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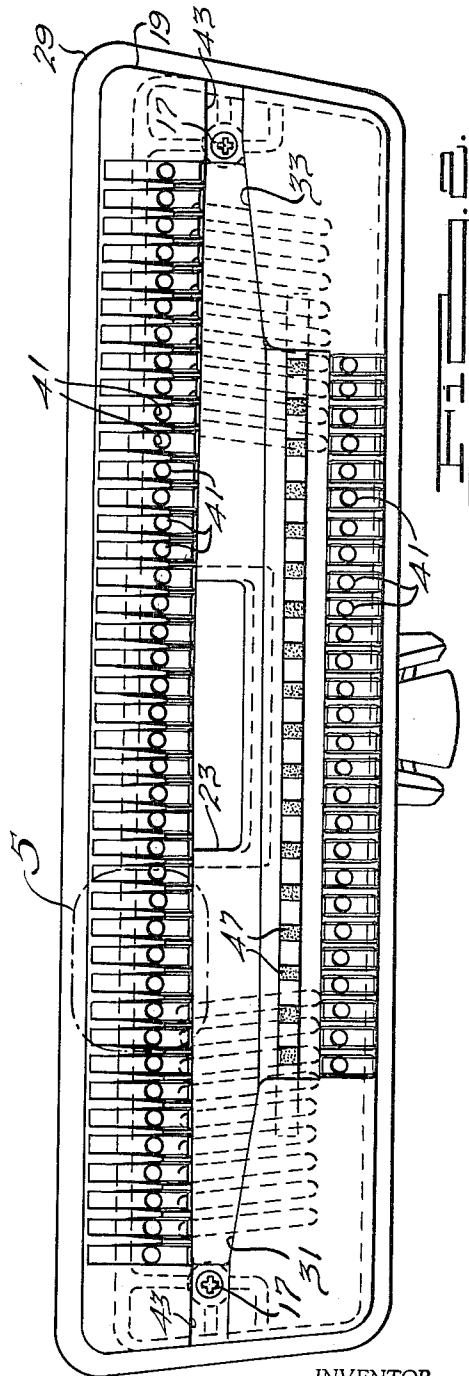
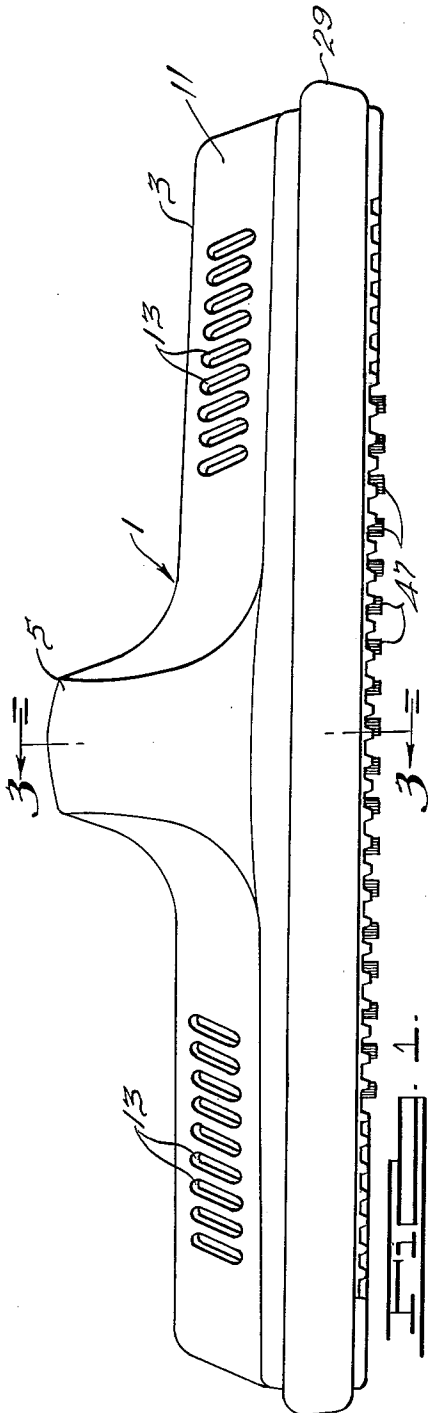
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3,225,379

