This mat is formed of plastic so that all of its projections and boundary areas are integrally formed with and extended from a base mat area. Extending upwardly from this base area are flexible and non-flexible projections. The flexible projections being more abundant and serving for light-weight scraping of the foot and non-flexible projections being spaced from one another and of less number but of such to provide for adequate support for a foot sole without effecting additional crushing upon the non-flexible projections. The non-flexible projections having angularly spaced ridges upon its upper end so that the more heavy scraping of the foot sole can be effected while the flexible projections remain in contact with the foot sole to remove the loosened debris effected with the rigid projections. The flexible projections are arranged in circular clusters and their ends extend upwardly beyond the top faces of the non-flexible projections. A peripheral ledge extends around the base portion to provide a sunken top surface upwardly from which the flexible and non-flexible projections extend. This ledge is less than the height of the projections and extending outwardly and downwardly therefrom is a peripheral boundary for the mat. Beneath the projections in the base portion and beneath the boundary area are lightening holes serving as vacuum seal openings by which the mat can be held tightly upon a floor surface after being weighted to render the vacuum seal openings effective.

7 Claims, 4 Drawing Figures
3,886,620

1

DOOR OR SHOE MAT

This invention relates to door mats. It is a principal object of the present invention to provide effective door mats formed of one piece of molded material and from which projections extend serving for engagement with the bottom sole of the shoe to remove debris therefrom upon the foot being run across the upper ends of the projections.

It is another object of the invention to provide a mat formed of plastic in one molding operation and as a self contained unit in which a mat will be provided for light wiping action of the bottom of the shoe and for heavy wiping action upon the bottom of the shoe within the same mat area and with the light-weight action being effected upon the bottom of the shoe while the heavy wiping action is being performed by the non-flexible upstanding projections.

It is another object to provide a door mat with a boundary area and a sunken top faced surface depending therefrom and in which the debris and liquid removed from the foot sole will be contained and made free of the foot sole by the scraping action.

It is another object of the invention to provide a door mat that will have a scraping action in which the scraped material will not lie upon the top of the same but will be collected below the upper scraping edges of the mat and cannot be given up to a shoe sole that is later applied to the mat and thus where the debris or material can be easily removed from the mat without washing action.

Other objects of the invention are to provide a door mat having the above objects in mind which is of simple construction, easy to manufacture, light in weight, durable, has long life, of pleasing appearance, effective and efficient in use.

For a better understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view of the door or shoe mat embodying the features of the present invention.

FIG. 2 is a fragmentary and enlarged top plan view of one corner of the mat as generally viewed in plan upon line 2—2 of FIG. 1 and in the direction of the arrows thereof.

FIG. 3 is a fragmentary transverse sectional view with certain of the projections of the mat shown in elevation and as viewed generally on line 3—3 of FIG. 2 and looking in the direction of the arrows thereof.

FIG. 4 is a similar sectional view but with the flexible and non-flexible projections being shown in full elevation with a foot shown in phantom thereon with the sole receiving its support from the rigid non-flexible projections and with the flexible projections that in their free state extend upwardly beyond the non-flexible projections and being crushed and their ends deflected to effect a wiping action on the bottom face of the sole of the shoe.

Referring now to the figures, 10 represents a door or shoe mat constructed according to the present invention and generally of rectangular shape with an outwardly and downwardly inclined boundary 11 surrounding an inner scraping or shoe mat area indicated generally at 12. This mat 10 is made from plastic, such as polystyrene and from a relatively flat plastic mold adapted to provide the undersurface of the mat which is flat for friction engaging contact with a floor surface that has lightening holes 13 extending upwardly from its bottom surface 14 under the mat area 12 and a peripheral lightening space 15 lying under the peripheral boundary area 11. These holes 13 and 15 extending upwardly from the bottom surface 14 will provide vacuum openings when the mat is stepped upon and the air squeezed from within the same outwardly from under the mat and in that way augment the gripping action of the mat upon a smooth floor surface.

