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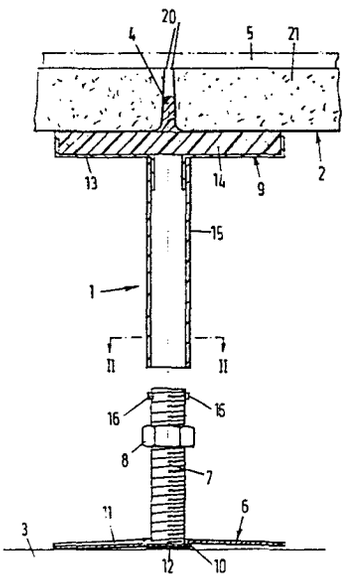
(54) Sectional false floor.

(57) A floating floor construction comprising adjoining floor slabs which are supported at the angular points by adjusting feet by means of which the floating floor rests on the subfloor, the adjusting foot being provided with a base plate, a screwed spindle with nut and a platform having on the under-side a bush fitting over the screwed spindle and resting on the nut. The base plate is fitted with a central dishing for receiving the screwed spindle, while the plate portion around the central dishing is provided with radial, downwardly embossed zones having depths increasing towards the edge of the plate. The arrangement is such that the adjusting foot can be placed on the subfloor without attachment means, resting in unloaded condition on embossed zones of the base plate and in loaded condition the supporting function is taken over by the under-side of the central dishing provided with a two-sided adhesive layer.



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Title: A floating floor construction TITLE MODIFIED see front page

The invention relates to a floating floor construction comprising adjoining floor slabs supported at the angular points by so-called adjusting feet by means of which the floating floor rests on the subfloor, use being made of separation cross fittings.

It is the object of the invention to provide such a floor construction which, in addition to being placeable at high speed and in a simple manner, has favourable properties when in use, i.e. being slightly resilient, no special features being required for carpeting the floating floor by means of adhesive, and this can be effected in the same manner as on an even, concrete floor, an inhibiting effect is exerted on the propagation of sound vibrations, a carpet on the floating floor is automatically earthed electrically and likewise the accessibility to the space underneath the floating floor is optimum, viz. the lifting of a tile with the superimposed carpet portion can be effected with minimal steps and with minimal visible discontinuity of the carpet.

In connection with the ease of installation, the adjusting foot in a floating floor construction as described in the above, which foot is provided in a known manner with a base plate mountable onto the subfloor without attachment means, is a screwed spindle with nut and a platform having on the underside a bush fitting over the screwed spindle and resting on the nut, said base plate according to the invention being fitted with a central dishing for receiving the screwed spindle, while the plate portion around the central dishing is provided with radial, downwardly embossed zones having depths increasing towards the edge of the plate in such a manner that the adjusting

foot, in unloaded condition, rests on embossed zones and in loaded condition the supporting function is taken over by the underside of the central dishing, which is provided with a two-sided adhesive layer. Such a design of the base of the adjusting foot has the advantage that, unlike a flat base plate, it is much less responsive to local irregularities in the subfloor area, for in unloaded condition, the support on a restricted number of spaced points underneath the embossed plate portions ensures stabilisation with fixation by the two-sided adhesive layer, while in loaded condition the plate can deflect, with the bottom of the central dishing taking over the compressive load.

The adjusting feet according to the invention can be consequently quickly positioned with minimum preparatory steps. After the level adjustment by means of the nut on the screwed spindle, the platform with the bush can be placed over the screwed spindle and for a quick fixation of the platform on the screwed spindle according to the invention the bush may be provided in cross-section with flat sides with an interspace substantially equal to the outside dimension of the screwed spindle, which is enlarged at least at one location by deformation. Thus, the platform can be anchored onto the screwed spindle by rotation.
For a slightly resilient support of the floor panels, the platform according to the invention can be formed by a metal receptacle filled as far as the upper edge with an elastomer, e.g. a sheet of synthetic rubber having a Shore hardness of 60-80.

If the angular points of a number, e.g. two or four, of floor panels rest on such an adjusting foot platform, the material of the

receptacle will deflect under the influence of a vertical load exerted thereon, so that the elastomer sheet takes over at least a part of the load, thus resiliently supporting the floor panels.

