July 6, 1954 L. M. BALLARD 2,682,679

ROTARY SWEEPER BRUSH HAVING PLASTIC IMPREGNATED CORE

Filed Dec. 24, 1951

Fig. 1.

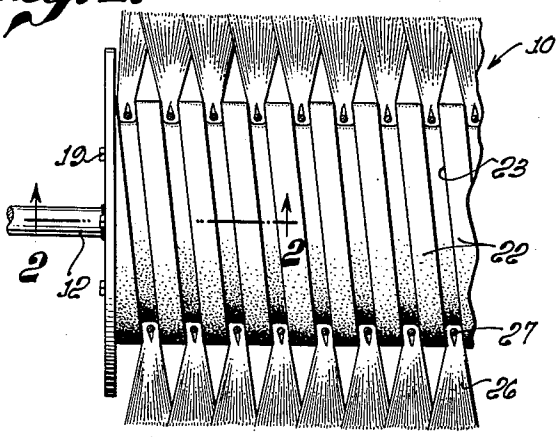


Fig. 4.

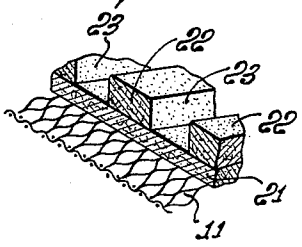


Fig. 2.

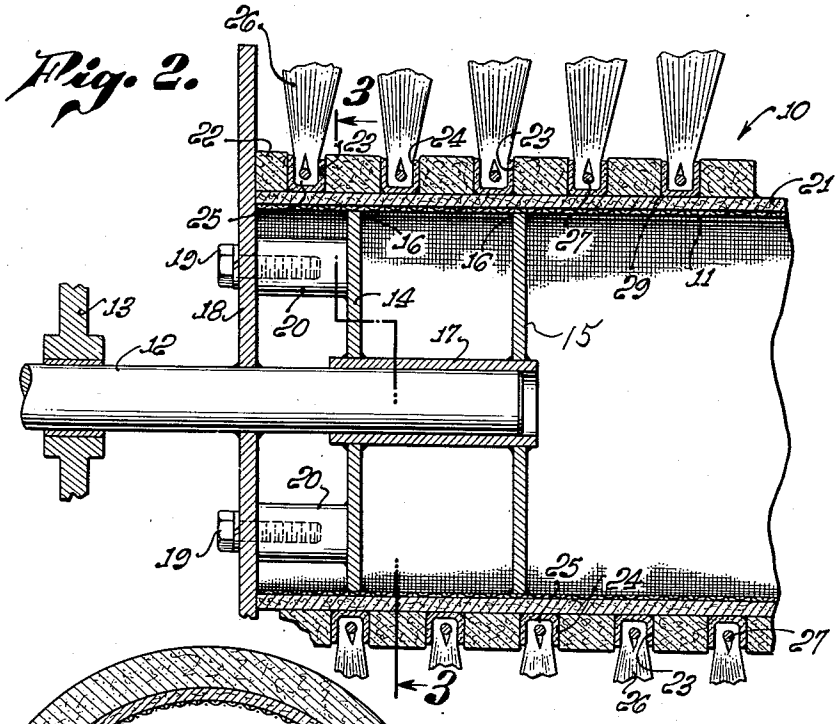
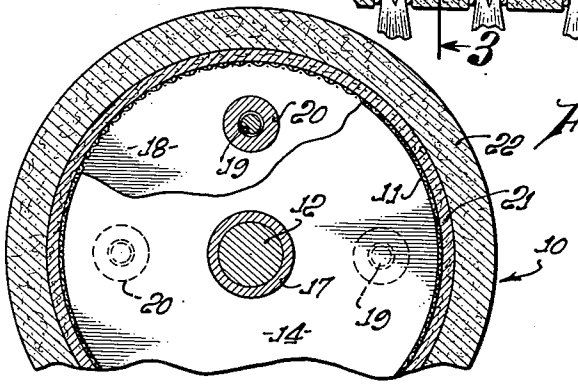


Fig. 3.



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ROTARY SWEEPER BRUSH HAVING PLASTIC IMPREGNATED CORE

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2 Claims. (Cl. 15—182)

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This invention relates to an improved type of rotary brush typically usable as the main transverse brush of a street sweeping machine.

Brushes embodying the present invention include essentially a core adapted to be mounted for rotation, and an elongated bristle-supporting member wrapped helically about the core to form between its successive turns a helical groove within which the bristles are anchored. The bristles are generally retained within this groove by forming each bristle to have a doubled or looped portion in the groove, and then helically wrapping within those doubled portions of the bristles a wire-like retaining element.

The general object of this invention is to provide an improved brush of the above general type, which is specially designed throughout for minimum cost of manufacture, and yet at the same time is sufficiently rugged to withstand very heavy use. This result is achieved in part by a unique manner of forming the helical bristle supporting member. Specifically, this member may comprise an elongated strip of felt material wound about the core of the brush and preferably impregnated with a resinous plastic material, which may be of a hard setting type adapted to form with the felt a hard and strong bristle positioning member.

I find it desirable to provide within the bristle receiving groove means for lining the groove in a manner assuring most effective support and positioning of the bristles. For this purpose, I may employ an elongated strip of sheet material preferably of a woven fabric such as glass cloth, wound helically within the groove and curved to a U-shaped configuration corresponding generally to the groove. This groove lining sheet may be impregnated with a resinous plastic material serving both to strengthen it and bond it to the other parts of the brush.

