May 4, 1965 W. H. NOBLES ETAL 3,181,193

FLOOR CLEANING BRUSHES

Filed Jan. 16, 1962

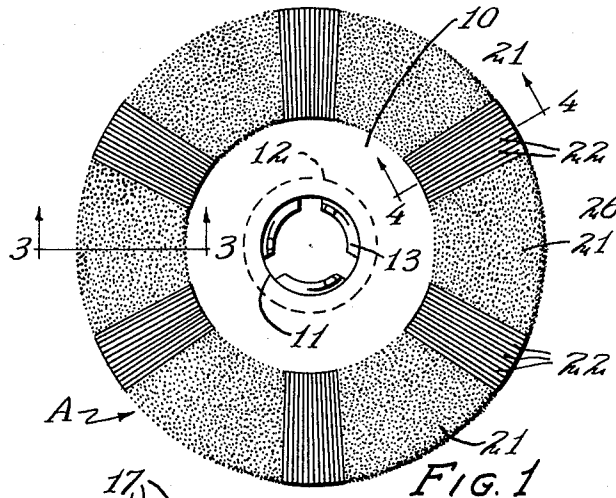


FIG. 1

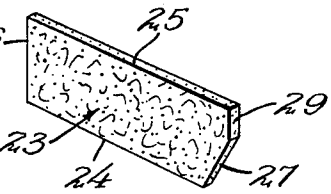


FIG. 2

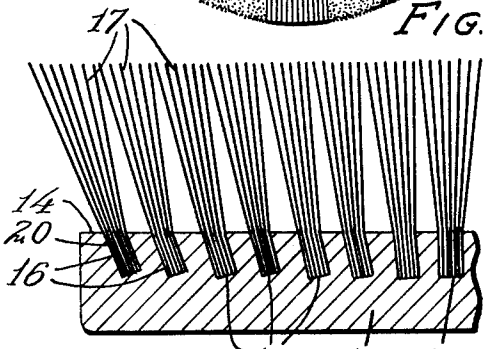


FIG. 3

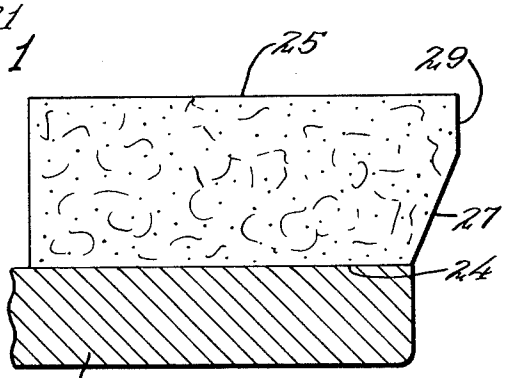


FIG. 4

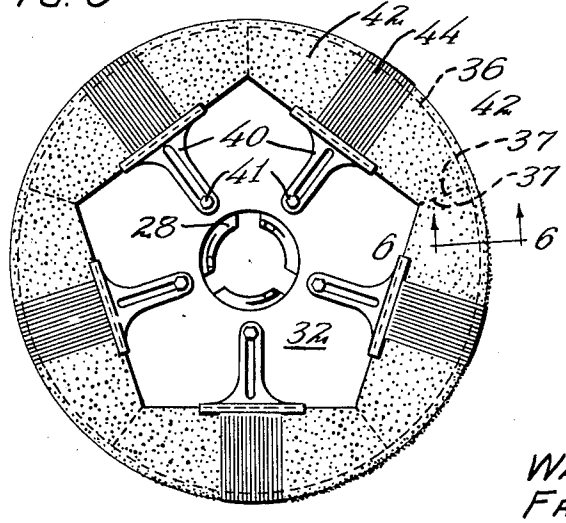


FIG. 5

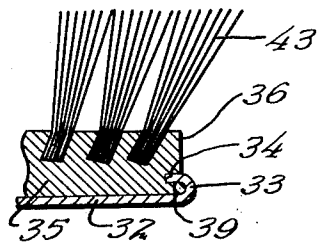


FIG. 6

INVENTOR

WARREN H. NOBLES

FRANKLIN C. HOUSER

DONALD J. BURGESS

BY

ATTORNEY

United States Patent Office 3,181,193 Patented May 4, 1965

3,181,193

FLOOR CLEANING BRUSHES

Warren H. Nobles, 645 E. 7th St., St. Paul 6, Minn.; Franklin C. Houser, 15520 Don Metz St., Granada Hills, Calif.; and Donald J. Burgess, 1784 Hartford Ave., St. Paul 6, Minn.

