

Aug. 10, 1965

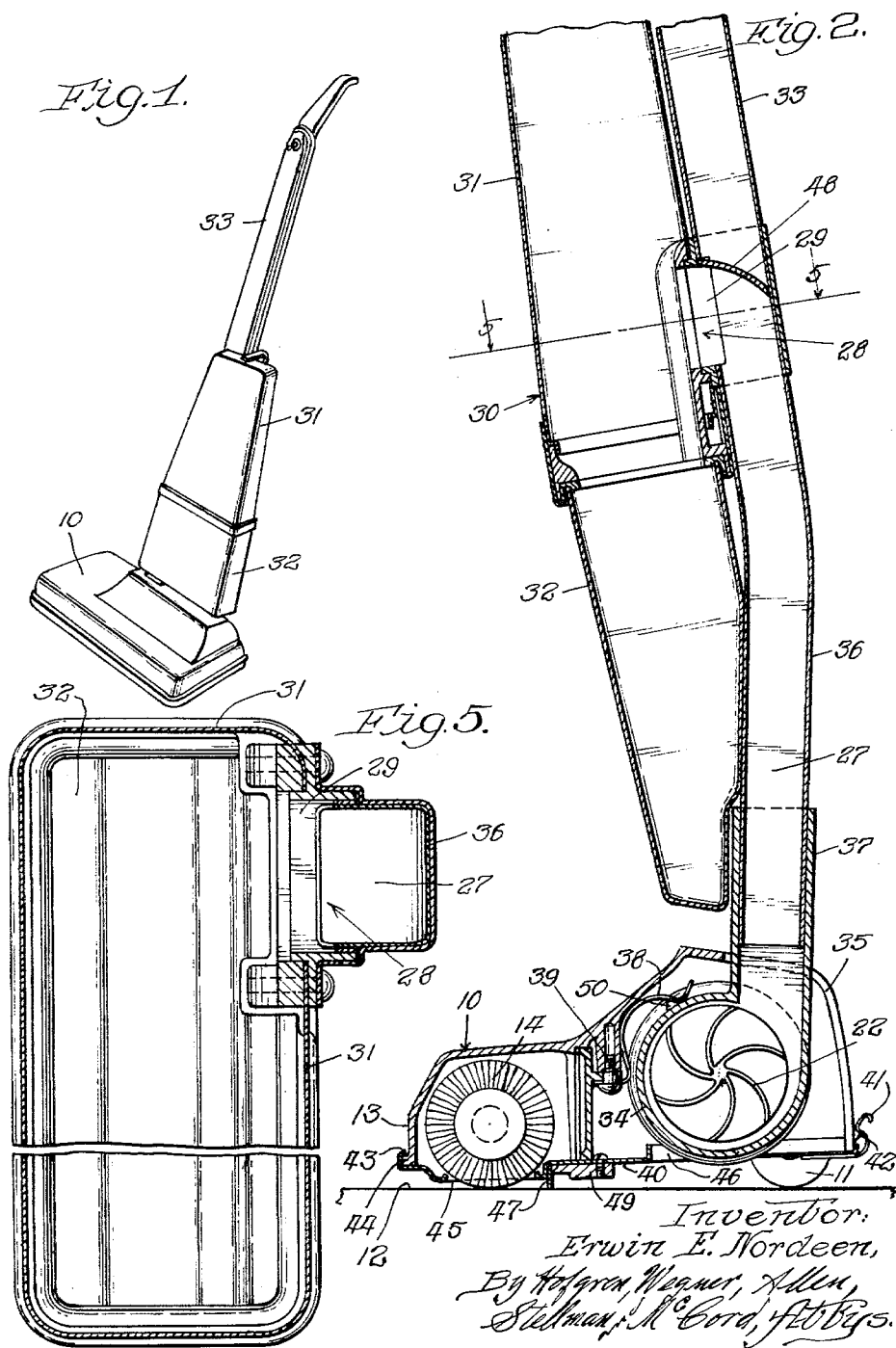
E. E. NORDEEN

3,199,138

CLEANER

Filed April 22, 1963

2 Sheets-Sheet 1



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