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(54) **Modular roller for industrial rotary cylindrical brushes, particularly for outdoor use**

(57) A modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, of the type constituted by a central support (2) in which a plurality of tufts of bristles (5) are fixed, the support being constituted by a cylindrical ring whose faces (3,4) are cut along two mutually parallel planes that are inclined with respect to planes that are perpendicular to the direction of the axis of the cylindrical ring, the tufts of bristles (5) that are distributed along the ring lying on planes that are substantially radial with respect to the ring and parallel to the inclined planes of the faces.

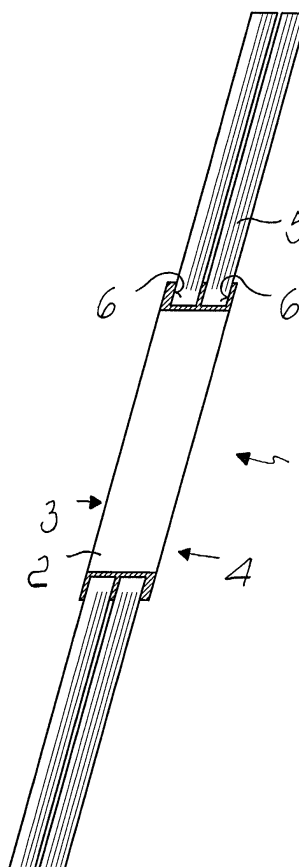


FIG 1

Description

[0001] The present invention relates to a modular roller for industrial rotary cylindrical brushes, particularly for outdoor use.

[0002] In the particular field of brushes for industrial use, large cylindrical brushes are known which have bristles up to 30 centimeters long, may have a length on the order of approximately two meters long, and are mounted and actuated so as to rotate about a horizontal axis for cleaning, for example, courts, roads, squares, industrial buildings or the like.

[0003] Brushes are also known which are constituted by a plurality of rings meant to be assembled by packing them side by side, optionally with spacers interposed, on a central tubular core: said rings have bristles that are usually arranged at right angles to the rotation axis (radial direction).

[0004] The radial arrangement of the bristles produces dirt release regions between the contiguous rows of bristles; owing to the linear motion of the roller on the ground, said regions take the shape of narrow elongated streaks of dirt.

[0005] Moreover, with the annular arrangement of the tufts of bristles there are no lateral movements that tend to better remove the dirt.

[0006] In known brushes it is usually not possible or convenient to arrange bristles made of different materials on the same ring; the ring further requires a certain pressure to reach the regions located between two contiguous rings of bristles, and this leads to more rapid wear and, with wear, to less effective cleaning.

[0007] The aim of the present invention is to obviate the cited drawbacks and to meet the mentioned needs, by providing a modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, that does not leave streaks of dirt on the ground, energetically removes dirt also by means of lateral motion components, can be fitted with filaments of different types and materials, works without requiring intense pressures, and therefore has a low wear and reduces the stresses affecting the mechanical parts.

[0008] Within this aim, an object of the present invention is to provide a structure that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0009] This aim and this and other objects that will become better apparent hereinafter are achieved by the present modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, of the type constituted by a central support in which a plurality of tufts of bristles are fixed, characterized in that said support is constituted by a cylindrical ring whose faces are cut along two mutually parallel planes that are inclined with respect to planes that are perpendicular to the direction of the axis of the cylindrical ring, and in that the tufts of bristles that are distributed along the ring lie on planes that are substantially radial with respect to the ring and

parallel to the inclined planes of said faces.

[0010] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a sectional side view, taken along a diametrical plane, of a modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, according to the invention;

Figure 2 is a side view of the roller of Figure 1, in which the bristles of the front region are not shown for the sake of clarity;

Figure 3 is a partially sectional side view of a rotary cylindrical brush provided by means of rollers according to the invention and spacers;

Figure 4 is a sectional front view of a roller according to the invention in a planned embodiment;

Figure 5 is a sectional side view of a roller according to the invention, whose length is equal to the length of the brush.