Filed Jan. 16, 1962, Ser. No. 166,551
5 Claims. (Cl. 15—114)

This invention relates to an improvement in floor cleaning brushes and deals particularly with a composite brush made up of a plurality of scrubbing material.

For many years, scrubbing machines used in the cleaning of floors and the like have used circular rotary brushes which most commonly comprise a disk of wood or similar material having bristles projecting from one side thereof, usually in a ring shaped pattern. In some instances, brushes have been produced including a metal disk designed for attachment to the machine and provided with means for supporting a series of angularly spaced brush segments which may be individually removed and replaced. While such brushes have been used successfully, from time to time requests have been made for brushes capable of producing a greater scouring action on the surface being cleaned. Various special types of brushes using pads of steel wool or other materials have been made, but such brushes for the most part, quickly disintegrated when put into use.

During recent years a scouring pad has been put upon the market comprising a thick web of matted or felted nylon fibers which form a fibrous block of material having good scouring or abrasive properties and which is effective for cleaning the surface of pots, pans, and other surfaces. In view of the fact that this material does not distintegrate rapidly, experimental brushes have been made using the material in various ways. For example, strips of the material have been folded or otherwise formed in parallel side by side relation, and brushes have been produced in which the strips are supported in generally right angular relation to the backing disk and extending generally radially from the axis of rotation, the edges of the strips most remote from the backing disk providing a relatively solid ring shaped scouring surface. While brushes of this type have been found very effective in tests and trials, two disadvantages have been found. In the first place, the basic material used is relatively expensive, and a brush made up of felted pads costs several times the price of a bristle brush of the same size. Furthermore, if the brush is formed of elongated strips of felted material folded back and forth to form a relatively solid block, the scouring surface does not flare outwardly from the supporting disk in the manner of a bristle brush, and the brush thus formed is less effective in cleaning corners of the floor or cleaning along the walls. Furthermore, tests have shown that considerable care must be used in operating the brush made up of felted pads or strips, due to the abrasive action of the brush which would actually injure the surface of the floor if improperly used.

An object of the present invention resides in the provision of a brush having a ring shaped cleaning surface which comprises segments of bristles alternating with segments formed of parallel side by side pads of felted scouring material. It has been found that brushes of this type have the advantages of the usual bristle brush, and also has most of the advantages of a brush formed of pads of scouring material without most of the accompanying disadvantages thereof. Due to the fact that the major portion of the scrubbing surface is formed of bristles, the cost of the construction is not out of proportion with the cost of the usual bristled brushes. At the same time, the blocks of scouring material which are alternated with the bristled sections provide the necessary scouring action which is desired.

A feature of the present invention resides in the provision of a rotary brush of the type described which has the long life of a bristled brush while at the same time having the increased scouring action provided by the blocks of scouring material. Due to the fact that the pressure of the brush against the floor is mainly supported by the bristles, the sections of scouring pad material will last much longer than a brush of the same size made entirely of side by side laminations of scouring pad material. At the same time, the composite brush does not have the highly abrasive action which might cause injury to the surface being cleaned.

A further feature of the present invention resides in the fact that, in preferred form, the blocks of scouring pad material are formed of side by side laminations which are preferably cut to the general outline shape of the projecting bristles on a bristled brush, the outer ends of the laminations preferably inclining outwardly to conform with the flare of the bristles.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification;

FIGURE 1 is a bottom plan view of a circular scrub brush, showing the general arrangement thereof.

FIGURE 2 is a perspective view of one of the laminations forming the block of scouring material.

