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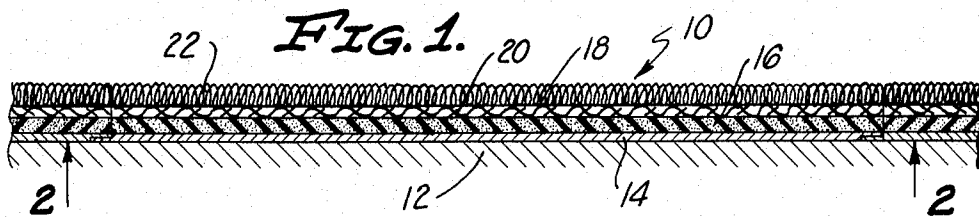
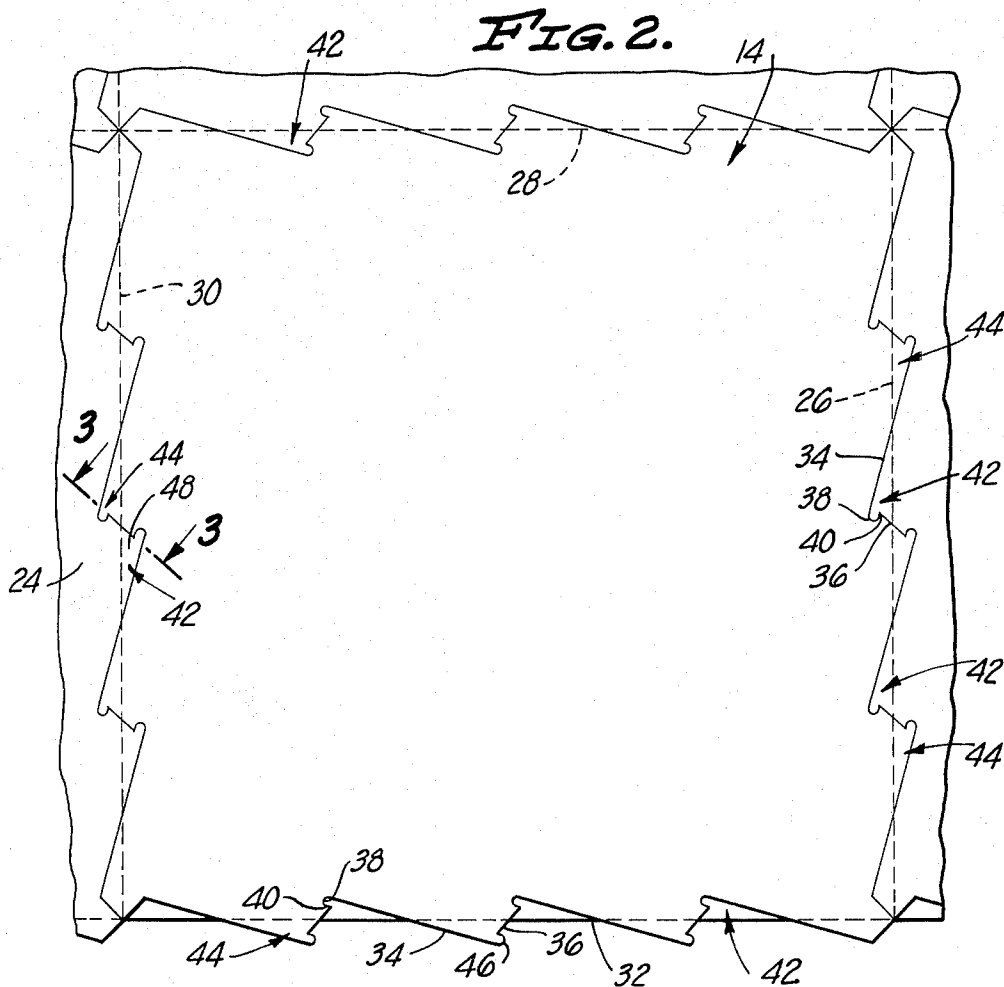
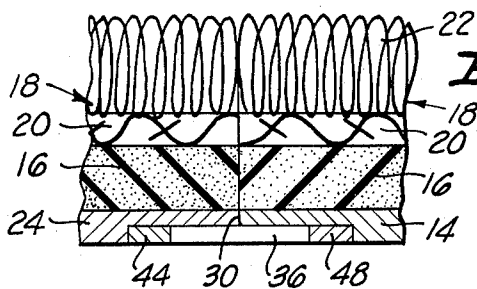
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3,247,638

INTERLOCKING TILE CARPET

Filed May 22, 1963

2 Sheets-Sheet 1



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FIG. 4.

