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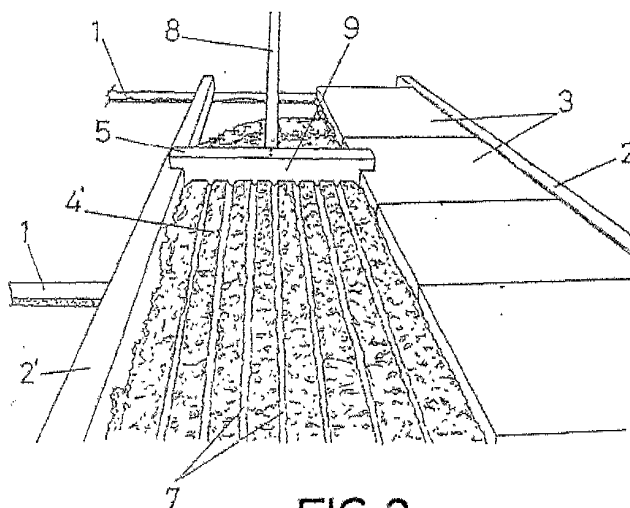
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(54) **TILE INSTALLATION METHOD AND DEVICES**

(57) This invention relates to a tile installation method and devices. According to the invention, level guides (1) are provided on the ground and a pair of rules (2-2') are disposed transversely thereon, said rules being separated from one another by a distance that is slightly greater than the size of the tiles (3) a are fixed in place by pouring mortar (4) into the space defined therebetween (3) and using a rake (5) to spread the mortar and level same, said rake being suitably dimensioned such that the ends thereof rest on the above-mentioned rules (2-2'). Subsequently, a line of tiles (3) is placed between the rules

(2-2'), with each tile being installed individually and a groove being formed in the mortar on the shared free side between said tile and the next. Once the tiles have been installed and levelled, one of the rules (2') is moved away such as to form a space together with the line of tiles (3) which is similar to that previously defined between the rules, in order to repeat the operation, i.e. to pour a new mass of mortar (4') between the rule (2') and the line of tiles (3) and to spread and level same with the rake (5) which rests on the rule (2') and on the line of tiles (3) already in place. Said cycle is repeated until the floor has been completed.



**FIG.3**

## Description

### OBJECT OF THE INVENTION

**[0001]** The present invention relates to a method for installing tiles upon a forging or any other type of flooring, as well as the tools that allow carrying out said method

**[0002]** The object of the invention is to achieve the installation of the tiles to be carried out rapidly and easily by scarcely qualified workers and with optimal results regarding tiling finishing.

### BACKGROUND OF THE INVENTION

**[0003]** There are different types of tiles for floor coating based on different materials such as stonewear, marble, terrazzo, etc., but they all have the common feature stone wear requiring highly skilled workers for their installation, given the evident complexity of such tasks. More specifically, the tiler works from establishing level references or guides on which he slides a rule in order to conveniently spread a mass of mortar that acts as a link between the tiles and the ground, subsequently placing an initial tile and levelling it by tapping it with a rubber paviour's hammer and constantly controlling the level. The following tile is placed by moving the material closer to the tile that is already in place with the aid of a paddle or the like, creating a groove that moves the mortar to the adjacent area in order to place the tile without the mortar protruding from between them, which when placing the new tile and pressing upon it with the paviour's hammer or calibrating it, makes the accumulated mortar give way and move slightly towards the previously placed tile, causing that tile to move, movement that has to be rectified by levelling it again.

**[0004]** This method is evidently complex, tiring and slow and requires specialised workers, who must proceed during the entire procedure in a bent or crouching position, which has negative long-term effects on their health.

### DESCRIPTION OF THE INVENTION

**[0005]** The method proposed by the invention solves the problems explained above in an entirely satisfactory manner, allowing performing tiling operations in a fast, comfortable and simple manner.