FIGURE 3 is a sectional view through the bristled portion of the brush, the position of the section being indicated by the line 3—3 of FIGURE 1.

FIGURE 4 is a sectional view through the scouring portion of the brush, the position of the section being indicated by the line 4—4 of FIGURE 1.

FIGURE 5 is a bottom plan view of a sectional brush showing in general the arrangement of parts therein.

FIGURE 6 is a sectional detail, the position of the section being shown by line 6—6 of FIGURE 5.

Commercial floor scrubbing brushes may be of various types and forms. Perhaps the most common form includes a backing disk 10 of wood or similar material having a central axial aperture 11 therein. A ring shaped plate 12 provided with a coupling sleeve 13 is provided on the upper surface of the disk 10, the sleeve 13 being shaped to detachably engage a cooperable drive means rotatable on a generally vertical axis and forming a part of the scrubbing machine. As such machines are well known in the art, the machine is not illustrated in the drawings.

As is indicated in FIGURE 3 of the drawings, which shows the disk 10 in inverted form, the under surface 14 is provided with spaced sockets 15 which are designed to accommodate the fixed ends 16 of bristles 17. The bristles 17 may be formed of any of a considerable number of materials depending on the purpose and having a bearing upon the cost of the brush. Oftentimes the inner rows of bristles such as indicated by the bristles in the inner row 19 of sockets are arranged with the axes of the sockets parallel to the axis of rotation of the disk. Oftentimes, each larger diameter row of sockets is inclined at a greater angle to the axis of rotation, the outermost row 20 of socket inclining downwardly and outwardly when the bristles are resting upon the floor so that the free ends of the bristles will contact an area larger than the area occupied by the disk 11. As a result, the brush can be operated along walls and into corners quite effectively.

The brush A is generally similar to a conventional circular brush, except for the fact that the ring shaped area of bristles is broken up to provide arcuate segments 21 having unbristled areas therebetween. These unbristled areas are filled with segments 22 of scouring material arranged to provide a continuous ring shaped cleaning area on the bottom surface of the brush.

The blocks 22 are formed in preferred construction of layers or laminations 23 best illustrated in FIGURE 2 of the drawings. The layers 23 are provided with parallel top and bottom surfaces 24 and 25 (the lamination 23 being shown in inverted position). The inner edge 26 of each lamination is preferably at right angles to the surfaces 24 and 25 to generally conform with the cross sectional shape of the bristled area as indicated in FIGURE 3. The outer edge 27 of each lamination preferably flares outwardly from the upper edge 24 toward the lower edge 25. Short portions 29 of the ends 27 are cut off along a line parallel to end 26 in order to prevent sharp corners which might catch on rough portions or nails in the molding to prevent injury to the laminations.

The various laminations 23 are placed in side by side relation, and may be partially cemented together in face contact, or may be free of adhesion to one another. The narrower upper edges 24 are normally cemented to the under surface of the disk 10 as indicated in FIGURE 4. When in contact, the laminations form a relatively solid block of material having an abrasive under surface substantially on the plane of the ends of the bristles 17.

The laminations 23 may be made of various materials used in the formation of scouring pads, the particular laminations illustrated being made of nylon filaments were built up to provide a porous web, the filaments of which are bonded together and which is capable of supporting a certain amount of liquid. Such pads have been commercially produced for sale by companies such as Minnesota Mining & Manufacturing Company for use as scouring pads in the cleaning of utensils and other soiled surfaces.

In the particular arrangement illustrated, the bristles occupy the major area of the ring shaped cleaning surface of the brush and these bristles act in their usual manner to clean the surface of the floor. The scouring pad units occupy a somewhat lesser area, the proportion between the two areas being variable in accordance with the results desired. The interspersing of the scouring pad blocks with the bristles apparently has a very effective cleaning ability, the resulting brush being considerably more effective than a bristled brush. At the same time, the bristles act as a support for the brush and prevent the weight of the brush from bearing down upon the scouring pad areas to the extent which will cause undue wear and undue abrasion. Furthermore, the bristles apparently act to spread the cleaning fluid in front of the scouring blocks and as a result the spaced scouring areas are more effectively moistened than could occur if the brush were made entirely of laminations of the scouring material. As a result, the blocks of scouring material may act more effectively than a solid brush of such material because of the better distribution of the cleaning fluid throughout the spaced blocks.

