Feb. 6, 1962 F. K. BAYLESS 3,019,465

RUG SCRUBBING TOOL ATTACHMENT PARTICULARLY FOR FLOOR POLISHERS

Filed May 28, 1959

Fig. 2.

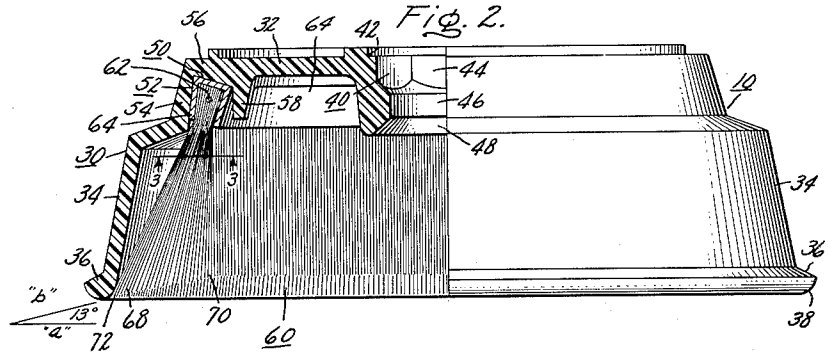


Fig. 1.

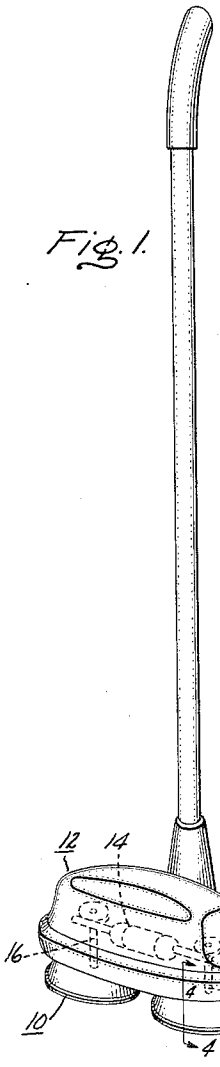


Fig. 3.

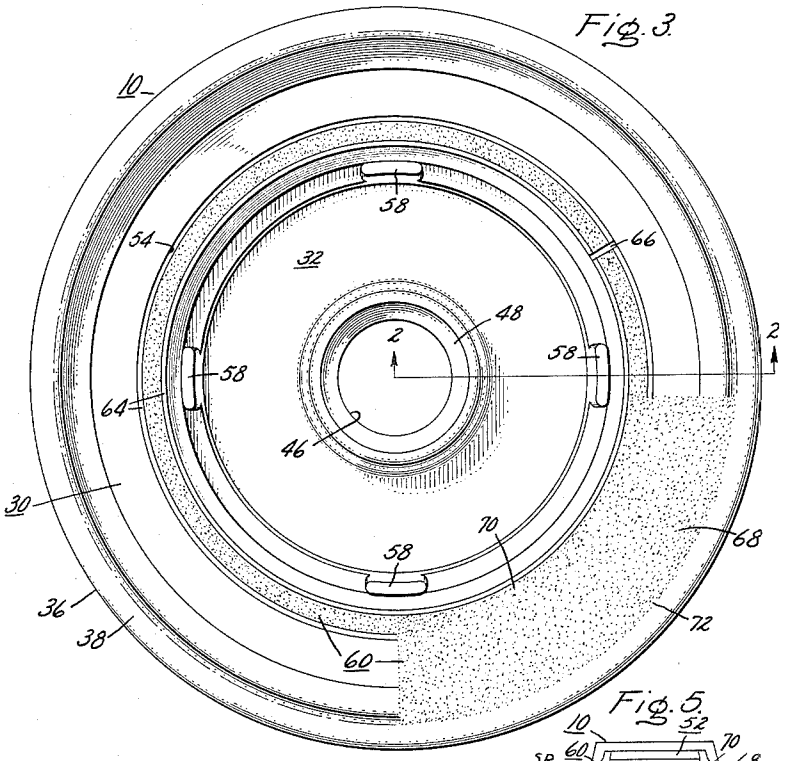


Fig. 4.

