, an absorbent particulate material can be provided in the lower layer and removed in any suitable way when it has become saturated. In the case in which the lower layer is a non-woven material as described above, it has been found that water removal can be facilitated by punching apertures through both the backing of the upper layer and the non-woven lower layer, even when the backing of the upper layer is inherently water-permeable.

It will be appreciated that material of any of the constructions described above as being suitable for use as a drop-down mat (i.e. having a water-impermeable lower surface) could also be used as carpeting in, for example, spaces such entrance lobbies in buildings or public transport vehicles (e.g. train carriages). The carpeting could, if required, be provided in wall-to-wall form and removably-secured in position with mechanical or adhesive fasteners.

Material of any of the constructions described above with reference to the drawings can, where suitable, also be used as infill material in a mat/carpet, where it would provide a part only of the surface area of the mat/carpet. For example, the material could be used in the profiles of a profile mat or in specially-adapted areas of a scraper mat. An example of a profile mat is the above-mentioned product available, under the trade name "Nomad™ Optima", from 3M Company. An example of a scraper mat with specially-adapted areas for textile infills is a one that is formed using Nomad 8900 "scraping and textile" tiles, also available from 3M Company.

CLAIMS

1. Carpet comprising an upper layer having a soil-removing outer surface for contacting traffic passing over the carpet, and a coextensive lower layer located below the upper layer and secured thereto, the upper layer comprising textile fibers;
wherein the upper layer is water-permeable whereby water can drain from the upper layer into the lower layer; and the lower layer is arranged to collect, for subsequent removal, water that is received from the upper layer.

2. Carpet as claimed in claim 1, in which the upper layer comprises a textile pile layer that provides the soil-removing outer surface.

3. Carpet as claimed in claim 2, in which the pile comprises cut pile fibers and/or loop pile fibers.

4. Carpet as claimed in any one of the preceding claims, in which the pile layer is a tufted layer.

5. Carpet as claimed in any one of claims 2 to 4, in which the pile layer has a backing that comprises an impervious material, the backing being perforated to permit the passage of water therethrough.

6. Carpet as claimed in any one of the preceding claims, in which the lower layer comprises channels through which water can flow in a direction generally parallel to the soil-removing outer surface of the carpet.

7. Carpet as claimed in claim 6, in which the channels are defined by extruded polymeric material.

8. Carpet as claimed in claim 6, in which the channels are provided by a layer of non-woven material or coiled web material.

9. Carpet as claimed in any one of the preceding claims, including a base layer located below the lower layer for containing water that is collected by the lower layer.

10. Carpet as claimed in claim 9, in which the base layer is water impermeable.

11. Carpet as claimed in any one of the preceding claims, in which the lower layer has a water-impermeable lower surface for containing water that is collected by the lower layer.

12. Carpet as claimed in claim 11, comprising an edging at the periphery of the carpet for containing water that is collected by the lower layer.

13. Carpet as claimed in any one of claims 1 to 8, the carpet being located in a recess in a floor for containing water that is collected by the lower layer.

14. Carpet as claimed in any one of the preceding claims, in which the upper layer is removably-secured to the lower layer.

