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Title: A TILE LEVELLING ARRANGEMENT AND AN IMPROVED METHOD OF LAYING TILES

Abstract: A tile levelling arrangement wherein a plurality of tile props are adapted to be placeable at each corner of a tile to be laid. Each tile prop includes a main body having a tile contact face and an opposing substrate contact face wherein the respective longitudinal length of the main body between the tile contact face and the substrate contact face of the tile prop defines a degree of elevation of tile above the substrate when the tile is laid.

Figure 3c
A TILE LEVELLING ARRANGEMENT AND AN IMPROVED METHOD OF LAYING TILES

TECHNOLOGICAL FIELD

This invention relates to an arrangement which will assist in the convenient requirement of laying tiles and more in particular to an arrangement and method that will make the installation of tiling with significance reduction or elimination of lippage of a tile even where those tiles that have been laid have been done so by a substantially inexperienced or unskilled Tiler.

BACKGROUND ART DISCUSSION

Tiles are known for their intricate design and aesthetics and a durability that makes them appropriate coverage for floors, walls and ceilings and so forth in both home and industrial locations.

In pursuit of accommodating different decor styles and also the requirement now to substantially increase coverage of tiled areas, particularly in industrial or commercial premises, there has been the need to increase significantly the overall size of the tile with now many manufacturers making available tiles well over the square metre and larger.

"Rectified tiles" are those tiles with vertical sides and square corners typically manufactured by cutting with a water jet or similar a large sheet of porcelain.

As the person skilled in the art will tell you, by increasing the overall size of the tile you actually increase the requirement for the substrate to which these tiles will be placed upon to be level.

Differences in the elevation between edges of adjacent tiles is generally known in the industry as "lippage" but to the general member of the public "lippage" means the tiles finished surface has an uneven appearance which is not only
aesthetically unacceptable it also becomes an important consideration with respect to the ongoing cleaning, safety and maintenance of the tiles as raised edges provide locations for the grout to protrude out from the general surface of the tile. This also makes cleaning quite difficult and wherein potentially sharp surfaces of the tile presents risks of injury when cleaning the tiles.

As introduced above many tiles include intricate designs or they have uniquely reflective surfaces and the significance of these important features of the tiles is often lost when there is unacceptable variance between the elevation levels between adjacent tiles.

While there are a variety of methods and products available that have attempted to try and address the "lippage" condition where one edge of the tile is higher than an adjacent tile, such solutions thus far have been inadequate, troublesome or too expensive.

For example "edge" treatment wherein the finished edge of the tile is chamfered may provide a certain degree of improvement but the problem is chamfering the edges of tiles is particularly difficult when one is moving towards tiles of a significant increase in size and wherein the production results in the rectifying of the edges of such tiles.

There have also been improvements in mortaring and adhesives, which are designed to reduce the degree to which of the tile to be pressed into the initial substrate.

Nonetheless these kinds of products are expensive and they still don't provide a mechanism where generally inexperienced or unskilled Tilers can conveniently and safely lay a series of tiles within an arrangement without creating the condition of "lippage". Lippage is an unacceptable outcome and is a major source of rejection of tiling work by architects.
Consequently as the requirement for increased areas of flooring and walls to be tiled becomes much larger and tiles become bigger the call upon Tilers to carry out this kind of work is even greater.

This means there are not going to be available adequate numbers of experienced or skilled Tilers to complete tasks that may reduce levels of lippage and so accordingly there needs to be an arrangement and/or method available which will allow the convenient and safe laying of tiles without the condition of "lippage" occurring even for those that are lacking in experience or generally unskilled when it comes to tiling. Importantly also no matter how much skill or experience one has some of the unique causes of "lippage" results from conditions to which often the Tiler has no control over.

For example moisture sensitivity of the applied adhesive during the day can vary depending on the temperature and so forth leading to different contractions as the adhesive settles. Often tiles themselves have a degree of inherent warpage which could present both concave and convexed surfaces again making it very difficult even for the trained Tiler to adequately place one tile against an adjacent tile without presenting an uneven appearance particularly if one tile has a concave configuration and the other having a convexed underside configuration.

Therefore it is an object of this invention to provide an arrangement, which will make it significantly straightforward to level off a tile with an adjacent tile during laying without the condition of "lippage" becoming an issue.

SUMMARY OF THE INVENTION

Accordingly in one form of the invention there is provided a tile levelling arrangement, wherein a plurality of tile props are adapted to be placeable at each corner of a tile to be laid, each tile prop including:

a main body including a tile contact face and an opposing substrate contact face wherein the respective longitudinal length of the main body
between the tile contact face and the substrate contact face of the tile prop defines a degree of elevation of tile above the substrate when the tile is laid.