If furthermore the floor panels according to the invention are kept interspaced by using a known per se separation fitting, e.g. a cross to be placed on the platform, the sound vibrations will be damped, since the trajectory of a vibration from one panel to an adjoining panel extends substantially through the elastomer.

The invention also concerns a floor panel in the form of a tile comprising a metal receptacle having a bottom and upright edges with a short outwardly directed circumferential flange at the upper edge, which receptacle is filled as far as the upper edge with a compression resistant material, in particular concrete. The advantage of such a metal receptacle filled with compression resistant material is that the metal receptacle can function as an external reinforcement taking up tensile stresses. Furthermore, in case of support of the angular zones of the receptacle by an adjusting foot according to the invention via the metal of the tile receptacle, the metal of the platform receptacle and the adjusting foot, there is formed a continuous electrically conductive trajectory adapted to discharge static electricity of a carpet placed on the floating floor, for the carpet in the edge regions of each tile is in contact with the circumferential flange of the metal tile receptacle.

By selecting according to the invention the dimensions of the separation cross and of the tile receptacle, in particular the edge flanges thereof, in such a manner that the edge zones of adjoining tiles of a mounted floating floor have a slight interspace, in the order of 1-3 mm,

on the one end lateral contact and hence direct transmission of vibrations from the one tile to the other is prevented and on the other end tile adhesive can be applied as a continuous layer. The interspace of the tiles is so small that the mostly viscous adhesive mass bridges this interpace without any difficulty.

Due to the comparatively small interspace of the tiles, the edge flanges thereof can function as knife guides for cutting the carpet. Within this scope according to the invention, the edge flanges of the tile receptacles may be rounded at the angular points. This facilitates the insertion of a knife between two tiles, while an engagement possibility is created at each angular point for lifting a tile without pulling up the latter on the carpet, which may lead to damage to the carpet which remains visible after the tile has been replaced in position.

An aid for minimizing the visibility of the unavoidable damage to the carpet during the cutting of a tile is a carpet knife having a handle and a cutting blade fitted according to the invention with a guide attached to the handle and extending into the cutting plane at the cutting edge side of the knife. When cutting a carpet with such a knife, the carpet piles will be laterally deflected and not be damaged by the knife.

In respect of the floor tile comprising a metal receptacle with compression resistant filling, it is observed that for minimizing the drawback of the high weight of a concrete filling, it is recommendable to render the underside of the tile arched, with the arch legs at the angular points.

According to the invention a favourable design is that in which the metal receptacle has the maximum depth in the angular zones, out-

side the angular zones the receptacle depth decreases abruptly and the receptacle bottom, except for discontinuities, extends substantially horizontally at a level lying at about 1/3 of the receptacle depth, while halfway two angular zones the receptacle bottom with raised portions links up approximately with the configuration of one half of a truncated cone with the receptacle sidewall in question.

In particular in the case of a floating floor of e.g. a computer space, passages have to be made at several places to the subjacent cable space. Adjacent the "apices" of the truncated cones, the thickness of the material of the floor tiles is minimal (e.g. in the order of 8 mm of concrete) and a passage can be made with comparatively light material.

In the central tile zone according to the invention, the horizontal bottom portion may be discontinued by a raised portion having the shape of a segment of a sphere, while radially embossed zones of outwardly increasing depth extend according to the tile diagonals from adjacent the sphere segment into the angular zones.

Concrete poured in the centre of the tile receptacle therefore easily flows to the relatively heavy angular zones and likewise reinforcing ribs are formed in the tile arch in the arch zones extending between the arch legs.

Additional reinforcing ribs can be formed in the concrete arch by fitting the tile receptacle with dishings disposed between the central sphere segment and each of the truncated cones, extending parallel to the respective tile edges, said dishings having such depths that, when cutting a tile for placement at an edge of a floor construction, the subtile with the rib formed by a dishing can rest on a molding or the like edge support.