RUG TOOL

Filed Jan. 22, 1964

2 Sheets-Sheet 1



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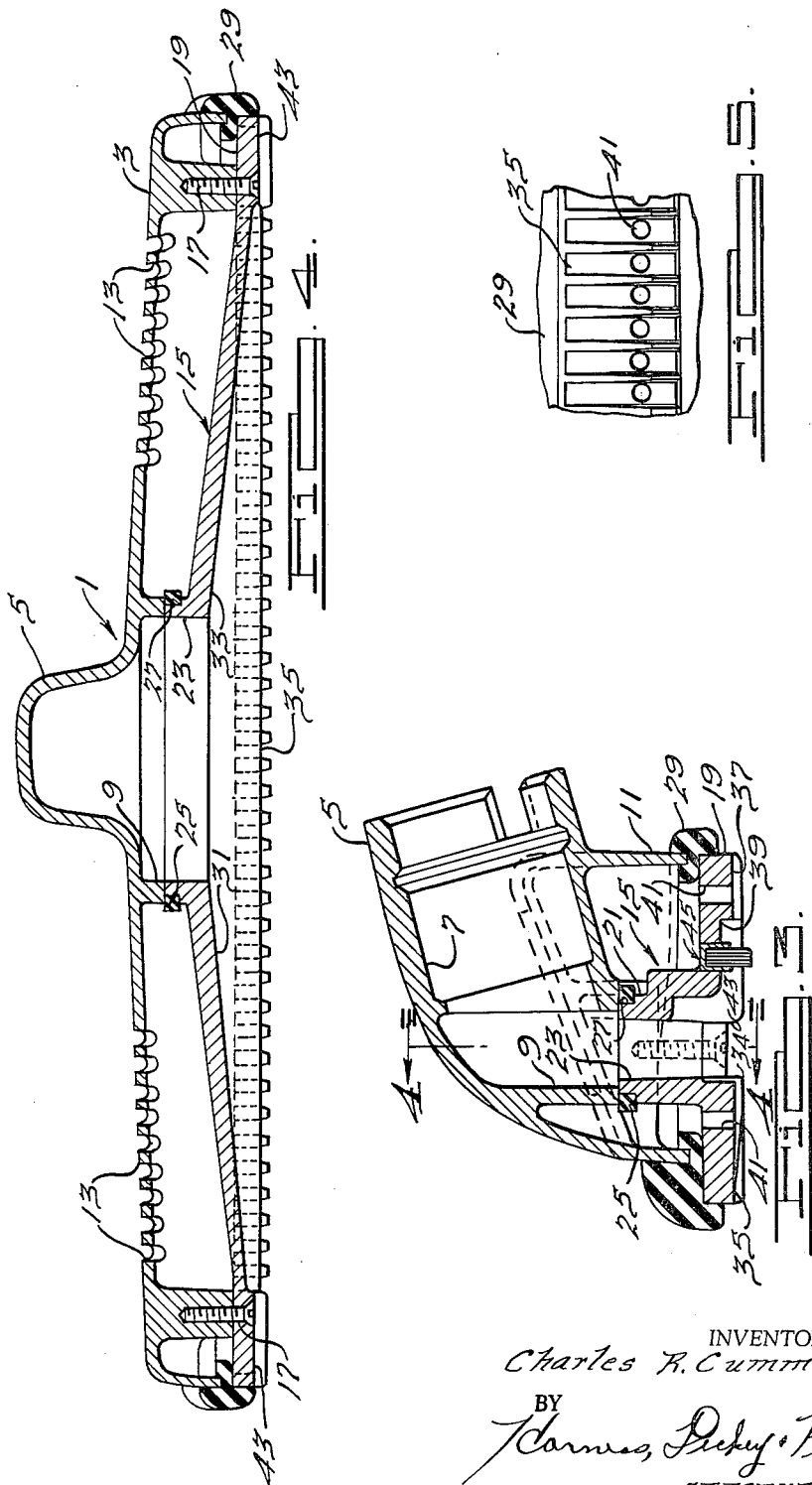
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2 Sheets-Sheet 2



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1

3,225,379 RUG TOOL

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4 Claims. (Cl. 15—367)

This invention relates generally to vacuum cleaners and, particularly, to an improved suction nozzle construction for a vacuum cleaner.

