

[54] VACUUM CLEANER SUCTION TOOL WITH OPPOSITELY ROTATING PILE AGITATORS FOR CLEANING DEEP PILE SHAG RUGS

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[22] Filed: Dec. 3, 1971

[21] Appl. No.: 204,548

[52] U.S. Cl. .... 15/377, 15/384

[51] Int. Cl. .... A47I 9/04

[58] Field of Search ..... 15/377, 383, 384, 15/388

[56] **References Cited**

**UNITED STATES PATENTS**

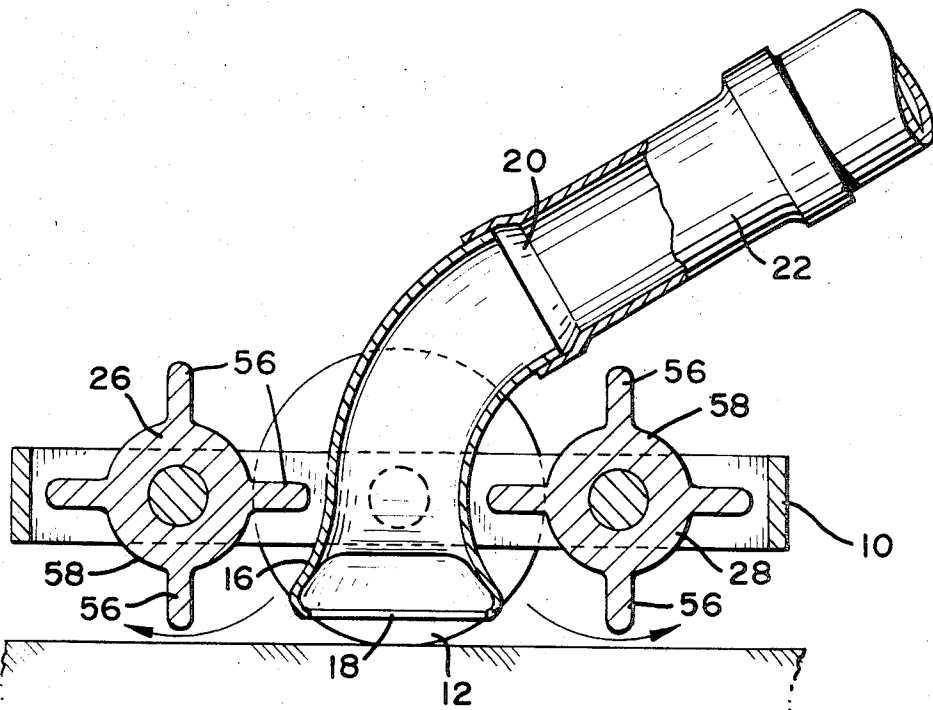
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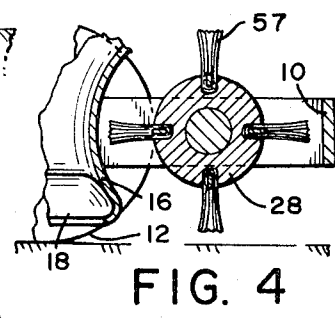
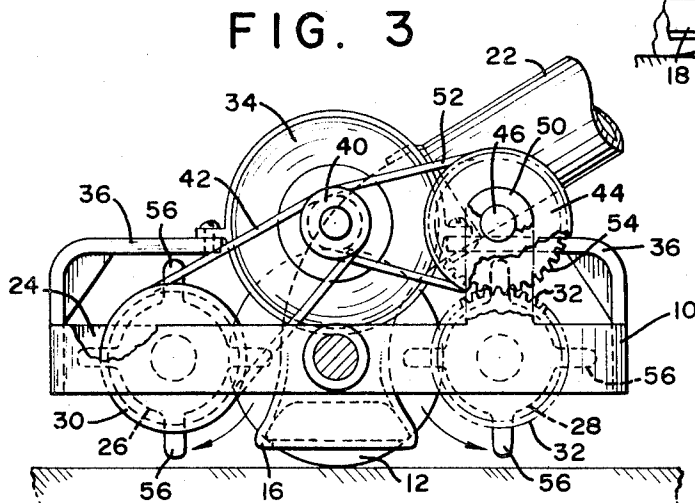
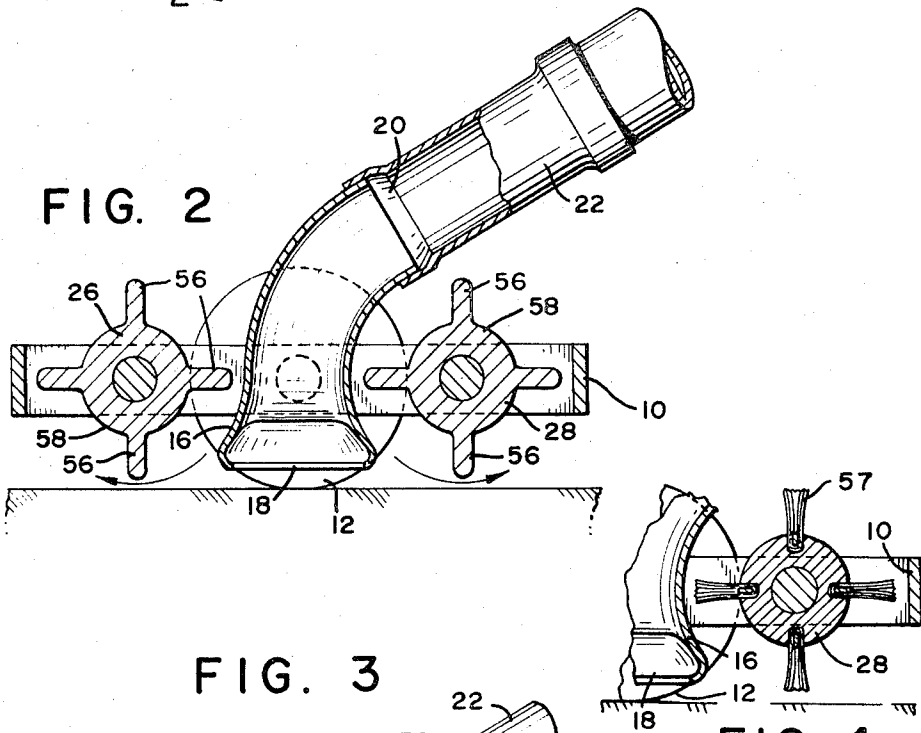
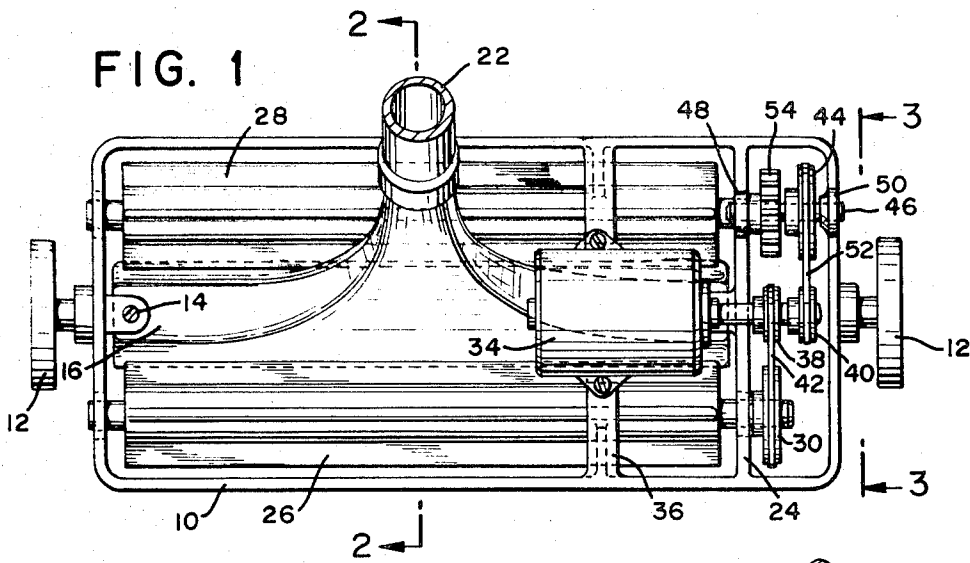
[57] **ABSTRACT**