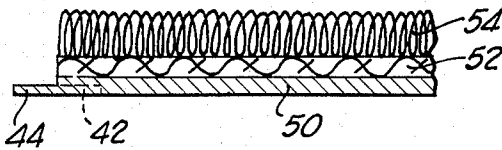


FIG. 5.

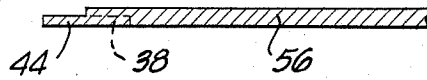


FIG. 6.

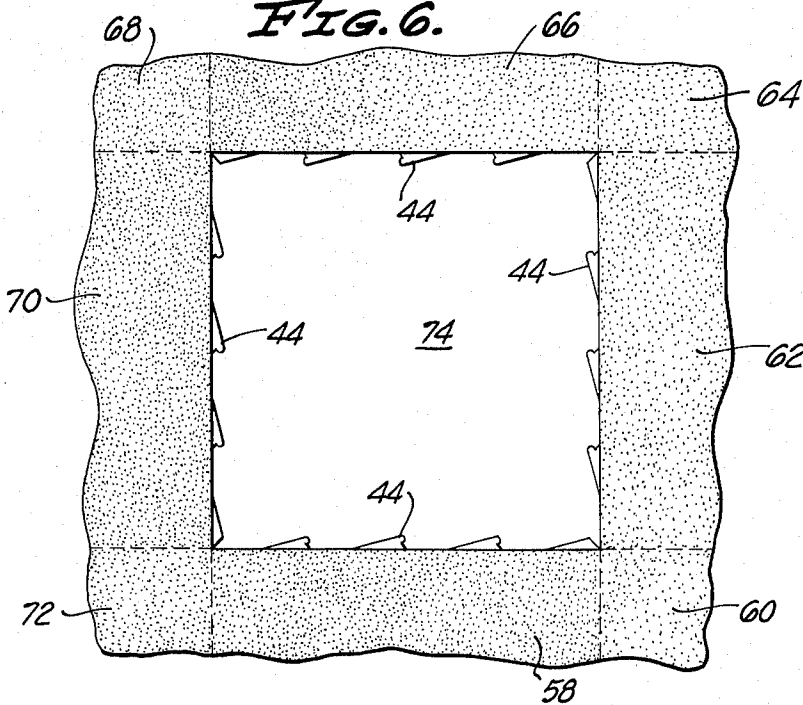
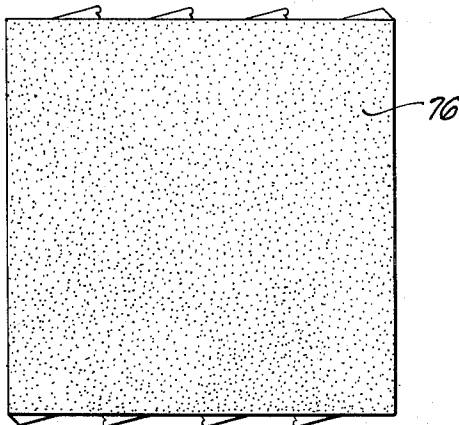


FIG. 7.



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This invention relates to an interlocking tile carpet.

It is well known in the art of carpeting floors that it is difficult to lay carpet upon a concrete floor. The difficulty, of course, lies with the fact that securement to concrete is difficult and thus it is difficult to engage the edges of the carpet in place. Needlebars are used which comprise a bar having upstanding needles which engage in the carpet. These are presumably secured to the floor around the periphery of the carpet area and the carpet is laid thereover. Securing the bars to the floor is a difficult task when the floor is of concrete construction. Accordingly, such carpets tend to come loose and do not give good service life. Carpet generally has another disadvantage as well. This disadvantage is the wear of areas where traffic is heaviest. Traffic patterns soon become noticeable in a new carpet and thus become objectionable, for the carpet does not present the proper uniform appearance as it has when it is in good condition. For best appearance, the whole carpet must be relayed with new material even though only 10 or 20 percent of the total area shows wear. This, of course, is a waste of good material and is objectionable for the replacing of unworn areas is a needless waste of labor and material.

