March 9, 1965 J. F. GARTH 3,172,142

PAD HOLDER

Filed April 10, 1963

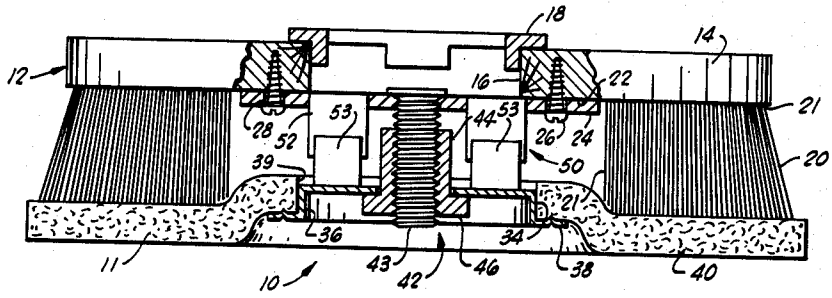


Fig. 1

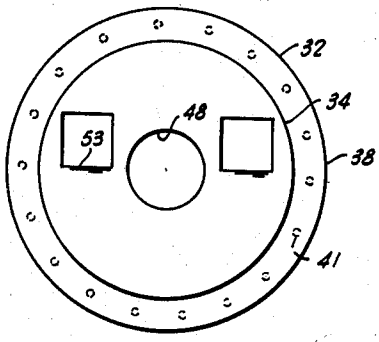


Fig. 2

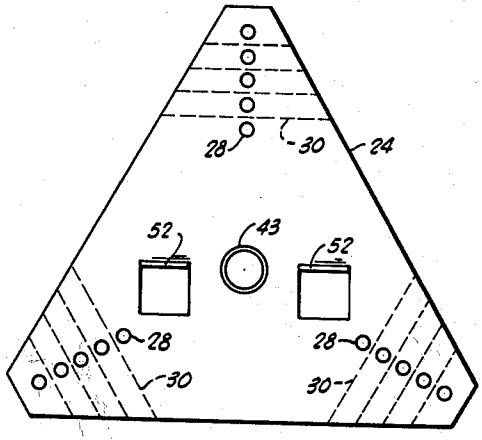


Fig. 3

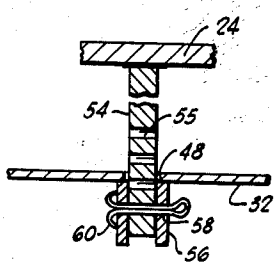


Fig. 4

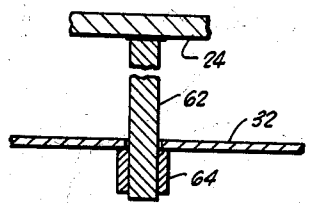


Fig. 5

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United States Patent Office

3,172,142

Patented Mar. 9, 1965

3,172,142

PAD HOLDER

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Filed Apr. 10, 1963, Ser. No. 271,983
6 Claims. (Cl. 15—246)

This invention relates generally to improvements in floor maintenance machines, and more particularly, but not by way of limitation, to improvements in means for operatively connecting fibrous scrubbing pads to conventional floor maintenance machines.

It is known to provide a variety of fibrous pads, which may include abrasive particles, for scrubbing, polishing or buffing tile, wood or terrazzo floors. These pads are generally made in the form of disks of various diameters and are adapted for use with the various floor machines now in use. One method of using these pads with floor maintenance machines having a rotatable circular bristle brush is to merely center the pad under the brush and depend upon the engagement of the brush bristles with the pad for an operative driving connection. Difficulties have arisen in the practice of this method in that unless the pad is initially centered under the brush it tends to spin away when the brush is rotated. Also, since there is only a loose engagement between the brush and the pad, the operative connection therebetween is broken when the brush is lifted or tilted away from the floor.

A pad holder has been provided in an attempt to alleviate these difficulties. This pad holder comprises a fastener plate which is connected to the backing of a brush by means of screws passing through cylindrical hollow spacers so that the plate is positioned a distance from the backing less than the length of the bristles. A disc-shaped locking plate is connected to the fastener plate by means of rotatable elongated locking members which are carried by the fastener plate and which pass through elongated slots in the locking plate. A fibrous pad is positioned between the fastener plate and the locking plate so that the locking plate when operatively connected to the fastener plate urges the pad against the bristles of the brush.

