Nov. 19, 1946. H. B. WHITE 2,411,488

SUCTION CLEANER

Filed April 19, 1943

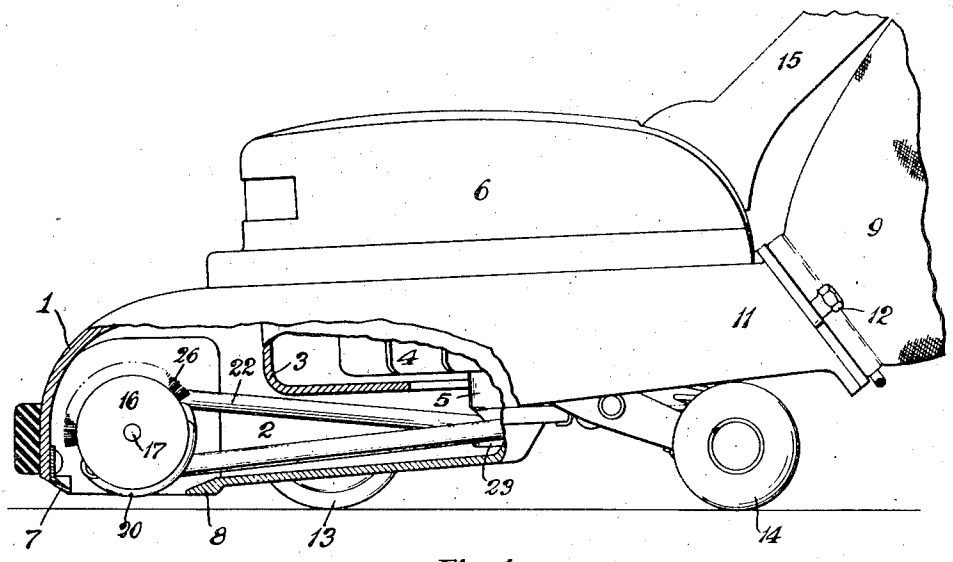


Fig. 1

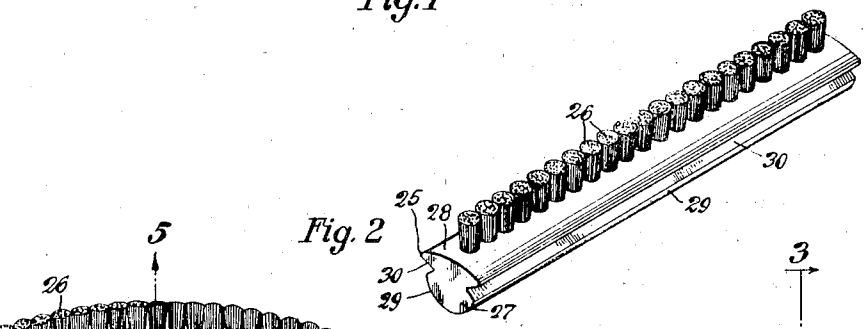
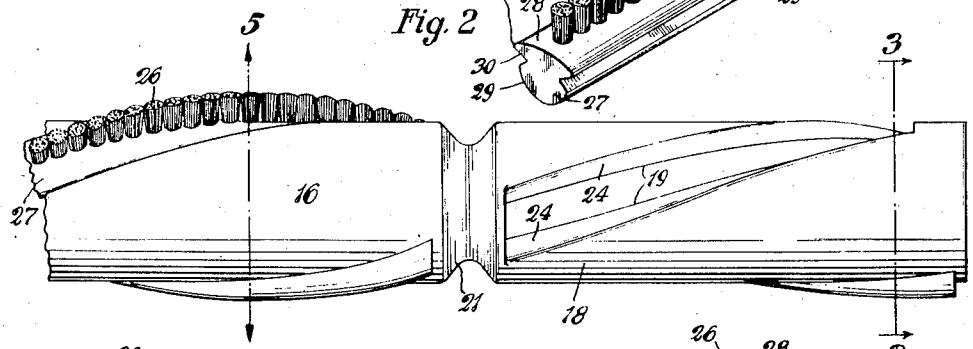


Fig. 2



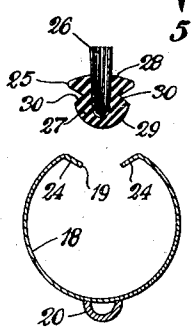


Fig. 3

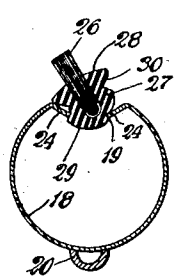


Fig. 4

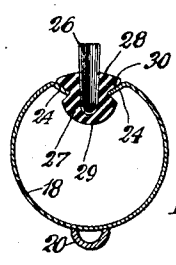


Fig. 5

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Patented Nov. 19, 1946

2,411,488

UNITED STATES PATENT OFFICE

2,411,488

SUCTION CLEANER

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Application April 19, 1943, Serial No. 483,548

1 Claim. (Cl. 15—182)

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The present invention relates to suction cleaners in general and more particularly to a new and novel suction cleaner brush or agitator. More particularly, the invention comprises improvements in the means of mounting a removable brush element in a rotatable brush or agitator body.