Accordingly, it is an object of this invention to provide a carpet that can be readily and conveniently attached to concrete floor.

It is another object of this invention to provide a carpet which can be replaced in sections so that worn areas may be readily removed and replaced with new material.

It is another object of this invention to provide a carpet attached to tile so that sections thereof may be removed and replaced without disturbing the adjacent carpet tile sections.

It is a further object of this invention to provide a fully interlocking tile carpet so that a minimum of adhesive is necessary to hold the carpet tile sections in place.

It is another object of this invention to provide fully interlocking carpet tile where each of the tile elements interlocks with the other so that individual tiles cannot become loose or be removed from the tile assembly.

Other objects and advantages of this invention will become apparent from a study of the following specification, the claims and the attached drawings in which:

FIGURE 1 is an elevational section through portions of several tile of this invention;

FIGURE 2 is a bottom view of the tile of FIGURE 1, taken along the line 2-2 of FIGURE 1;

FIGURE 3 is a section along the interlocking joint between the tile, taken along the line 3-3 of FIGURE 2;

FIGURE 4 is a partial elevational section of one of the interlocking tiles of this invention showing carpet attached thereto;

FIGURE 5 is a partial side elevational section of an interlocking tile of this invention intended to be used without carpet;

FIGURE 6 is a plan view of a floor having interlocking tile secured thereto, having one tile removed; and

FIGURE 7 is a plan view of a replacement tile for use in insertion in the space indicated as being without tile in FIGURE 6.

In summary, this invention is directed to interlocking tile useable either with or without carpet thereon. The

interlocking feature is a special design and furnishes interlocking rigidity so that tiles do not shift with respect to each other and can be held down with a minimum, or no adhesive. The tile can be used either with or without carpet secured to the top surface thereof, and the top surface is defined by a normal, square or rectangular shape. At a plane below the top surface both fingers and finger receiving recesses of complementary design are formed in the tile. These fingers and recesses are of special design so that they interengage and completely interlock, and once a tile is in place it cannot move with respect to its adjacent tiles without deformation of parts. This interlocking is accomplished by having fingers with protuberances extending as interlocking elements, with equivalent recesses to receive these fingers. The basic interlocking is accomplished by defining the lower edge by straight surfaces at an acute angle to the upper edge of the tile. These straight surfaces define the fingers and recesses referred to above and the fingers provide locking in three directions. A further, more complete understanding of this invention will be had by reference to the drawings.

Referring now to FIGURE 1, the tile assembly of this invention is indicated generally at 10. The tile is mounted on a floor 12 while in use, and the tile comprises the basic tile 14, carrying the interlocking members, a carpet pad 16 secured thereto and a carpet 18 secured on top of the carpet pad 16. The carpet 18 is conventionally comprised of a woven base 20 and pile 22 stitched thereto. An enlarged section of this construction is seen in FIGURE 3.

As seen in FIGURE 2, tile 14 is the same as several other identical tiles, one of them being indicated by the numeral 24. FIGURE 2 is a bottom view of the adjoining tile and shows the interlocking fingers and associated recesses in interengagement with each other. The upper surface of the tile is defined by straight edges 26, 28, 30 and 32. These edges are arranged at right angles to each other, in normal fashion, and define the appearance of the tile as seen from the top surface after it is laid. Conventionally, these edges define a square but other configurations, such as rectangles, are within the purview of this invention. The mold for the tile of this invention is arranged in such a manner as to define the straight edges 26 through 32 at the top surface of the tile 14. The mold also creates interlocking fingers and associated recesses in the lower half of the tile.