Some embodiments of parts of the floating floor construction according to the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Fig. 1 is a cross-sectional side view, partly with exploded parts, of a detail of the floor construction;

Fig. 2 is a cross-sectional view on the Line II-II of Fig. 1;

Fig. 3 is a top view of the base plate of the adjusting foot;

Fig. 4 diagrammatically shows the interconnection of four floor tiles,and

Fig. 5 shows a carpet knife that is particularly suitable for use in the floor construction according to the invention.

As shown in the drawing, adjusting feet 1 are used for supporting floor panels in the form of tiles 2 spaced above a subfloor 3. Each adjusting foot 1 supports a plurality of tile angular points, use being made of a separation fitting 4, e.g. at four tile angular points one separation cross.

A carpet 5 can be installed on the floating floor formed by the tiles 2 by means of an adhesive layer, not shown.

The adjusting foot 1 is composed of a base plate 6, a screwed spindle 7 with thereon a nut 8 adjustable in height and defining the local level of the floating floor, as well as a platform 9 on which tile angular points 2 are supported.

The base plate comprises a central dishing 10 with downwardly embossed portions 11 starting thereform and distributed circumferentially, having dephts increasing towards the edge of the plate 6 to such a value that in unloaded condition and placed on a flat bottom, the base plate rests exclusively on the embossed portions 11 and the under-side of the central dishing 10 is clear of the bottom.

At the under-side of the central dishing 10 of the base plate there is applied a two-sided adhesive layer 12.

The tile carrier platform 9 comprises a metal receptacle 13 with upright side edges, which is filled with an elastomer 14 as far as the top level of the edges. At the under-side of the receptacle 13 there is provided a bush 14 having a rectangular cross-section in the embodiment shown (see Fig. 2) dimensioned in such a manner that the shortest distance between opposite sides is approximately equal to the outside dimension of the screwed spindle 7. In the screw thread of the spindle 7 there are disposed local deformations 16 that project beyond the screw thread.

The positioning of such an adjusting foot is effected as follows:

At the appropriate place it has only to be ensured that the location where the central dishing is present is reasonably flat. The assembly of base plate 6, screwed spindle 7 and bush 14 placed thereover with platform 9 is mounted at this location and fixed onto the under-side of the central dishing 10 by means of the two-sided adhesive layer 12. The platform 9 with the bush 14 attached to the under-side thereof is pushed over the free top end of the screwed spindle 7, i.e. with the bush 14 in the position shown in Fig. 2, in such a manner that the projections 16 of the screwed spindle 7 extend into the free angular zones of the bush section 14. After vertical adjustment of the platform by means of the nut 8, the platform is turned in the arrow direction shown in Fig. 2, so that the projections 16 deform the walls of the bush section 14, thus fixing the platform 9 at the correct level.

After the positioning of a plurality of adjusting feet 1 according to a grid pattern, the floating floor tiles 2 are positioned by means of separation crosses 4 and as a result of their weight, the base plate 6 of the adjusting foot 1 is deformed in the sense that, while so far the weight of the adjusting foot had been taken up by the downwardly embossed zones 11, the weight of the tiles 2 comes to rest directly on the subfloor 3 via the bush 14 and the screwed spindle 7 via the dishing 10 and the two-sided adhesive layer 12.

The floor tiles 2 each comprise a metal receptacle 17 having a bottom 18, upright walls 19 with a circumferential flange 20 at the upper edge of each. The receptacle is filled with compression resistant material 21 such as concrete as far as the level of the circumferential flange 20.

As shown in Fig. 1, the tiles 2 are positioned by means of the separation fittings 4 in such a manner on the platforms 9 of the adjusting feet 1 that a space is provided between facing edge flanges 20, however only along a limited distance, in the order of 1-3 mm. This slight interspace between adjoining tiles enables to apply a continuous adhesive layer on a mounted floating floor for a continuous carpet 5.