This method of assembly, however, is subject to several serious drawbacks. An initial difficulty relates to the spacing of the fastener and locking plates from the base of the brush. For this assembly, a plurality of sizes or lengths of shims or cylindrical spacers are provided so that the correct length of spacer may be used as the bristles are worn and the length thereof diminishes. In practice, it has been found that custodians or unskilled maintenance men tend to loose or misplace these spacers so that the correct spacers are not available when needed. Another problem has been encountered in the difficulty custodians have in purchasing the correct length of spacers for the particular floor maintenance machines they use.

Even when a custodian has managed to locate the proper spacers for his floor maintenance machine, there is likely to be difficulty in assembling this pad holder. In assembling such a pad holder, it is necessary to pass screws through the locking plate and cylindrical spacers into the relatively hard wood backing of a brush means. This difficulty of assembly is aggravated by the fact that since the bristles are depressed to some extent during assembly it is difficult to gauge, when the bristles are worn to any extent, the exact length of spacer which will be required. Thus, the problems encountered with this pad holder has made the widespread acceptance of these fibrous pads difficult. As a result, these pads are normally not utilized by custodians or, if used, the crude method of a loose centered engagement is utilized.

From the foregoing, it is apparent that a very real need exists for a practical and economical pad holder which will substantially eliminate the aforesaid difficulties.

The present invention contemplates a pad holder adapted to secure a fibrous pad to the rotatable brush of a floor maintenance machine, such brushes generally comprising a backing with bristles extending from one face thereof. In one of its broader aspects, the present invention may be defined as a first member adapted to be secured to the backing of the brush. In one embodiment of this invention, the first member is triangularly shaped and is provided with a plurality of spaced apertures extending inwardly along bisectors of each apex of the member. These apertures are provided to permit screws to extend therethrough for attaching the member to the backing of the brush. A scored line or indentation extends across each apex between each pair of apertures and perpendicularly to the bisecting line. The scored lines are provided so that portions of each apex of the member may be removed therefrom with the use of a suitable tool, such as pliers. Thus, each apex may be suitably truncated to form a member which will fit the backing of a brush used with any commonly used floor maintenance machine.

A second member of annular shape and having a recessed portion and an annular, radially extending flange is adapted to position a fibrous pad against the bristles of a brush. A means is provided to urge the second member toward the first member thereby operatively connecting the fibrous pad to the bristles of the brush for a rotation therewith. In one embodiment of this invention, this means comprises an axially threaded shaft carried by the first member and a locking nut which engages the depressed portion of the second member and is threadably disposed upon said shaft so that the second member is urged toward the first member regardless of the length of the bristles of the brush. This novel pad holder also includes means to preclude relative movement between the first and second members during rotation of the brush and to insure that the first and second members rotate together. In an illustrated embodiment of the invention, this means includes cooperating flanges carried by the first and second members which extend parallel to the axis of rotation of the first and second members and which insure that the first and second members rotate together. The second member is provided with a depressed portion so that the particular locking means used will not extend beyond the plane of the fibrous pad where it could come into damaging contact with a floor surface.

Accordingly, it is an object of this invention to provide a novel pad holder for operatively connecting a fibrous pad to the rotatable brush means of a floor maintenance machine.

Another object of this invention is to provide a novel pad holder for operatively positioning a fibrous pad against the bristles of a brush means regardless of the length of the bristles.

And another object of this invention is to provide a novel pad holder which positions a fibrous scrubbing pad against the bristles of the brush means of a floor maintenance machine with a desired pressure irrespective of the length of the bristles.

And yet another object of this invention is to provide a novel pad holder for floor maintenance machines which may be used as easily with worn brushes as with new brushes.

And still another object of this invention is to provide a novel pad holder which is simple in construction and which may be easily assembled by relatively unskilled labor.

A further object of this invention is to provide a pad holder which may be adapted for use with the rotatable

brush means of substantially all presently obtainable floor maintenance machines.

A further object of this invention is to provide an improved pad holder having few parts and being rugged in construction.

A still further object of this invention is to provide a novel pad holder which may be economically manufactured, and which has a long service life.

Other objects and advantages of the invention will be evident from the following detailed description, when read in conjunction with the accompanying drawings, which illustrate the invention.

In the drawings:

FIG. 1 is a longitudinal sectional view of a pad holder constructed in accordance with one embodiment of this invention as it may be used to operatively connect a fibrous pad to the rotatable brush means of a conventional floor maintenance machine.

FIG. 2 is a plan view of a member which operatively positions the fibrous pad against the bristles of the brush means.

FIG. 3 is a plan view of a member secured to the backing of a brush means.

FIG. 4 illustrates another embodiment of a locking means which may be used in the practice of this invention.

