BRUSH ADAPTOR FOR VACUUMING

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Filed: Dec. 11, 1972

Appl. No.: 314,119

U.S. Cl. .................................................. 15/400
Int. Cl. .................................................... A47I 9/06
Field of Search .................. 15/231, 393, 398, 399, 15/400

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ABSTRACT

A slant pile brush surrounds an aperture to a chamber which is connectible to a vacuum source.

2 Claims, 4 Drawing Figures
This invention relates to an adaptor for a vacuum cleaner to provide for more advantageous cleaning of rugs.

In one aspect, the invention provides a brush holding body wherein the brush is apertured to provide an air passage past or adjacent the bristles. The air passage continues through the interior of the brush holding body, and means are provided for this air passage through a coupling for attachment to a vacuum source, usually a vacuum cleaner. It is found that, with such arrangement, very effective particle removal is achieved, the brush, to a greater degree than would be expected, moving the particles in the rug or the like, loosely in the brushing direction, and aiding in the withdrawal of the particles by the vacuum, while the vacuum tends to lift both the particles themselves, and the pile of the rug, to make the particles more easily extracted and the pile more easily brushed.

The combined beneficial effects of brush and vacuum have been particularly enhanced where the conventional bristles of a brush are replaced by bristles formed in a suitably cut pile fabric, comprising synthetic fibres woven through a fabric backing, to provide extents of such synthetic fibres which may be cut to produce a pile which is then treated to cause substantially all the fibres to slope in approximately the same direction. Such treatment comprises the application of a heated surface to the piles, in one sense, to produce the required slant. When such pile fabric material is applied to the device, previously described, as the brush surface, and oriented so that the direction of advance of the sloped bristles is one of the brushing directions employed during the brushing operation, then the cumulative effect of the detaching of particles by the bristles, the raising of the pile by the vacuum, and the detachment of particles by the vacuum from pile raised by the bristles, is particularly enhanced.

In drawings which illustrate a preferred embodiment of the invention:

FIG. 1 shows a perspective view of the device;
FIG. 2 shows an exploded view showing the means for coupling the device to a vacuum cleaner;
FIG. 2a shows an alternative to one of the members shown in FIG. 2;
FIG. 3 shows an exploded view of the elements forming the device; and
FIG. 4 shows a cross-section along the lines 4—4 of FIG. 1.

In the drawings, FIG. 1 shows the brush holding body and, as will be described hereinafter, this is hollow, having a brush surface 12 with apertures 14 therethrough, connected to the hollow interior, while the hollow interior is connected to a vacuum cleaner by the tapping conduit 16.

As indicated in FIGS. 3 and 4, the device comprises a brush holding body having a peripheral wall 18 extending about the outer edge of a transverse wall 20 with the wall 18 extending on each side of the wall 20 to form flange 22 on the vacuum coupling side and flange 24 on the brush support side.

The transverse wall 20 extends with its long dimension from lower left to upper right as shown, in FIG. 3 and extending in this direction are three, longitudinally extending, slot-like apertures 32 in wall 20, located approximately midway across the width dimension of the transverse wall. The side of transverse wall 20 corresponding to flanges 24 is provided with a plurality (here six) of posts 34 projecting substantially parallel to each other and substantially parallel to the flanges 24, arranged about the periphery of the apertures 32 considered collectively. In the bridging portions separating adjacent pairs of apertures 32, there are also provided posts 36 parallel to posts 34.

A brush support member is provided having a base wall 40, a peripheral wall 42 extending approximately transversely to said base wall, with tines 44 extending outwardly from the edge of said peripheral wall remote from said base wall. The tines are dimensioned to contact the inner surface of flange 24 and this inner surface tapers slightly inwardly, inward from its extremity to increase the frictional contact between the tines and the wall, as the member is pressed inwardly. The fabric support member is centrally slotted by a longitudinally extending aperture 46 arranged to be in register with the three apertures 32 considered collectively. About these slots are arranged bosses 48 to extend toward posts 34 to which the bosses correspond in arrangement and number when the support member is moved toward the body 10 and each boss is provided with a well to receive its corresponding post 34 so that the fabric support member may be mounted on the body member thereby. The attachment of the posts in the wells may be achieved by friction between these two members or by the use of an adhesive.

The members shown in this application will preferably be of molded plastic with the exception of the bristle fabric and its padding which are separately discussed.