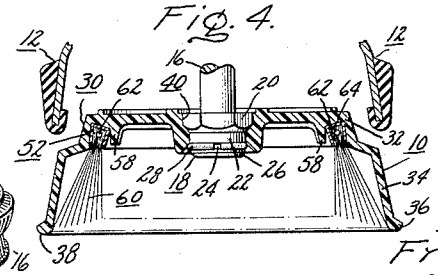
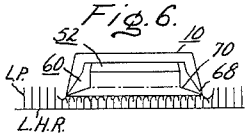


Fig. 5.

Fig. 6.



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RUG SCRUBBING TOOL ATTACHMENT PARTICULARLY FOR FLOOR POLISHERS

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6 Claims. (Cl. 15—180)

My invention relates to the rug cleaning art and devices, and particularly to rug scrubbing tool attachments for floor polishers of the type having motor-driven, detachably connected, rotatable floor brushes, which may be selectively detachably connected thereto in the same manner as the floor brushes thereof, and which when so connected are capable of effectively cleaning a rug by working granular or powdered rug cleaning compounds into the rug.

Rug scrubbing devices of various types, including attachments for floor polishers, which work granular or powdered cleaning compounds into the rug to effect rug cleaning are known. None of them, however, are entirely satisfactory, and therefore, the art has devoted much effort and energy in the direction of providing an inexpensive, effective and satisfactory rug scrubbing device. This is particularly true of rug scrubbing attachments for floor polishers, for the floor polisher industry is highly competitive and attachments are considered to be attractive features which function, marketing-wise, as inducements to purchase the principal product, viz., the floor polisher. Hence, the element of cost is extremely important. All known rug scrubbing attachments for floor polishers are unsatisfactory for one reason or another. One type of known device comprises a wheeled platform for supporting a floor polisher for movement over a rug with the conventional bristled floor brushes in contact with the rug to work the granular or powdered cleaning compound into the rug; this type is expensive, relatively difficult to maneuver over a rug, cleans only a small area at a time and is prone to spray cleaning compound about the room. Another type comprises formed disk-like attachments which are detachably connected to and driven by the floor brushes of the floor polisher and which have an irregularly formed face for working the granular or powdered cleaning compound into the rug; this type lacks the desirable dynamic and vigorous cleaning action of bristles and is inclined to spray cleaning compound about the room. Another type simply utilizes bristled brushes to work granular or powdered cleaning compound into the rug; this type is prone to spray cleaning compound about the room, causes undue wear on high pile rugs because the bristles are not designed to compensate for different height rug piles, and the driving motor is subject to overloading because the full weight of the machine which drives the bristled brushes is borne by the bristles. It will, therefore, be understood that the problem of providing an inexpensive, effective, satisfactory rug scrubbing tool, and particularly an attachment for a floor polisher, still plagues the rug cleaning and floor polisher arts.

It is an object of this invention to provide an improved rug scrubbing tool which utilizes granular or powdered rug cleaning compounds and is inexpensive, effective and satisfactory.

It is a further object of the invention to provide an improved rug scrubbing tool as set forth in the preceding paragraph which is capable of being utilized as an attachment for a floor polisher.

It is a still further object of this invention to provide an inexpensive, effective, satisfactory bristled rug scrubbing tool that utilizes granular or powdered rug cleaning compounds, which may be in the form of a floor polisher attachment, wherein a relatively large rug area is cleaned at any given moment, wherein the cleaning compound is not sprayed about the room during use, wherein the bristles do not bear the full weight of the cleaning machine which drives the tool to thereby avoid overloading the driving motor and undue wear on the rug, and wherein the bristles are uniquely designed to clean rugs of different pile heights without unduly subjecting high pile rugs to wear or overloading the motor.