**[0006]** To do this said method starts from using a pair of rules that are conveniently levelled in parallel on the floor, with a distance to one another that is slightly greater than the width of the tiles to be installed and a height that is also in agreement with the thickness of said tiles plus that of the layer of mortar to be used to fasten them. The rules are fixed to the ground, parallel to one another upon parallel level guides, and the mortar is poured into the space determined between them, spreading it with a tool shaped like a rake that is discussed below. This tool does not only perfectly spread the mortar so that it is perfectly

distributed, defining a notably levelled upper surface, but it also makes said surface be in conditions to receive the tiles so that they are in turn level with the rules. A line of tiles is then placed laterally resting upon the rules placed at the beginning and the tiles are placed individually after having removed part of the mortar existing on the free edge between said tile and the next with the aid of a grooving device, which will also be discussed below. Having covered the intended area, the tiles are then definitively levelled with a paviour's hammer, which is a minimal operation since the regular distribution of the mortar performed before placing the tiles makes the possible unevenness between the tiles and said rules not exceed one or two millimetres, so that the definitive levelling is performed very quickly. Said rules are then removed and one of them is placed parallel to the line of tiles and with an equal distance with respect to these tiles as the two rules had initially, the line of tiles then acting as the other rule, and the method described above is then repeated.

**[0007]** The devices used to put said method into practice consist of toothed rakes of different kinds, specifically with different widths and different arrangements of the toothing, according to the size of the tiles, their thickness, the flooring arrangement and the type of fastening material used, so that each rake is introduced between the pair of rules, or between the rule and the line of tiles already in place, and is slid, perfectly guided, spreading the mortar in order to leave a homogeneous layer on the ground with the desired thickness.

**[0008]** More specifically, when the layer of mortar must be thin because the tile to be placed is not very heavy, such as those in stonewear or the like, the rake will have small, identical, evenly distributed triangular teeth. If a flooring arrangement is required having a contraction joint or open joint where there is a certain distance between the tiles, the rake will incorporate blades on its ends acting as runners to facilitate its movement over these joints.

**[0009]** When placing tiles upon existing flooring, the fastening material used is fast-drying cement or similar materials that require thinner layers of fastening material. The rake will then have double the number of teeth described above, said teeth having an identical triangular configuration and even distribution.

**[0010]** When thicker layers of mortar are required, such as for example to place tiles of considerable weight such as marble and the like, the rake will have small teeth such as those mentioned above, alternating with other longer teeth with truncated vertices.

**[0011]** In either case the rakes have a handle to facilitate their manual operation, they have end supports on the rules that specify the degree or working level thereof and they will also have side stops in order to prevent the mortar from spilling out over the side with respect to the rake.

**[0012]** Finally, and regarding the grooving device mentioned above, it will have a grooved body with a trapezoidal profile, the side branches of which configure to-

gether with its middle branch at a right angle inside of which to couple a handgrip. This last side branch incorporates two openings inside of which to insert a pin acting as a level regulator according to the height of the tile used and the depth of the groove desired, the grooving device shifts on the free edge between said tile and the next, generating a groove and accumulating the excess mortar removed when grooving inside its grooved body, preventing an accumulation of said material in the adjacent area and also preventing the shifting of the tile that is already in place when placing the following tile.

## DESCRIPTION OF THE DRAWINGS

**[0013]** As a complement to the description being made and in order to aid towards a better comprehension of the features of the invention, according to a preferred practical embodiment thereof, we incorporate as an integral part of said description a set of drawings that are illustrative and not limiting in nature and represent the following:

Figure 1.- Shows, according to a perspective view, an initial phase of the method for installing tiles object of the present invention.

Figures 2 and 3.- Show other successive phases of said method.

Figure 4.- Shows, also according to a perspective view, the practical phase for the use of the grooving device.

Figure 5.- Shows a perspective view of a rake in order to put into practice the method of the previous Figures.