FIG. 5 is another embodiment of a locking means which also may be used in the practice of this invention.

Referring to the drawings in detail and particularly FIG. 1, reference character 10 designates a pad holder constructed in accordance with this invention and which operatively connects a fibrous disc-like pad 11 to a rotatable brush means 12 of a conventional floor maintenance machine (not shown). The brush means 12 comprises an annular disc-shaped backing 14 having a central aperture 16 and a suitable metal adapter plate 18 for attachment of the brush means 12 to the drive mechanism of the floor maintenance machine (not shown). A plurality of relatively stiff bristles 20 axially extend from one face 21 of the backing 14. The bristles 20 are arranged in generally a ring like shape with a central aperture 21 so that an annular surface 22 is left uncovered on the backing 14.

A first member 24 is connected to the surface 22 of the backing 14 in a suitable manner such as by screws 26 which extend through apertures 28 in the member. The first member 24, in one embodiment of this invention, is triangularly shaped. Water or other fluid (not shown) may be exhausted by the floor maintenance machine through the aperture 16 in the backing 14 and easily pass by the member 24 for application to a floor surface (not shown). The member 24 is also adapted to be used with brush means 12 of any presently obtainable floor polishing machine. A plurality of spaced aligned apertures 28 are provided in the triangularly shaped member 24 along a line (not shown) bisecting the acute angle of each apex of the member 24. These apertures 28 extend inwardly toward the center of the member 24.

Scored lines or indentations 30 are provided on each apex of the member 24 and extend between each pair of apertures 24 perpendicularly to the bisecting line. Thus, it is possible for a custodian with a pair of pliers or other tool to break off or remove a portion of each apex so that the member 24 will easily be positioned within the aperture 21 of the bristles 20, and the screws 26 will pass through the apertures 28 and enter the surface 22 of the backing 14 in a position to insure a secure connection of the member 24 to the backing 14. Presently obtainable brush means 12 provide a surface 22 which is generally 2⅞ inches to 5 inches in diameter. In one embodiment of the invention, it has been found that providing five apertures 28 and four scored lines 30 in each apex of the member 24 will permit the member 24 to be adapted for use with substantially all of the presently obtainable brush means used in conventional floor maintenance machines.

A second member 32 is provided for operatively positioning the fibrous pad 11 against the bristles 20 of the brush means 12. The second member 32 is provided with an annular central body portion 34 and an annular depressed or recessed portion 36. An outwardly extending annular rib or flange 38 is formed on the outer periphery of the body portion 34. The diameter of the body portion 34 generally approximates the diameter of a central aperture 39 provided in the fibrous pad 11 so that the body portion 34 may extend upwardly through the aperture 39 and permit the flange 38 to contact the bottom 40 of the pad 11. The flange 38, if desired, may be provided with a plurality of spaced circumferentially arranged indentations 41 or the like on the upper portion thereof for contacting the fibrous member 11 and precluding relative movement therebetween when in use.

A locking means 42 is provided for urging the second member 32 toward the first member 24 so that the fibrous member 11 may be operatively connected to the bristles 20 regardless of the extent to which they have been worn from usage. In the illustrated embodiment of the invention, the locking means 42 comprises a threaded shaft 43 connected to the member 24 and extending axially therefrom. A suitable nut 44 has an outwardly extending flange 46 formed on the outer periphery thereof and extends through a central aperture 48 in the second member 32. As shown in FIG. 1, the nut 44 is threadedly disposed upon the shaft 43 so that the fibrous pad 11 is urged against the bristles 20 regardless of the length thereof. The nut 44 is threaded on the shaft 43 in a direction which opposes the direction of rotation of the brush 12 so that rotation of the brush 12 will not permit the nut to become loosened on the shaft 43. Conversely, the rotation of the brush 12 will cause the nut 44 to tend to travel upwardly on the shaft 43 and urge the fibrous pad 11 into even tighter engagement with the bristles 20.

A means 50 is provided to preclude relative movement between the first and second members 24 and 32 during rotation of the brush means 12. As shown in the drawings, the means 50 takes the form of a pair of flanges 52 which are formed from the body of the first member 24 and depend axially therefrom. The flanges 52 are shown as being formed directly from the body of the member 24 by being punched therefrom on either side of the shaft 43. It would also be within the scope of this invention to form the flanges 52 from a separate member and to attach this member to the first member 24.