An advantage of such an arrangement is that by having the "Prop" member positioned at the respective corners or if need be along peripheral edges of extremely large tiles or alternative shaped tiles, means that there is no requisite skill or appreciation as to trying to buoyance the tile onto the adhesive applied to the floor or wall so that the adjacent tile has no elevated differences between the edges of said "other" tiles.

As can be seen all the natural experienced skill of trying to almost place the tile into a buoyant position relative to an adjacent tile during the pressing process of laying the tile upon the adhesive has now been taken away.

All a Tiler will need to do is that once "Prop" members are positional in the respective corners of the tile; the Tiler simply presses only as far as the "TileProp" can go.

Hence the elevation or degree of buoyancy of the tile within the adhesive is not arbitrarily decided upon by the Tiler by way of some feel or general overall look of the tile being laid with that of an adjacent tile, but by a structural "Tile Prop" which tolerance within the substrate will be completely consistent with its actual overall dimensions.

Advantageously all the skill, stress, knowhow, trepidation and so forth is all taken out and all the Tiler now needs to do is simply make sure that the "Tile Prop" has been positioned appropriately in the corners of the tile to be laid and as the "Prop" member has been selected with the size relative to the dimensions of the tile and also at a height relative to the required elevation well inside the matrix of the tiles being laid against adjacent tiles the problem of "lippage" is eliminated or at least substantially reduced.
No longer will a Tiler need to develop that intrinsic feel as to whether or not they are applying the correct amount of pressure when laying one tile against another in order to avoid the problem of "lippage".

Consequences of shrinkage wherein the incorrect amount of water has been mixed with the adhesive or temperature fluctuations during the day in which tiles have been laid and wherein the skill of one Tiler to another is different now no longer becomes an issue.

Advantageously no matter how many people are working on the tiling of a particular location, all the elevation of the respective tiles will remain the same if they are using the "TileProp" of the appropriate dimension and height to the tiles being laid.

Advantageously once the tiles are laid if any shrinkage is occurring the tiles will only shrink back to the level of the "TileProp" accordingly no matter what time of the day or the temperature that the Tiler lays the tile if any shrinkage results again the consequences will be insignificant as any shrinkage will only place the tile back to the elevation of the "TileProp" size which is the requirement in any event in order to establish appropriate elevation of one edge with that of an adjacent tile.

Now that the problem of "lippage" can be removed or substantially eliminated through the use of the "TileProp" no matter who the Tiler is, whether they are a hobbyist or a seasoned skilled Tiled labourer, the point to be made is that their job becomes more efficient, trouble free and consistent providing a professional, aesthetic and presentable surface for cleaning and reflection as required.

As the "lippage" condition has been removed no longer will there be the requirement of having to remove or pull up uneven tiles nor will there be the requirement to use expensive non-slump adhesives and so forth because the "TileProp" of this invention overcomes all those traditional problems associated
with tiling that has led in the past to differences in the elevation between edges of adjacent tile modules.

In preference each tile prop is placable within adhesive or mortar that has been buttered onto the back of a tile to be laid upon a floor.

In preference each tile prop is placeable within the adhesive or mortar applied upon a wall to which a tile to be laid would be placed thereupon said wall.

In preference the main body of the tile prop has dimensions comparable to size of the tile to be laid.

For example, the larger the tile the larger the tile prop.

In a further embodiment of the invention the Tile Prop is integral with the tile to be laid.

In another embodiment the "TileProp" would be similar to four small protruding prongs or legs close to each of the respective corners of the tile.

Nonetheless there is no limitation on the invention as to whether or not the "TileProp" is integral or comes as a separate member in order to achieve the solution provided for by this invention by removing problems associated with lippage wherein the "Tile Prop" provides a consistent positioning of one tile against another so that there will be no differences in the elevation between edges of the adjacent tiles.

In preference the tile props include a variety longitudinal lengths of the main body between the tile contact face and the substrate contact face to provide different degrees of elevation of the tile to be laid above the substrate depending of the tile prop used.

In preference the tile prop longitudinal length size would be could be 2.5, 3.5, 4.5, 5.5 or 6.5mm.
As the person skilled in the art will appreciate the different size of the "Tile Prop" to be used will be dependent on the different substrates of the walls and floors to which the tile will be laid upon.

Another particularly advantageous feature of being able to have the "Tile Props" of different longitudinal lengths is that they can also assist in the drainage requirements when tiling floors.

