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3,141,185

APPLICATOR ATTACHMENT

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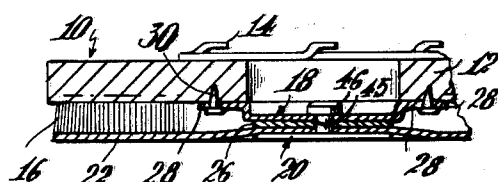


Fig. 1

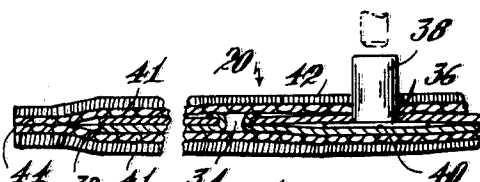


Fig. 3

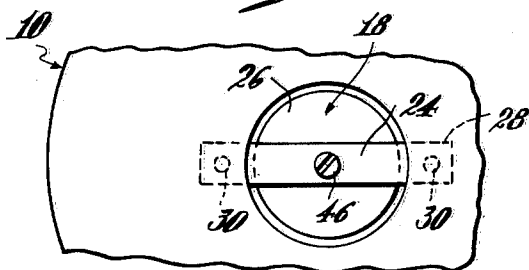


Fig. 2

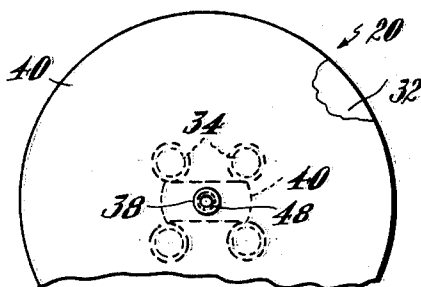


Fig. 4

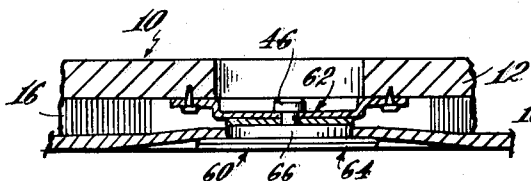


Fig. 5

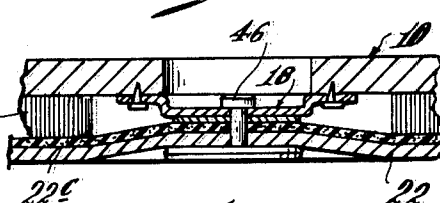


Fig. 7

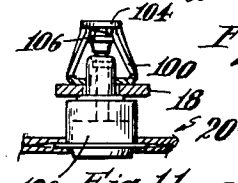


Fig. 11

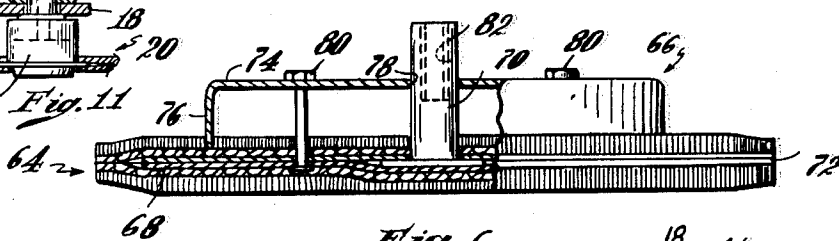


Fig. 6

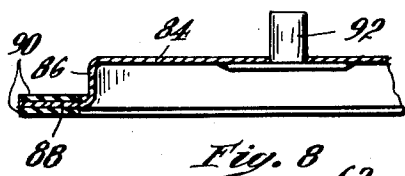


Fig. 8

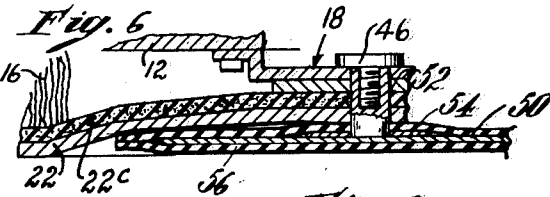


Fig. 9

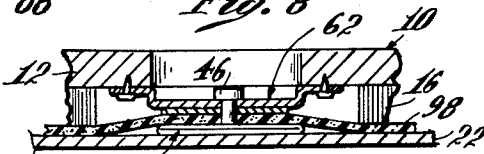


Fig. 10

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ATTYS

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APPLICATOR ATTACHMENT

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4 Claims. (Cl. 15-246)

This invention relates to apparatus for treating floors and, in particular, to machines for use in cleaning large areas such as the floors in office buildings and public places.