All of the objects of this invention are achieved in one form by providing a rug scrubbing tool attachment for a floor polisher, which is designed for detachable connection to the usual floor polisher driving shaft in the same manner as and in place of the conventional floor brushes, which is rotatably driven during use and which comprises an inverted cup-shaped brush back that supports a ring brush, the bristles of which are uniquely trimmed at their rug contacting ends, and proportioning and disposing the parts in such a manner that the lower edge of the skirt of the brush back contacts and rests on a rug and bears a portion of the weight of the floor polisher during use, whereby the brush bristles automatically contact the rug pile of different pile height rugs in a manner to avoid overloading the motor or unduly wearing the rug, and the skirt is flared outwardly and downwardly to increase the area of rug being cleaned at any given moment and prevent cleaning compound from being sprayed about the room.

The above and other objects and further details of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawings, wherein:

FIG. 1 is a front perspective view of a known twin-brush floor polisher having the improved rug scrubbing tool attachments detachably mounted thereon in place of the usual floor polisher brushes;

FIG. 2 is an enlarged side elevational view of an improved rug scrubbing tool attachment which incorporates the instant invention, with portions cut away and shown in section substantially on line 2—2 of FIG. 3 for clarity;

FIG. 3 is a bottom plan view thereof with portions of the ring brush assembly cut away and shown in section substantially on line 3—3 of FIG. 2 for clarity;

FIG. 4 is an enlarged sectional view taken substantially on line 4—4 of FIG. 1, and

FIGS. 5 and 6 are schematic views illustrating use of the improved rug scrubbing tool on rugs of different pile heights.

Referring to the drawings, a preferred embodiment of my invention is illustrated. As illustrated, the invention is incorporated into a rug scrubbing tool attachment for an electric floor polisher of the known "twin-brush" type. It will be understood by those skilled in the art that the invention contemplates an improved rug scrubbing tool construction that may be integrally formed with a complete rug scrubbing machine if desired, as well as take the preferred form of an attachment. Further, it contemplates use of the improved rug scrubbing tool construction singly or in pairs. It will also be apparent that the preferred attachment form of the invention may be utilized with any type of floor polisher or other motored machine, as long as there is at least one driving shaft, preferably a vertical driving spindle, to which the attachment may be selectively detachably secured to effect a driving relationship for the spindle to drive the attachment.

The rug scrubbing attachment is generally designated by reference numeral 10 in the drawings, and in FIG. 1 there is illustrated a pair of such attachments operatively attached to the driving spindles of a known floor polisher 12 of the "twin-brush" type. It will be understood that

floor polisher 12 has an electric motor and gearing, which are illustrated schematically in FIG. 1 and indicated by reference numeral 14, for rotatably driving the spindles 16, which in turn are designed to detachably receive attachments 10 thereon in a manner that effects a driving connection between the spindles and the attachments. It will be apparent that the means for effecting a driving connection between the spindles 16 and attachments 10 may be similar or the same as the means for coupling conventional floor brushes of floor polishers to the driving spindles.

In the illustrated floor polisher spindles 16, see FIG. 4, the attachment connection means comprises a generally enlarged coupling head 18 formed at the lowermost end of each of the spindles, which comprises a hexagonal portion 20, an adjacent lower reduced cylindrical portion 22 having an annular groove 24 therein, and a further reduced tapered entrance portion 26. A split C-shaped retaining ring 28 is loosely mounted in groove 24, and is of larger internal diameter than the external diameter of the base of groove 24.

