Nov. 21, 1944. E. R. SWANN 2,363,452

SUCTION CLEANER

Filed Dec. 26, 1941 4 Sheets-Sheet 1

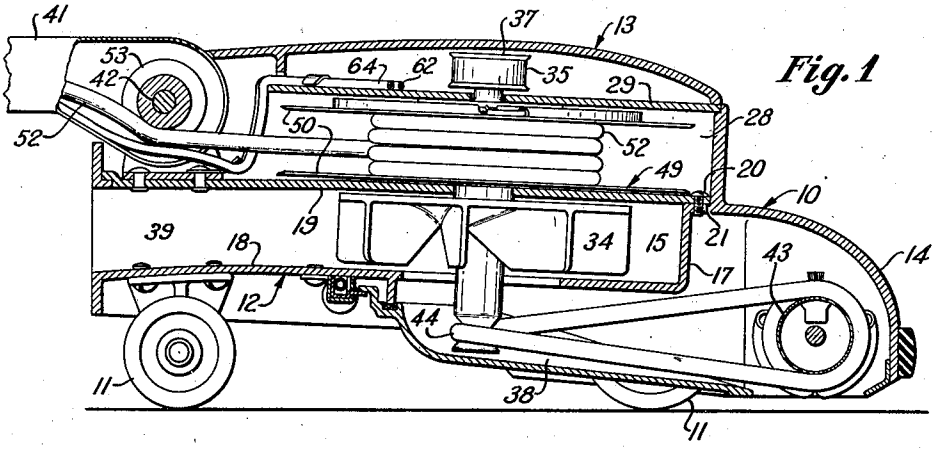



Fig. 1

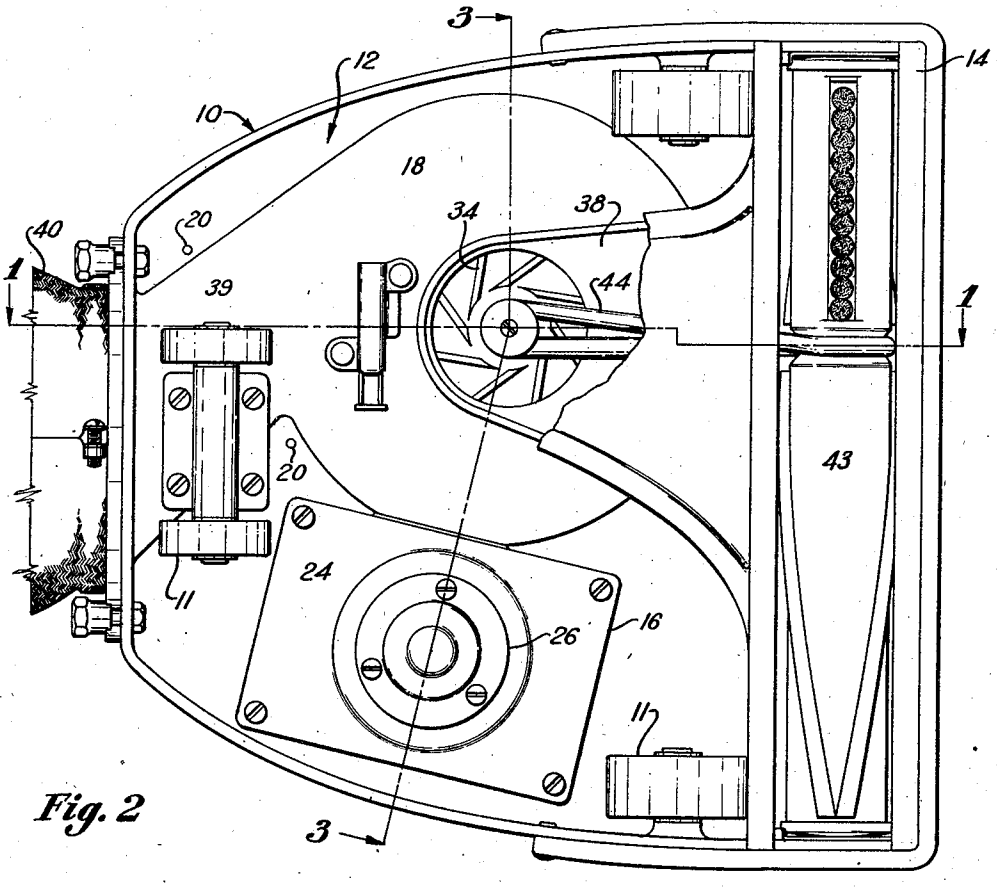



