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(54) **Stirring roller brush**

(57) Stirring roller brush comprising the set of identical spikes (1), identical preferably in regard of their length/height, further comprising at least one spacing element (2) that extends beyond the outline of the set of the identical spikes (1).

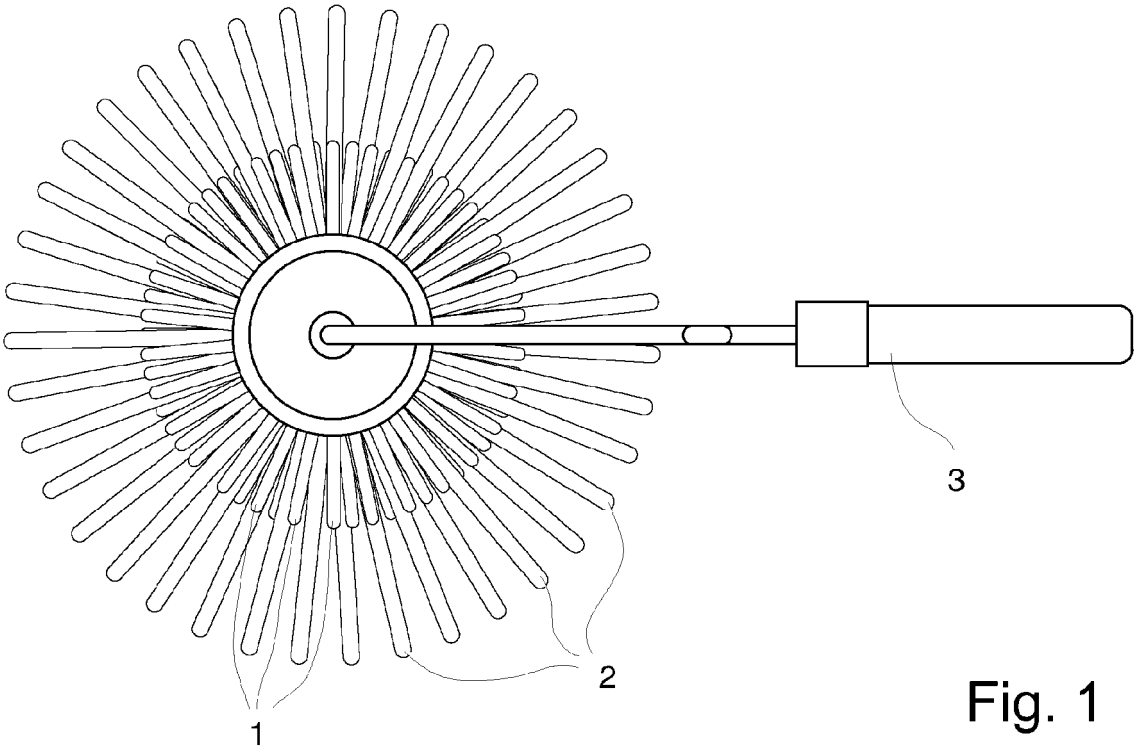

Fig. 1

EP 2 589 727 A2

Description

Technical Field

[0001] The invention relates to tools for working - levelling of self-levelling floor screeds in building industry, particularly tools designed to reduce or avoid cracking of cement based floor screeds.

Background Art

[0002] Self-levelling floor screed is a material that is able to form a planar surface after simple working using a vibrating tube (vertical motion of the immersed part of the tube with the diameter ø = approx. 20 mm without being removed from the screed). Self-levelling screed is commonly applied in thickness from 35 mm - anhydrite (gypsum-based) screed, cement screed from 20-60 mm. Both basic types contain aggregates, usually mined (not crushed), with grain size 0-8 mm. The described working manner is used with all types of self-levelling screeds.

[0003] Manufacturers of self-levelling screeds prescribe to vibrate it twice, in directions perpendicular to each other. The disadvantage of the said working of self-levelling screeds consists especially in the strenuousness of work in all-day use of the vibration tube and also in that the use of the vibration tube may cause segregation of aggregates in the screed, i.e. that greater particles are pushed down towards the bottom of the screed layer. Consequently, the surface is thus richer in cement paste, affecting its shrinkage behaviour, thus the surface shrinkage will be substantially different than in the rest of the screed. Said segregation of aggregate particles with a greater diameter brings along the risk of the occurrence of cracks, mainly on the surface, which may even result in the need to remove the cracked screed from the place of installation.

[0004] Some other devices aim at that the surface of the screed remains smooth, as described in DE 3227056 A1 or to ensure that the thickness of the layer is constant for a given surface, as described in US 6350083. The mentioned however, are not the object of the present invention that mainly aims at reducing the risk of screed heterogeneities and formation of cracks.

