July 17, 1962 J. P. ZAIDAN 3,044,100

ROTARY BRUSH ATTACHMENT FOR TANK TYPE VACUUM CLEANERS

Filed Sept. 12, 1958 2 Sheets-Sheet 1

Fig. 1

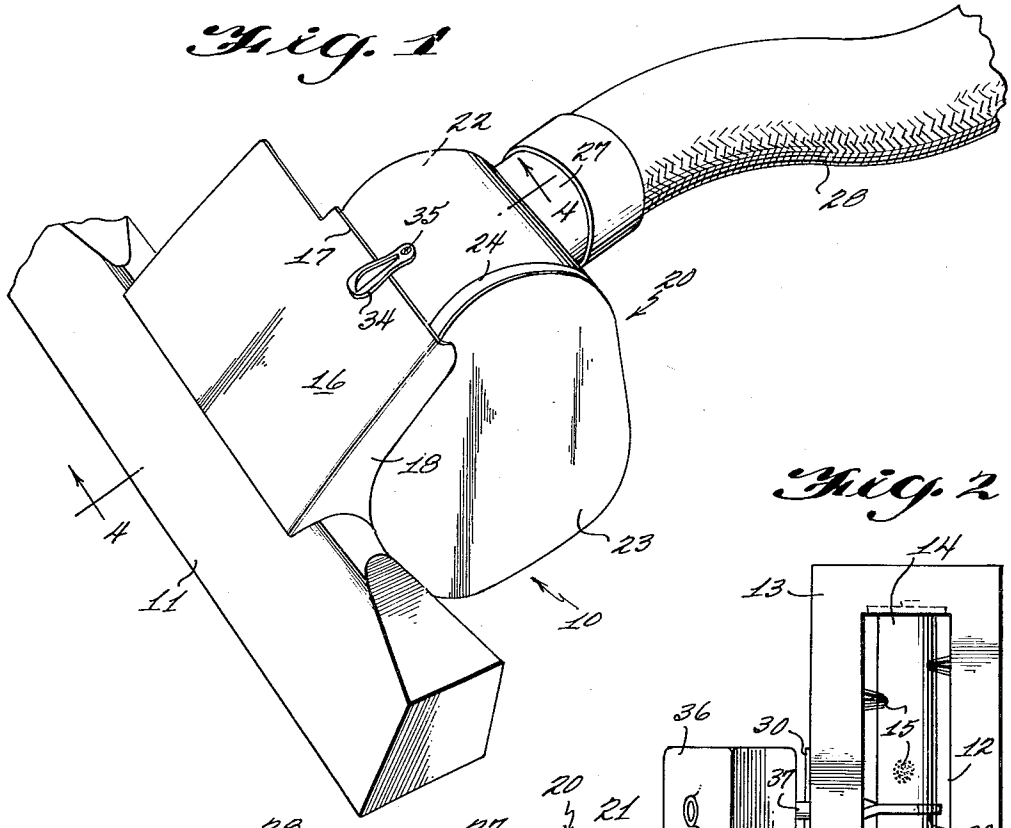



Fig. 2

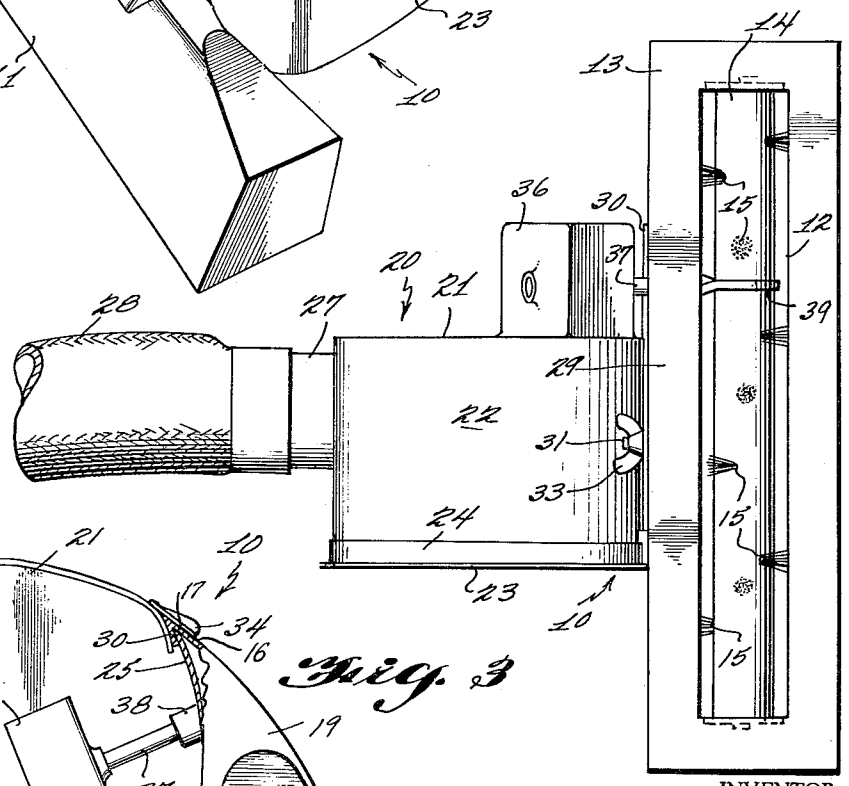
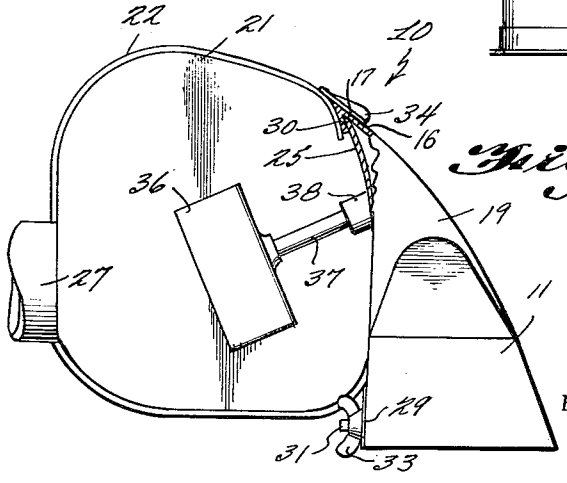