[0011] With reference to the figures, the reference numeral 1 generally designates a modular roller for industrial rotary cylindrical brushes, particularly for outdoor use, according to the invention.

[0012] The roller 1 is of the type that comprises a central support 2 which is produced by molding or extruding material such as plastics and has a cylindrical tubular shape and a maximum thickness of approximately thirty millimeters; the rollers are keyed on a driving shaft A which can rotate substantially horizontally, and in relation to this, for example, in a planned embodiment the central hole of the support has at least one radial slot for rotationally rigid coupling to a corresponding external longitudinal coupling rib of the shaft A.

[0013] The faces 3 and 4 of the support are cut along two mutually parallel planes, which are inclined, with respect to planes that are perpendicular to the direction of the axis a of the cylindrical ring, by an angle B between zero and thirty degrees.

[0014] The reference numeral 5 designates tufts of bristles, which are distributed along the ring and lie on planes that are substantially radial to the ring and parallel to the inclined planes of the bases 3 and 4; in particular, the tufts can be actually radial or parallel to a radial plane r but slightly offset by a short extent therefrom (see Figure 4); with this distribution of the tufts of bristles, if the roller is actuated in the direction of the arrow B, a sort of gentle sweeping of the ground is achieved, whereas rotation in the opposite direction has a stronger scraping effect on the ground; the tufts 5 have an end that is inserted and retained by means of a metallic staple or glued or hot-welded in a corresponding radial hole 6 of the support.

[0015] The tufts of bristles are made of a material such as polypropylene and/or nylon and/or polyester and/or metal, and can be distributed in the holes with different characteristics, alternating tufts of a certain material with tufts of a different material: the tufts can also be made of bristles having multiple diameters and/or made of multiple different materials: it is possible to alternate on the shaft A rollers provided with bristles and spacer rollers 7, which are also oblique and have no bristles.

[0016] The width of the support 2 may be any and may even cover the entire length of the brush, and the holes for the tufts can be distributed on any number of rows and can be mutually aligned or staggered.

[0017] In order to rotationally rigidly couple the pack of rollers to the shaft A, two end heads 8a and 8b are fixed to the shaft A at the beginning and at the end of the pack of rollers 1; such heads are constituted by tubular bodies, in which one face 9 is inclined for resting against the outer rollers of the pack and the other face 10 is flat and provided with means for locking their rotation and longitudinal sliding with respect to the shaft A (optionally, said means can be constituted by radial screws inserted in corresponding radial holes 11 of the heads or also by front screws).

[0018] The operation of the invention is as follows. By way of the rotation of the shaft A, which drives the pack of rollers 1 by means of the heads 8a and 8b, the crest of the free end of the tufts 5 oscillates laterally on either side, affecting a certain width of the roller that is greater than the distance between two contiguous rows of tufts.

[0019] By way of the inclination of the tufts of bristles, no dead spaces remain in the ground where streaks of dirt may deposit: moreover, the inclined distribution of the bristles produces a component of lateral motion that ends to better remove the dirt from the ground: it is also possible to alternate tufts of bristles made of different materials without producing uneven cleaning streaks.

[0020] It has thus been shown that the invention achieves the intended aim and object.

[0021] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0022] All the details may further be replaced with other technically equivalent ones.

[0023] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0024] The disclosures in Italian Patent Application No. BO2001A000376 from which this application claims priority are incorporated herein by reference.