[0005] Self-levelling materials used (as well as designed) for thickness below 20-60 mm are called self-levelling thin screeds. Self-levelling thin screeds are worked using a levelling roller which is equipped with a set of identical spikes (all having the same length or height with respect either to the centre or the surface of the roller rod. Self-levelling thin screeds are then worked by moving, rolling the roller in the layer of self-levelling thin screed. The use of the said roller is easier in regard of laboriousness, but such roller cannot be used to work self-levelling screeds due to that their thickness is greater than that of self-levelling thin screeds.

[0006] The object of the present invention is to overcome disadvantages of the prior art technology and to provide a technical solution that is simple and fast to apply on freshly placed screeds.

Disclosure of Invention

[0007] The object of the present invention is achieved by the stirring roller brush comprising the set of identical spikes, identical preferably in regard of their length/height, diameter and design. Spikes are distributed on the surface of a rod, rotating along its axis. Key feature of the stirring roller brush according to the present invention consists in that the said roller is provided with at least one spacer which extends beyond the outline of the first set of identical spikes.

[0008] It is advantageous, when the spacer belongs to the set of identical spikes.

[0009] It is advantageous, when the end of the spacer is rounded.

[0010] It is advantageous, when length/height of the spacer is proportional to thickness of the screed.

[0011] As will be, described more in detail, the spacer consists of a set of identical spacing elements, which extend beyond the outline of the set of identical spikes.

Brief Description of Figures in the Drawings

[0012] The invention is described more in detail in figures on attached drawings, where;

[0013] Fig. 1 shows side view of the roller brush according to the invention;

[0014] Fig. 2 shows top schematic view of the roller brush according to the invention, wherein individual spikes of the set of identical spikes and individual spacing elements are not shown for sake of simplicity.

Mode(s) for Carrying Out the Invention

[0015] An example of the stirring roller brush is shown in figures 1 and 2. The roller brush according to Fig. 1 and 2 comprises the set of identical spikes 1, preferably identical in regard of their length/height associated with the spacer, hereby represented by spacing elements 2 which extend beyond the outline of the set of identical spikes 1. In this the most preferred embodiment, the spacing elements 2 are part of or formed as an extension of a set of identical spikes 1. The roller brush in this example also comprises a handle 3 to guide the roller, with a hollow to insert a shaft (not shown in the drawings) in order to extend the working range and to reduce the laboriousness for a worker due to bending down.

[0016] The difference in length/height between the set of spikes 1 and spacing elements 2 is proportional to the thickness of the screed to be processed and the design of the stirring roller brush also includes the possibility to modify the length/height of the spacing elements 2 to adapt to the thickness of worked screed. This can typically be achieved by having the spacing elements 2 movable and adjustable on the set of spikes 1 as a prolon-

gation of some of the spikes 1 of the set of spikes 1.

[0017] The difference in length/height between the spacing elements 2 and the set of identical spikes 1 is at least smaller than the thickness of the screed, to ensure that the shorter spikes, in this case spikes 1, are stirring and remixing the surface of the screed to eliminate heterogeneities.

[0018] In a preferred embodiment, the design of the roller brush enables the short spikes 1 to sink some millimetres into the screed (2mm - 5 mm).

[0019] The number of spacing elements 2 in relation to the number of spikes 1 in the set of identical spikes 1 can be advantageously adjusted to the grade of used aggregate.

[0020] The number of spikes 1 in the set of identical spikes 1 is selected so as to ensure homogeneous stirring of the screed surface, while avoiding that the larger aggregate particles get blocked between spikes. Therefore, the main distance between the spikes is always selected to be larger than the biggest particles in the screed (2-8 mm). Density of spikes 1 (ends of the spikes) of the set of identical spikes 1, expressed as their density (density of strokes on the screed surface) projected on a given surface, ranges preferably between 1200 and 600 spikes per square meter.

[0021] In order to ensure that the distance between spikes of the set of identical spikes 1 and spacing elements 2 is always greater than the size of the biggest aggregate in the screed, the spacing elements 2 are placed on top or at the location of the spikes of the set of identical spikes 1. The number and distribution of spacing elements 2 is selected so as to ensure that the working depth, depth of the penetration of the spikes 1 into the screed surface, is kept substantially constant. Some variations in said depth can exclusively be caused by unevenness or height differences on the base layer provided below self-levelling screed. Density of the spacing elements 2, expressed as their density projected on the given surface defined by the spikes of the set of identical spikes 1, ranges preferably between 120 and 60 spacing elements 2 per square meter.

[0022] Advantageously, spikes of the set of identical spikes 1 and spacing elements 2 are made of polymer.