Figure 6.- Shows a similar representation to that of the previous Figure, corresponding to a practical embodiment variant of the rake.

Figure 7.- Shows a similar representation to that of Figure 5, corresponding to a practical embodiment variant of the rake.

Figure 8.- Shows a similar representation to that of Figure 5, corresponding to a practical embodiment variant of the rake.

Figure 9.- Shows, finally, a perspective detail of the grooving device.

## PREFERRED EMBODIMENT OF THE INVENTION

**[0014]** In view of the Figures mentioned above, and more specifically of Figures 1 to 4, it can be observed how the method described starts from establishing parallel and conveniently spaced level guides (1) on the

ground in order to place upon them a pair of transverse rules (2-2'), made for example in square aluminium tubes of suitable length, placing said rules (2-2') on the level guides (1) with a slightly greater separation than that of the width of the tiles (3) to be placed and parallel to one another.

**[0015]** The mass of mortar (4) or fastening material chosen for the tiles (3) is then poured between the rules (2-2') and spread with the aid of a rake (5) that leaves the mortar (4) perfectly level and grooved (7) between the rules (2-2') and at a suitable height so that when the tiles (3) are adequately placed they remain level with the upper side of the rules (2-2').

**[0016]** A line of tiles (3) is then placed by individually placing each one and using the grooving device (6) shown in Figure 4, which defines a groove on the mortar on the free edge between said tile (3) and the next, preventing excess accumulation of material at this point when placing the following tile and preventing shifts in the position of the tile that is already in place.

**[0017]** Having finished placing a line of tiles (3), as shown in Figure 2, any possible and slight levelling errors of said tiles (3) are corrected using a paviour's hammer and a level, then one of the rules (2'), the one that was initially separated from the tiles (3), is shifted sideways until the position shown in Figure 3, wherein between said rule (2') and the aligned tiles (3) there is a distance equal to that initially existing between the rules (2-2') in Figure 1. The rule- (2') is now functionally combined with the aligned tiles (3) themselves, as also shown in Figure 3, and a new mass of mortar (4') is poured between them, which is similarly spread with the rake (5) and remains in conditions to receive a second alignment of tiles (3).

**[0018]** This method is repeated as many times as necessary until covering the entire surface to be paved.

**[0019]** The rake (5) basically adopts a dihedral and obtuse configuration, preferably of about 125°, such that a handgrip or handle (8) of considerable length, enough for a worker to work from a standing position, emerges from its oblique branch (5), whereas its vertical branch (9) incorporates on its lower free edge a plurality of triangular teeth (10), as shown in Figure 5, determining longitudinal grooves in the mortar (7) strip as it is being spread, which perfectly levels the layer of mortar. The rake (5) is provided with staggered notches (11) on its ends for support upon the rules (2-2') or on the rule (2') and the aligned tiles (3) previously fastened to the ground.

**[0020]** These staggered notches (11) have a closed internal edge (12) in order to prevent the mortar from spilling out.

**[0021]** This rake (5) from Figure 5 is especially suited for slabs or tiles of little thickness and therefore little weight, whereas when dealing with larger slabs, such as terrazzo, marbles and the like, it is expected to use rakes (5') as those shown in Figure 6, with a similar basic structure to the previous one but also with small triangular teeth (10'), alternating with considerably larger teeth (13)

with truncated vertices (14) These rakes (5'), being intended for slabs of considerably greater thickness, have larger staggered notches (11') on the ends.

[0022] In order to place tiles upon existing flooring, the fastening material used is fast-drying cement or similar materials that require smaller amounts of fastening material, resulting in thinner layers of fastening material. In these cases, rakes (5") will be used such as the one shown in Figure 7, which have a basic structure similar to that of Figure 5, with small, evenly distributed triangular teeth (10) in a proportion that doubles the amount of teeth shown in said Figure 5. This rake (5") has a closed edge (12) on both ends in order to prevent the mortar from spilling out.