Fig. 3




INVENTOR
JOSEPH P. ZAIDAN

BY Kimmel & Crowell
ATTORNEYS

July 17, 1962 J. P. ZAIDAN 3,044,100

ROTARY BRUSH ATTACHMENT FOR TANK TYPE VACUUM CLEANERS

Filed Sept. 12, 1958 2 Sheets-Sheet 2

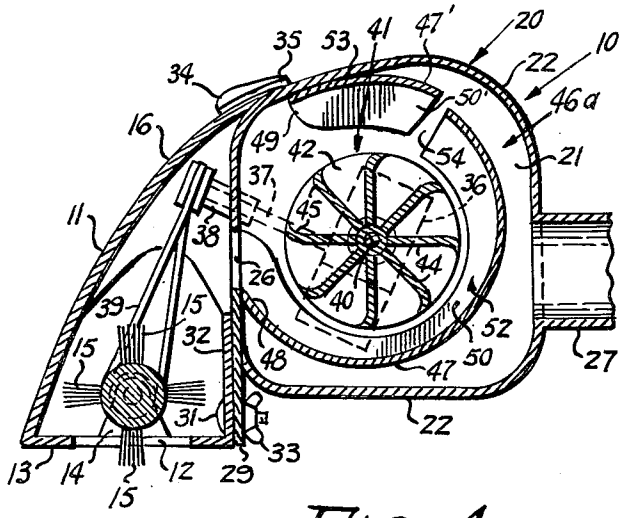



FIG. 4

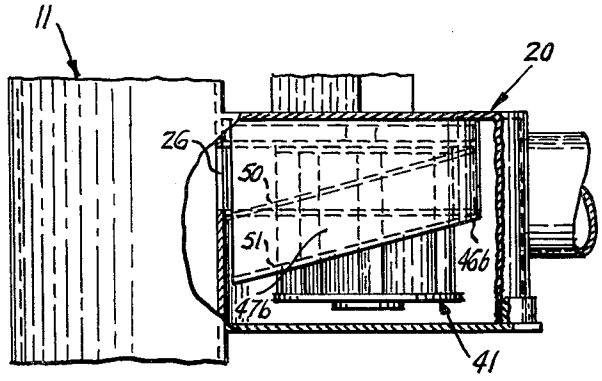
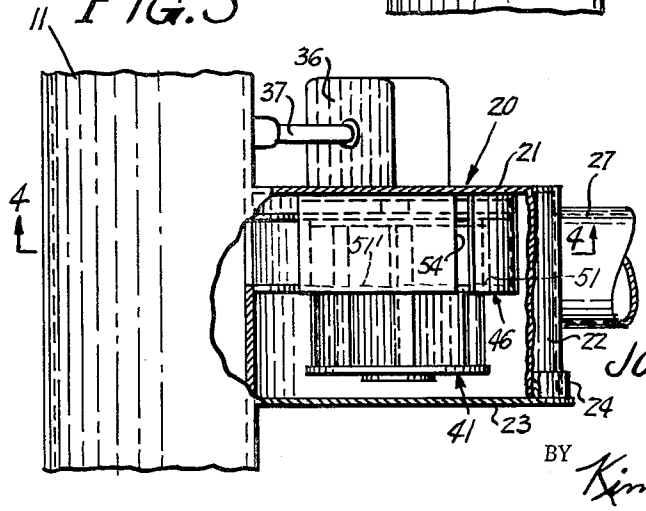



FIG. 6

FIG. 5




INVENTOR.
JOSEPH P. ZAIDAN

BY Kimmel & Crowell
ATTORNEYS.

United States Patent Office

3,044,100
Patented July 17, 1962



3,044,100

# ROTARY BRUSH ATTACHMENT FOR TANK TYPE VACUUM CLEANERS

Joseph P. Zaidan, 1234 S. Broad St., Philadelphia, Pa.

Filed Sept. 12, 1958, Ser. No. 760,748
1 Claim. (Cl. 15—387)

The present invention relates to rotary brush attachments for tank type vacuum cleaners and particularly to such attachments which are operated by air moving therethrough.

The primary object of the invention is to provide a rotary brush attachment for tank type vacuum cleaners having an air motor drive for the brush which is sufficiently efficient that the vacuum cleaning power of the vacuum cleaner is only very slightly reduced.

Another object of the invention is to provide in a rotary brush attachment for tank type vacuum cleaners an air motor which will permit dirt and trash picked up by the suction of the vacuum cleaner to pass therethrough without stalling the air motor.

A further object of the invention is to provide in a brush attachment of the class described above an air motor having an encompassing air directing housing positioned over approximately one-half of the area of the air motor rotor to increase the efficiency of the air motor.

A still further object of the invention is to provide a rotary brush attachment for tank type vacuum cleaners which is inexpensive to manufacture, easy to attach and use and which can be readily opened for cleaning and repair as required.

Other objects and advantages will become apparent in the following specification when considered in the light of the attached drawings, in which:

FIGURE 1 is a fragmentary perspective view of the apparatus shown attached to the vacuum hose of a tank type vacuum cleaner;

FIGURE 2 is a bottom plan view of the apparatus;

FIGURE 3 is a side elevation of the apparatus shown partially broken away for convenience of illustration;

FIGURE 4 is a vertical sectional view taken along the line 4—4 of FIGURE 1, looking in the direction of the arrows;

FIGURE 5 is a fragmentary top plan view of the apparatus shown partially broken away and in section for convenience of illustration; and

FIGURE 6 is a fragmentary top plan view of modified form of the apparatus, shown partially broken away and in section for convenience of illustration.

Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures, the reference numeral 10 indicates generally a rotary brush attachment for tank type vacuum cleaners constructed in accordance with the invention.