[0023] Working of self-levelling screed using the roller brush according to this invention is performed as follows. The dimensions of the roller are chosen according to the thickness of self-levelling screed so that the spacing elements 2 are able to reach the base layer below self-levelling screed while the ends of the set of identical spikes 1 are immersed in the layer of self-levelling screed. Thus, the spacing elements 2 lean against the base layer and maintain a stable working position of the set of identical spikes 1 in the layer of self-levelling screed. It is advantageous to have the spacing elements 2 with rounded ends, so their possible interferences with aggregates and sand particles at the bottom of the screed are limited, i.e. rounded ends of the spikes of the spacing elements 2 would allow aggregate particles to slide along these rounded ends. Thus the position (substantially constant distance to the bottom of the screed) of the spikes 1 relative to screed surface is maintained and consequently so is performance of the roller brush.

[0024] Accidental "jump" of the spacing element 2 on an aggregate particle (if it does not slide on its rounded end), and thereby formation of unevenness on the surface of the self-levelling screed is clearly visible, and can easily be corrected by re-rolling the screed.

[0025] Processing efficiency is increased if the motion of the roller brush is preformed in two mutually perpendicular directions.

[0026] The stirring roller brush according to the invention basically eliminates any laborious work of processing/levelling the screed, as the entire weight of the tool, roller, is born by base layer. Also, the segregation of aggregates is eliminated, thus minimizing the occurrence of shrinkage cracks in the screed. Therefore, fundamental defects of the screed are minimized so the need to remove defect screed is minimized and thus consequent damages are prevented. The screed worked by the stirring roller brush according to the invention matures evenly through its entire thickness, whereby the need to spray the worked surface of the screed with a protective spray is avoided, moisture evaporates evenly from the entire surface. Furthermore an additional advantage is the possibility to reduce the thickness of the screed by at least 5mm with no negative effect on its function - carrying capacity.

[0027] Last but not least, it is worth to mention, that the spacing elements 2 as they are passing through the entire thickness of the worked screed, also ameliorate distribution of aggregate particles within the entire thickness below the surface of the screed.

Industrial Application

[0028] Stirring roller brush according to the present invention can be used preferably for working - levelling of self-levelling screeds in building industry.

Claims

1. Stirring roller brush comprising the set of identical spikes (1), identical preferably in regard of their length/height, **characterized in that**, it comprises at least one spacing element (2) that extends beyond the outline of the set of the identical spikes (1).

2. The roller brush according to claim 1, **characterized in that**, at least one spacing element (2) is part of the set of the identical spikes (1).

3. The roller brush according to claim 1 or 2, **characterized in that**, the end of the spacing element (2) is rounded.

4. The roller brush according to claim 1, 2 or 3, **characterized in that**, the length/height of the spacing element (2) is proportional to the thickness of the worked screed.