[0023] The rake (5) of Figure 5 is especially ideal for slabs or tiles placed in a conventional paving arrangement. The use of rakes (5") such as that shown in Figure 7, is expected for a paving arrangement requiring contraction joints or open joints where there is a certain distance between the tiles, with a basic structure similar to that of Figure 5 but incorporating on either end blades (20) acting as runners that aid its shifting along the tiles without said joints preventing their correct shifting.

[0024] Obviously, and as explained already above, there may be rakes with different lengths, suited to different tile (3) sizes for them to be coupled to the rules (2-2') as shown in Figure 1.

[0025] Finally and regarding the grooving device (6), Figure 9, it has a grooved body in order to accumulate the excess mortar that corresponds to reference (6), with a trapezoidal profile as seen above, with a handle (15) integral to one of its ends that has a side (16) that is perpendicular to its middle branch (6), i.e. forming a right angle with the latter, and defining between them a protruding section (17) that consists in an operating end of the device, i.e. of the grooving device, and is consequently the one that will generate the groove (7) on the mortar, as shown in Figure 4.

[0026] A pair of openings (18) is established on this same branch (16) for inserting a pin (19) that can be used as a supporting guide on the tile (3) such that the working depth of the protruding section (17) of the grooving device will depend on which of these openings (18) is chosen to insert the pin, in order to adapt to thinner or thicker tiles.

## Claims

1. A method for installing tiles, specifically for installing and fixing them upon forging or any other type of flooring, **characterised in that** it consists of the following operating phases:

- The classic level guides (1) are established parallel to one another on the ground.
- A pair of rules (2-2') is established transversally upon said level guides (1), separated by a distance slightly greater than that of the size of the

tiles (3) that are to be placed parallel to one another.

- The mass of mortar (4) or fastening material chosen for the tiles (3) is then poured between the rules (2-2') and spread with the aid of a rake (5) that slides upon the rules (2-2') and determines the homogeneous spreading of the mortar, its levelling and its distance with respect to the upper plane of the rules (2-2') according to the thickness of the tiles (3) to be placed.

- Positioning the tiles (3) between said rules (2-2'), after having performed a groove on the mass of mortar according to the free edge between said tile and the next, with the aid of a grooving device.

- Levelling the aligned tiles (3) with the aid of a paviour's hammer and a level, both level to one another and to the rules (2-2') that frame them.

- Separating one of said rules (2-2') and placing it parallel to the free edge of the aligned tiles (3) with a distance with respect to this edge that is notably equal to the initial distance between the rules (2-2').

- Pouring the mortar between the moved rule (2') and the already placed aligned tiles (3).

- Placing a tile (3), grooving, defining a new line of aligned tiles (3) and levelling these.

- Indefinite repetition of the second cycle until completing the flooring.

2. The devices used to put into practice the method of claim 1, **characterised in that** they consist of a set of toothed rakes suited to different kinds of tiles, according to the size of the tiles, their thickness, the flooring arrangement and the type of fastening material used, and a grooving device that is able to define a groove in the mortar next to said free common edge.

3. The devices according to claim 2, **characterised in that** each rake (5-5' -5" -5'") adopts a dihedral and obtuse configuration, such that a handgrip or handle (8) is attached to one of its branches, whereas the other branch ends in an operative end provided with a plurality of triangular teeth (10'), alternating with other larger teeth (13) with a truncated free edge (14), and to which blades (20) are added to act as runners depending on the type of paving arrangement, and in any case incorporating staggered notches (11-11') on its ends so that they rest on the rules (2-2') or on a rule (2') and a line of aligned tiles (3), and where the inner side of said notches (11-11') is closed with a parting (12) that prevents the mortar from spilling out sideways.