Various types of vacuum cleaner nozzles have, in the past, been used for removing lint, dirt, and any other foreign substances embedded in or on the surface of rugs. These nozzles included those which utilize a vacuum alone as well as those which use rollers, agitators, or brushes in conjunction with a vacuum to aid in removing the embedded substances. However, in many cases, these prior nozzles are not satisfactory because in the nozzles which use a vacuum alone, the cleaning power often is not adequate, and nozzles which utilize agitators or other moving parts, in addition to being relatively complex and thus expensive, often inflict severe wear on the carpet or rug.

The suction nozzle of the present invention is one of unique design which virtually eliminates the need for any moving parts and greatly increases the vacuum cleaning effect of the nozzle and therefore the nozzle efficiency without increasing the size or power of the vacuum creating fan to which it is connected. This is done by creating a plurality of paths of continuously flowing air into and through the rug pile which loosen and carry surface and embedded dirt and lint into a central vacuum opening.

It is a principal object, therefore, of the present invention to provide a suction nozzle for a vacuum cleaner having a greatly improved operating efficiency and cleaning characteristics.

It is a further object of the present invention to provide an efficient suction nozzle for a vacuum cleaner which utilizes no moving agitator parts.

It is a further object of the present invention to provide a suction nozzle for a vacuum cleaner which provides greatly increased vacuum cleaning effect and nozzle efficiency without increasing the size of the suction creating fan to which it is connected.

It is a further object of the present invention to provide a suction nozzle for a vacuum cleaner which provides greatly increased suction power without increasing the size, weight, or complexity of the nozzle.

It is still a further object of the present invention to provide a suction nozzle for a vacuum cleaner which is relatively simple and inexpensive to manufacture, reliable in operation and efficient in use.

Other objects and advantages of the present invention will become more apparent from the following detailed description taken in conjunction with the drawings, in which:

FIGURE 1 is a front elevational view of a rug suction nozzle constructed according to the present invention;

FIG. 2 is a bottom plan view of the structure of FIG. 1;

FIG. 3 is a sectional view of the structure of FIG. 1 taken along line 3—3 thereof;

FIG. 4 is a sectional view of the structure of FIG. 3 taken along line 4—4 thereof; and

FIG. 5 is an enlarged view of a portion of FIG. 2 encompassed by dashed line 5.

Referring now to the drawings, the illustrated rug tool assembly is seen to include a tool body 1 having an elongated portion 3 and a hollow integral extension 5 disposed centrally thereof. The extension 5 defines a cylindrical opening 7 adapted to be connected to a hose of a conventional vacuum cleaner (not shown), which opening

2

communicates with a downwardly facing rectangular opening 9. Elongated portion 3 terminates in a downwardly depending rectangular skirt portion 11 and has formed therein a plurality of louvered openings 13 to permit air flow therethrough in a manner to be described.

A tool shoe 15 is fixed to the underside of the tool body 1 by suitable means such as screws 17. Tool shoe 15 includes an elongated portion 19 generally coincident with elongated portion 3 of tool body 1 and an upwardly facing hollow rectangular portion 21 defining an upwardly and outwardly tapering opening 23 communicating with the opening 9. A suitable sealing gasket 25 may be disposed in a notch 27 formed in rectangular portion 21 adjacent the end thereof to prevent any vacuum leaks between openings 9 and 23, and a resilient bumper and seal 29 may be positioned in sealing relationship between skirt portion 11 and tool shoe 15, surrounding elongated portion 19.