Similarly, a pair of flanges 53 depend from the body portion 34 of the second member 32 in an axial direction. The flange members 52 and 53 cooperate, as shown in FIG. 1, to preclude relative movement between first and second members 24 and 32 as the brush means 12 is rotated. The flange members 52 are formed so that they generally lie within a plane passing through the center of the member 24. Similarly, the flanges 53 of the member 32 are formed so that they generally lie within a plane passing through the center of the member 32. In FIG. 1, the bristles 20 are shown as being relatively new and near their maximum length. As the brush is used, the length of the bristles 20 will diminish so that the engagement of the flanges 52 with the flanges 53 will become progressively greater. It will be apparent, however, that the means 50 will insure that the members 24 and 32 rotate together from the time the brush 12 is new until it is discarded.

Referring now to FIG. 4, another embodiment of the locking means 42 is illustrated. A shaft 54 having a plurality of longitudinally spaced apertures 55 extends axially from the first member 24. The second member 32 is positioned upon the shaft 54 according to the length of the bristles 20. A sleeve 56 having a pair of aligned opposed apertures 58 is positioned on the shaft 54 so that a suitable locking pin such as a cotter pin 60 may extend

through the apertures 58 and one of the apertures 55 for locking the second member 32 on the shaft 54. The shaft 54 and the sleeve 56 may be either annular or square in configuration.

In FIG. 5, another embodiment of the locking means 52 is illustrated. A shaft 62 is connected to the first member 24 and extends axially therefrom. A suitable sleeve 64 is press-fitted onto the shaft 62 so that the second member 32 may be spaced from the first member a distance according to the length of the bristles 20. It will be understood that the shaft 62 and the sleeve 64 may be either annular or square in configuration.

Operation

It may be assumed that it is desired to utilize the pad holder 10, illustrated in FIG. 1, to operatively connect a fibrous pad 11 to the brush means 12 of a floor maintenance machine (not shown). Initially, portions of each apex of the first member 24 are removed so that it will easily fit against the annular surface 22 of the backing 14 and within the central aperture 21 of the bristles 20. These portions may be removed in a suitable manner as with pliers, or the like. Screws 26 are then passed through the apertures 28 in the member 24 for securing the member 24 to the backing 14.

The flanges 52 extend axially away from the face 21 of the backing 14 containing the bristles 20. The fibrous pad 11 is then positioned upon the second member 32 so that the body portion 34 of the member 32 extends upwardly through the aperture 39 in the pad 11. The pad 11 is then positioned against the bristles 20. The nut 44 is threadedly disposed upon the threaded shaft 43 so that the second member 32 is drawn toward the first member 24 and the pad 11 is positioned against the bristles 20 with any desired pressure, regardless of the length of the bristles 20. It will be seen in FIG. 1 that the flange 38 of the second member 32 and an adjacent portion of the pad 11 is drawn above the lowermost portion of the fibrous pad 11 so that the flange 38 will not come into contact with the floor surface as the brush means 12 is rotated. Thus, substantially the entire bottom 40 of the pad 11 will be permitted to contact a floor surface (not shown).

The second member 32 will also be positioned so that the flanges 53 extend axially toward the backing 14 and abut the similar flanges 52 of the first member 24. The pad 11 is now operatively connected to the brush means 12 for rotation therewith. As the brush means 12 rotates, the nut 44 does not tend to unscrew on the threaded shaft 43 but will only tend to travel more upwardly thereon since the direction in which the nut 44 is threaded upon a shaft 43 is opposite to the direction of rotation of the brush means 12. As the brush means 12 rotates, the second member 32 does not move with respect to the first member 24 since the flanges 52 carried by the first member 24 abut the flanges 53 carried by the second member 32 and preclude relative movement therebetween by coupling the first and second members 24 and 32 together.

From the foregoing, it will be apparent that the present invention provides a novel pad holder which will operatively connect a fibrous pad to the rotatable brush means of a conventional floor maintenance machine regardless of the length of the bristles of the brush means. It will also be apparent that as the bristles of the brush means diminish in length according to usage, the novel pad holder will correctly position the pad on the bristles regardless of the length thereof. The novel pad holder is simple and rugged in construction so that relatively unskilled labor can use it. Also, the novel invention provides a pad holder which may be adapted for use with the brushes used with substantially all presently obtainable floor maintenance machines. Finally, it will be apparent that the present invention provides a novel pad holder which may be economically manufactured and which has a long service life.

Changes may be made in the combination and arrangement of parts or elements as heretofore set forth in the specification and shown in the drawings, it being understood that changes may be made in the precise embodiment disclosed without departing from the spirit or scope of the invention as defined in the following claims.