In accordance with the present invention there is provided a suction cleaning tool having an elongated suction nozzle on either side of which and closely adjacent thereto, is a rotatably mounted member for contacting the pile of the rug. These members are caused to rotate in mutually opposite directions with their lower sides turning away from the nozzles.

The nozzle and rotating members depend from a base which is provided with means, such as wheels or runners at opposite ends thereof, for movably supporting the tool on the rug. The rotating members may be driven by an electric motor or by the wheels through suitable drives which rotate them in opposite directions.

4 Claims, 4 Drawing Figures





# VACUUM CLEANER SUCTION TOOL WITH OPPOSITELY ROTATING PILE AGITATORS FOR CLEANING DEEP PILE SHAG RUGS

## BACKGROUND OF THE INVENTION

The present day shag rugs have a pile formed of exceedingly long fibers, frequently several inches, thus making them very difficult to vacuum clean. The ordinary suction nozzle, which is elongated in a direction at right angles to the normal direction of movement of the nozzle, tends to dig into the pile, thus making it hard to move the nozzle. Also, as the nozzle will only slide over the fibers, the nozzle opening is held well above the base of the rug thus preventing the air flow from penetrating low enough to remove deeply embedded dirt.

## SUMMARY OF THE INVENTION

The oppositely rotating members on either side of the nozzle act to part the fibers of the pile, thus permitting the nozzle to sink down therein so as to be close to the base of the rug where much of the dirt accumulates. As the nozzle is moved over the rug, the rotating members keep the pile parted directly underneath the nozzle and hence the resistance to movement of the latter offered by the pile is greatly reduced.

## DESCRIPTION OF THE FIGURES

FIG. 1 is a top view of a cleaning tool in accordance with my invention;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on the line 3—3 of FIG. 1; and

FIG. 4 is a fragmentary cross-sectional view similar to FIG. 2 showing a modification of the invention.

Referring to the drawings, reference character 10 indicates a frame provided with suitable supporting means, such as runners or the narrow wheels 12 at opposite ends thereof. Secured to the frame, as by means of bolts 14, one of which is shown in FIG. 1, is a nozzle 16 having an elongated suction opening 18 disposed below the frame and but slightly above the line of the bottom of wheels 12. Nozzle 16 is formed with an outlet opening 20 to which may be connected a hollow wand 22 constituting both a manipulating handle for the tool and a conduit for connecting nozzle 16 to a source of suction.

Frame 10 is formed with a cross member 24 adjacent to one end thereof and elongated beater members 26 and 28 are rotatably mounted in bearings supported by the cross member and the opposite end of the frame. The shafts of members 26 and 28 extend through the bearings in cross member 24 and carry a belt pulley 30 and a gear 32, respectively. An electric motor 34 is mounted on a somewhat elevated cross member 36 of the frame and has a shaft carrying axially spaced pulleys 38 and 40 of the same diameter. Pulley 38 is in line with pulley 30 of rotary member 26 and drives it by means of a belt 42 while pulley 40 is in line with pulley 44 mounted on an idler shaft 46 journeled in arms 48 and 50 extending upwardly from cross member 24 and the adjacent end of frame 10, respectively. Pulley 40 drives pulley 44 through a belt 52 and, as the pulleys 30 and 44 are of the same diameter, the member 26 and the idler shaft 46 are rotated at the same speed and in the same direction. The idler shaft also carries a gear

54 which meshes with gear 32, and as these gears are of the same diameter, the members 26 and 28 are rotated at the same speed, but in opposite directions. However, if desired, the respective diameters of gears 32 and 54 may be varied so that members 26 and 28 are rotated at different speeds. The direction of rotation of the motor shaft is selected so that the members 26 and 28 turn in the directions shown by the arrows in FIGS. 2 and 3, that is so that the lower portion of each member is turning away from the nozzle 16.

As shown in FIGS. 1, 2 and 3, beater members 26 and 28 are formed with a plurality of circumferentially spaced axially extending blades or vanes 56 which project radially from the hub portions 58 of the members, or, shown in FIG. 4, as radially projecting rows of bristles 57 may be employed.

In operation, when the tool is used on a deep pile rug, the rotation of beater members 26 and 28 in the opposite directions, as indicated by the arrows in FIGS. 2 and 3 as the nozzle is moved back and forth over the rug in the usual manner, causes the blades 56 or bristles 57 to part the pile, thus creating a sort of valley between the members into which the elongated nozzle 16 tends to sink and hence penetrates the pile to a greater depth than otherwise would occur. The rotation of the beaters 26 and 28 also disturbs and dislodges dirt embedded in and adhering to the fibers, which dirt is entrained by the air stream entering the nozzle opening 18 from whence it is conveyed through the hollow wand 22 and connected hose to the suction unit of the vacuum cleaner. In as much as back and forth movement of the tool over the rug causes the nozzles to pass over fibers of the pile while the latter are in inclined positions resulting from the action of the beater members, the single nozzle opening 18 moves in close proximity to both the upper and lower ends of the fibers and therefore is able to pick up both dirt near the surface and embedded dirt. The narrowness of the wheels 12 enables them to sink into the pile, while preventing the beater members and the nozzle 10 from contacting a hard surface covering, should the tool be placed thereon.

While I have shown more or less specific embodiments of my invention, it is to be understood that this has been done for purposes of illustration only and shall not be considered as limiting the scope of my invention, which is to be determined from the appended claims.

What is claimed is:

1. In a suction cleaning tool for cleaning high pile shag rugs, a base, means for movably supporting said base above the surface of a rug, an elongated suction nozzle depending from said base, a pair of pile contacting elongated members rotatably mounted on said base entirely outside said nozzle and closely adjacent either side of and parallel to said nozzle, and means for rotating said members in mutually opposite directions, the lower portion of each member turning away from said nozzle.

2. A suction tool as defined in claim 1 in which each of said pile contacting members includes a plurality of circumferentially spaced radially extending blades.

3. A suction tool as defined in claim 1 in which each of said pile contacting members includes a plurality of circumferentially spaced radially extending rows of bristles.

4. A suction tool as defined in claim 1 which said means for supporting said base comprises a pair of relatively narrow wheels rotatably mounted at opposite ends of the tool, the axis of said wheels being between the axis of said pile contacting members.

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