If for lifting a tile 2 - after the floor has been put into use - renewed access to the space between the floating floor and the subfloor 3 is required, a tile lifting tool can be inserted in the space created at the angular points by the roundings 22. The space between adjoining edge flanges 20 may serve for guiding a knife by means of which the carpet above the tile to be lifted can be cut. Preferably, use is made therefore of a knife shown in Fig. 5, which is fitted with a handle 28, a blade 29 and a guide 30 attached to the handle 28 and extending into the cutting plane. During the cutting movement of the knife, the guide ensures a separation between carpet piles, which consequently are not

cut by the knife, so that during the subsequent replacement of a lifted tile, the carpet adhered thereto links up again entirely with surrounding carpet portions.

Preferably, the under-side of the metal receptacle 17 of each tile 2 has an arch shape, with arch legs at the angular points. To this effect, the deepest portions of the metal receptacle are present in the angular zones 23 and the receptacle bottom 18 has a plurality of raised portions. Between two angular zones, the receptacle bottom is raised with portions 24 having substantially the configuration of one half of a truncated cone, by means of which the receptacle bottom between two angular zones 23 links up with the respective receptacle sidewall 19.

In the middle of the bottom 18 there is provided a raised portion 25 having the shape of a sphere segment and from the central zone there extend radial, downwardly embossed zones 26 terminating in the angular zones 23. The radial dishings 26 form on the one end guides for concrete poured in the middle of the receptacle to the recessed angular zones 23 and on the other end radial reinforcing ribs are formed in the concrete mass in the dished portions 26.

Furthermore, the metal receptacle 17 is also fitted with dishings 27 extending between the central raised portion 25 and the wall elevations 24, parallel to the respective receptacle walls 19, by means of which reinforcing ribs can also be formed in the concrete mass, the vertical dimensions of said ribs can be selected in such a manner that if only use is made of a part of a floating floor tile, e.g. along an edge of a floating floor, the respective tiles with a rib thus formed can rest in a dishing 27 on an edge supporting molding of the room.

The floating floor construction according to the invention has a number of highly favourable properties when in use. As already observed, it is possible to apply a carpet or other fixed floor covering by means of a continuous adhesive layer in the same manner as on a continuous floot area not composed of tiles or such like panels.

Due to the interspace of the tiles in horizontal direction, sound vibrations cannot be propagated directly from one tile to an adjoining tile. When a tile 2 is loaded (see Fig. 1) the metal receptacle 13 of the adjusting foot 1 will slightly deflect at its circumference, so that the load is taken over at least partly by the elastomer 14 in the receptacle 13 and thus the floating floor is slightly resilient.

Since a carpet 5 laid on the floating floor is in direct contact at the circumference of each tile 2 with the circumferential flange 20 of the metal tile receptacle 17 and since the metal receptacle 17 is in direct contact at each adjusting foot with the metal receptacle 13 of the platform 9 of the adjusting foot, static electricity is discharged immediately in all places.

In spite of the fact that the floating floor has sufficient structural strength, there are a great many places distributed over the entire floor where the thickness of the material of the tiles 2 is slight, e.g. at the apex of each of the truncated cone configurations 24. In such places a passage to the space underneath the floating floor can be made in a simple manner by using light material.

CLAIMS

1. An adjusting foot destined for use in a floating floor construction, comprising adjoining floor slabs supported at the angular points by adjusting feet by means of which the floating floor rests on the subfloor without attachment means, a screwed spindle with nut and a platform having at the under-side a bush fitting over the screwed spindle and resting on the nut, characterized in that the base plate is fitted with a central dishing for receiving the screwed spindle, while the plate portion around the central dishing is provided with radial, downwardly embossed zones having depths increasing towards the edge of the plate in such a manner that the adjusting foot, in unloaded conditions, rests on embossed zones and in loaded condition the supporting function is taken over by the under-side of the central dishing, which is provided with a two-sided adhesive layer.

2. An adjusting foot according to claim 1, characterized in that the bush of the tile supporting platform is provided in cross-section with flat sides with an interspace substantially equal to the outside dimension of the screwed spindle, which is enlarged at least at one location by deformation.

3. An adjusting foot according to claim 1 or 2, characterized in that the platform is formed by a metal receptacle filled as far as the upper edge with an elastomer.

4. An adjusting foot according to claim 3, characterized in that the metal receptacle contains a sheet of synthetic rubber filling the receptacle, having a Shore hardness of 60-80.

