

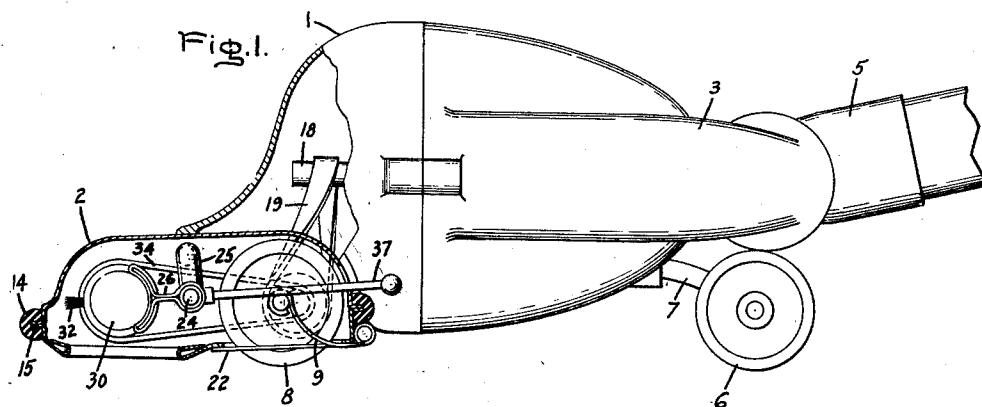
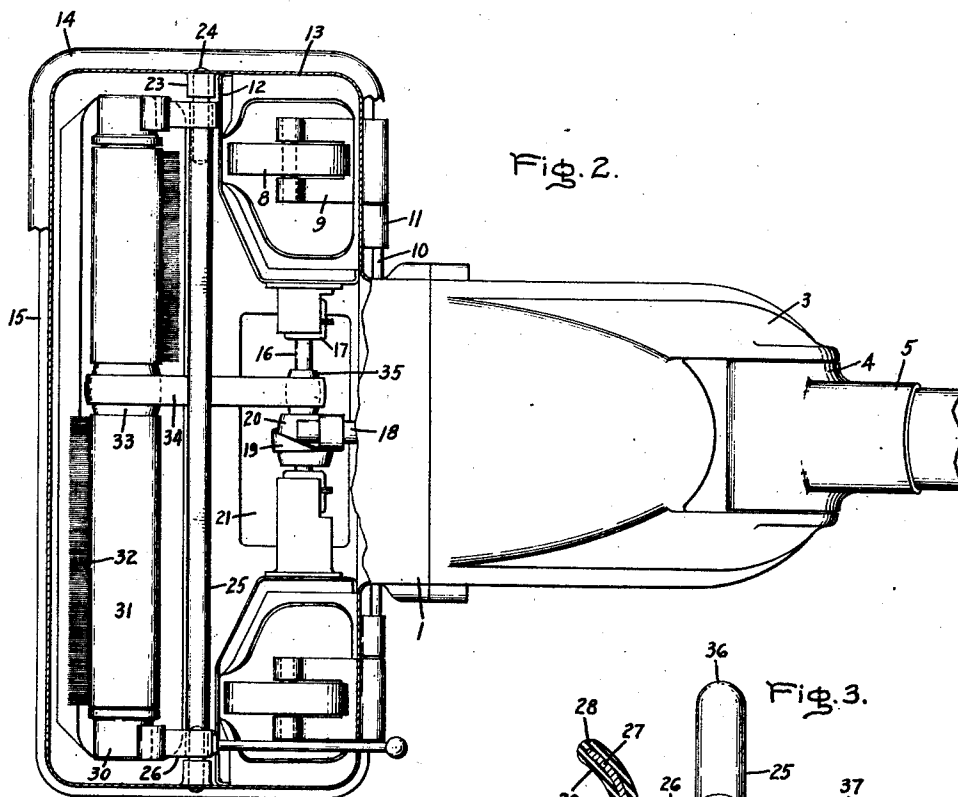
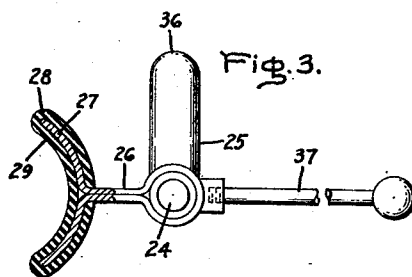
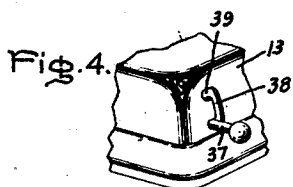
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2,197,641

VACUUM CLEANER

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UNITED STATES PATENT OFFICE

2,197,641

VACUUM CLEANER

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1 Claim. (Cl. 15-8)

The present invention relates to vacuum cleaners of the type having an agitating element in the suction nozzle for agitating the floor covering or other surface being cleaned.

5 The object of my invention is to provide an improved construction and arrangement for supporting the agitating element in the suction nozzle of a vacuum cleaner, and for a consideration of what I believe to be novel and my invention, attention is directed to the following description and the claim appended thereto.

10 In the accompanying drawing, Fig. 1 is a side elevation, partly broken away, of a vacuum cleaner embodying my invention; Fig. 2 is a top plan view of the vacuum cleaner broken away to show the construction for driving and supporting the agitating element; Fig. 3 is a detail view of the rock shaft and one of the seats for resiliently supporting the agitating element; and Fig. 4 is a fragmentary view showing the construction for holding the agitating element in a plurality of positions.