Fig. 2

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SUCTION CLEANER

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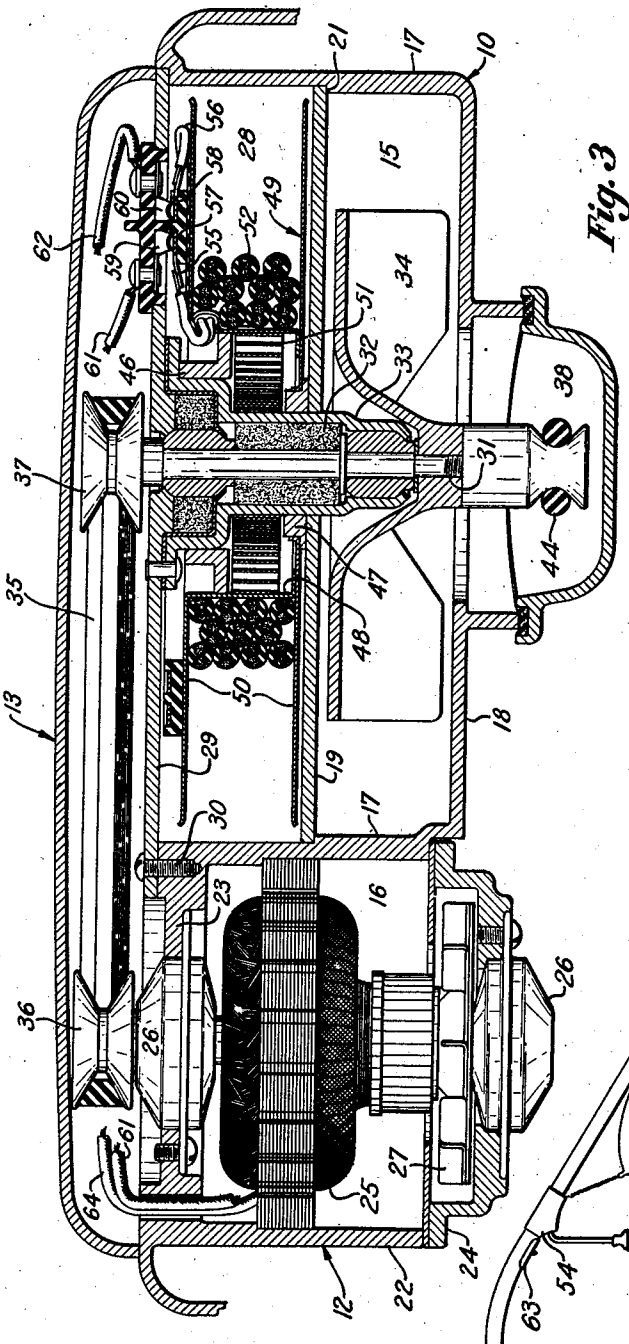