4. The devices, according to claim 2, **characterised in that** the grooving device is materialised as a grooved body (6) with a trapezoidal profile and a han-

dle (15) integral to one of its ends, one of the side branches (16) of which forms a right angle with its middle branch (6) and defining in the area where they converge a protruding section (17) that in turn defines the groove or channel on the mortar, said side branch (16) incorporating a pair of openings (18) for the selective coupling of a pin, intended to rest and slide upon the tiles to generate a suitably sized groove upon the mortar independently of whether the tiles are thick or thin

#### Amended claims under Art. 19.1 PCT

1. A method for installing tiles, specifically for installing and fixing them upon forging or any other type of flooring, **characterised in that** it consists of the following operating phases:

- The classic level guides (1) are established parallel to one another on the ground.
- A pair of rules (2-2') is established transversally upon said level guides (1), separated by a distance slightly greater than that of the size of the tiles (3) that are to be placed parallel to one another.
- The mass of mortar (4) or fastening material chosen for the tiles (3) is then poured between the rules (2-2') and spread with the aid of a rake (5) that slides upon the rules (2-2') and determines the homogeneous spreading of the mortar, its levelling and its distance with respect to the upper plane of the rules (2-2') according to the thickness of the tiles (3) to be placed.
- Positioning the tiles (3) between said rules (2-2'), after having performed a groove on the mass of mortar according to the free edge between said tile and the next, with the aid of a grooving device.
- Levelling the aligned tiles (3) with the aid of a paviour's hammer and a level, both level to one another and to the rules (2-2') that frame them.
- Separating one of said rules (2-2') and placing it parallel to the free edge of the aligned tiles (3) with a distance with respect to this edge that is notably equal to the initial distance between the rules (2-2').
- Pouring the mortar between the moved rule (2') and the already placed aligned tiles (3).
- Placing a tile (3), grooving, defining a new line of aligned tiles (3) and levelling these.
- Indefinite repetition of the second cycle until completing the flooring.

2. The devices used to put into practice the method of claim 1 consisting of a set of toothed rakes suited to different kinds of tiles, according to the size of the tiles, their thickness, the flooring arrangement and

the type of fastening material used, adopting a diheral and obtuse configuration, such that a handgrip or handle (8) is attached to one of its branches, whereas the other branch ends in an operative end provided with a plurality of triangular teeth (10), or depending on the type of tile to be placed triangular teeth (10') alternating with other larger teeth (13) with a truncated free edge (14), **characterised in that** the rakes (5-5' -5" -5''' ) have staggered notches (11-11') on its ends, for resting upon the rules (2-2') or on a rule (2') and a set of aligned tiles (3), where the inner side of said notches (11-11') is closed with a parting (12) that prevents the mortar from spilling out sideways and where a grooving device is used in addition to the rakes that is able to define a groove in the mortar next to said free common edge.

3. The devices according to claim 2, **characterised in that** each rake (5-5' -5" -5''' ) adds blades (20) to the ends to act as runners when placing a flooring with a contraction joint or open joint.

4. The devices according to claim 2, **characterised in that** the grooving device is materialised as a grooved body (6) with a trapezoidal profile and a handle (15) integral to one of its ends, one of the side branches (16) of which forms a right angle with its middle branch (8) and defining in the area where they converge a protruding section (17) that in turn defines the groove or channel on the mortar, said side branch (16) incorporating a pair of openings (18) for the selective coupling of a pin, intended to rest and slide upon the tiles to generate a suitably sized groove upon the mortar independently of whether the tiles are thick or thin.