Further features of the invention have to do with a preferred construction for the main body of the brush about which the bristles and bristle supporting members are wound. In particular, the brush body may include a central core, in combination with a layer of material wrapped about the core and forming a base for the other parts of the brush. The core may take the form of a tubular metal screen, and the base material may comprise a sheet of felt wound about and suitably secured to the screen. Desirably, the felt is strengthened by impregnation with a preferably hard setting resinous plastic material, which may extend into the openings of the screen in a manner tightly bonding the felt to the screen.

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The above and other features and objects of the present invention will be better understood from the following detailed description of the typical embodiment illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary view of a rotary brush embodying the invention, with the bristles at the viewed side of the brush being broken away to show the external appearance of the brush body;

Fig. 2 is an enlarged fragmentary section taken axially through an end portion on the line 2—2 of the Fig. 1 brush;

Fig. 3 is a transverse section through the brush taken on line 3—3 of Fig. 2; and

Fig. 4 is an enlarged fragmentary perspective view of the various components forming the brush body.

Referring first to Fig. 2, the brush 10 is built up around an elongated, cylindrical, hollow, perforated screen 11, adapted to be mounted for rotation about its longitudinal axis by a pair of shafts 12 projecting axially from opposite ends of the core and journaled within bearings 13 (only one shaft and bearing shown). Core 11 may be of any conventional type of perforated screen, such as of woven wire or punched sheet metal.

It is desirable that the mounting shafts 12 be removably attached to core 11 and its carried parts. For this purpose, core 11 may contain near each of its ends a pair of axially spaced transverse partitions 14 and 15, suitably secured to the core as by welding at 16, and carrying at their centers an axially extending tubular boss 17 removably receiving the inner end of the corresponding shaft 12. For fastening each shaft to the core, the shaft may carry a transverse circular plate 18 engaging the ends of screen core 11 and the brush parts carried about the core, and fastened at a number of circularly spaced locations by screw bolts 19 to bosses 20 carried by the core partition 14.

In forming the body of the brush, I first wrap about screen 11 a sheet of base material 21 of a size to substantially completely cover the outer surface of the screen. This base material preferably comprises a sheet of felt impregnated with a hard setting resinous plastic material. The felt of course is porous, so that the plastic material may extend into its pores in a manner forming a very strong and well integrated unit. To facilitate manufacture of the brush, this resinous material may be of an air drying type, though it is also contemplated that for certain

types of brushes, a thermosetting resin may be employed. The following resins are typically useable for the purpose: phenolic resins (e. g. phenol-formaldehyde), urea resins (e. g. urea-formaldehyde), alkyd resins, vinyl resins, and others commonly used as bonding and impregnating materials.

About base member 21 I helically wrap an elongated bristle supporting member 22, which extends continuously from one end of the brush to the other. Successive turns of this member are spaced axially apart to form between its turns a helical bristle receiving groove 23. Member 22, which may be of rectangular transverse section as shown, is preferably formed of relatively thick felt impregnated with a hard setting resinous plastic material such as that impregnating sheet 21.

The helical bristle receiving groove 23 may be lined by a suitable initially flexible elongated strip of sheet material 24, wound helically within the groove and formed to a U-shaped configuration corresponding generally to, but curving at the corners of, the groove. Lining strip 24 is desirably of a woven fabric, such as glass cloth, and is impregnated with a hard drying resin such as that employed for impregnating base sheet 21 and bristle supporting member 22.

Within liner 24 and along the entire helical extent thereof are anchored the inner doubled portions 25 of conventionally formed essentially U-shaped bristles 26, which project radially outwardly from the brush body for engagement with a work surface. All of the bristles are retained to the brush body by a single wire or cable 27 wound helically about the body and through the inner doubled portions 25 of the bristles. The wire is wound tightly to assure positive retention of the bristles and is suitably fastened at its opposite ends to screen 11.

In assembling the brush, the base sheet 21, bristle supporting member 22, and groove liner 24 may all be impregnated at approximately the same time with a suitable hard drying resin of the type previously discussed, and then applied in succession about screen core 11 in the relation illustrated. Sufficient resin is applied to the inner surface of felt base sheet 21 to extend through the openings of screen 11 and to its inner side, in a manner embedding screen 11 within the resin to form a tight and positive connection between sheet 21 and the screen. Similarly, sufficient resin is applied to parts 21, 22 and 24 to form effective bonds between these parts and to fill the corners 29 of bristle receiving groove 23. After all of these resin impregnated parts have been applied to core 11, the resin is dried or cured in the manner customary for the particular resin employed, and the result is a hardened externally grooved core body whose parts are tightly bonded together by the cured resin. The bristles may then be fastened in place, shafts 12 attached to the opposite ends of the brush, and the brush mounted within its bearings 13 for use.

I claim:

1. A rotary brush comprising a tubular apertured screen, means on the screen for rotatively mounting it, a sheet of felt base material fastened about said screen, an elongated strip of felt wound helically about said base material and screen, successive turns of said felt strip being spaced apart to form therebetween a helical groove, a resinous plastic material impregnating said felt sheet and strip and extending into the apertures of said screen, U-shaped bristles having doubled portions received within said groove and projecting outwardly therefrom, and an elongated bristle-retaining member wound helically within said groove and extending through said doubled portions of the bristles.

2. A rotary brush comprising a cylindrical perforated metallic screen, shaft means projecting from opposite ends of said screen and adapted to mount it for rotation, a sheet of felt wrapped about and substantially covering said screen, an elongated strip of felt wound helically about said felt sheet and screen, successive turns of said felt strip being spaced apart to form therebetween a helical groove, an elongated strip of woven cloth of U-shaped transverse section wound helically within and lining said groove, a hardened resinous plastic material impregnating and bonding together said felt sheet, felt strip and woven fabric and extending into the perforations of said screen, bristles having doubled portions received within said groove and projecting outwardly therefrom, and an elongated element wound helically within said doubled portions of the bristles to retain them in said groove.

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