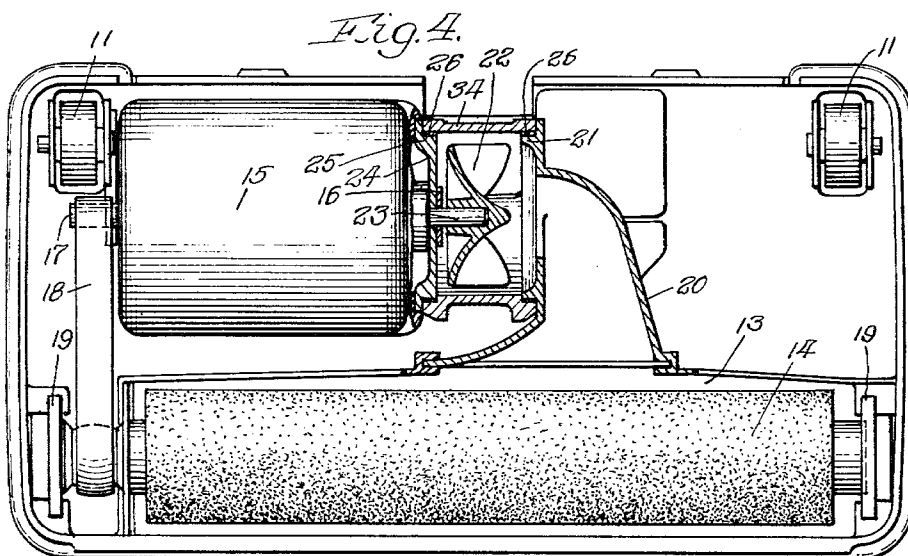
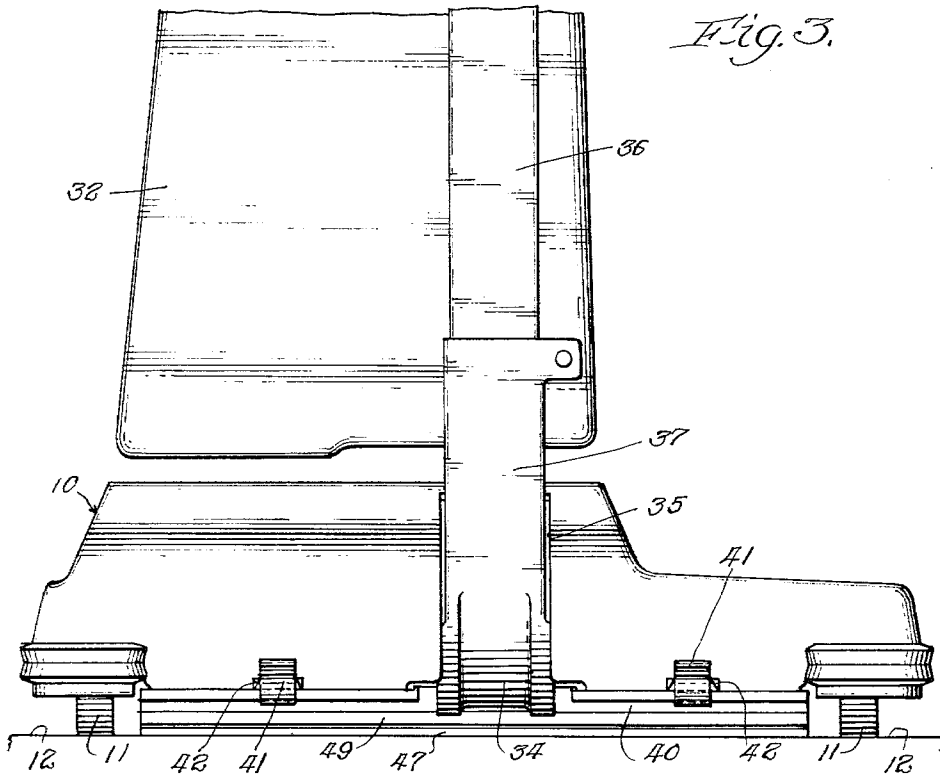
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3,199,138
CLEANER