Attachment 10 has connection means which cooperate with the spindle connection means to effect the desired detachable driving connection. Attachment 10 comprises an integral, main body member which is designated as a "brush back" and identified by reference numeral 30. Brush back 30 comprises an inverted, cup-shaped, integral member which is preferably molded, or equivalently formed, of any suitable plastic material, such as the one sold under the trade designation Cycolac "T," which is an acrylonitrile-butadiene-styrene copolymer. Brush back 30 generally comprises a disk-like mounting portion 32 and a skirt 34 which depends therefrom and flares generally axially downwardly and radially outwardly to its lowermost edge which is formed into a bead 36 which has a lower curved surface 38. Centrally of the mounting portion 32 there is formed the means for effecting the desired connection of the attachment to the driving spindle in the form of a connection socket 40.

Socket 40 extends completely through mounting portion 32 and comprises an upper cylindrical entrance portion 42, an adjacent hexagonal portion 44, a reduced cylindrical portion 46 and a lower tapered enlarged cylindrical retaining portion 48. The socket 40 is dimensioned relative to the spindle head 18 to provide a secure, but loose fit when the parts are assembled, so the attachment can "wobble" during use and thereby be self-leveling with the rug surface. Additionally, the retaining spring 28 is of larger external diameter than the minimum internal diameter of socket retaining portion 48, but it is compressible to a small diameter to "clear" it during connection and disconnection.

To effect assembly, the brush back mounting portion 32 of the attachment 10 is juxtaposed to the spindle 16 with the socket 40 disposed adjacent to the spindle head 18 in such a manner that spindle head entrance portion 26 is within socket entrance portion 42. Thereafter, the attachment is simultaneously pushed onto the spindle axially and rotated until it snaps into assembled position, which is illustrated in FIG. 4, wherein it will be seen that the cooperating corresponding portions are adjacent each other, i.e., spindle hexagonal portion 20 is in socket hexagonal portion 44; spindle cylindrical portion 22 is in socket cylindrical portion 46, and retaining ring 28 is disposed below socket retaining portion 48 and in contact therewith to retain the attachment on the spindle. It will be understood by those skilled in the art that the foregoing connection is a detachable driving connection, the cooperative operative relationship of the retaining ring 28 and socket retaining portion 48 rendering it a detachable connection, and the cooperative operative relationship of the socket and spindle hexagonal portions 44 and 20, respectively, rendering it a driving connection. It will be understood that attachment or detachment of the attachments may be readily effected simply by pushing the attachments on the spindles or pulling them off, and that during such manipulation, the retaining springs 28 are forced into their grooves 24 to permit attachment or detachment to be effected.

Within the brush back 30 there is formed a downwardly facing, annular, groove-like seat 50 for a ring brush assembly 52. Seat 50 is formed by generally vertical, cylindrical, wall portion 54 formed on the inner side of skirt 34, generally horizontal, annular wall portion 56 formed on the peripheral lower side of mounting portion 32, and the depending lugs 58 which are spaced radially inwardly of wall portion 54 and spaced angularly in a circular path.

Ring brush assembly 52 comprises a substantially annular unitary assembly of brush bristles that comprises a large number of bristles which are folded over a circular rod 62 and securely clamped thereon by a circular channel-shaped brush back strip 64 which has firm frictional contact with the bristles. In practice, the bristles may be folded over an elongated rod and then have an elongated brush back strip secured thereto; thereafter, a length of this subassembly may be bent into an annulus. The completed ring brush assembly is C-shaped and has a slight split 66, if the ring brush assembly is made in this manner. The ring brush assembly is then secured in seat 50, as by being cemented therein by use of a suitable adhesive. The split 66 may be seen in FIG. 3, wherein the ring brush assembly is shown in its fully assembled position with some portions of the bristles 60 cut away and omitted for clarity.

In operation, it will be understood that the attachments are snapped onto the driving spindles of the motored machines they are utilized with, a limited quantity of granular or powdered rug cleaning compound is placed on the rug which is to be cleaned, the attachments are placed over the cleaning compound and rest on their beads 36, and the motored machine is energized. This causes rotation of the attachments and results in the mass of bristles 60 "working" the cleaning compound into the rug pile. Some of the cleaning compound is hurled about by the centrifugal force created, but the flared skirt 30 prevents it from flying about the room. Furthermore, because of the flare of the skirt 34, a maximum amount of rug area is covered at any given time. Because of the "wobbly" mounting of the attachments on their spindles, they automatically level themselves with the rug surface. This process may be continued and repeated, replenishing cleaning compound as needed, until the entire rug is scrubbed. When scrubbing is completed, the cleaning compound that remains on the rug may be removed by vacuum cleaning the rug.

