UNITED STATES PATENT OFFICE

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BEATER FOR VACUUM CLEANERS


The present invention relates to beaters which are located in the nozzles of vacuum cleaners and are rotated at relatively high speed to exert a beating effect upon a floor covering or other article to dislodge dirt therefrom when said covering or article is by the suction of the cleaner fan drawn into contact with the lips of the nozzle.

Our invention has for its object the provision of a beater of improved construction whereby the effective beating action on a floor covering or other article is increased, and this with a simple construction.

In the accompanying drawing which is illustrative of our invention, Fig. 1 is a view partly in elevation and partly in section of the front end of a vacuum cleaner; Fig. 2 is a perspective view of our improved beater; Fig. 3 is a perspective view of the tubular supporting member of the beater; Fig. 4 is a perspective view of one of the beater members; Fig. 5 is a sectional view showing how the spline or key is fastened to the supporting tube, and Fig. 6 is a view partly in section showing means for supporting the beater.

7 indicates the nozzle of the vacuum cleaner of any suitable construction and 8 the floor wheels for supporting the lips 9 of the nozzle a small distance above the surface covering to be cleaned. 10 indicates the casing of the suction fan, the latter being mounted on the shaft 11. The fan is driven as usual by an electric motor and when the fan is rotated at the proper speed draws said surface covering into engagement with the lips of the nozzle. 12 indicates the discharge conduit of the fan chamber through which dust laden air passes into the bag 13 which separates the dust from the air. The cleaner is moved about by a handle 14. 15 indicates a device whereby the nozzle may be raised and lowered with respect to the floor covering.

Located within the nozzle is a beater 16 having end bearings 17, the latter being carried in supporting means 18 secured to the end of the nozzle. The supports for the bearings may be of any suitable construction.

The beater comprises a shaft or rotor made of a thin walled metal tube 20 of uniform section and of small diameter so as to reduce the weight. In the center is a band 21 which acts as a pulley to receive the driving belt 22 and also as an abutment for the beater members. For simplicity of construction it is made separate from the tube. On the peripheral surface of the tube is a key or spline 23 arranged in the form of a long pitch helix or spiral, said key being of thin metal, half round in cross section with the ends engaging the cylindrical wall of the tube. In order to fasten the key in place, the tube is drilled at a suitable number of places to receive rivets 24, the heads of which are electrically welded or otherwise secured to the key. The rivets are of the split type and after extending through holes in the tube are bent over as indicated at 25 in Fig. 5.

The tube is covered with a plurality of beater elements 26 made of leather or equivalent slightly elastic or yielding material. Each member is of elliptical shape and has a central bore 27 of the same diameter as the tube and also a slot 28 of the same general shape as key 23. The members are threaded or stacked on the tube and are divided into two sets or portions with the band or pulley 21 located between the sets, the pulley 21 acting as an abutment or stop for both sets of members. The members are held in place at their outer ends by bearing elements 29, Fig. 6, each of said elements having a portion that fits the interior of the tube and an external shoulder, said shoulder engaging the outermost beater member. The beater elements may be readily cut from sheet stock by suitable dies, and because the cut surfaces are presented to the surface covering they serve to dislodge threads, hair, etc. along with the imbedded dirt and the suction fan discharges the material into the dust bag.

Inside of the tube 20 is a smaller or inner tube 30 also made of thin metal which extends into the bearing elements and is held by nuts 31 at each end. When the nuts 31 are screwed on the tube 30 to their seats they serve to hold the shoulders of the bearing elements in engagement with the ends of the tube 20 and with the members 29. Inside of the tube is a shaft 32 which is supported in suitable ball or other bearings 33.
The end of each bearing is enclosed by a cup shaped element 34.

Our experience with the type of beater herein disclosed demonstrates that because of the yielding or elastic nature of the leather it is less destructive of the pile of carpets and rugs than beaters of the rigid type, and furthermore our improved beater does not require a brush in addition to the beater elements to remove clinging litter such as cotton, hair, etc. because the leather serves the dual purpose of a beater and a brush. Due to the nature of the beater elements they do not become clogged as do tufted brushes and hence the disagreeable task of removing and cleaning them is avoided. Also by a suitable selection of parts, the beater as a whole may be made lighter than those composed wholly or chiefly of metal.

What we claim as new and desire to secure by Letters Patent of the United States, is,—

1. A beater for use in a vacuum cleaner nozzle comprising a means extending longitudinally of the nozzle, a series of disk-like counterpart non-metallic members arranged side by side and rigidly fitted over the means, each having a projecting part for engagement with the surface covering as it is rotated, means for preventing relative rotation of the members and means, and a means for rotating the members.

2. A beater for use in a vacuum cleaner nozzle comprising a thin walled metal tube extending longitudinally of the nozzle, a series of counterpart non-metallic members snugly fitted over the tube, each of said members being elliptically shaped, a spirally ar-

3. A beater for use in a vacuum cleaner nozzle comprising a thin walled metal tube extending longitudinally of the nozzle, a series of counterpart leather members of elliptical shape in cross section, each having a central bore, through which the tube extends and a small slot opening into the bore, a spirally arranged key secured to the peripheral surface of the tube and projecting into the slots, and a means for rotating the tube.

4. A beater for use in a vacuum cleaner nozzle comprising a metal tube extending longitudinally of the nozzle, a non-metallic covering of elliptical cross section for the tube, said covering being divided into two parts to afford a space for driving means, a means on the tube between said parts and acting as a abutment for adjacent ends of the covering and as a part of the driving means, an inner tube, and heads secured to the inner tube and cooperating with the means to clamp the members against movement on their supporting tube.

5. A beater for use in a vacuum cleaner nozzle comprising a rotor located within the nozzle and extending longitudinally thereof, a leather covering for the rotor rigidly mounted thereon and comprising disk-like members arranged side by side having alternate projections and depressions, said projections forming a spirally extending rib, and means for rotating the rotor.

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