[0025] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A modular roller (1) for industrial rotary cylindrical brushes, particularly for outdoor use, of the type constituted by a central support (2) in which a plurality of tufts of bristles (5) are fixed, **characterized in that** said support is constituted by a cylindrical ring whose faces (3,4) are cut along two mutually parallel planes that are inclined with respect to planes that are perpendicular to the direction of the axis of the cylindrical ring, and **in that** the tufts of bristles (5) that are distributed along the ring lie on planes that are substantially radial with respect to the ring and parallel to the inclined planes of said faces.
2. The roller according to claim 1, **characterized in that** said planes on which the faces (3,4) of the ring lie have an inclination of zero to thirty degrees with respect to planes that are perpendicular to the axis of the ring.
3. The roller according to claim 1, **characterized in that** the tufts of bristles (5) are made of a material such as polypropylene and/or nylon and/or polyester and/or metal.
4. The roller according to one or more of the preceding claims, **characterized in that** said tufts of bristles (5) are made of different materials.
5. The roller according to one or more of the preceding claims, **characterized in that** in order to rotationally rigidly couple a pack of rollers to the driving shaft, at the beginning and at the end of the pack there are end heads (8a,8b), constituted by tubular bodies in which one face (9) is inclined for resting against the outer rollers of the pack and the opposite face is flat and provided with means for locking rotation and longitudinal sliding with respect to the shaft.
6. The roller according to one or more of the preceding claims, **characterized in that** said means for rotationally coupling said heads are constituted by screws screwed into corresponding radial holes (11) of the heads (8a,8b).