As is best seen in FIGURE 2, these fingers and recesses are defined by straight surfaces which are the edge or rim of the lower section. The lower portion is defined by the straight surface 34 which is at an acute angle with respect to the tile edge 26. The surface 34 adjoins the surface 36 which is also at an acute angle with respect to the edge line 26. These two surfaces define a recess, for they are recessed under the edge defined by the line 26. The surfaces 34 and 36 join each other in a finger receiving recess portion 38 which is in the form of a half circle tangent to the surface 34. The surface 36 may intersect with the recess 38 as a radius, or the surface 40 may extend tangent to the recess portion 38, parallel to the surface 34 and intersect the surface 36. The surface 40 is of such length that the dimension from where the surface 40 intersects the surface 36 to the end of the circular finger receiving recess 38 is approximately equal to the diameter of the semicircle, or the distance between the surface 34 and the surface 40. This construction thus provides a generally triangular recess having a generally hemicylindrical additional recess formed at the apex of the triangle. This entire combination of surfaces provides an undercut for acceptance of the finger on the mating tile is generally indicated at 42.

These surfaces 34 and 36 extend beyond the tile edge

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36 to form a protuberant finger 44 which is of such configuration as to be complementary to the recess 42. Thus the protuberant finger 44 includes the surfaces 34 and 36 which extend outwardly from the tile edge, as is seen at the lower edge of the tile in FIGURE 2. Here the surfaces 34 and 36 extend outwardly from the tile edge 32, each being at an acute angle with respect thereto. Protuberance 46 is of hemicylindrical form tangent with the surface 34 and joins with the surface 36. The finger defined by the surfaces 34 and 36 and the protuberance is of complementary structure to the recess 42. The interlocking nature of such tile is shown at the left tile edge 30 of FIGURE 2 and in s section thereof in FIGURE 3. Here, the recess 42 is occupied by a finger 48 on the adjacent tile 24, and finger 44 carrying its protuberance at the apex extends into the equivalent recess in the mating tile.

The construction is such that the recesses and fingers come together at the corners of the tile edge for full fitting of the corners.

As seen in FIGURE 4, a tile 50 is shown having a carpet with a woven back 52 and pile 54 secured thereto. In this case, the carpet is secured directly to the tile 50. This construction is adequate for less expensive installations, and is particularly suitable where the tile 50 is of such resiliency as to obviate the need of a separate pad. Similarly, there are some cases where the woven back 52 of the carpet has an additional resiliency and thus eliminates the need for the pad. Such a tile includes the hereinbefore described finger receiving recess 38 and finger 44. The recess 38 includes a suitable space for receiving the hereinbefore recited protuberance, and the finger 44 carries such a protuberance for positive interlocking.

FIGURE 5 illustrates a tile 56 which is used in areas where no carpet is necessary. This tile 56 has the standard, smooth finished tile top and carries toward its rear surface the hereinbefore described finger receiving recess 38 and finger 44. The finger 44 carries the herein before recited and described protuberance and the recess is of suitable configuration as to receive the finger and protuberance.

FIGURE 6 and FIGURE 7 illustrate the manner in which an individual tile can be replaced after damage occurs to an area. Tiles 58, 60, 62, 64, 66, 68, 70 and 72 adjoin the area 74 from which a damaged tile has been removed. The tiles 58 through 72 are of any of the embodiments of FIGURES 1, 4 or 5, for this replacement is feasible whether or not carpet is secured to the top of the tile. Fingers 44 of the adjoining tile extend into the area 74, and the adjoining tile have recesses of a nature hereinbefore described to accept the fingers on the tile which is to be put into the area 74. Tile 76 is the tile which is to be placed into the open area 74. It is either specially molded without fingers on opposite edges, or such fingers are removed before installation so that the tiles 76 may be slipped into the area 74. Accordingly the under side of the tile 76 is identical to those tile hereinbefore described, except for the removal or absence of the fingers from two opposite edges thereof. The tile 76 is installed by placing the fingers on one edge thereof into corresponding recesses in an adjacent tile. Thus the fingers on the upper part of tile 76, as seen in FIGURE 7, engage in the recesses on the under side of tile 66. The tile 76 is then bent until the fingers on the lower part of the tile 76, as seen in FIGURE 7, are in such position as to be able to slip into the recesses on the under side of tile 58.