Referring to the drawing, I have shown my invention in connection with a vacuum cleaner 25 having an outer casing 1 having walls providing a suction nozzle 2 at the front and forked discharge outlets 3 at the rear between which is pivoted the forked end 4 of a discharge conduit 5. Within the casing is mounted an electric motor driven fan which draws the dust-laden air through the suction nozzle and discharges it through the discharge outlets 3 to the conduit 5. The air discharged through the conduit 5 is passed through a suitable separator (not shown), such as a filter, which removes the dust from the air. The casing is supported at the rear by wheels 6 rotatably carried on an arm 7 fixed to the casing 1 and is supported at the front by wheels 8 rotatably carried in arms 9 fixed to a rock shaft 10. The rock shaft is journaled in bearings 11 fixed to the casing. By rotating the rock shaft 10 the position of the wheels 8 with respect to the casing can be varied, thereby changing the height of the suction nozzle above the surface being cleaned. Arrangements for rotating the rock shaft 10 and holding it in this adjusted position are well known in the art and illustration thereof is not required for the purposes of the present invention. The nozzle is provided with walls 12 and 13 which enclose the wheels 8. A rubber bumper 14 fits over an outwardly extending flange 15 on the outside of the suction nozzle.

55 At the rear of the suction nozzle, and extend-

ing lengthwise thereof, is a countershaft 16 journaled in bearing housings 17 fixed to the vacuum cleaner casing. The countershaft 16 is in substantially the same horizontal plane as the suction nozzle and is directly below the outer end of the motor shaft 18. The countershaft 16 is rotated by a belt 19 extending over the motor shaft 18 and a pulley 20 fixed to the countershaft. The belt is accessible through an opening 21 in the bottom of the cleaner casing. The opening 10 is closed by a cover plate 22.

On the inner side of the end walls of the suction nozzle are bosses 23 having pins 24 fixed therein on which a rock shaft 25 is pivotally supported. At each end of the rock shaft are fixed arms 26 15 having forked or semi-cylindrical seats 27 offset from the pivotal axis of the rock shaft. The seats are covered by a coating 28 of rubber or other resilient material which provides a yielding support for the agitating element. The yielding support of the agitating element, permits it to yield upwardly after striking the floor covering, reducing the pressure on the floor covering and the resultant wear. The yielding support also reduces noise due to vibration of the agitating element. The seats 27 have open ends 29 presented toward the front of the suction nozzle which are adapted to receive the bearing housings 30 of an agitating element. Bearing housings of the agitating element are insertable in the seats by movement transverse to the axis of the agitating element. The agitating element comprises a body 31 journaled in the bearing housings 30 and having agitating members, such as brushes 32, projecting therefrom. At the center of the agitating element is a pulley 33. The agitating element is rotated by a belt 34 running over the pulley 33 and over a pulley 35 fixed to the countershaft 16. In addition to driving the agitating element the belt 34 also holds the bearing housings 30 of the agitating element in the seats 27. There is a double speed reduction between the motor shaft and the agitating element which permits a desirable reduction in the speed of rotation of the agitating element. The belt 34 is in substantially the horizontal plane of the suction nozzle. This permits the suction nozzle to be relatively low and to extend forward from the main portion of the vacuum cleaner casing. This is advantageous in cleaning under furniture. The rock shaft 25 has an offset portion 36 extending upward over the top of the belt 34. This permits 50 55

the belt to be removed without disassembling the rock shaft.

Under some circumstances, it is desirable to lower the agitating element with respect to the nozzle lips, for example, in cleaning floors. When the agitating element is lowered the brushes contact the floor and sweep the surface of the floor. The adjustment of the agitating element is accomplished by rotating the rock shaft 25 by means of the crank 37 fixed to the rock shaft and projecting through a slot 38 in the walls 13 of the vacuum cleaner casing. The slot 38 is provided with notches 39 which engage the crank 37 and retain the rock shaft in a plurality of positions.

When the crank is in the position shown in Fig. 4 the rock shaft is in its normal position for cleaning floor coverings. In this position the agitating element is supported above the nozzle lips and the floor covering drawn against the nozzle lips will be subject to a beating and sweeping action. When the crank 37 is moved upward to the other notch 39, the rock shaft 25 is rotated in a counter-clockwise direction, as viewed in Fig. 3, lowering the agitating element with respect to the nozzle lips. In this latter

position the brushes 32 of the agitating element may directly contact the floor.

What I claim as new and desire to secure by Letters Patent of the United States is:

In a vacuum cleaner, an elongated suction nozzle, an agitator in the suction nozzle rotatable on an axis parallel to the length of the suction nozzle, a rock shaft within the suction nozzle at the rear of and extending substantially parallel to the agitator, said rock shaft being journaled in the nozzle for rotation on an axis parallel to the axis of the agitator, arms at the ends of the rock shaft and projecting forward therefrom, forked seats at the front ends of said arms presented to the agitator into which the agitator is insertable by movement transverse to its axis, a suction chamber connected to the rear of the suction nozzle, a power shaft therein, a horizontally extending belt operatively connecting said power shaft to the agitator intermediate said arms for rotating the agitator and for holding the agitator element in said seats, a portion of said rock shaft intermediate said arms extending over the belt, and means for rotating the rock shaft whereby the position of the agitator in the nozzle is adjusted.

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