It is an object of the present invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved rotary brush or agitator for a suction cleaner. A further object of the invention is to provide improved means of removably mounting a brush element in a rotatable agitator or brush body. A still further object of the invention is to provide a removable brush element including flexible brush bristles and a resilient back which is removably positioned within a seat in a rotatable brush body. These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which the same reference character refers to the same part in the various views:

Figure 1 is a side elevation of a suction cleaner incorporating a rotary brush constructed in accordance with the present invention, certain parts being broken away and shown in section;

Figure 2 is a partial side elevation of a rotary brush with one brush element removed and ready for insertion into its seat in the agitator or brush body;

Figure 3 is a section through the agitator body upon the line 3—3 and shows the brush seat adapted to receive the brush element which is spaced therefrom;

Figure 4 is a view similar to Figure 3 but shows the first step in the insertion of the brush element in its seat in the body; and

Figure 5 is a section upon the line 5—5 of Figure 2 and shows the brush element seated within the brush body.

The modern suction cleaner relies upon agitation and air flow to remove foreign material from a surface covering undergoing cleaning. Agitating means dislodge the foreign material and the air flow carries that material from the surface to a suitable receptacle which filters it from the air, permitting the latter to escape into the atmosphere. The usual agitating means of the modern suction cleaner comprises a rotatable agitator or brush. If the agitator or brush includes flexible brush elements, which preferably

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it does for most efficient cleaning, these elements must from time to time be adjusted or replaced for they become worn after extended use. The present invention is directed to the provision of a brush element and a rotatable agitator body which are adapted to make the task of replacing the worn brush element relatively simple. A brush element is provided which includes flexible brush bristles and a deformable back of material such as rubber or its equivalent. The brush seat in the body is so contoured as to permit the back to be inserted radially and to retain it in place after insertion.

Referring again to the drawing, a suction cleaner is illustrated and is seen to comprise a nozzle 1 which is interiorly connected by an air passageway 2 to a fan chamber 3 which houses a suction-creating fan 4 carried by the extended lower end of a motor shaft 5, the motor being unshown but positioned within a motor casing 6 immediately above the fan chamber. Nozzle 1 is formed with front and rear surface-contacting lips 7 and 8 through which the cleaning air enters to be drawn by the rotating fan 4 through the air passageway 2 and discharged through an exhaust outlet 11 of the fan chamber into a removably connected dust bag 9 which is secured by suitable manually operable nuts 12. The machine is movably supported upon front wheels 13 and rear wheels 14 and, as in the usual machine, a pivoted handle 15 is provided by which the operator may exert a propelling force.

Within the nozzle 1 is positioned a rotatable agitator 16 which is rotatably mounted upon a shaft 17 and includes a cylindrical body 18 formed with a helically extending brush seat 19 and with helically extending rigid beater elements 20 upon its surface. Body 18 of agitator 16 is centrally grooved, as at 21, to form a pulley surface which seats a power-transmitting belt 22 connected to the pulley 23 at the extreme lower end of the motor shaft 5.

The brush seat 19 extends helically and its sides are formed by inwardly extending side edges or walls 24 which, in any given transverse plane, extend as illustrated in Figures 3, 4, and 5. Brush element 25 comprises flexible bristles 26 which are firmly imbedded in a back 27 which is transversely curved to conform to the curvature of the cylindrical body 18, as indicated at 28, and is formed with a rounded projecting lower bulbous portion 29 which is separated from the top surface 28 by a pair of parallel longitudinally extending V-sectioned slots 30.

The back 27 is formed as an elongated straight

body, as illustrated in Figure 2, of a material which is resilient and deformable and therefore adapted to be deformed into the curvature of the helical brush seat 19.

The seating of the brush element 25 in its seat 19 is in the manner illustrated in Figures 3, 4, and 5. One end of the brush at 27 is first forced downwardly through the conical opening formed by the side walls 24 of the seat 19 which, because of their inward extension, act as a funnel. The brush back 27 being soft and deformable can be wedged through the brush seat in the manner illustrated in Figure 4 one side slot or groove 30 enabling the adjacent face of the rounded portion 29 to be forced through the opening, whereupon a downward force upon the opposite side of the back results in the entire bulbous portion 29 being projected through the seat or slot 19 into the relationship illustrated in Figure 5, after which the entire length of the back is advanced into its seat. Once positioned therein the natural resilience and flexibility of the bulbous portion 29 causes it to fill completely the seat 19, as illustrated in Figure 5, and it is impossible for the element to be displaced from its seat under the action of centrifugal force in the high speed rotation of the agitator. The sides of the grooves 30 lie flush with the seat side walls 24 and a tight fit is present which prevents foreign material from entering the agitator body.

Displacement of the brush from the seat requires the use of a tool such as a screw driver and the insertion of one edge thereof under and into the V-shaped slot 19 adjacent one edge of the

brush and a wedging action will result in the sliding of one corner of the bulbous portion 29 from its seat to the position illustrated in Figure 4, after which the entire brush element can be displaced by suitable withdrawing force applied and effective on the dislodged end.

I claim:

In a rotary agitator for a suction cleaner, a cylindrical body, a helically extending brush seat having closed ends, formed by apposed inwardly sloping side walls, positioned permanently in said body and which intersects at an angle a transverse plane through said body perpendicular to the major axis thereof, and a normally straight brush including flexible non-compressible bristles seated in a back of deformable material such as resilient rubber, said back being divided by longitudinally extending V-shaped grooves into a top portion and a backing portion, said back being sufficiently flexible to enable said brush to curve helically, and said backing portion being sufficiently compressible to enable it to be deformed and inserted radially between said side walls of said brush seat, said grooves being shaped as to lie flat upon the surface of said inwardly sloping side walls and being sufficiently spaced as to provide a back thickness which fits between said walls with a clamping and sealing action, said backing portion also being sufficiently resilient and of such size as to expand and underlie said side walls.

HARRY B. WHITE.