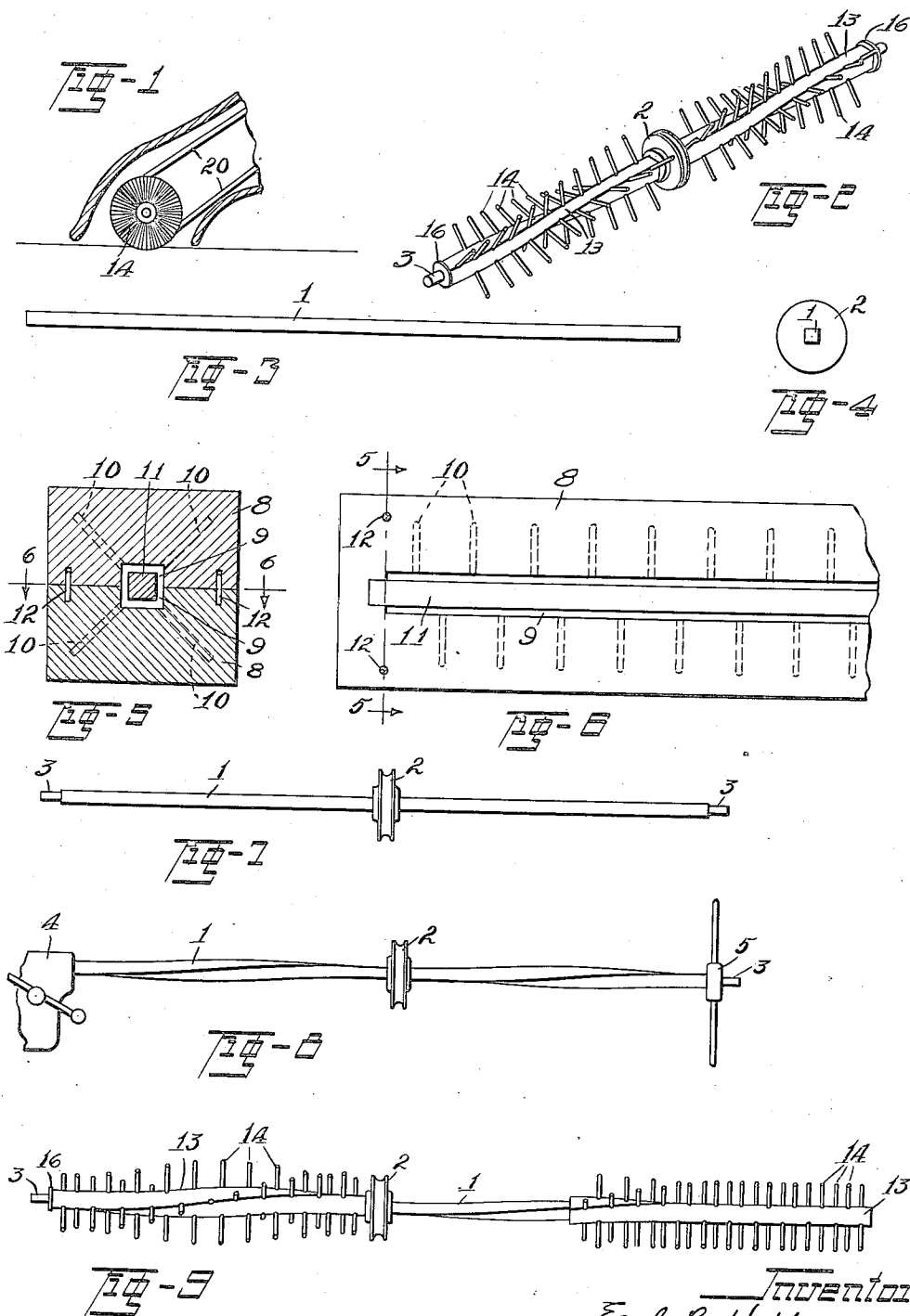


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 BEATER FOR SUCTION CLEANERS.
 APPLICATION FILED MAR. 5, 1919.

1,422,100.

Patented July 11, 1922.



Inventor
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UNITED STATES PATENT OFFICE.

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ELECTRIC VACUUM CLEANER COMPANY, INC., OF EAST CLEVELAND, OHIO, A COR-
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BEATER FOR SUCTION CLEANERS.

1,422,100.

Specification of Letters Patent.

Patented July 11, 1922.

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To all whom it may concern:

Be it known that I, EARL B. HOFF, a citizen of the United States, residing at East Cleveland, Ohio, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Beaters for Suction Cleaners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to suction cleaners or vacuum cleaners such as are widely used for the purpose of removing dust, lint, and other light and dry refuse from rugs, carpets, and other floor coverings by means of an inrush of air into a suitably shaped nozzle applied thereto and moved about and over the surface thereof. Experience indicates that the effectiveness of the cleaner is much increased in case the fabric can be whipped, beaten, or otherwise agitated during the time that the suction nozzle is applied thereto; and experience has further proven that the use of a stiff or bristle brush for this purpose is often disadvantageous, particularly in case that brush be positively driven; for the abrading action of such bristles upon the carpet is sufficient to do serious injury thereto in case the tool be stopped and held momentarily in a single place as is frequently done thoughtlessly or as incident to the moving of furniture. Also bristle brushes because of their stiffness are subject to rapid wear which necessitates replacement or else results in an inefficient cleaning; and bristles are peculiarly liable to become entangled with lint, hairs, and carpet nap.