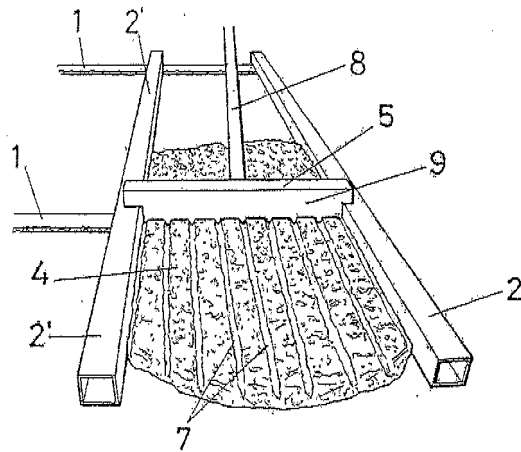


FIG. 1

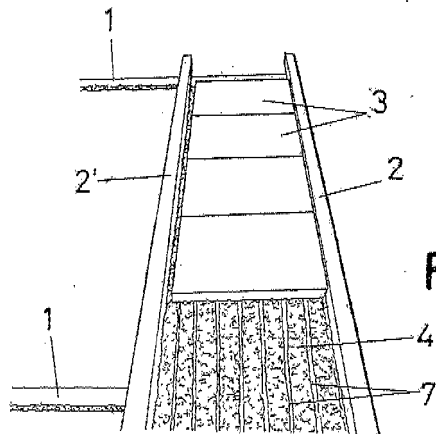


FIG. 2

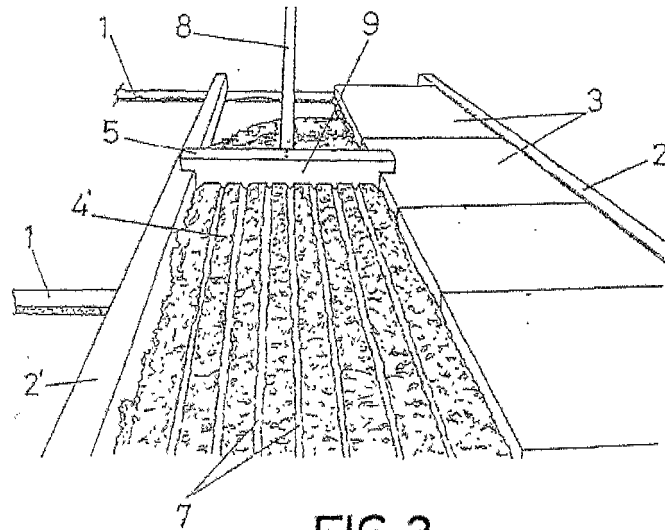


FIG.3