As can be best seen from FIGURE 2 the protuberances 46 on the fingers 44, and the associated recesses 42 on the adjacent tile are such that the tile cannot simply be slipped into place, and accordingly cannot simply be slipped out of place when the tile is being laid into a corner. One tile may be laid against another by simply slipping it into place, but one tile cannot be laid against two others by such slipping. Accordingly the material

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of the protuberances 46 must be sufficiently resilient to permit it to deform to a sufficient amount to permit the tile to be laid with edges next to each other. When such deformation is accomplished, then the natural resiliency of the protuberances 46 extends then into the accommodating recesses 38 and the tile cannot be displaced without sufficient force to again deform the protuberances 46. This provides positively interlocking tile which can be held in place with minimum adhesive or in some cases, no adhesive at all. It is apparent from this construction that a plurality of fingers and recesses are desirable to interlock the tile along the length of one of its edges. However, in view of the distortion necessary to place the protuberances 46 into their appropriate spaces, it may be desirable to have only one protuberance 46 along each edge of the tile. The number of such protuberances along an edge is determined by several factors including the size of the protuberance, the related angles, the thickness of the protuberance and the resiliency of the material. Each of these factors affects the amount of force necessary to distort it, resiliently, into the protuberance receiving recess provided therefore. Accordingly, either these factors must be adjusted, or the number of such protuberances 46 along each edge be adjusted so that the tile may be placed in its proper position in a complete layment of tile without undue force, yet the tile has sufficient interlocking strength for the circumstances. Thus, this becomes a balance of factors to permit the tile to be easily laid yet strongly interlocked into position.

This invention having been described in its preferred embodiment, it can be seen that it is capable of numerous embodiments within the skill of the routine engineer. Accordingly, it is desired that the scope of the invention be defined by the scope of the appended claims.

I claim:

1. An interlocking floor tile, said floor tile being defined by upper and lower sides, four edges and interlocking surfaces, said four edges being straight lines and said interlocking surfaces being adjacent to said edges; said interlocking surfaces comprising surfaces at a first acute angle with respect to said edges and surfaces at a second acute angle with respect to said edges, said surfaces intersecting with each other and defining triangular interlocking fingers and finger receiving recesses, said fingers and said finger receiving recesses being located adjacent to each edge of the tile, a protuberance located on the apex of at least one of said triangular fingers adjacent each of said edges, and a corresponding protuberance receiving recess adjacent each of said tile edges, whereby a plurality of tile, laid together, interlock with each other with said fingers and said protuberances engaging in said finger receiving recesses and protuberance receiving recesses.

2. The interlocking tile of claim 1 wherein said straight edges form a square, and said square is toward the upper side of said tile.

3. The structure of claim 1 wherein a carpet is secured to the upper side of said tile.

4. The structure of claim 3 wherein a carpet pad is located between the upper side of said tile and said carpet.

5. An interlocking tile:

said tile being defined by upper and lower sides, four edges and surfaces defining interlocking fingers and recesses;

said upper and lower sides being respectively adapted to be arranged upward and downward toward the floor upon which the tile is to be mounted, said upper and lower sides being substantially planar;

said edges being defined by straight lines intersecting at substantially right angles;

said fingers and finger receiving recesses being defined by a plurality of first surfaces and a plurality of second surfaces, both said first and second surfaces being arranged at an acute angle with respect to said edges, said edges being toward the upper side and intersect-

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ing with said upper side of said tile and said surfaces being adjacent to and intersecting with said lower surface of said tile, said fingers and recesses defined by said surfaces being arranged for mutually interlocking with adjacent tile, a protuberance extending past said second surface mounted on at least one of said fingers on each of said side, said recess corresponding to said protuberance carrying finger containing a corresponding protuberance receiving recess, said protuberance being of such configuration that it must be resiliently distorted upon laying said floor tile in series on a floor, whereby said floor tile is adapted for positive interlocking upon installation upon a floor.

6. The floor tile of claim 5 wherein a carpet is secured to the upper side of said tile.

7. The carpet tile of claim 6 wherein a carpet pad is secured between said tile and said carpet.

8. The structure of claim 5 wherein the upper side of said tile is arranged to be the visible, wear area of said tile.

9. The structure of claim 5 wherein said surfaces and

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said edges intersect at the intersection of said edges of said tile.

10. The floor tile of claim 5 wherein said protuberance is resiliently distorted when said floor tile is laid in series with similar floor tiles upon a floor and said protuberance substantially returns to its previous configuration after such distortion and after it is positioned within a corresponding protuberance receiving recess so that said floor tile is adapted for positive interlocking in both an upward and edgeward direction.

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