A member 50 is provided with peripheral side wall 52 of dimensions to be slightly spaced from the edges of slot 46. The side wall 52 surrounds and defines a slot-like passage therethrough having the length of the member and broken by bridging members 54 located to align with the bridging members separating slot 32 and provided with wells 56 to slide over posts 36 and mount the member in position. The outer surface of peripheral wall 52 is provided with tines 53 directed outwardly from the wall and in the direction of movement of member 52 toward wall 20.

Fabric 58 of the type previously described with bristles sloping in the same direction is backed up by resilient spongy plastic or foam rubber 60 to achieve a resilient, somewhat conforming brushing surface. The fabric 58 backed by a layer of foam rubber 60 as shown, is applied over the exposed surface of base wall 40, opposite to the side with bosses 48. The fabric with its backing centrally apertured to correspond to slot 46 (as shown in FIG. 3) is dimensioned to overlie both the tines 44 and tines 53 provided, inwardly directed, on the outer surface of member 52. Thus the brush portion of the device is assembled by extending the fabric over the tines 44 and allowing it to overlie the edges of aperture 46. The fabric is oriented so that the direction of advance of the bristle tips over their roots (which is in the plane of the paper in FIG. 4 and indicated by the arrow A in FIG. 1) is transverse to the longitudinal extension direction of slot 46.

The support member 40 is then moved into place on body member 10 with the posts 34, being received in the wells of bosses 48 and the fabric 58 retained on the ends of tines 44 pressing outwardly on the inner surface of flange 24. Member 50 is then applied through slot
46, with the posts 36 being received in the wells 56 and tines 53 engaging the fabric 58 to hold it in place at the edges of slot 46. The brushing fabric is then firmly retained in place with the aperture therethrough and through base wall 40 communicating with the open-sided chamber defined by the opposite side of wall 40 and flange 22.

A coupling member 64 defines a tapering conduit, wide enough at its outer end to meet the open sided chamber defined by flange 22 and wall 40. The wide end of the conduit is stepped inward as shown at 66 to receive the upper end of the flange 22 and to attach thereto by friction or by adhesive. The narrow end 68 of the conduit is preferably arranged perpendicular to the direction faced by the brush.

A tube 70, designed to be rotatably slidable in the sleeve 68 is provided at its open end with a pair of expandible ears 72. The end of tube 70 is provided with recesses in which said ears may lie parallel to the tube and extending away from the ends thereof during the insertion of tube 70 in sleeve 68. When the ears have passed completely through sleeve 68, these are designed to spring up and prevent removal of the tube. The tube 70, in that portion exterior of the sleeve 68, is preferably provided with a slight bend to increase the maneuverability of the vacuum-brush head.

The end of the pipe 70 remote from the head may be constructed to couple directly to a vacuum cleaner conduit. However, since each make of vacuum cleaner has a different end coupling, it is preferable to provide a plurality of adaptors such as 72a and 72b, illustrated in FIG. 2 and FIG. 2a respectively, each suited to a particular popular make of vacuum cleaner so that the invention may be coupled to whichever model is available to the householder.

With the device, as described, coupled to the vacuum source, such as a vacuum cleaner, the vacuum is applied through tube 70, through the chamber and through apertures 32 and 46. With the vacuum so applied, and the bristles applied by a brushing action to the surface to be cleaned; particles are removed by the combination of brushing action by the bristles on the surface to be cleaned and by the suction as previously described.

While the preferred embodiment shows three longitudinally extending apertures 14, it will be obvious that the number is selected to best conform to the structural qualities of the brush and that one, two or more longitudinally extending apertures may equivalently be used.

I claim:

1. Combination brush and vacuum cleaner adaptor comprising:
   a body including peripheral side walls extending about a wall transverse thereto and forming flanges on each side of said transverse wall,
   said transverse wall having at least one aperture therethrough;
   means for attaching to the flanges on one side of said transverse wall, fabric having bristles projecting therefrom in a direction to brush surfaces exterior to said body;
   means including an aperture in said fabric defining a path for air flow past said fabric and through the said at least one aperture in said transverse wall;
   a tapering conduit provided with a wide end shaped and designed to couple to the flanges on the other side of said transverse wall, and a narrow end shaped and designed to be coupled to a vacuum source.

2. A device as claimed in claim 1 wherein said aperture is arranged to extend longitudinally in a predetermined direction, wherein said bristles are arranged so that the majority thereof are sloped in approximately the same said direction relative to the fabric and the direction is such that the tips of such majority of bristles are advanced over the roots in a direction transverse to said predetermined direction.

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