In FIGURE 5 of the drawings, a modified form of construction is illustrated which employs a backing disk 32 of metal or similar material which incorporates the coupling sleeve 28. As indicated in FIGURE 6 of the drawings, the disk 32 is provided with a peripheral flange 33 which terminates in an inwardly projecting flange 34 in parallel spaced relation to the disk 32. The brush comprises a series of angularly spaced blocks 35 which are shown as having arcuate outer edges 36 and radially extending ends 37 so that the various blocks abut together when in position. The blocks 35 are provided with a groove 39 in their outer arcuate surfaces 36 to accommodate the flange 34. The brushes may either be bolted to the disk 32 or may be fastened in place by lugs 40 which are detachably bolted to the disk as indicated at 41.

In the particular arrangement illustrated, the brush segments include spaced bristle areas 42 which include the bristles 43, the bristled areas being at opposite ends of the backing blocks and spaced from one another at the center of each block. The area betweeen the spaced bristled portions 42 is filled by a block 44 of scouring material, the block 44 being made up of laminations 23 of the type illustrated in FIGURE 2 of the drawings, and anchored to the blocks 35 at their upper ends in the manner previously described.

As will be noted, the brush illustrated in FIGURE 5 differs from the brush illustrated in FIGURE 1 mainly by the fact that the brush shown in FIGURES 5 and 6 is a sectional brush, each section of which may be provided with an area of scouring pad material embodied therein. These sectional blocks may be merely substituted for the completely bristled segmental sections normally employed.

In accordance with the patent statutes, we have described the principles of construction and operation of our improvement in floor cleaning brushes, and while we have endeavored to set forth the best embodiment thereof, we desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of our invention.

We claim:

1. A rotary floor brush including a supporting disk, a series of angularly spaced arcuate segments of bristles mounted on a face of said disk, and a series of segments of similar radius of scouring material interposed between said bristled segments, said segments of scouring material including a plurality of flat pads arranged in contiguous relation and in face contact on planes generally normal to the said face of the disk, the free ends of said bristles and the free edges of said scouring material segments being in substantially the same plane, said segments of bristles and said segments of scouring material having substantially the same outer periphery, and said segments of bristles and said segments of scouring material abutting to provide a continuous brushing surface.

2. The structure of claim 1 and in which said flat pads extend in a generally radial direction from the center of the disk.

3. The structure of claim 1 and in which said pads comprise felted porous laminations of matted plastic fibers.

4. A rotary brush including a ring-shaped backing member, said member having angularly spaced arcuate segments of bristles projecting from a surface thereof, and segments of scouring material between said bristled segments, said segments of scouring material comprising blocks formed of a plurality of laminations of porous abrasive material arranged in face contact with the contacting faces of the laminations arranged on generally radial planes substantially normal to said surface of said backing member, outer bristles of said bristled segments flaring beyond the periphery of said backing member, and said blocks having their outer edges also flaring beyond said backing member.

5. A rotary brush including a ring-shaped backing member, said member having angularly spaced arcuate segments of bristles projecting from a face therof, and segments of scouring material comprising blocks of porous abrasive material secured to said face between the bristle segments, outer bristles of the bristled segments flaring beyond the periphery of said backing member, and said blocks having their outer edges also flaring beyond said backing member.

References Cited by the Examiner

UNITED STATES PATENTS

103,210	5/70	Lithgow	51—25
1,870,232	8/32	Brim	15—49
3,020,139	2/62	Camp et al.	51—298 X
3,038,279	6/62	Becker	51—195
3,047,897	8/62	Bartos et al.	15—114

FOREIGN PATENTS

403	1854	Great Britain.
866,897	5/61	Great Britain.
29,978	1/85	Germany.

CHARLES A. WILLMUTH, *Primary Examiner.*