The attachment 10 includes an elongated generally horizontal housing 11 having a generally rectangular opening 12 formed in the bottom wall 13 thereof. An elongated spindle 14 is journalled in the housing 11 in overlying relation with respect to the opening 12. The spindle 14 is provided with a plurality of brush tufts 15 which are adapted to project through the opening 12 below the housing 11 on rotating of the spindle 14.

The housing 11 is provided with an upstanding central portion 16 which terminates in a generally horizontal upper edge 17 and is provided with a flange 18 extending rearwardly on one side thereof, and a second flange 19 arranged in spaced parallel relation thereto and extending rearwardly on the opposite side thereof.

A second housing, generally indicated at 20, is provided with an upright side wall 21 having a generally



arcuate wall 22 fixedly secured to the peripheral edge of the side wall 21 and projecting substantially perpendicularly laterally therefrom. A generally flat cover panel 23 engages the arcuate wall 22 on the free edge thereof in spaced parallel relation to the side wall 21. The flat cover panel 23 is provided with a perpendicularly extending relatively short flange 24 which engages over the arcuate wall 22 securing the cover panel 23 thereto in sealed relation.

The side wall 21 is provided with a generally upright laterally extending forward wall 25 projecting generally perpendicularly from the side wall 21 oppositely of the arcuate wall 22.

The arcuate wall 22 is provided with a port 26 in the forward portion thereof for reasons to be assigned. The arcuate wall 22 is provided with a cylindrical tubular extension 27 projecting rearwardly therefrom on the side thereof opposite the port 26. A tank type vacuum cleaner vacuum hose 28 is shown in FIGURES 1 and 2, detachably engaged over the extension 27 to connect the housing 20 therewith.

The housing 20 is provided with a depending upright front wall 29 which is secured to the arcuate wall 22 and projects downwardly therefrom. The housing 11 is adapted to be secured to the housing 20 with the flange 19 engaging the side wall 21 thereof and the flange 18 engaging the outer face of the cover panel 23. The upstanding central portion 16 of the housing 11 has the horizontal edge 17 thereof formed into a reverted hook 30 along the portion of its length overlying the front wall 25 so as to encompass the upper edge of the front wall 25, as best shown in FIGURE 3.

A bolt 31 extends through the lower part of the rear wall 32 of the housing 11 and projects through the depending wall 29, as best seen in FIGURE 4. A wing nut 33 is threaded on the bolt 31 to detachably secure the depending wall 29 to the rear wall 32 of the housing 11. A latch 34 is pivotally secured at 35 to the arcuate wall 22 in position so that the latch 34 can be pivoted to engage over the horizontal edge 17 of the portion 16 so as to releasably lock the housing 11 to the housing 20 with the port 26 providing communication between the housing 11 and the housing 20.

A right angle drive gear box 36 is secured to the side wall 21 with the driving shaft 37 thereof projecting through the front wall 25 into the housing 11 and having a drive pulley 38 fixed thereto within the housing 11.

A twisted drive belt 39 is trained over the drive pulley 38 and around the spindle 14 so that rotary motion of the drive shaft 37 will rotate the spindle 14 and the brush tufts 15 thereon.

A driven shaft 40 extends generally horizontally from the gear box 36 through the side wall 21 into the housing 20. A rotor, generally indicated at 41, includes a pair of spaced apart circular side disks 42, 43 which are mounted on the shaft 40 to rotate therewith. A plurality of radially extending rotor blades 44 have their inner edges secured to the shaft 40 with their opposite side edges secured respectively to the circular disks 42, 43. The rotor blades 44 have their outer edges arcuately offset at 45 in a clockwise direction, as can be best seen in FIGURE 4.