The peripheral boundary 11 may be 2 or 3 inches in width and extends outwardly and downwardly from a raised ledge 16 extending upwardly from a sunken top surface 17 overlying the bottom surface 14 and parallel therewith and surrounding the full area 12 and upwardly from which there extends non-flexible projections 18 and clusters 19 formed of a series of circularly arranged, tapered flexible projections, some eight in number, circumferentially spaced from one another as best seen in FIG. 2. These projections are indicated at 21 and their outer ends extend upwardly of the upper end faces of the non-flexible projections 18. These flexible projections are self supporting, resilient and by drawing a shoe sole face over the upper ends of the same a scraping action of such a shoe 22 and the undersurface 23 of its sole 24 will be effected to remove from the shoe sole any debris or dirt which may have become adhered to the shoe sole face 23. While these projections 21 may appear flexible and adapted to be crushed as seen in FIG. 4, they have sufficient rigidity and upon being spread cover sufficient area as to permit the scraping action of the full face of a shoe sole. If the full length of the foot is placed upon the mat area when the scraping action of the foot is not being made, the mat will support the foot from the upper ends of the more rigid and non-flexible interspaced projections 18. When heavy scraping action is desired with the foot these non-flexible projections 18 can serve for the effecting of the heavy scraping action. These non-flexible projections 18 have their upper ends notchd in several planes about its periphery as indicated at 25 to provide alternate radially extending and angularly spaced scraping ribs 26 dispersed and extending radially outwardly from a small central hole 27 depending into the upper notched face of the non-flexible projections 18. These non-flexible projections 18 replace the clusters 19 and they are only about one-third as many of them as of the clusters 19 but the spacings are adequate so that the shoe sole 24 can overlie enough of them to support the shoe without penetration of the clusters 19 with the shoe sole below a plane over the upper ends of the non-flexible projections 18.

The holes 13 extending upwardly from the bottom surface 14 of the mat centrally underlie the respective non-flexible and flexible cluster projections 18 and 19 as best seen in FIGS. 3 and 4 and thus at locations to have the weight of the foot to be centered upon the holes 13 so that the vacuum retaining action provided by these holes 13 will be most effectively furnished. It should be seen that the upper ends of the projections 21 of the clusters 19 extend upwardly beyond the more solid or non-flexible projections 18 so that as the foot is wiped thereagainst the upper ends which may be turned over slightly that there may be full wiping action for the removal of light weight debris or dirt from the foot. This debris or dirt can be collected on the mat and
will gravitate upon the second surface 17 any liquid or wet matter will be held against outward flow from the mat onto the floor by the peripheral ledge 16 surrounding this sunken top surface 17. If desired this mat can be provided with liquid, in the nature of a disinfectant or otherwise in order to assist in the removal of the dirt and debris from the shoe and to provide for a washing action upon the bottom sole 24 of the shoe 22. When the full footweight is placed upon the mat the bottom surface 23 of the shoe will span several of the non-flexible projections 18 so as to crush or lower the projections 21 in order to permit scraping action to be effected by the more rigid or non-flexible projections 18.

The holes 13 lying respectively under the non-flexible projections 18 are deepened by a reduced diameter extension of the opening as indicated at 13' which will even though the projections 18 are made of relatively non-flexible material give some resiliency to the projections 18 and at the same time increase the vacuum seal space thereunder. This hole extension 13' is axially aligned with the top hole 27 depending downwardly from a top end of the projection 18 but not in communication therewith.

The boundary 11 extends outwardly from the ledge 16 some two or three inches and runs along parallel side edges of the mat. It should be understood that this mat does not need to be of rectangular shape but may be circular in shape and such boundary 11 would be extended continuously about the periphery of the mat and without the sides ending in angular relationship with one another at the corners of the mat as with the mat shown. More often these door mats are generally of rectangular shape and accordingly such a mat has been shown as a preferred embodiment of the invention.

Since the boundary 11 is relieved by an open area 15 thereunder, some flexibility can be given to the downwardly and outwardly extending boundary body. Parallel extending ridges 28 extend upwardly from its upper surface and provided alternately between grooves 29 extending between the upper face of the peripheral ledge 16 and the projections 28 and between the projections themselves. These ribs 28 provide also for scraping edges over which the foot can be drawn to remove debris although in order to keep the debris from getting upon the floor it is intended that the scraping action be done on the mat surface 12 of the mat.