FIG 2

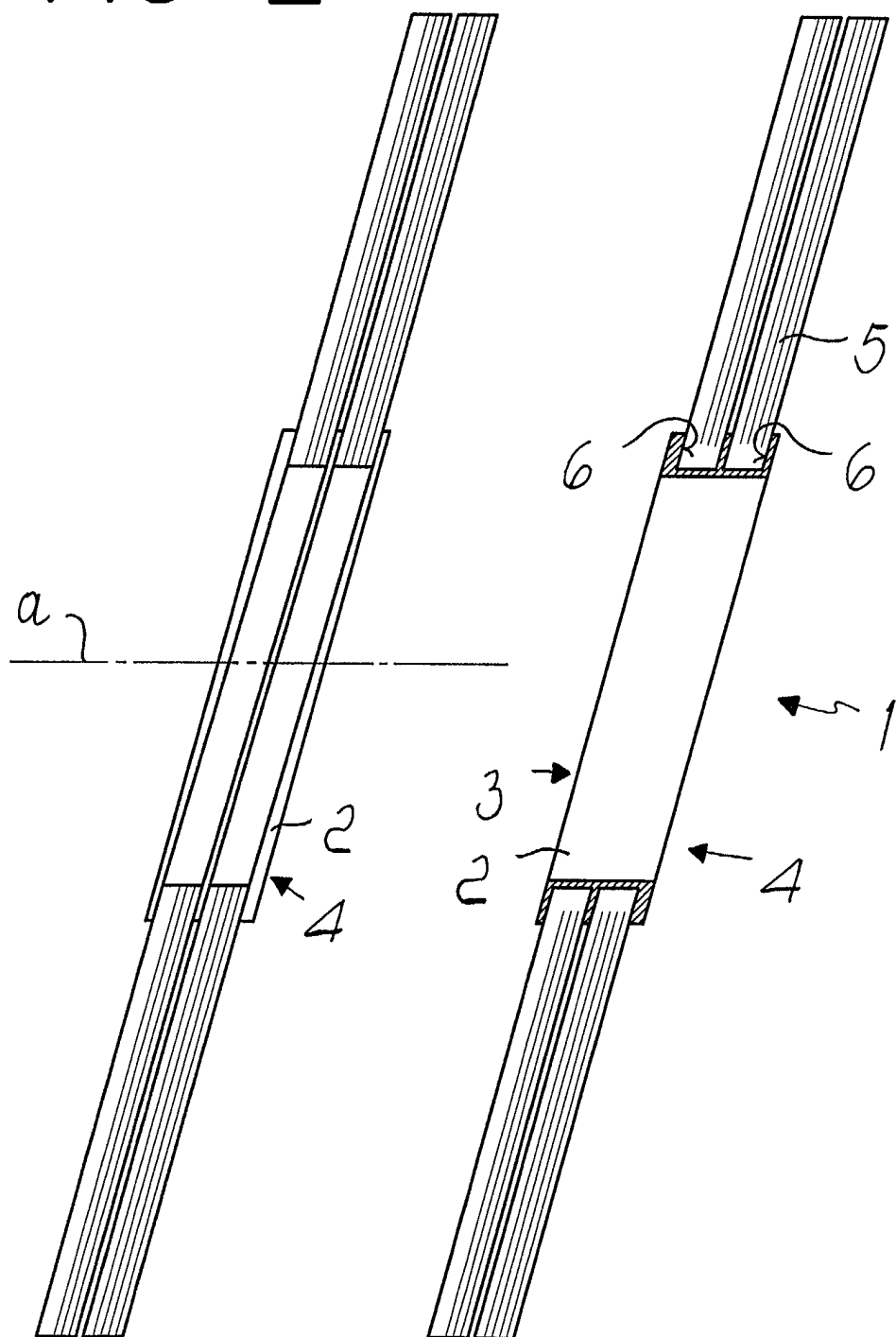
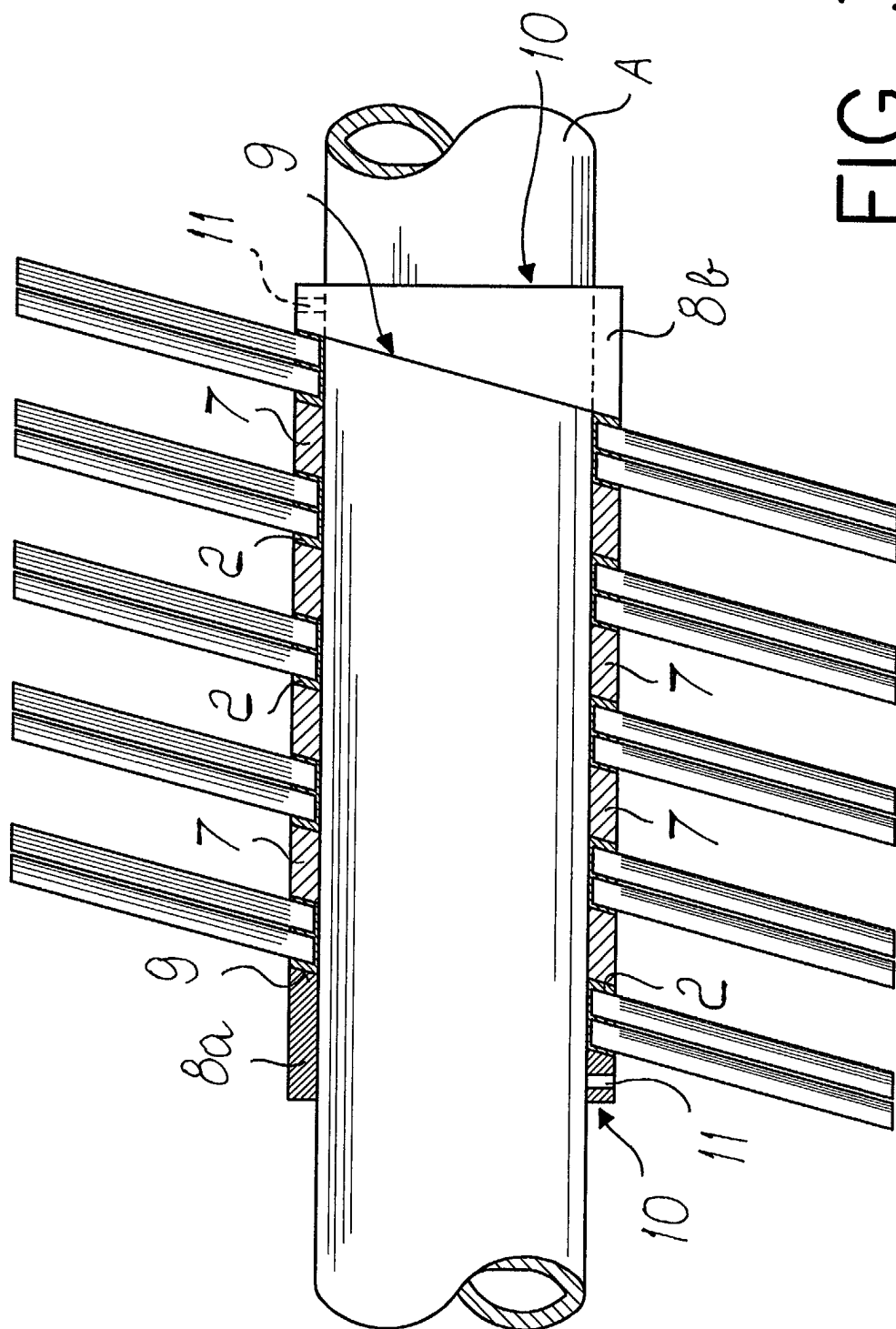