Tool shoe 15 is formed at its underside with a pair of elongated channels 31 and 33 each of which extends from a point adjacent a respective end of elongated portion 19 and inclines upwardly to the opening 23. The bottom of the tool shoe 15 is downwardly and rearwardly tapered at the front portion thereof to facilitate easy movement over the rug and terminates in a sharp corner 34 adjacent channels 31 and 33. A plurality of relatively long parallel slots 35 are formed over nearly the entire length of the bottom of shoe 15 extending from a point adjacent the front of the tool shoe to the channels 31 and 33. Another set of parallel slots 37, fewer in number and shorter in length than slots 35, extends along the bottom of the tool shoe in the same plane as slots 35 from a point adjacent the rear edge thereof to a longitudinally extending recessed portion 39 adjacent the rear edge of channels 31 and 33. A plurality of identical generally vertical openings 41 are formed in elongated portion 19, one of each extending from the top thereof to each of slots 35 and 37. Thus, when a vacuum is applied to the opening 7 by the fan (not shown), air will be drawn downwardly in a plurality of paths through louvered openings 13, vertical openings 41, slots 35 and 37, channels 31 and 33, and finally, with the paths converging, through openings 23, 9 and 7. In so doing, the air as it passes downwardly through openings 41 and along slots 35 and 37 will penetrate deep into the rug fibers, thereby loosening dirt, lint, or other foreign material imbedded therein and carrying it to the vacuum cleaner tank (not shown). As the rug tool moves forwardly over the rug, the rug pile positioned within slots 35 will be subjected to the flow of air directed through openings 41 and slots 35 as it carries the lint and imbedded dirt to the vacuum cleaner tank. The relatively small portion of rug pile fibers positioned between the slots 35 will not be subjected to this deep penetrating flow of air at this time; however, as the rug tool continues its forward movement, these last mentioned fibers will reach channels 31 and 33 and will be subjected to the cleaning effect of the air passing along these channels. Also, those fibers positioned between slots 35 during forward movement of the rug tool will "spring up" upon reaching channels 31 and 33. This same condition will exist for the rug pile fibers in and between slots 37 during rearward movement of the rug tool.

In addition to the slots 35 and 37, a slot 43 is formed in each end of the tool shoe adjacent the bottom thereof creating additional air flow along channels 31 and 33 when a vacuum is applied to opening 7. To aid in loosening deeply imbedded dirt, lint, and other foreign material, a brush 45 having its lower edge positioned below the lower surface of the tool shoe may be carried by tool shoe 15 within the recessed portion 39. As shown, brush 45 is formed with spaced bristle groups 47 to permit the

3

free passage of air from slots 37 to channels 31 and 33.

It has been discovered that by providing rows of slots along both the front and rear of the tool shoe through each of which a flow of air is directed, an unexpectedly improved rug cleaning effect is achieved. Also, by directing the flow of air vertically downwardly through openings 41 in the tool shoe, dirt which has become deeply imbedded in the rug will be reached and carried away in the continuing flow of air to the nozzle and vacuum cleaner tank. Thus, by the present invention a highly efficient and effective vacuum cleaning rug tool will have been provided, without the use of damaging agitators.

While a preferred embodiment of the present invention has been illustrated and described herein, various addition, modifications, substitutions and omissions may be made thereto without departing from the spirit of the invention as encompassed by the appended claims.

What is claimed is:

1. A rug cleaning nozzle comprising an elongated shoe having a top surface and a bottom surface adapted for movement over a rug to be cleaned, a vacuum opening in said shoe adapted to have a vacuum applied thereto, an elongated groove extending longitudinally along the bottom surface of said shoe, means defining a plurality of first substantially parallel transverse grooves in said shoe bottom surface extending from one side edge thereof and communicating with said longitudinal groove, said means presenting sharp edges along one side of said groove, a longitudinal recess in said body bottom surface adjacent the other side edge of said longitudinal groove, means defining a plurality of second substantially parallel transverse grooves in said shoe bottom surface extending from

4

the other side edge thereof and communicating with said longitudinal groove through said recess, a plurality of openings in said shoe extending therethrough from the top surface thereof, one each communicating with a respective one of said transverse grooves, a brush carried by said shoe within said recess and having a plurality of spaced bristle groups to permit the free passage of air from said second transverse grooves to said longitudinal opening.

2. A rug cleaning nozzle as defined in claim 1 wherein said elongated groove extends from end to end of said shoe.

3. A rug cleaning nozzle as defined in claim 1 wherein said shoe bottom surface tapers downwardly from said one side edge to said elongated groove.

4. A rug cleaning nozzle as defined in claim 1 and further including a tool body overlaying and secured to said shoe, said body defining with said shoe a cavity adjacent said openings, and a plurality of louvered openings in said body communicating with said cavity.

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