This invention relates generally to floor scrubbing machines and more particularly concerns such machines which have a brush which is rotationally power driven about an axis perpendicular to the floor surface.

Rotary type floor scrubbing machines are well known in the art. Generally these brushes have a horizontally circular configuration and are mounted for rotation within an annular housing or shield, normally called the floor plate as described herein and extends over the top of the brush. The rotary drive shaft extends downwardly through the center of the shield for axial connection to the brush. The purpose of this invention is to provide improvements in this general type of brush assembly.

A feature of the invention is to provide a floor scrubbing machine having a rotary brush disposed for rotation within an annular shield or hood wherein the brush has an equilateral polygonal configuration for ease of insertion into and removal from the shield and of mounting pads on the brush.

Another object of the invention is to provide a new and improved construction for a rotary floor scrubbing brush which will perform a better scrubbing action upon a floor surface and which will have greater durability than a circular brush.

Still another object of the invention is to provide a new and improved rotary brush for a floor scrubbing machine which brush will cover the same floor area during rotation as a circular brush but which is so designed to have a substantially lighter weight than a circular brush to thus require less power in the machine.

Still another and more specific object of the invention is to provide a rotary floor scrubbing brush with a construction wherein the bristles having the greatest abrasive action upon the floor surface will retain their stiffness and toughness just as long as the bristles performing a lesser degree of such action.

With these objects in mind the invention broadly comprises a brush having an equal sided polygonal-shaped backboard mounted within an annular machine base or shield for rotation upon an upright axis, the underside of the backboard being covered with downwardly extending bristles for scrubbing engagement with a floor surface, the bristles on the radially outermost portions of the backboard being high molecular weight polymer filaments formed from the remaining bristles which are natural fibers.

The above mentioned and still additional objects of the invention will be brought to light during the course of the following specification, reference being made to the accompanying drawing, in which:

FIG. 1 is a side elevation of a floor scrubbing machine base embodying the subject invention and shown in scrubbing position on a floor surface.

FIG. 2 is an inverted plan view of the invention taken on line 2--2 of FIG. 1.

FIG. 3 is a vertical diametrical section through the base taken on line 3--3 of FIG. 2.

Referring now more particularly to the drawing, reference characters will be used to denote like parts or structural features in the different views. FIG. 1 shows a conventional floor scrubbing machine base 10 designed to be moved over a floor surface F by suitable handle means to perform a rotary scrubbing action against the surface as water and detergent are applied thereto.

Base 10 includes a circular shield 11 having a circular convee top wall 12 which peripherally curves into an annular side wall 13 to form a downwardly opening brush chamber 14. An electric motor 15 is mounted on the top wall 12 for driving a shaft 16 which extends downwardly and axially through the wall 12 into chamber 14. A flat floor scrubbing brush, denoted generally at 17, is mounted within the chamber 14. This brush is a square backboard 18 of rigid material such as wood treated or coated against moisture deterioration. Backboard 18 is mounted concentrically within the wall 13 by having its center connected to the shaft 16 to be rotationally driven thereby. As will be noted by observance of FIG. 2, the corner-to-corner dimension of backboard 18 is only slightly less than the diameter of the chamber 14 so that there is a close fit of the board within the shield without actual engagement therebetween. This leaves four uniform circle segment spaces or pockets 19 around the backboard between the board sides and the shield wall 13.

Referring now particularly to FIG. 2, the arrangement and makeup of the brush bristles will be described. Each corner of the backboard is provided with a square section of bristles 20 of nylon. These bristles may also be formed of polypropylene or any other high molecular weight polymer filaments. The remaining bristles, denoted at 21, are formed of basixine or other natural fibers conventionally used in floor brush construction. It is preferred that the bristle 20 sections comprise from five to fifteen percent of the overall bristle area, with said percentage being distributed uniformly to the four corners of the brush.

Bristles 20 have substantially different inherent characteristics than the bristles 21. The former have a higher coefficient of friction, a greater tensile strength and a greater resistance to abrasion than the latter. Moreover, the polymer filaments 20 have a more regular pattern and are inert to caustic chemicals, dilute acids and harsh detergents. All of these characteristics of the bristles 20 substantially greater wear life than the bristles 21. This is significant as, of course, the bristle sections 20 travel a substantially greater distance during operation than do the bristles located near the center of the brush. It will accordingly be understood that the center sections 21 will resist taking a "set" and thus effectively perform their scrubbing action for a longer period of time than would natural fiber bristles located in these areas. At the same time the cost of the brush is increased only minimally as the more expensive bristles 20 are used in a relatively small quantity.

The square brush will, of course, rotationally cover the same floor area as a circular brush. However, the square configuration leaving the pockets 19 therearound within the wall 13 allows ready manual gripping of the brush for insertion into or removal from the shield 11. The protruding corners of the backboard also facilitate the mounting of a pad under the brush, where such is desired, with the pad loops hooking over the corners. These advantages are not present where a circular brush is used.

The power supply demand is another important advantage in this brush over the circular brush fully fitted with natural fibers. Present conventional household electric power supply greatly limits the size of a machine of this type that can be used in the home. Accordingly for speed of polishing, scrubbing or finish removing it is highly desirable to provide a brush which will give maximum surface coverage within the power limits. The square brush provides this advantage. For example, it
is found that a 25 inch full-plied circular brush requires a two h.p. motor to drive the brush at 175 revolutions per minute during the desired operations. On the other hand, where the present brush construction, with a 25 inch diagonal dimension, is used, a one h.p. motor will adequately drive the brush at the same speed throughout the same scrubbing and polishing steps.

Still another advantage is the polygonal brush over the circular brush lies in the fact that it has a leading brush edge engaging the floor surface during rotation to perform a more effective scrubbing action.

The invention accordingly economically and effectively carries out the aforementioned objectives. It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. In a floor scrubbing machine, a downwardly opening annular base, a brush mounted within the base for rotation on the center axis of the base, said brush having a horizontally disposed backboard enclosed within the base with bristles covering the underside of and extending downwardly from the backboard beyond the base opening whereby when the bristles are engaged with a floor surface the base will be supported thereby in spaced relation to the surface, said backboard having the horizontal configuration of an equilateral polygon with the corners thereof lying just within the annular wall of the base, and the bristles on the corner areas of the backboard being formed of a material having a greater resistance to abrasion than the material forming the remaining bristles in the brush.

2. In a floor scrubbing machine having a downwardly opening annular shield and a brush journaled axially within the shield for rotation on an upright axis, said brush having a square backboard with bristles covering the underside thereof and extending downwardly therefrom for engagement against a floor surface, the bristles on the corner sections of said backboard being formed of material having a greater tensile strength than the remaining bristles on the backboard.

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