FIG 1



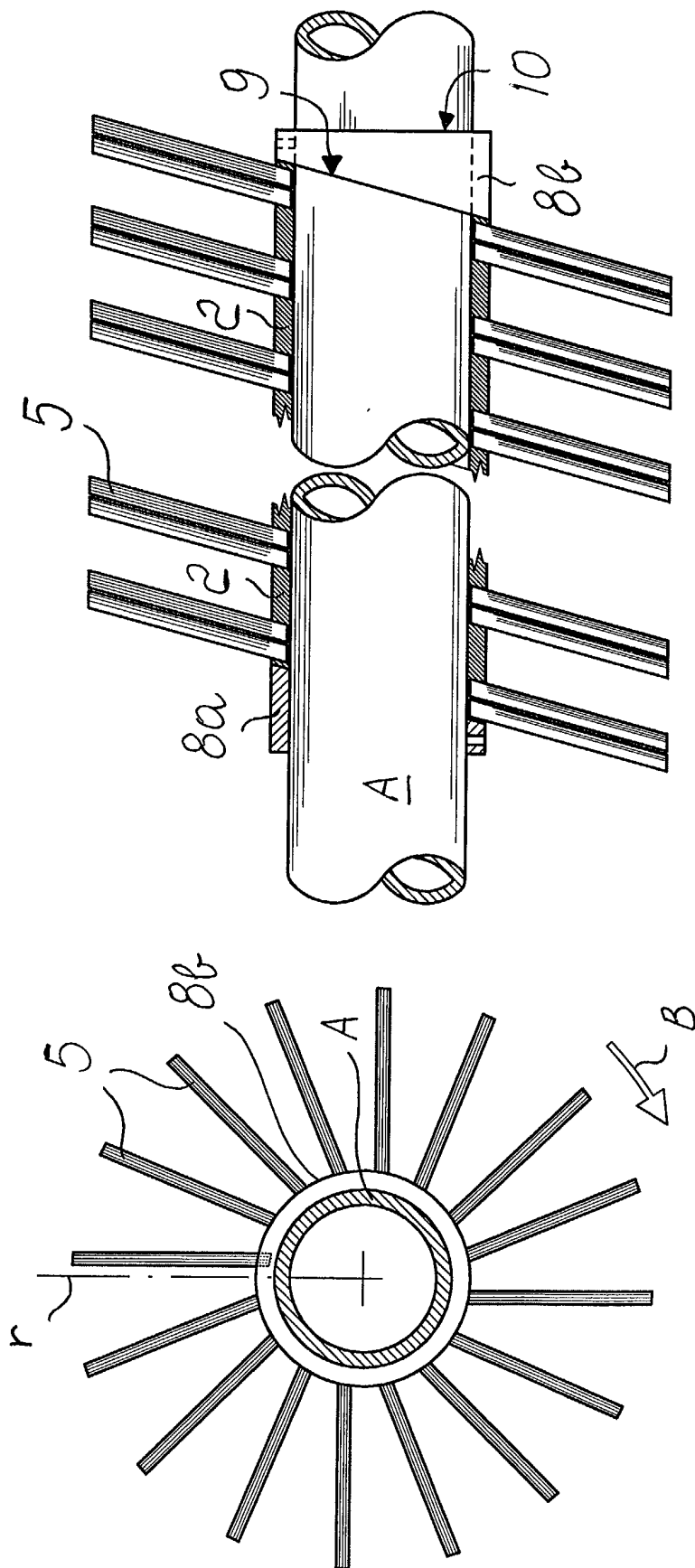


FIG 4

FIG 5