5. A floating floor construction with adjusting feet according to any one of the preceding claims, wherein use is made of a separation fitting, such as a cross to be placed on the platform, characterized in that the floor panels are kept interspaced by the separation fitting.

6. A floor panel for use in a floating floor construction in combination with adjusting feet according to any one of the preceding claims, characterized in that the floor panel is designed in the form of a tile consisting of a metal receptacle having a bottom and upright edges with a short, outwardly directed circumferential flange at the upper edge, said receptacle being filled as far as the upper edge with compression resistant material, in particular concrete.

7. A floating floor construction according to claim 5 and using a floor panel according to claim 6, characterized in that the dimensions of the separation cross and of the tile receptacle, in particular the edge flanges thereof, are chosen in such a manner that in a mounted floating floor construction, the edge flanges of adjoining tiles have a slight interspace, in the order of 1-3 mm.

8. A floor panel according to claim 6 in the application according to claim 7, characterized in that the edge flanges of the tile receptacles are rounded at the angular points.

9. An aid for cutting a tile from a carpet laid on a floating floor according to any one of the preceding claims, in the form of a carpet knife having a handle and a blade, characterized in that the knife is fitted with a guide attached to the handle and extending into the cutting plane at the cutting edge side of the knife.

10. A floor panel according to claim 6 in the form of a floor tile consisting of a metal receptacle with a compression resistant filling, while the under-side of the tile has an arch shape, with the arch legs at the angular points, characterized in that the metal

receptacle has the maximum depth in the angular zones, outside the angular zones the receptacle depth decreases abruptly and the receptacle bottom, except for discontinuities, extends substantially horizontally at a level lying at about 1/3 of the receptacle depth, while halfway two angular zones the receptacle bottom with raised portions links up approximately with the configuration of one half of a truncated cone with the receptacle sidewall in question.

11. A floor panel according to claim 10, characterized in that in the central tile zone the horizontal bottom portion is discontinued by a raised portion having the shape of a sphere segment, while radially embossed zones of outwardly increasing depths extend according to the tile diagonals from adjacent the sphere segment into the angular zones.

12. A floor panel according to claim 10 or 11, charachterized by dishings disposed in the tile receptacle between the central sphere segment and each of the truncated cones, extending parallel to the respective tile edges, said dishings having such depths that, when cutting a tile for placement at an edge of a floor construction, the sub-tile with the rib formed by a dishing can rest on a molding or the like edge support.

FIG. 4

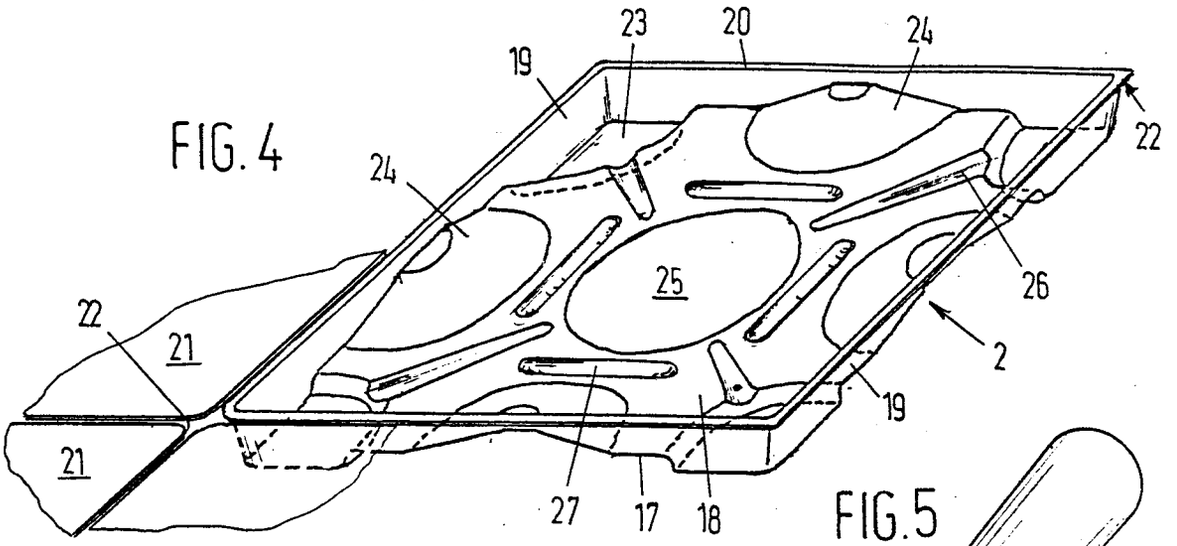
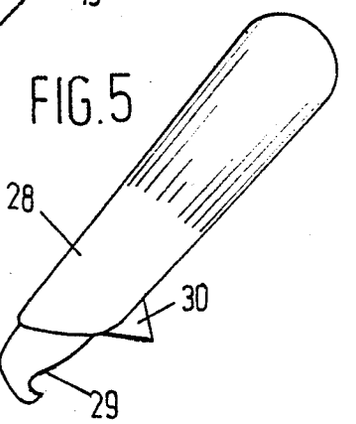