It should be understood that while this mat is formed of a plastic, it may be also formed of rubber or other suitable materials which can provide for both flexible and non-flexible portions of the molded mat. It also should be apparent that this mat while providing these portions is a composite body in which inherent properties of the same material allow by varying the transverse dimension of the projections 21 to be relatively flexible while larger transverse projections such as with the projections 18 permit the projections to be relatively more rigid and non-flexible.

It should thus be apparent that there has been provided a mat made of one material having projections for the removal of debris from the foot by a light-weight wiping action and also under the same foot area there is provided a more rigid non-flexible projection by which at the same time a heavy wiping action can be effected to remove the more adhering debris.

What is claimed is:

1. A door mat comprising a molded one-composite material having a bottom base portion with top and bottom surfaces, flexible projections being integrally formed with the top surface of the base and extending upwardly therefrom with which wiping action can be effected upon the bottom of a shoe sole, annularly inter-connecting base ridges extending upwardly from and integral with each of adjacent flexible projections provideable of upright reinforcement support such that said projections are substantially rigidly self-supporting but adapted to be flexed under the weight of a foot-worn shoe; upstanding non-flexible scraper-projections with an upper top surface having a plurality of upwardly directed separate scraper sharp edges integrally fused laterally to one another such that hard or fastened debris on a shoe sole is readily scraped by the non-flexible projections being dispersed through the flexible projections and rising upwardly to less than the height of the free and extended flexible projections and adapted for full weight of a foot-worn shoe being placed upon the mat to support the weight of the foot-worn shoe and at the same time providing means upon which heavier and concentrated wiping action can be effected upon the more adhered debris upon the shoe sole and while the flexible projections still lie in contact with the shoe sole for light wiping action thereupon, said flexible projections being formed in clusters with the individual projections being circularly arranged thereabout and circumferentially spaced from one another, each of the projections extending upwardly from a common base and being of tapering section and having its ends overlying a plane extending between the surface of the upper ends of the non-flexible projections, the diameter of the clusters being generally the same diameter as the non-flexible projections, the clusters and the non-flexible projections being spaced from one another to support a foot sole under its full weight without depressing the flexible projections below the plane extending across the top surface of the non-flexible projections, and in which the plurality of scraper sharp edges of the non-flexible projections are formed as ridges with notches alternately angularly spaced between adjacent ridges of said non-flexible projections upper top surfaces and the plurality of notches and ridges extending radially downwardly from the center of the top surface of the rigid projections and being formed as part of the rigid projections providing thereby sharp rigid scraping edges.

2. A door mat as defined in claim 1, and a peripheral ledge portion surrounding the top surface of the base and providing thereby a sunken top surface in which the debris including liquid will be retained after being scraped from the shoe by the projections and thereby kept within or upon the mat.

3. A door mat as defined in claim 2, and a peripheral boundary extending outwardly and downwardly from the peripheral ledge about the face of the mat and said boundary being provided with parallel extending ribs upon its top surface.

4. A door mat as defined in claim 1, and said peripheral ledge surrounding the base having its upper face lying below the upper ends of the flexible and non-flexible projections.

5. A door mat as defined in claim 1, and lightening holes extending upwardly from the bottom face of the base and providing vacuum cups for effecting the tight engagement of the bottom surface of the base portion
with a floor area, said lightening holes being centrally and vertically aligned with clusters of the flexible projections and the non-flexible projections whereby the weight of a shoe foot will be directly provided upon the vacuum seal lightening holes in the bottom face of the mat.

6. A door mat as defined in claim 1 and said base having a peripheral ledge extending about the base and providing for a sunken bottom face, a boundary extending outwardly and downwardly from the ledge, said boundary being provided with a lightening hole thereunder that is adapted to provide a vacuum seal extending about the full peripheral extent of the mat.

7. A door mat as defined in claim 6, and said lightening holes under the non-flexible extensions having a reduced diameter upwardly extending space to augment the gripping effect of the lightening holes upon the floor surface under the projections.

* * * *