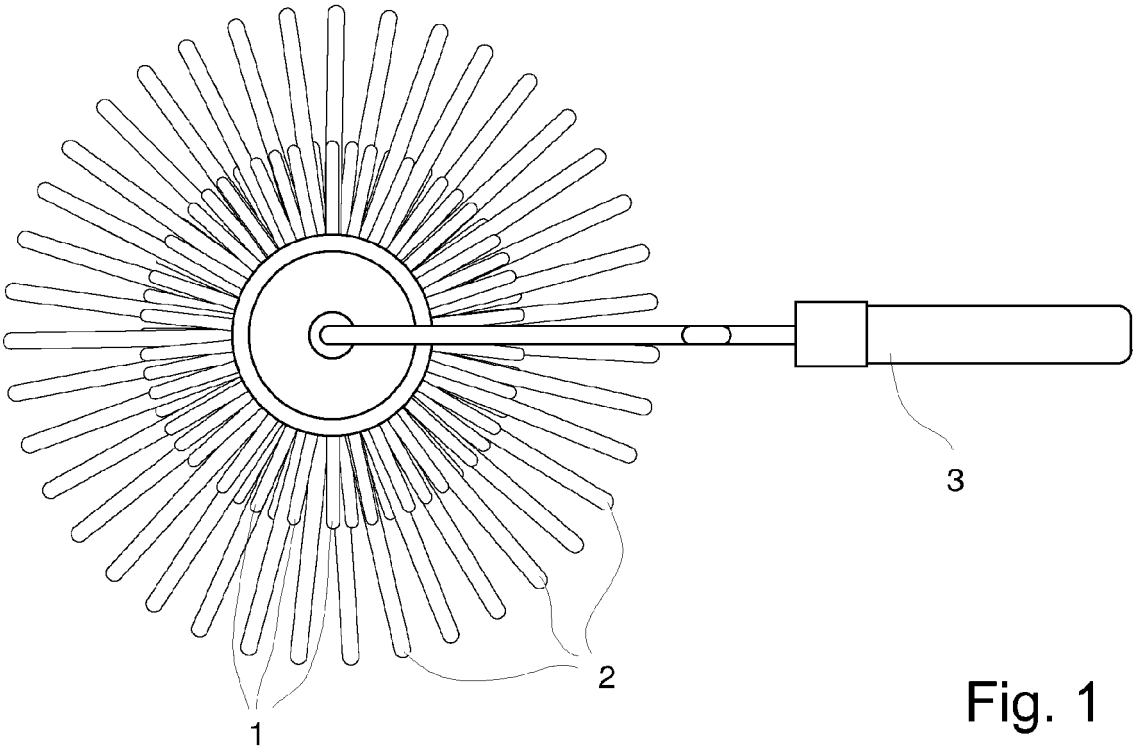

Fig. 1

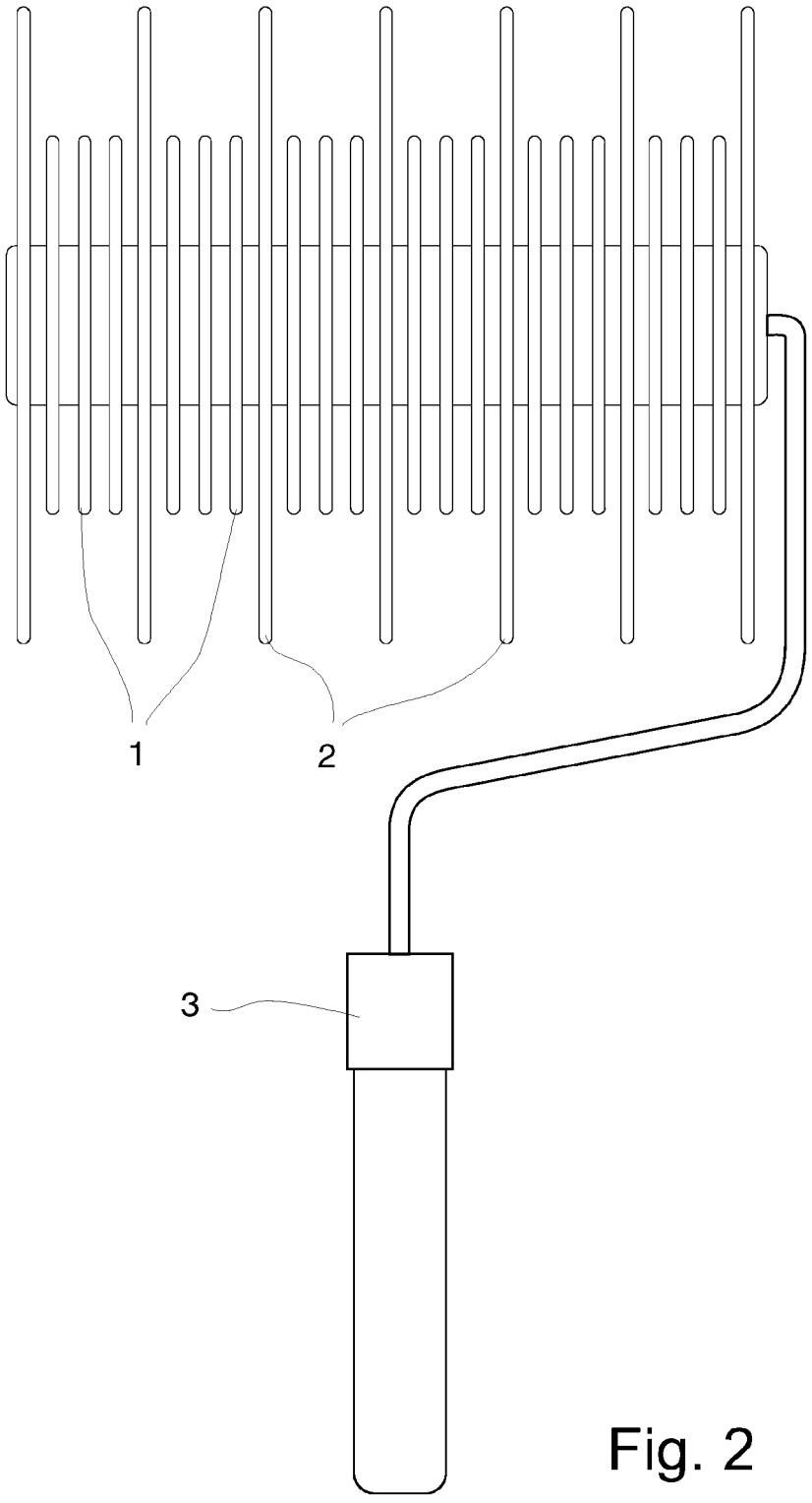

Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 3227056 A1 **[0004]**
- US 6350083 B **[0004]**