For example at one part of the tiled floor one can start at a certain level and then slowly build up the elevation of the Prop member so there is the overall required inclination of the laid tiles to establish the requisite drainage of the floor where tile application is taking place.

The ability to present adequate drainage flow on a tiled floor often requires significant preparation and measuring. Once again all these cumbersome tasks are removed as all the Tiler needs to do is simply use "Tile Props" of the required selected size in order to establish the overall requisite inclination that would provide for adequate drainage of the tiled floor.

In order now to describe the invention in greater details a series of illustrations will be presented along with accompanying text of preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is perspective view of a tile prop used in the tile levelling arrangement in a preferred embodiment of this invention.

Figure 2 is an underside view of the tile showing the tile props positioned at each of the corners of the tile.

Figures 3a - 3g show a series of schematic sketches of a method of laying tiles using the tile props of the tile leveling arrangement of this invention.
Figure 4 shows a schematic representation of a preferred embodiment of laying tiles upon a wall using the tile props of the tile leveling arrangement of this invention.

Figures 5a & 5b show schematic representations wherein the use of the tile props will allow tiles to be walked on immediately after laying.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings now in greater detail where Figure 1 shows the preferred embodiment of a tile prop shown generally as 10.

It does however need to be kept in mind that the tile prop need not be a separate member to the tile to which the tile prop will ultimately be attached thereto.

Some embodiments of this invention envisage the use of tiles wherein the Prop would be integral with the tile to be laid or wherein the tile prop has been previously fixed or fastened thereon before it comes to the possession of the Tiler responsible for actually laying the tile.

Nonetheless in the embodiment shown in Figure 1 the tile prop 10 has its main body, which includes the Tile Contact Surface 12 and the Substrate Contact Surface 14 wherein, the sidewalls 16 define the height shown generally by way of arrow 18 of the tile prop 10.

The overall size of the tile prop will be dependent upon the actual size of the tile to be laid.

The actual height 18 of the tile prop while being dependent on the tile being laid will also be relative to any drainage considerations that need to be designed into the overall laid tile configuration.
For example if there is a requirement to have water drain away from a wall that the tiles placed up close to the proximity of the wall would utilise a tile prop of a higher height and as the Tiler moved away from the wall it would be a progressive selection of tile Prop with lower height dimensions.

Advantageously not only then will the tile prop be able to assist the Tiler in the general laying of the tiles to avoid the "lippage" condition, but will also provide an expedited way of being able to achieve drainage.

Figure 2 shows in the preferred embodiment a tile 20 would have one tile prop member 10 locatable at each corner of the tile 20.

As introduced above whether or not the tile prop 10 is integral or separate to the tile to be laid is quite incidental so long as there is a tile prop member ultimately positional at the respective corners of the tile to be laid, whether that is attached to the tile or otherwise or whether the tile prop is first placed upon the substrate to have the tile then placed thereupon is not restrictive upon the scope of the invention.

What remains important to the invention is the fact that there is a tile prop 10 located between the substrate and the laid tile 20 means that the appropriate elevated positioning of a tile 20 within the applied adhesive or bonding agent to the floor means that adjacent tiles will now be configured through the use of the tile prop so that there is no inadvertent discrepancies or differences in the elevation edges between these adjacent tiles being laid.

Figures 3a through to 3g show a preferred method in which the tiles may be laid utilising the tile prop.

Following through each of the respective stages illustrated in Figures 3a through to 3g you will see that the Tiler 22 using the appropriate tool 24 will troll out adhesive 26 upon the floor 28 being layered.
A tile 30 then has its back surface buttered with an adhesive or mortar 27 which then allows the Tiler 22 to place the respective tile props 10 on each of the corners of the tile 30 as best seen in Figures 3c, 3d and 3e.

Once the tile props 10 have then been positioned in each of the corners of the tile 30 the Tiler 22 is then able to lay the tile by pressing only as far as the tile prop will allow. This is best seen in Figures 3f and 3g wherein the Tiler 22 can press upon the Tile 30 into the adhesive 26 so that tile 30 adjacent to tile 32 provides a spacing or gap shown generally as 34, assisted by tile spacer 36, where there is no unacceptable difference between the elevation in the edges between these adjacent tiles 30 and 32.

Figure 4 shows an alternative embodiment of the invention where the tiles 38 can be placed against the wall 42 wherein as shown there is a series of already laid tiles 38 which have their adjacent gaps 40 aligned and rested in position so that there is no discrepancies or difference between the elevated edges of the adjacent tiles that have been laid upon wall 42 as the tile props 10 have been position already in the adhesive applied on the wall to which the corners of the tiles were then aligned up with before having the tiles 38 pressed in.