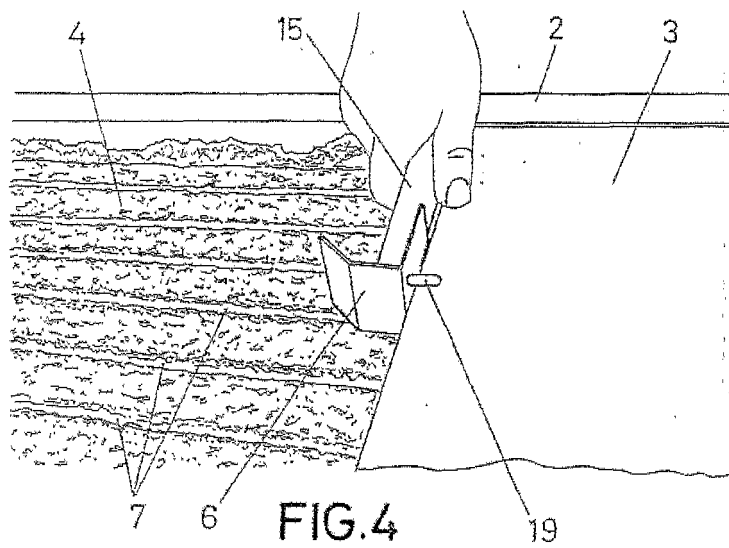
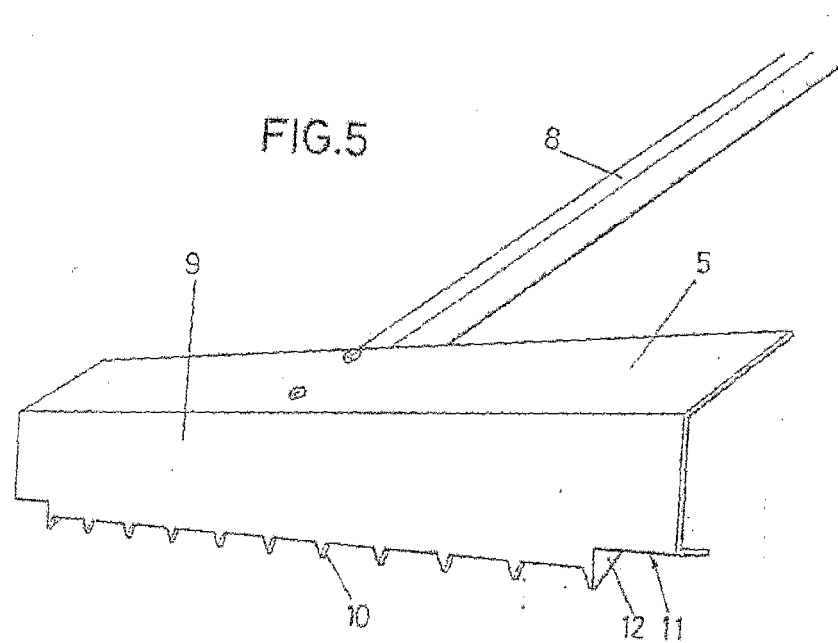
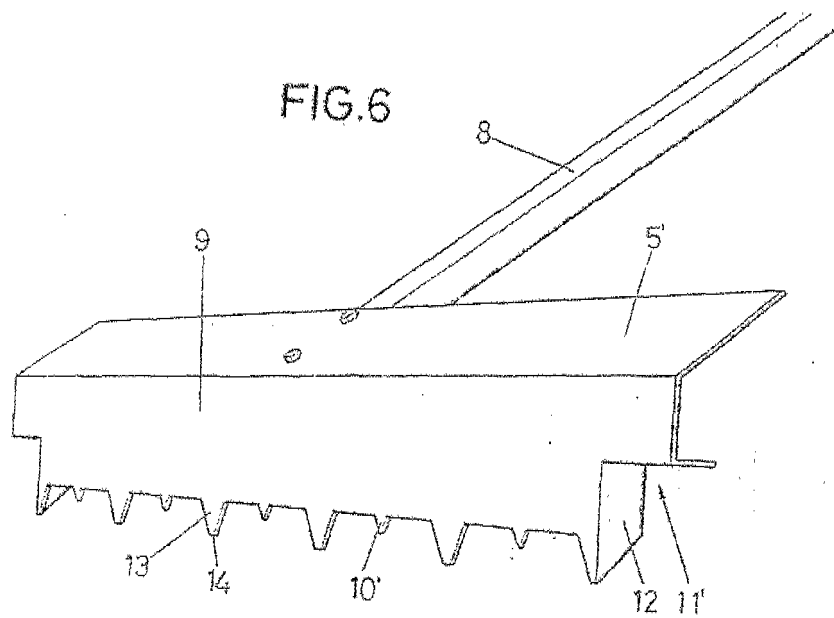
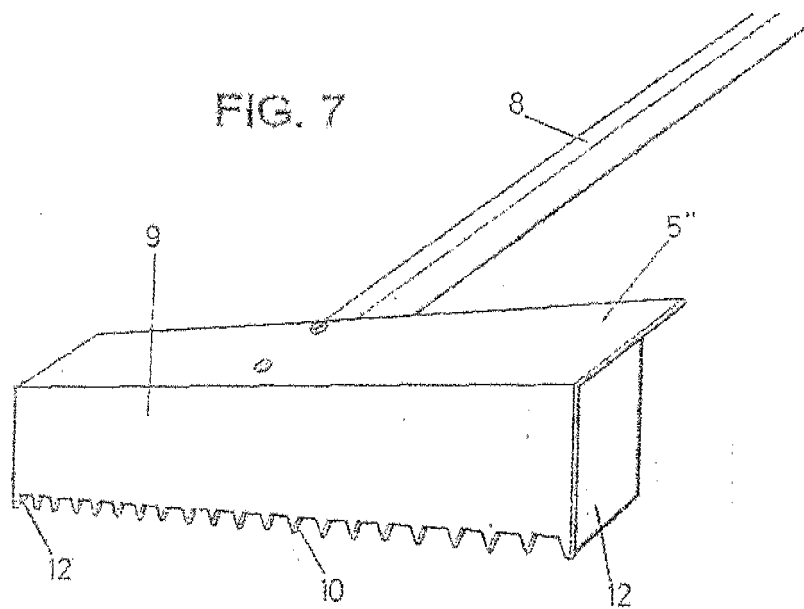