Customarily, such machines are provided with large diameter brushes comprising a rigid circular head having at one side brush bristles and at the other side attaching elements by means of which the brushes are fastened to driving elements. It is desirable to employ such brushes for scrubbing floors as well as for polishing and, to this end, means have been provided for attaching a pad to the brush subjacent the bristles which may be of a sponge-like or abrasive character according to the operation to be performed. Prior devices of this kind have not been wholly satisfactory because of the difficulties of attaching; their tendency to scratch the floor; and their failure to effectively rotate the pad with the brush.

The principal objects of this invention are accordingly to provide an attachment of simple and yet effective construction which may easily be attached to the brush; which will not scratch the floor; which will provide sufficient friction effectively to turn the pad with the brush; and which will prevent crumpling of the pad beneath the brush.

As herein illustrated, the attachment comprises a rigid anchor plate adapted to be secured diametrically of the opening in the brush at the side of the bristles and a disc-shaped clamping plate having a projection at one face by means of which it may be fastened to the anchor plate, so that one face of the clamp, in cooperation with the anchor plate, holds the central portion of the pad displaced upwardly relative to the plane of the marginal portion. The upper surface of the clamp has a high coefficient of friction for engagement with the pad and the lower surface is relatively soft for engagement with the floor. In one form, there is a circular hub of smaller diameter than the clamping plate, at the side of the attaching projection, for engagement within the hole at the center of a pad having such a hole. The high coefficient of friction and the softness are provided by flexible covering material which extends beyond the peripheral edge of the plate and are secured together marginally thereof. This material may be a woven fabric with a stiff pile or a rubberized or rubberlike sheet material.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is a fragmentary, diametrical section through a circular brush, showing the attachment for fastening a pad to the brush;

FIG. 2 is a fragmentary elevation of FIG. 1;

FIG. 3 is a diametrical section to much larger scale of the clamping plate;

FIG. 4 is an elevation of FIG. 3;

FIG. 5 is a fragmentary, diametrical section of a brush showing an alternative form of attachment, partly in elevation;

FIG. 6 is a view partly in elevation and partly in section of the alternative form of clamping plate;

FIG. 7 is a fragmentary, diametrical section of the brush showing a clamping plate securing a pad to the brush with a cushion pad behind it;

FIG. 8 is a fragmentary, diametrical section of another form of clamping plate;

FIG. 9 is a fragmentary, diametrical section of still another form of clamping plate;

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FIG. 10 is a fragmentary, diametrical section showing an unattached pad driven by contact with the lower surface of a cushion pad secured to the brush by means of a clamping plate; and

FIG. 11 is an elevation of a snap fastener for fastening a clamping plate to the anchor plate.

Referring to the drawings, there is shown a brush 10 of circular construction comprised of an annular head 12, to one side of which there is secured coupling elements 14 (FIG. 1) for fastening the head to a driving member and to the other side of which are secured bristles 16. Brushes of this kind are in the order of 12 to 18 inches in diameter and are used extensively in office buildings, public buildings and other places where there are large floor area to be cleaned. For the purpose of scrubbing the floor with a fluid detergent a pad is generally placed against the face of the bristles and held in place by a fastening element secured to the center of the pad which, in turn, is cooperable with a mating element secured to the brush head, or by a clamping element designed to be placed against the center of the pad and secured to the brush by a fastening stud or the like passing through the pad into engagement with a cooperable fastening element on the brush. Such fastening means as the foregoing, however, have not proved satisfactory, on the one hand because it is not desirable to have to make up the pad with a fastening element secured thereto, and on the other hand because such fastening elements and other clamping means, placed at the center of the pad for securing it to the brush, inevitably scratch the floor. Additionally, no fastening means has been developed for fastening a pad to a brush which will insure rotation of the pad with the brush when the pad is wet and limp.

The foregoing disadvantages are wholly eliminated by the attachment shown herein which comprises an anchor plate 18 secured diametrically of the central opening in the brush head 12 and a clamping plate 20 adapted to be secured against the underside of a pad 22 placed against the bristles to hold the center of the pad clamped between it and the anchor plate 18. As shown in FIG. 2, the anchor plate 18 comprises a bar 24 having welded to it a circular plate 26. The end portions of the bar are bent upwardly and outwardly to provide attaching flanges 28 for receiving attaching screws 30. The anchor plate may alternatively be a single stamping instead of two pieces welded together.

