Floor tiles have conductors embedded and define male and female sockets to run power and data signals to randomly placed devices designed to interface therewith anywhere along the conductor(s) path.
FLOOR TILE SYSTEM WITH ELECTRICAL ACTIVATION AT RANDOMLY PLACED LOCATIONS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to an earlier filed Provisional Application Ser. No. 60/523,043 filed Nov. 18, 2003 entitled “Floor Tile System With Electrical Activation At Randomly Placed Locations” priority to which is claimed, and which is incorporated by reference herein.

BACKGROUND OF THE INVENTION

[0002] Surface mounted raceways are known, for providing randomly spaced electrical receptacles along the raceway, and examples of such prior art are as follows: U.S. Pat. No. 5,759,051 and U.S. Pat. No. 5,688,132 both assigned to the assignee herein, and incorporated by reference in this application.

SUMMARY OF THE INVENTION

[0003] The present invention seeks to adapt the random placement of outlet plugs or receptacles along a raceway to an electrically wired floor tile system so that an entire floor or a portion thereof can be prewired so as to afford random placement of electrical outlet boxes or electric connections generally to accommodate varying uses of the floor space itself.

[0004] In accordance with the present invention a unique floor tile system is disclosed, and includes a plurality of polygon shaped floor tiles, at least some of these tiles being fitted with electrical conductors embedded in the tiles alongside slots that typically extend from one edge of the tile to an opposite or adjacent edge thereof.

[0005] The tiles preferably include interfitting side edges which include a recess in one side edge that accepts an electrically connecting protrusion in the complimentary shaped edge of an adjacent tile to afford a continuous conductor, or sets of conductors, that extend from a preexisting poke through in the underlying floor itself, or from some other convenient source of power. Thus, the tiles can run electrical wires, or low voltage communication/data wiring throughout the floor which is provided with the tiles of the present invention.

[0006] The upper surface of each tile defines upwardly open slots similar to those disclosed in U.S. Pat. No. 5,688,132 mentioned previously, the slots being provided alongside embedded conductors in the form of wires or in the form of metal conductive strips as shown in the drawings submitted herewith.

[0007] As so constructed and arranged an electrical outlet plug can be placed in the slots, which are spaced to accommodate the plug, and as a result the prongs of the plug will make contact with the embedded electrical connectors.

[0008] Alternatively, an outlet device can be provided in slots provided alongside such connectors as taught for example in U.S. Pat. No. 5,759,051.

[0009] As shown, the tiles are preferably of rectangular or square shape, and the majority include linear conductors extending from one side edge to an opposite side edge of each tile.

[0010] The embedded conductors can also be arcuate in configuration as shown in the drawings so that they extend from one side edge of a tile to an adjacent side edge thereof with the result that a 90° change in direction for the conductors can be provided for. In this manner, an entire floor can be provided with electrical conductors embedded in the tiles allowing use of at least the straight sections thereof to accommodate connections where convenient and depending upon the layout of the space itself as determined by the ultimate user.

[0011] As a further feature of the present invention, the upwardly open slots provided alongside these connectors can be covered as shown for example in Fig. A. Such a cover can take the form of a T-shaped extrusion of polymeric material having an upper surface adapted to be co-planar with the upper surface of the tile. Thus, the tiles, with conductors embedded therein, will have in addition to the slotted recesses provided alongside the conductors, a shallow recess for accommodating the cover, as shown in Fig. A.

DETAILED DESCRIPTION OF THE DRAWINGS

[0012] Turning now to the drawings in greater detail,

[0013] FIG. 1 shows a linear tile system for accommodating a single electrical outlet plug at a particular location in the floor. In this case the power would be delivered from a conventional wall outlet or from a baseboard raceway configuration (not shown) through each of the tiles to the endmost tile in the line so as to afford a convenient location for a receptacle, all as shown and described in greater detail in the above-mentioned patents (U.S. Pat. No. 5,759,051 and/or U.S. Pat. No. 5,688,132).

[0014] FIG. 2 shows the raceway of FIG. 1 in vertical section where the power wires are run along the center line of the rectangular tiles, and where optional low voltage compartments are provided for running data/communication low tension wires. Although not shown in detail the low tension wires may be provided either in an embedded configuration in accordance with the present invention, or might instead be provided in shallow wireways defined by the tile alongside the embedded conductors of the present invention.

[0015] FIG. 3 shows an area of a floor fitted with wire tile in accordance with the present invention. As in the linear arrangement of FIGS. 1 and 2 beveled edges are provided alongside the tile outer edges to afford less obstruction and more convenient use of the floor space itself. In lieu of these tapered bezel edges one might instead provide conventional tile without embedded conductors or conventional carpeting. It is an important feature of the present invention that the vertical height for the tiles be held to a minimum height, and preferably be on the order of conventional carpeting and under layment ¼-½ inches.

[0016] FIG. 4 shows in somewhat schematic fashion a typical tile constructed in accordance with the present invention, and having embedded conductors running the length thereof. The conductors extend beyond one marginal edge of the tile, and the opposite marginal edge (not shown) defines a socket for receiving electrically conductive projecting portions as displayed in FIG. 4.

[0017] Preferably, and in accordance with the present invention, floor tile of the present invention should be
between ⅛-⅝ an inch in thickness so as to minimize the obstruction created in a floor should the invention be utilized in the form of a linear arrangement as shown in FIGS. 1 and 2, or in the FIG. 3 configuration where the tile system occupies only a portion of the floor space.

[0018] FIG. 5 shows a slightly modified version of the present invention wherein the opposed edges of the tile include complementary notches, and projecting portions, the latter fitting, within the notches, to better align the tiles one with another, and not rely solely upon the electrically conductive protuberances described previously with reference to their associated sockets.

[0019] Fig. A shows still another version of the present invention wherein a shallow recess is provided in the tile, and communicates with the slots alongside the embedded conductors, for receiving a T-shaped cover to provide a planar surface for the upper surface of the tile itself, and to protect from debris, the slots that extend the length of the tile from one edge to an opposed mating edge of an adjacent tile as described above.

[0020] Finally, Fig. B illustrates a cover which has a barbed end portion for releasably engaging the lower marginal edge of the embedded conductor in the tile so as to afford a greater degree of security for the cover and tile assembly.

[0021] Other variations will be apparent given the disclosure presented herein. More particularly, and as taught in the prior art ‘132 Patent, incorporated by reference herein, the necessary resiliency to provide security for the assembly might instead be provided for in the design of the tile itself where the slots have a sidewall which is itself resilient, and which acts on the electric outlet prongs or on the depending stem of the polymeric cover to assure a suitable retaining force on these components.

1. A plurality of polygon shaped floor tiles, including tiles with conductors embedded therein, said floor tiles having interfitting side edges, said tiles with conductor embedded defining at least one recess in one of said interfitting side edges, and said tiles with said conductors further defining conductive protuberances for electrically connecting said conductors in one tile to conductors in an adjacent tile, said tiles with conductors further including an upper surface defining upwardly open slots alongside said embedded conductors for receiving prongs of male plugs associated with electrical outlet devices.

2. The combination of claim 1 further comprising closure means for said slots coextensive with said slots to cover said slots in at least some of said tiles with said embedded conductors therein.

3. The combination of claim 1 wherein said tiles with embedded conductors are of generally rectangular shape and include linear conductors extending from one edge to an opposite edge of said tile.

4. The combination of claim 3 wherein other of said tiles where embedded conductors having accurately shaped conductors extending from one edge of said other tile to an adjacent edge thereof.

5. The combination of claim 1 wherein said tiles have a vertical thickness in the range between ⅛ and ½ inch approximately.

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