The objects of the present invention are the provision of a beating or agitating device which shall not injure or wear the floor fabrics or mar or abrade bare floors or become entangled with refuse or itself be subject to destructive wear; the provision of a device which shall be highly efficient for the purpose in view, easy to make, and install; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have shown one embodiment of my said invention although it will be understood that those drawings are illustrative merely and do not limit me to the particular features and constructions therein set forth.

In these drawings Fig. 1 is a sectional

view of a suction cleaner nozzle showing the same equipped with a beater of my improved type; Fig. 2 is a perspective view of the beater itself; Fig. 3 illustrates the bar from which the beater-shaft is made; Fig. 4 is the beater pulley; Fig. 5 is a sectional view of the mould in which the rubber parts of the beater are formed, the same corresponding to the line 5-5 of Fig. 6; Fig. 6 is a plan view of a part of said mould corresponding to the line 6-6 of Fig. 5; and Figs. 7, 8, and 9 are diagrammatic representations of successive steps performed in the completion of the said beater.

Essentially my improved beater consists of a shaft having bearing means and driving means and encircled by a rubber sleeve having radiating flexible lashes adapted as the shaft is revolved to beat and whip the floor covering; in order to prevent slippage between the shaft and sleeve the two are preferably non-cylindrical, and in order to secure uniformity of effort one or both of the same are preferably twisted. The shaft is preferably a square rod of soft steel as shown at 1 in Figs. 3 and 7, and the driving device is a grooved belt pulley 2, having a square hole adapted to slip over the shaft. The ends of the shaft are turned down as shown at 3, 3 to form bearings and the pulley slipped in place, preferably but not necessarily at the middle of the shaft. One end of the shaft is then clamped in an immovable manner as by a vice (shown conventionally in Fig. 8 at 4) and the other end is provided with a movable handle as shown conventionally at 5 in Fig. 8, and the shaft given a twist around its longitudinal axis. I have shown this twist as subtending an angle of 180° which I find very satisfactory, but it could be more or less as desired. One of its effects is to lock the pulley rigid in place while a further beneficial result will appear later.

Upon this shaft I locate a hollow rubber sleeve 13 carrying lashes 14 which may be made either integral therewith or independent thereof. One mode of forming these rubber parts I have illustrated in Figs. 5 and 6, in which 8, 8 represent the halves of an elongated split mould made of similar metal blocks formed with registering rectangular grooves 9, 9 which cooperate to form a square recess of the external size of the desired sleeve. From the corners of these grooves there extend the diverging narrow

holes 10, 10 which lead toward the corners of the block; and supported in the axis of the recess is a square core-bar 11 which is spaced from all the walls thereof. I have shown
 5 dowel pins 12, 12 for keeping the halves of the mould in line; and by injecting the cavity full of suitable rubber composition under pressure the same can be caused to assume the form of a square tube 13 having integral
 10 flexible lashes 14 defined by the radiating holes. This tube is cured or vulcanized in the usual way as customary with other rubber articles designed to yield a flexible product.

15 These tubes are then cut to the proper length or lengths and applied to the shaft 1 as illustrated in Fig. 9 whereupon the rubber being soft will acquire the twist of the shaft and the lashes which formerly projected in
 20 a straight row will assume a spiral arrangement and thus in action will strike and beat the operating surface successively instead of all at once. As soon as the sleeves have been seated in place steel washers 16 may be
 25 pressed upon the bearing portions 3, 3. The device is driven in any suitable manner as by the belt 20.

I do not restrict myself to the moulds or methods herein set forth for making the rubber parts since any known or desired mode of
 30 making the tubes may be employed; and I do not restrict myself to the making of the lashes integral with the tube or by extrusion from the tube since it is equally feasible to
 35 insert strips of flexible material into the holes 10, 10 prior to the injection of the rubber composition, or otherwise to apply those lashes to the tube in case some other mode be adopted for its production. Neither
 40 do I restrict myself to a square shaft or a square tube, or even to a tube of the same shape as the shaft, since the flexibility of the former will enable it to conform to the shape of the latter; and I do not restrict myself to

a construction in which the lashes are all 45 originally arranged in a straight row, although this is desirable for manufacturing reasons. It will be understood that many changes in detail can be made within the scope of my inventive idea. 50

Having thus described my invention, what I claim is:—

1. A rug beater for suction cleaners comprising, in combination, an elongated shaft having bearing means and driving means, 55 said shaft being non-cylindrical and being twisted from end to end, a flexible rubber sleeve closely embracing said shaft, and flexible radiating lashes carried by said sleeve and projecting therefrom in directions 60 which vary with the twist of the said shaft.

2. A rug beater for suction cleaners consisting of a non-cylindrical metal bar having a driving pulley fitting snugly thereon, between its ends said bar being twisted from 65 end to end, in combination with a flexible rubber sleeve embracing said bar and formed with radiating lashes.

3. As an article of manufacture a hollow prismatic rubber sleeve having flexible lashes 70 projecting outwardly from its edges, the ends of said sleeve being open.

4. As an article of manufacture a square rubber sleeve having a row of integral flexible lashes projecting from each of its corners, 75 the ends of said sleeve being open.

5. In a device of the character described, in combination, a prismatic rubber sleeve having a row of integral flexible lashes projecting from each of its corners, and a 80 twisted prismatic rod inserted into said sleeve with its corners coinciding with the corners of said sleeve, whereby said lashes are given a helical arrangement, and bearing and driving means for said rod. 85

In testimony whereof, I hereunto affix my signature.

EARL B. HOFF.