FIG.4









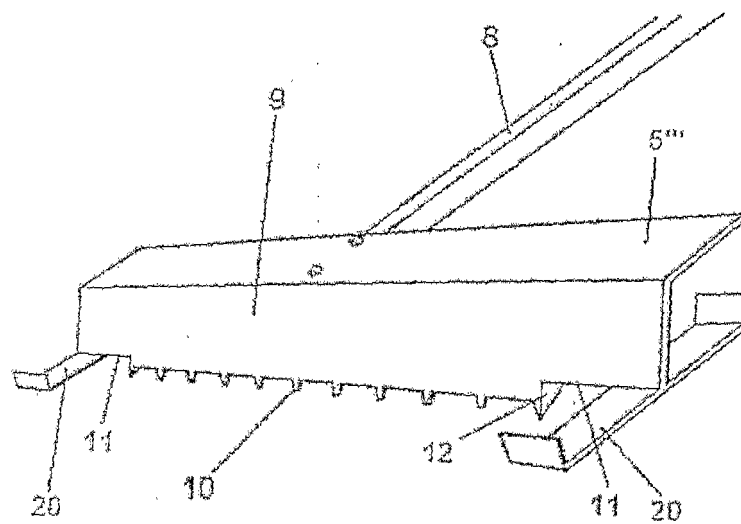


FIG. 8

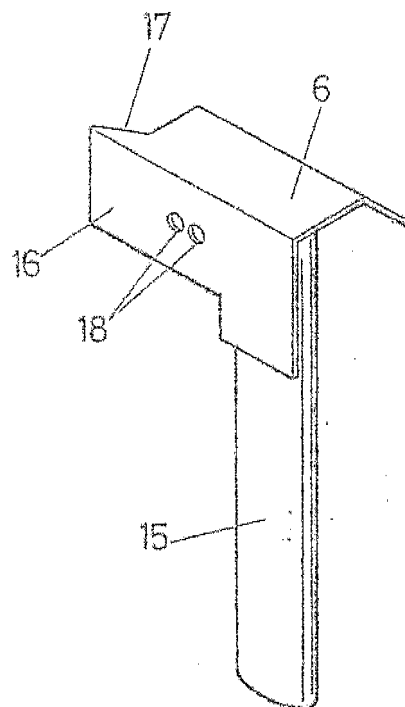


FIG. 9

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2006/000293

## A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04F15,E04F21

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)

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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| A         | US 5807022 A (MCCLEARY et al.) 15.09.1998, abstract and figures.                                             | 1-3                   |
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☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

11.September.2006 (11.09.2006)

Date of mailing of the international search report

(27-09-2006)

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**EP 1 923 524 A1**

## INTERNATIONAL SEARCH REPORT

### Information on patent family members

International application No.

PCT/ ES 2006/000293

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Form PCT/ISA/210 (patent family annex) (April 2005)

INTERNATIONAL SEARCH REPORT

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CLASSIFICATION OF SUBJECT MATTER

*E04F 15/02* (2006.01)

*E04F 21/20* (2006.01)

*E04F 21/165* (2006.01)