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1 Claim. (Cl. 15—350)

This invention relates to a cleaner of the type adapted to be propelled over a surface being cleaned and to utilize a dust separating member for separating dust from an air stream.

The cleaner of this invention utilizes a rotatable brush for removing dust and dirt from a surface such as a floor and propelling it into an air stream where the dust and dirt are carried to a separating member. This air stream is created by a motor operated blower and the air stream is given sufficient velocity to carry the entrained dust and dirt.

One of the features of this invention is to provide a cleaner having improved mounting means for mounting a conduit for the dust laden air in operative relationship with the blower that provides the air stream.

Other features and advantages of the invention will be apparent from the following description of one embodiment of the invention as shown in the accompanying drawings. Of the drawings:

FIGURE 1 is a perspective view of a cleaner embodying the invention.

FIGURE 2 is an enlarged fragmentary sectional view through the lower portion of the cleaner of FIGURE 1.

FIGURE 3 is a fragmentary rear elevational view of the cleaner of FIGURE 2.

FIGURE 4 is a bottom view partially in section of the cleaner with the cover plate removed.

FIGURE 5 is a broken sectional view taken substantially along line 5—5 of FIGURE 2.

The cleaner shown in the accompanying drawings comprises a casing 10 mounted on spaced rollers 11 for movement over a surface such as a floor shown diagrammatically at 12. The casing 10 is provided at the front thereof with a nozzle 13 in which is located a rotatable brush 14 which is illustrated diagrammatically in the drawings.

Within the casing 10 behind the nozzle 13 there is mounted a motor 15 substantially parallel to the brush 14 and having one end 17 of its shaft extending outward therefrom. This shaft end 17 is provided with a spindle for driving a belt 18 in order to rotate the brush 14. The ends of the brush are held in bearings 19 at each end of the nozzle 10. The construction and assembly of the shaft end 17, the brush driving belt 18 and brush support bearings 19 is conventional.

Leading from the rear of the nozzle 13 is an air passage means 20 provided on its inner end with a vertically arranged annular bearing portion 21. Positioned adjacent this bearing portion 21 is a small blower 22 mounted on the extending shaft end 23 that is opposite the end 17. Between the blower 22 and the motor 15 is a circular plate 24 forming a blower housing element having a felt washer 25 sealing means cemented to circular plate 24 which seals around extending shaft end 23. This blower housing means or plate 24 is also provided with an annular bearing portion 25. The two bearing portions 21 and 25 are on opposite sides of the blower 22, are substantially concentric with the axis of rotation of the blower 22 which is the axis of rotation of the motor shaft end 23 and are each of substantially the same diameter. Each of these bearing portions 21 and 25 is provided with an annular felt seal 26. As can be seen from the drawings the common concentric axis for the blower 22, shaft end 23 and bearing portions 21 and 25 is essentially horizontal.

The cleaner also includes a conduit 27 for dust laden air from the blower 22 with this conduit including an

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upper exhaust portion 28 exhausting through an opening 29 into a dust separating member 30 that is formed in two parts. The upper part 31 is a cloth filter material for liberating the air by holding the dust and dirt and a lower removable container 32 into which the dust and dirt falls when the cloth part 31 is shaken or otherwise agitated. This container 32 is removably held by means not shown so that it can be removed periodically for emptying. The conduit 27 is formed in the bottom portion of propelling handle 33, and said handle 33 extends upwardly beyond the upper exhaust portion 28 of conduit 27.