I claim:

1. In a pad holder adapted to secure a fibrous pad to a rotatable brush having a backing with bristles extending from one face thereof, the combination of:
   - a first member adapted to be secured to the backing of the brush;
   - a second member adapted to position the fibrous pad against the bristles;
   - locking means to operatively connect the second member to the first member and to space the second member from the first member a distance directly related to the length of the bristles;
   - a first flange member extending from said first member toward said second member; and,
   - a second flange member extending from said second member toward said first member arranged to abut said first flange member to prevent relative rotation between said first and second members while permitting movement of said second member relatively toward said first member.

2. In a pad holder adapted to secure a fibrous pad to a rotatable brush having a backing with bristles extending from one face thereof, the combination of:
   - a first triangularly shaped member adapted to be secured to the backing of the brush;
   - a second member adapted to position the fibrous pad against the bristles;
   - means to operatively connect the second member to the first member and to urge the second member and the fibrous pad toward the first member regardless of the length of the bristles;
   - said means comprising an axially extending shaft secured to the first member, a nut threadedly disposed on said shaft and contacting the second member so that the second member may be urged toward the first member; and,
   - means including a flange member on said first and second members arranged in abutting relationship to preclude rotation between the first and second members when operatively connected.

3. In a pad holder adapted to secure a fibrous pad to a rotatable brush having a backing with bristles extending from one face thereof, the combination of:
   - a triangularly shaped first member having three apexes and being provided with a plurality of spaced apertures extending radially inward along each apex, the member also being provided with a scored line extending between each pair of apertures so that a selected portion of each apex may be easily removed;
   - means passing through said apertures for securing the first member to the backing of the brush;
   - an annular second member having a central annular body portion which is provided with a central depressed portion and an outwardly extending annular flange that is adapted to position the fibrous pad against the bristles of the brush;
   - bolt means cooperating with the first and second members for operatively connecting the fibrous pad to the bristles regardless of the length thereof and being received partially within the recessed portion of the second member so as to not extend below the bottom of the fibrous pad;
   - a flange secured to said first member and extending toward said second member; and
   - a flange secured to said second member and cooperat-

ing with the flange carried by the first member to preclude relative movement between the first and second members as the brush is rotated.

4. A pad holder as defined in claim 3 wherein the bolt means comprises:

an axially extending threaded bolt secured to said first member; and

a nut threadedly disposed on said shaft and provided with an outwardly extending annular flange which cooperates with the second member to urge the second member toward the first member and thereby operatively connect the pad to the bristles of the brush means for rotation therewith.

5. In a pad holder adapted to secure a fibrous pad to a rotatable brush having a backing with bristles extending from one face thereof, the combination of:

a first member adapted to be secured to the backing of the brush;

a second member adapted to position the fibrous pad against the bristles;

locking means to operatively connect the second member to the first member and to space the second member from the first member a distance directly related to the length of the bristles, said locking means including:

a shaft extending from the first member toward the second member and being provided with a plurality of spaced, transversely extending apertures.

a sleeve slidably disposed on said shaft and abutting the second member so that it operatively connects the pad to the bristles of the brush, and

a locking pin extending through one of said apertures in the shaft to secure the sleeve on said shaft in a predetermined position; and,

means to preclude rotation between the first and second members when operatively connected.

6. In a pad holder adapted to secure a fibrous pad to a rotatable brush having a backing with bristles extending from one face thereof, the combination of:

a triangularly shaped first member having three apexes and being provided with a plurality of spaced apertures extending radially inward in each apex, the member also being provided with a scored line extending between each pair of apertures so that a portion of each apex may be easily removed;

an annular second member having a central annular body portion which is provided with a central depressed portion and an outwardly extending annular flange that is adapted to position the fibrous pad against the bristles of the brush;

bolt means cooperating with the first and second members for operatively connecting the fibrous pad to the bristles regardless of the length thereof and being received partially within the recessed portion of the second member so as not to extend below the bottom of the fibrous pad;

the first member being provided with at least one flange extending toward the second member; and

the second member being provided with at least one flange that extends toward the first member and which cooperates with the flange carried by the first member to preclude relative movement between the first and second members as the brush is rotated.

References Cited by the Examiner

UNITED STATES PATENTS

1,673,160	6/28	Ross.	
1,724,742	8/29	Albertson et al.	
2,280,149	4/42	Gerst.	
2,281,722	5/42	Smith.	
2,995,765	8/61	Ballato et al.	
3,056,988	10/62	Clarke	15—230.1
3,091,788	6/63	Shears	15—230.1 X
3,135,981	6/64	Fitch et al.	15—230.1

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