The clamping plate 20, which is shown to much larger scale in FIG. 3, is made up of a pair of thin rigid metal plates 32 which are secured together in face-to-face relation by punching the metal of one of the plates through the other and folding it over a plurality of points as shown at 34 in FIGS. 3 and 4. One of the plates 32 is provided with a central opening 36 and an attaching stud 38, having a rigid foot plate 40, is disposed in the opening 36 with the foot plate 40 between the plates 32 prior to fastening so that when the plates are fastened the stud 38 is secured rigidly in place. Layers 41 of a material which is relatively soft and has a high coefficient of friction are applied to the outer surfaces of the plates 32. As shown in FIG. 3, these layers 41 are comprised of a woven fabric having a relatively stiff, thick nap 42. The layers 41 are of a larger diameter than the plates 32 so that they project beyond the peripheral edges of the plates 32. The projecting portions are secured to each other by means of a waterproof adhesive 44. Alternatively, the edges may be secured by stitching or fastener elements clinched below the surface of the pile.

The anchor plate is provided with a central opening 45 through which the stud 38 is inserted and secured by a left-hand screw bolt 46, the stud being provided with a threaded opening 48 for receiving the screw bolt. The stud 38 is of an axial length such that when secured in

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the hole in the anchor plate the clamping plate will hold the central portion of the pad clamped between it and the anchor plate with the pile layer 42 frictionally engaged with the pad. Additionally, the stud 38 is designed to hold the pad displaced upwardly relative to the face of the brush so that the lower side of the clamping plate lies substantially in the plane of the lower surface of the pad.

From the foregoing, it is clear that the clamping plate will hold the pad for rotation with the brush and yet will not scratch or scar the floor.

A simpler form of the pad is shown in FIG. 9, in which a rigid metal plate 50 has welded to one side of it a stud 52 having a foot plate 54 on its lower end. Layers of a rubberized material 56, coated on their inner surfaces with an adhesive, are applied to the opposite surfaces of the plate 50 and secured to each other marginally thereof. The stud 52 is provided with a threaded opening 58 for receiving a left-handed screw bolt as previously explained with respect to the form of the clamping device shown in FIGS. 1 to 4 inclusive.

Sometimes a very thick pad is employed for cleaning purposes, for example $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick, and, in such circumstances, it is desirable to use a modified form of clamping plate such as shown in FIGS. 5, 6 and 8. Such thick pads are provided with a relatively large central opening 60. An anchoring plate 62, corresponding to that shown in FIGS. 1 and 2, is employed as before however the clamping plate 64 is modified to the extent that it is provided with a hub 66 corresponding substantially in diameter to the hole 60 in the pad and in depth to the thickness of the pad. The clamping plate 64 is shown in FIG. 6 as comprised of thin rigid metal plates 68 secured together with the lower end of a stud 70 clamped between them and covered on opposite surfaces with flexible covering material 72. The hub 66 is a rigid metal disc 74 having a peripheral right-angular flange 76 and a central opening 78. The hub 66 is placed over the stud 70 and secured to the upper side of the clamping plate, for example, by means of screw bolts 80 inserted through the disc 74 and threaded into the plates 68. The stud 70 is provided with a screw-threaded opening 82 for receiving a left-handed screw bolt as previously explained. The stud and hub are so proportioned that the pad is held displaced upwardly with reference to the lower surface of the bristles so that the lower surface of the clamping plate lies in the same plane as the lower surface of the pad.

A simplified form of this clamping member is shown in FIG. 8, comprising a circular plate 84 having a peripheral right-angularly disposed flange 86 and an annular flange 88 bounding the lower edge of the flange 86. Annular layers 90 of a material which has a high coefficient of friction and is soft are applied to the upper and lower surfaces of the flange 88. An attaching stud 92 is welded or otherwise secured to the center of the disc 84. The depth of the flange 86 is approximately equal to the thickness of the pad to be secured to the brush so that when the clamp is secured to the anchor plate the frictional surface afforded by the annulus 90 will secure the pad against rotation relative to the brush. The annulus 90, at the underside of the clamp, as previously explained, will lie substantially in the plane of the underside of the pad and since it is soft will not scratch the floor.