It should be observed that the rug scrubbing tool is designed to avoid overloading the driving motor. This is so, because a portion of the weight of the entire machine is borne by the skirt on its bead 36, and therefore, the bristles do not bear all of such weight and thereby cause motor overloading and harsh abrasion of the rug pile, as is the case in known prior art devices.

Another advantage of the rug scrubbing tool which should be noted flows from the unique manner in which the bristles are trimmed. This can best be seen structurally in FIG. 2, wherein it will be seen that the lower ends of the bristles 60 are trimmed in a radially inward direction, and therefore, the radially outer ends 68 are longer than the radially inner ones 70. It has been found in practice that the optimum angle of trim is 13°, and this is indicated schematically by the angle formed between a horizontal plane "*a*" and a radial line "*b*" passing through the ends of the bristles 60 in a vertical plane passing centrally through the rug scrubbing tool. However, other similar angles of trim are operative, and may be used. This bristle construction enables the rug scrubbing tool to operate effectively on rugs of varying pile heights, as can be schematically observed from FIGS. 5 and 6, for on the short pile SP of a short pile height rug SHR shown in FIG. 5, the longer radially outer

bristles 68 contact the short pile and scrub effectively, and on the long pile LP of a long pile height rug LHR shown in FIG. 6, all the bristles contact the rug pile, but because the radially inner bristles 70 are shortened, too much frictional contact between the bristles and rug pile is avoided, and therefore, motor overloading and undue rug wear are also avoided.

Lastly, it should be noted that the longest peripheral bristles 72 are slightly shorter than the skirt 34 and that this aids in avoiding motor overloading. This structural feature aids in avoiding overloading the motor because the bead 36 sinks down into the pile of any rug, and therefore, the longer bristles 72 would be likely to bear too much of the weight of the entire machine if they were not shorter than the skirt.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the example illustrated, and I contemplate that various and other modifications and applications will occur to those skilled in the art. For example, if desired, the brush back 30 can be made in two parts, viz., a disk and a ring, and the brush bristles can be tufted directly to the disk, thereby eliminating the ring brush assembly as a separate subassembly. However, if a two-part brush back is used, the parts have to be secured together to form the unitary brush back. It is, therefore, my intention that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A rug scrubbing tool comprising: a rigid inverted cup-shaped brush back having a generally disk-like mounting portion and a skirt which depends therefrom and defines a downwardly facing opening; a plurality of brush bristles rigidly secured in and within said brush back and disposed in a generally circular path; said bristles being disposed to extend toward the downwardly facing opening, and said mounting portion having means for connection to the driving shaft of a motor powered machine, said bristles being of such length that the lower ends thereof are positioned above the lower edge of said skirt when the skirt rests on a rug and the tool is rotated by said shaft on an axis perpendicular to said mounting portion.

2. A device as defined in claim 1 wherein the lower edges of said brush bristles are trimmed in such a manner that the mass of bristle ends is tapered upwardly from the radially outer side to the radially inner side of the mass, whereby some bristles will contact the rug pile regardless of the pile height.

3. A device as defined in claim 1 wherein said bristles are formed into a unitary ring assembly which is adapted to be bodily mounted in said brush back.

4. A device as defined in claim 1 wherein said brush back is flared downwardly and radially outwardly.

5. A device as defined in claim 1 wherein said mounting portion includes a centrally disposed socket which is adapted to be detachably connected to the motor driving shaft.

6. A device as defined in claim 1 wherein said brush back is an integral piece.

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