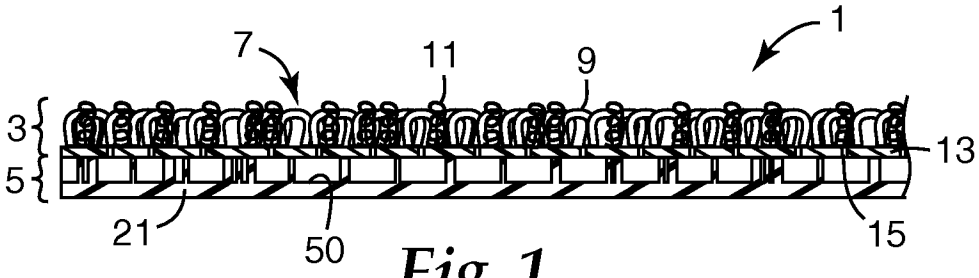

Fig. 1

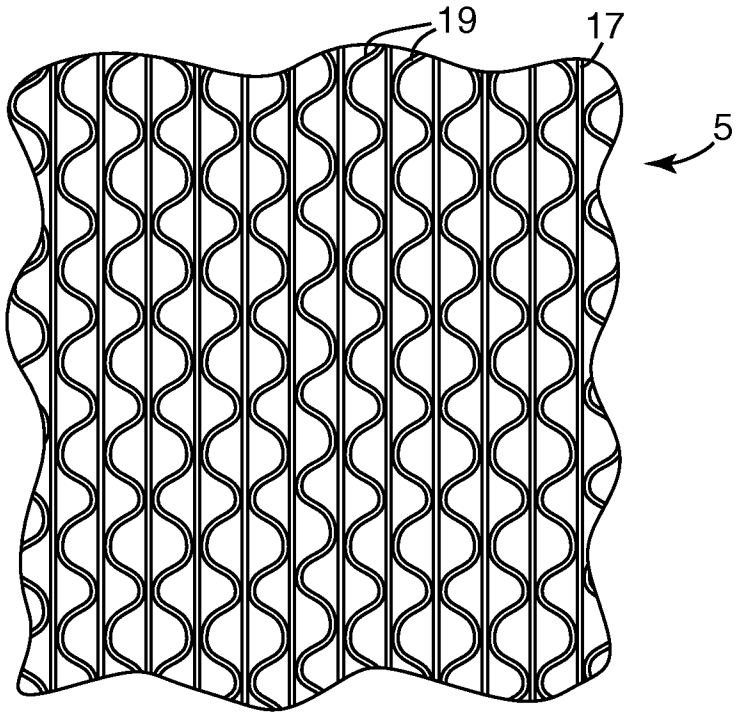

Fig. 2

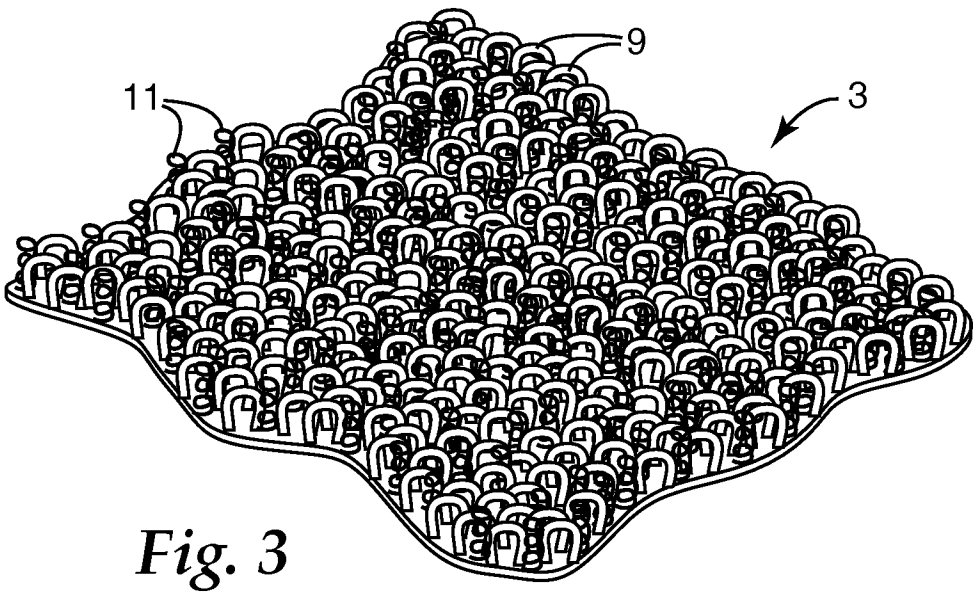

Fig. 3

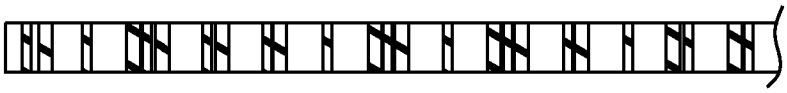

Fig. 4

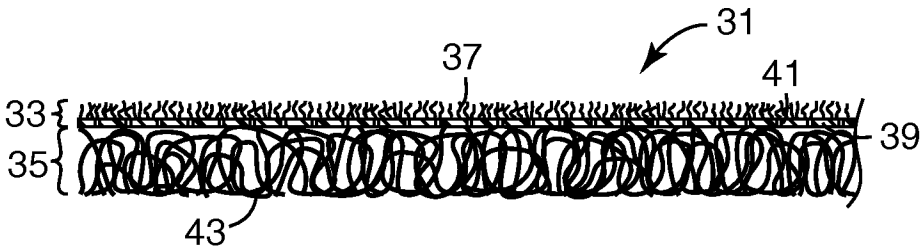

Fig. 5

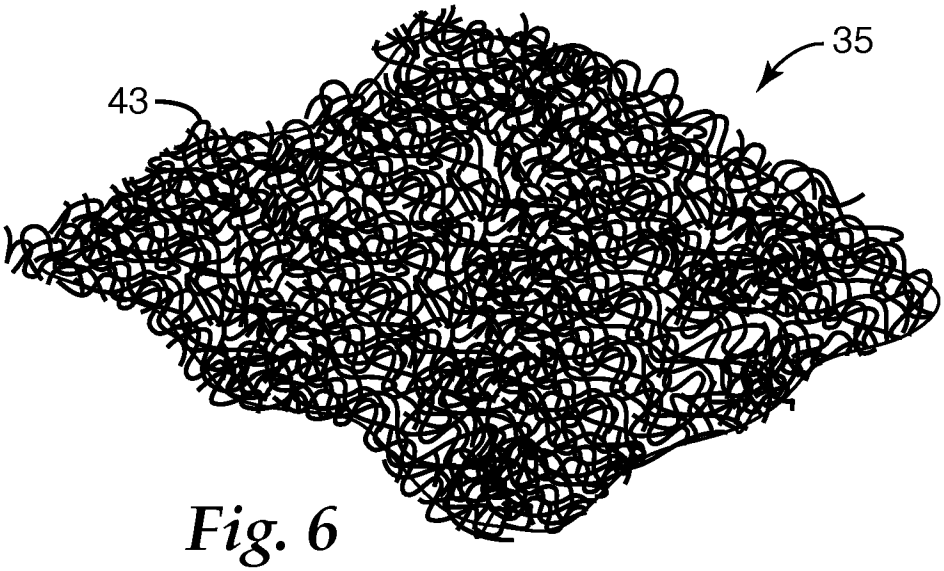

Fig. 6

Fig. 7