The attaching device is described above as providing means for fastening a single pad to the brush however, if desired, as shown in FIG. 7, the pad 22 may be backed by a cushion pad 22c, for example a layer of sponge rubber or equivalent sponge-like material. The advantage of using the sponge layer 22c is to make the cleaning pad 22 more conformable to irregularities in the surface of the floor and hence to obtain better cleaning. Furthermore, after the cleaning pad has been used for a time and becomes thoroughly saturated with water and dirt, it loses a considerable amount of its inherent stiffness so that it tends to crumple beneath the brush. By providing the

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cushion pad 22c the added frictional resistance of the sponge-like surface coextensive with the upper surface of the pad 22 holds the pad outspread and substantially eliminates any crumpling. Furthermore, the porous surface of the sponge layer 22c affords a particularly good driving connection between the bristles and the pad.

Operators sometimes object to having to remove a dirty pad and secure a clean pad in place and want to be able merely to place a cleaning pad on the floor and then lower the brush onto the pad and commence operation, without having to fasten the pad to the brush. If the pad is new, it may function for a time in this manner if perfectly placed, however, as soon as it becomes wet and limp it will be thrown out by the rotation of the brush. The advantages of not having to fasten the cleaning pad to the brush with the disadvantage of not having an unattached wet pad ejected can be avoided by the use of the fastening means shown herein in the following manner. Referring to FIG. 10, a fastening clamp 96, which may be any one of the kind described above, is used to clamp a sponge-like layer 98 to the brush. With this sponge layer fastened to the brush it is now only necessary to place the cleaning pad 22 on the floor and then lower the brush with the sponge pad fixed thereto against the upper surface of the pad. The frictional resistance provided by the sponge-like pad in contact with the upper surface of the cleaning pad will hold the latter outspread and securely in place without other attachment during the entire cleaning operation regardless of how wet, dirty and limp the pad may become.

Although a left-handed screw is described herein, in a twin-brush machine where one brush is rotating in one direction and one in the other, a right-handed screw will be employed with the brush which is rotating counter-clockwise.

If desired, a snap-fastener type of fastening may be employed such as shown in FIG. 11 for securing the clamping plate to the anchoring plate, comprising a pair of spring fingers 100 secured to the upper side of the anchor plate 18 and a spring-biased plunger 102 fastened to the clamping plate 20. The plunger 102 has an upper end 104 which may be forced upwardly between the spring fingers 100 by pushing the lower end of the plunger 102 upwardly so as to engage the fingers beneath the end 104. This locks the clamping plate to the anchor plate. To disengage the clamping plate the plunger is pushed up further which, by means of an expanding ring 106, spreads the fingers 100 apart sufficiently to permit the end 104 to be retracted by spring means between them. Such fasteners may be purchased from the Deutsch Fastener Corporation, Los Angeles 61, California.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. An adapter for operatively attaching a flexible pad to an annular disc-shaped brush of the kind having a rigid base containing a center hole, bristles on one side of the base, and means on the other side to operatively attach said brush to a floor machine; said adapter comprising a circular anchor plate having diametrically extending attaching flanges for receiving screws by means of which it is adapted to be fastened to said base diametrically of the center hole, said anchor plate containing a center hole, a clamping plate, and an attaching stud secured at one end to the clamping plate, said stud containing in its opposite end a threaded hole for receiving a left-hand threaded screw bolt for securing the clamping plate to the anchor plate, and plies of relatively soft non-abrasive material of larger diameter than the clamping plate secured to the upper and lower sides of the clamping plate for engagement, said upper ply adapted to afford frictional engagement with a pad and said lower ply providing a non-abrasive surface next to the floor.

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2. An adapter according to claim 1, wherein the stud has a rigid foot plate fixed to one end and the clamping plate comprises two rigid plates, one of which contains a center hole through which the stud extends, disposed in engagement with the opposite sides of the foot plate and secured to each other.

3. An adapter according to claim 1, wherein the plies of relatively soft material cover substantially the entire upper and lower surfaces of the clamping plate and have marginal portions which project beyond the peripheral edge of the clamping plate and are secured to each other by fastening means.

4. An adapter according to claim 1, wherein the clamping plate has a flat circular part, a right-angularly disposed circular flange integral with its peripheral edge, and a radially disposed annular flange peripherally of the

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free edge of the right-angularly disposed circular flange, the stud is secured to the center of the flat circular part, and the plies of soft non-abrasive material are secured to the opposite sides of the radially disposed annular flange.

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