An arcuate two-part channel-shaped baffle, generally indicated at 46*a*, is arranged in substantially encompassing relation to the rotor 41 overlying approximately one-half the axial length thereof. The channel baffle includes a lower section having an arcuate outer wall 47 secured at its forward end 48 to the arcuate wall 22 immediately beneath the port 26 therein. The lower section of the channel baffle 46*a* is indicated at 52. The channel baffle also includes an upper section having an

arcuate outer wall 47' secured at its forward end 49 to the arcuate wall 22 at a point spaced vertically above the port 26. The upper section of the channel baffle 46*a* is indicated at 53. The arcuate walls 47 and 47' each have a side edge thereof connected to the side wall 21 for rigidity and strength. The upper section 53 of the channel baffle 46*a* is disposed in radially outwardly offset relation with respect to the lower section 52 and spaced therefrom at 54. The space 54 between the sections 52 and 53 and their radially offset relation permits the lateral escape of a portion of the dirt collected by the device to reduce the possibility of clogging the apparatus.

An inner flange 50 projects perpendicularly inwardly from the wall 47 of the lower section 52 in generally aligned relation with the disk 42 of the rotor 41. A second flange 51 is supported on and projects inwardly from the edge of the circular wall 47 opposite the side wall 21, with the flange 51 generally overlying the midpoint of the axial length of the rotor 41. The flanges 50, 51 have their lower forward ends secured to the arcuate wall 22 immediately adjacent to and on opposite sides of the port 26. The upper section 53 includes flanges 50' and 51' which are in substantially aligned relation to the flanges 50 and 51 on the lower section 52.

In the use and operation of the invention the vacuum hose 28 is connected to the extension 27 and with the tank type vacuum cleaner (not shown), to which the hose 28 is attached in operation, the housing 20 is evacuated. The evacuation of the housing 20, due to the port 26, causes a flow of air to enter the opening 12 in the housing 11, which flows upwardly through the port 26 into the housing 20. The air flow is directed by the channel shaped baffle 46*a* into the inner half of the rotor 41. The blades 44 of the rotor 41 form closed pockets and, hence, the air flow from the baffle 46*a* moves axially outwardly between the blades 44 away from the wall 21 and then radially outwardly from the rotor 41 into the housing 20. The flow of air into the rotor 41 and out of the rotor 41 moves past the offset ends 45 causing the rotor 41 to rotate in a counter-clockwise direction, as seen in FIGURE 4. The channel baffle 46*a* materially increases the efficiency of the rotor 41 since the air flow is caused to exert a driving force on the offset ends of the blades 44 when entering the rotor 41 and again on leaving the rotor 41.

It should be noted that the circular flanges 50, 51, and 50', 51' are spaced from the rotor 41 to permit trash and other material to move outwardly from the channel baffle 46*a* into the housing 20.



In FIGURE 6 the housing 20, housing 11, rotor 41 and its mounting in the housing 20 are all identical with the preferred form of the invention. In the modification illustrated in FIGURE 8, the generally circular baffle 46B has the upper portion 55 thereof extending outwardly at an angle to the rotor 41. In this form of the invention, the arcuate wall 47B widens toward its upper terminal end with the inner flange 50 and the outer flange 51 remaining in parallel relation to each other forming a spiral passage from port 26 to the interior of housing 20 as shown in dotted lines. In this form of the invention increased efficiency and additional power is obtained from the rotor 41.

Having thus described the preferred embodiments of the invention, it should be understood that numerous modifications and adaptations may be resorted to without departing from the scope of the appended claim.

What is claimed is:

An attachment for vacuum cleaning devices comprising, in combination, a first elongated housing including a lower wall member and a pair of convergent side wall members, an opening in the lower wall member, a rotatable brush in said housing adjacent said opening, an opening in one of said convergent side walls, a second housing removably secured to said first housing and in communication therewith through the opening in said side wall, a rotor in said second housing, a gear drive means secured exteriorly of said second housing and driven by said rotor, a drive shaft from said gear drive drivingly connected to said rotatable brush, a pair of arcuate channel members in said second housing around said rotor, one of said pair of arcuate channel members being radially offset from the other, and a suction outlet leading from said second housing.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 858,500 | Dake | July 2, 1907 |
| 2,701,892 | Mingus | Feb. 15, 1955 |
| 2,732,671 | McFadden | Jan. 31, 1956 |
| 2,812,155 | Woodruff | Nov. 5, 1957 |
| 2,962,748 | Magarian | Dec. 6, 1960 |