In the embodiment shown in Figure 4 in that example the tile props 10 are placed on the wall 42 once the adhesive has been applied to the wall and then the tile 38 is positional upon the tile props 10.

This example just goes to show that the tile prop 10 need not necessarily be first attached to the tile itself but can just as easily be placed on the substrate either a wall, ceiling or floor prior to the tile being placed thereupon.

As introduced above numerous times preceding the significance is the tile prop member per se rather than whether or not it is integral, separate or attached first to the tile and or the substrate, which the tile will rest thereupon.
The fact that there is a tile prop means the Tiler is unable to exert unnecessary pressure or not provide enough pressure so that adjacent tiles align themselves so their respective edges don't have any elevation differences.

Advantageously with this invention all the skill has been taken out to be replaced by the simple use of the tile prop which will provide the necessary consistency of one tile against another when placed within the adhesive upon the substrate.

Figures 5a and 5b illustrate an advantage of this invention in that through the use of the tile props it is possible for the Tiler 22 or even occupants of the premises being tiled to immediately walk upon adjacently laid tiles 50 and 52 with no adverse effect upon the gap 54 therein between. As the tiles 50 and 52 will be resting upon the tile props 10.

Advantageously Tilers will now no longer have to wait for tiles to dry before they can be walked upon to access other areas and so forth. The tile prop will allow immediate access and movement upon the tile.
CLAIMS:

1. A tile levelling arrangement wherein a plurality of tile props are adapted to be placeable at each corner of a tile to be laid, each tile prop including:
   - a main body including a tile contact face and an opposing substrate contact face wherein the respective longitudinal length of the main body between the tile contact face and the substrate contact face of the tile prop defines a degree of elevation of tile above the substrate when the tile is laid.

2. The tile levelling arrangement of claim 1 wherein the substrate is a floor, wall and/or ceiling.

3. The tile levelling arrangement of claim 1 wherein each tile prop is placeable within adhesive or mortar that has been buttered onto the back of a tile to be laid upon the floor, wall and/or ceiling.

4. The tile levelling arrangement of claim 1 wherein each tile prop is placeable within adhesive or mortar applied to a floor, wall and/or ceiling to which the corners of a tile to be laid would be aligned with said placed tile props in said adhesive or mortar when laid thereupon said floor, wall and/or ceiling.

5. The tile levelling arrangement of claim 1 wherein each tile prop is an integral part of the tile to be laid.

6. The tile levelling arrangement of claim 1 wherein the tile props have different longitudinal lengths of the main body between the tile contact face and the substrate contact face to provide different degrees of elevation of the tile to be laid above the substrate depending on the tile prop used.

7. The tile levelling arrangement of claim 6 wherein the tile prop longitudinal lengths are selectable at sizes including 2.5mm, 3.5mm, 4.5mm, 5.5mm or 6.5mm.
8. The tile levelling arrangement of claims 6 or 7 wherein two corners of the tile being laid have tile props of longer longitudinal lengths to those of the tile props being used on opposing corners of said tile being laid, such that when the tile is being laid, drainage across the laid tile is possible by the differing degrees of elevation from one side of the tile to other through the use of tile props with differing longitudinal lengths.

9. The tile levelling arrangement of claims 6 or 7 wherein a first tile and a second tile being laid adjacent to each other, has the first tile with tile props of longer longitudinal lengths to those of the tile props being used with the second tile, such that when the first tile and second tile are laid, drainage across the laid first and second tiles is possible by the differing degrees of elevation from the first tile to the second tile through the use of tile props with differing longitudinal lengths.

10. The tile levelling arrangement of anyone of the proceeding claims wherein the main body of the tile prop have dimensions comparable to size of the tile to be laid with a larger main body to be used with a larger tile and a smaller main body to be used with a smaller tile.
A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, IPC E04F21/20, E04F21/18, E04F13/-, E04F15/- & KEYWORDS (TILE, SPACER, FEET, SHIM, PROP, PAD, PACKER, RAISE, HEIGHT, LEVEL, LIPPAGE, BACK, UNDER, BENEATH AND SIMILAR TERMS)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C

Date of the actual completion of the international search: 20 June 2012

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Form PCT/ISA/210 (fifth sheet) (July 2009)
### DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>WO 2004/106665 A1 (HARRISON et al.) 09 December 2004 Figures 25a to 25f; page 10, line 16 to page 11, line 2; claim 24</td>
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This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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