The conduit 27 has a lower blower housing portion 34 that surrounds the blower 22 and that is arcuate to engage the felt seals 26 on the bearing portions 21 and 25. With this arrangement the handle 33 which includes conduit 27 can be arcuately moved to a desired position either for propelling the cleaner over the floor or other surface or for storing. In order to permit this arcuate movement about the bearing portions 21 and 25 the casing 10 is cut away as indicated at 35.

As is shown in FIGURE 2 blower housing portion 34 and connector portion 37 of conduit 27 are somewhat heavier than upper portions 36 of the conduit 27. Upper portion 36 and connector portion 37 of the conduit 27 are telescopically associated.

In order to hold the handle and conduit assembly in adjusted position, there is provided a leaf spring 38 within the casing 10 having one end fixed as by the bolts 39 and the other end bearing against a projection 59 on the surface of the blower housing portion 34.

The bottom of the casing 10 is covered by a cover plate 40 having a pair of rear spring clips 41 releasably engaging projections 42 at the rear of the casing and a front inwardly turned flange 43 releasably held by a projecting casing edge 44. The cover plate 40 is cut away in the customary manner at 45 to provide an opening through which the bottom of the brush 14 projects. The cover plate is also cut away at 46 to provide for the bottom of the blower housing portion 34.

When the motor shaft 17 rotates the brush 14 by means of the belt 18 the brush is rotated in a counterclockwise direction as viewed in FIGURE 2. In order to prevent solid particles from being blown rearwardly beneath the cover plate the edge of the cover plate to the rear of the edge 35 is provided with a flexible flap 47, held in place with a tapping strip 49, to intercept these solid particles and direct them into the brush 14. This flexible flap 47 engages the surface being cleaned, in this case the floor 12.

The operation of the cleaner is as follows: The handle 33 may be lowered to any convenient position for propelling the casing 10 over the floor illustrated at 12 and the positioning is achieved by the blower housing portion 34 rotating on the bearing portions 21 and 25. The rotation of the small blower 22 sets up a stream of air of relatively low suction from the nozzle 13, through the air passage means 20 and blower housing portion 34 into the conduit 27. This stream of air carries dust and dirt that have been raised by the rotating brush 14 and the stream with the entrained dust and dirt exhausts through the opening 29 into the dust separating member 30. The air passes on through the cloth filter part 31 and the dust and dirt falls into the removable container 32. Passage of this dust laden air stream from the top of the conduit 27 into the dust separating member 30 is aided by the curved baffle 48 at the top of the conduit 27.

As can be seen from this description, the construction of the cleaner is kept quite simple with a consequent reduction in weight and cost.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rath-

er be construed broadly within its spirit and scope as set out in the accompanying claim.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

In a cleaner including a nozzle and a dust separating member spaced therefrom, apparatus comprising: a blower rotatable about a substantially horizontal axis for moving a stream of dust laden air; air passage means for said stream from said nozzle to said blower; bearing means on said air passage means at one side of said blower; a blower housing element at the opposite side of said blower; a motor adjacent to but spaced from said blower housing element for rotating the blower; second bearing means on said blower housing element; a conduit for said air having an exhaust portion exhausting into said separating member and a blower housing portion around said blower engaging and movable on said bearing means, said air passage means, said blower housing element and

said blower housing portion cooperating as substantially the sole housing for said blower; a motor shaft having an end extending through said blower housing element and on which said blower is mounted within said blower housing portion; and a sealing means on said blower housing element sealing around said shaft.

References Cited by the Examiner

UNITED STATES PATENTS

10	1,063,559	6/13	Long	15—383
	1,752,882	4/30	Boutwell	15—364 X
	2,149,588	3/39	Dow	15—410
	2,225,621	12/40	Burkhardt	15—350 X
15	2,300,266	10/42	Smellie	15—350 X
	2,689,969	9/54	Seck	15—351

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