FIG. 5



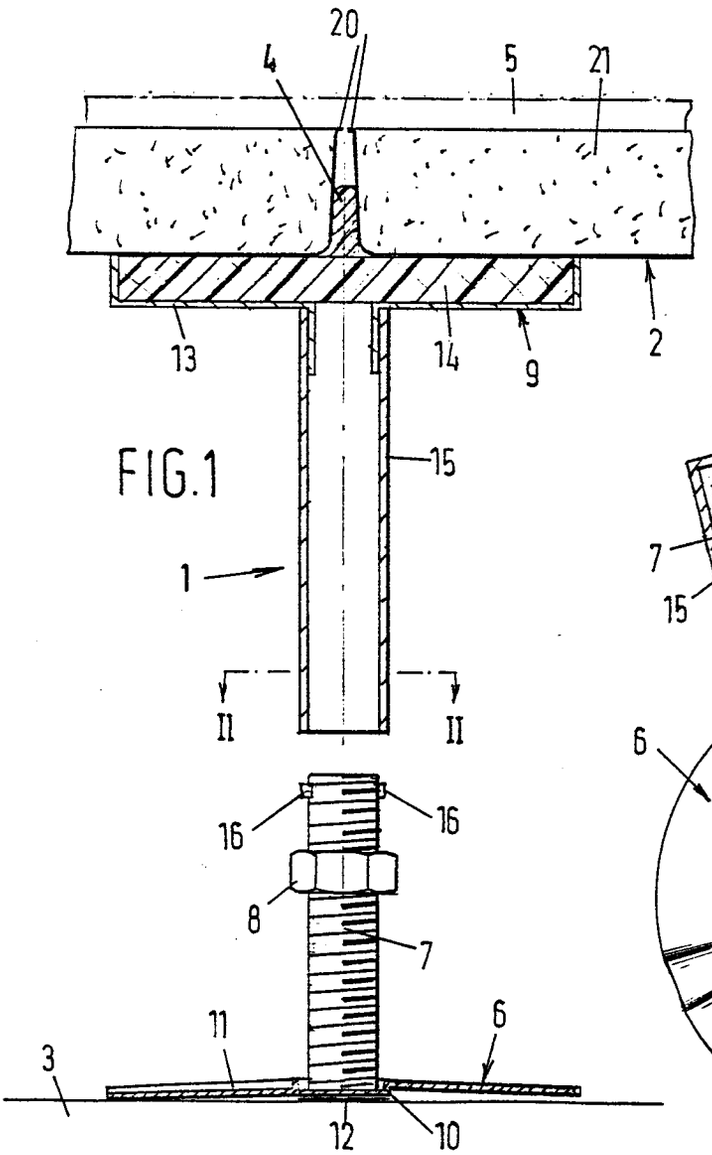


FIG. 1

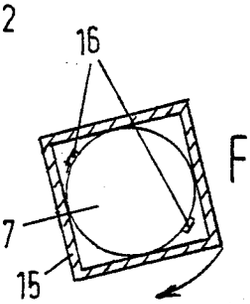


FIG. 2

FIG. 3