Fig. 3

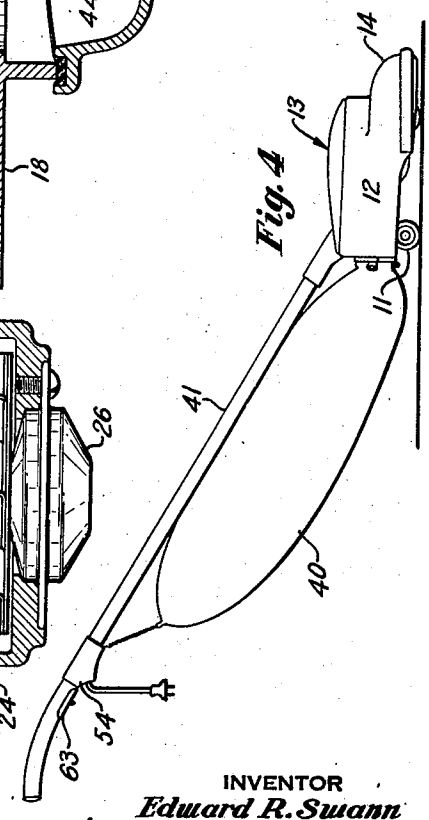


Fig. 4

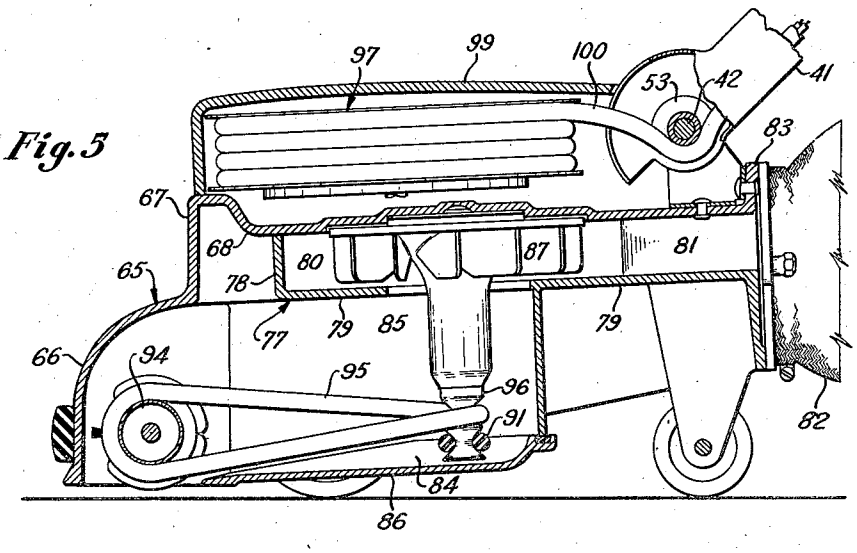
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SUCTION CLEANER

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Fig. 5



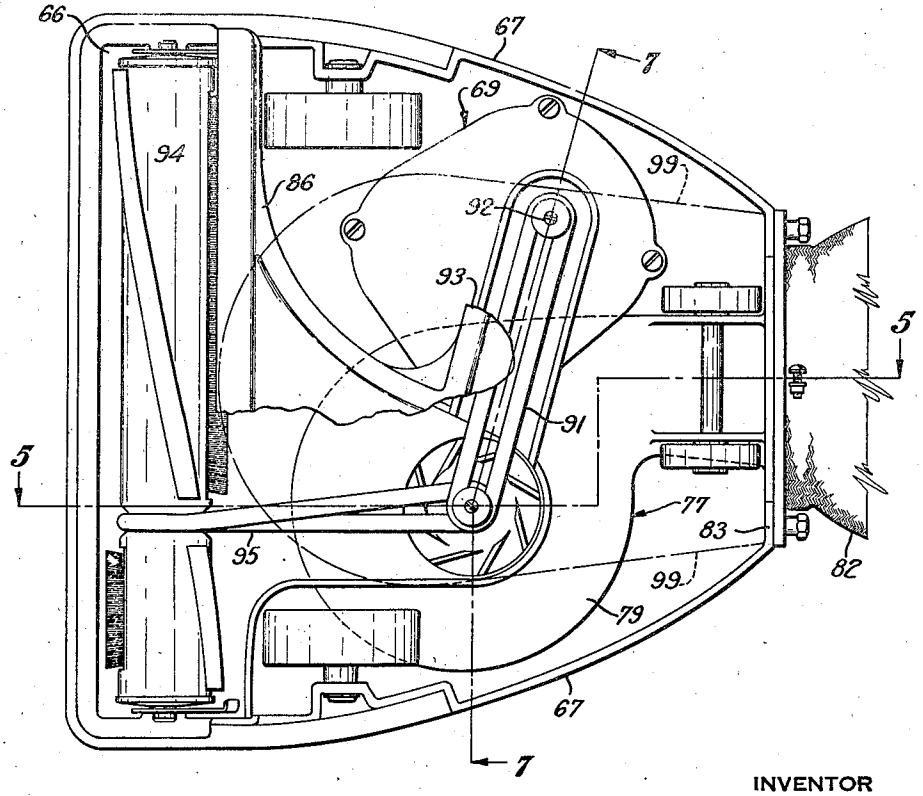




Fig. 6

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SUCTION CLEANER

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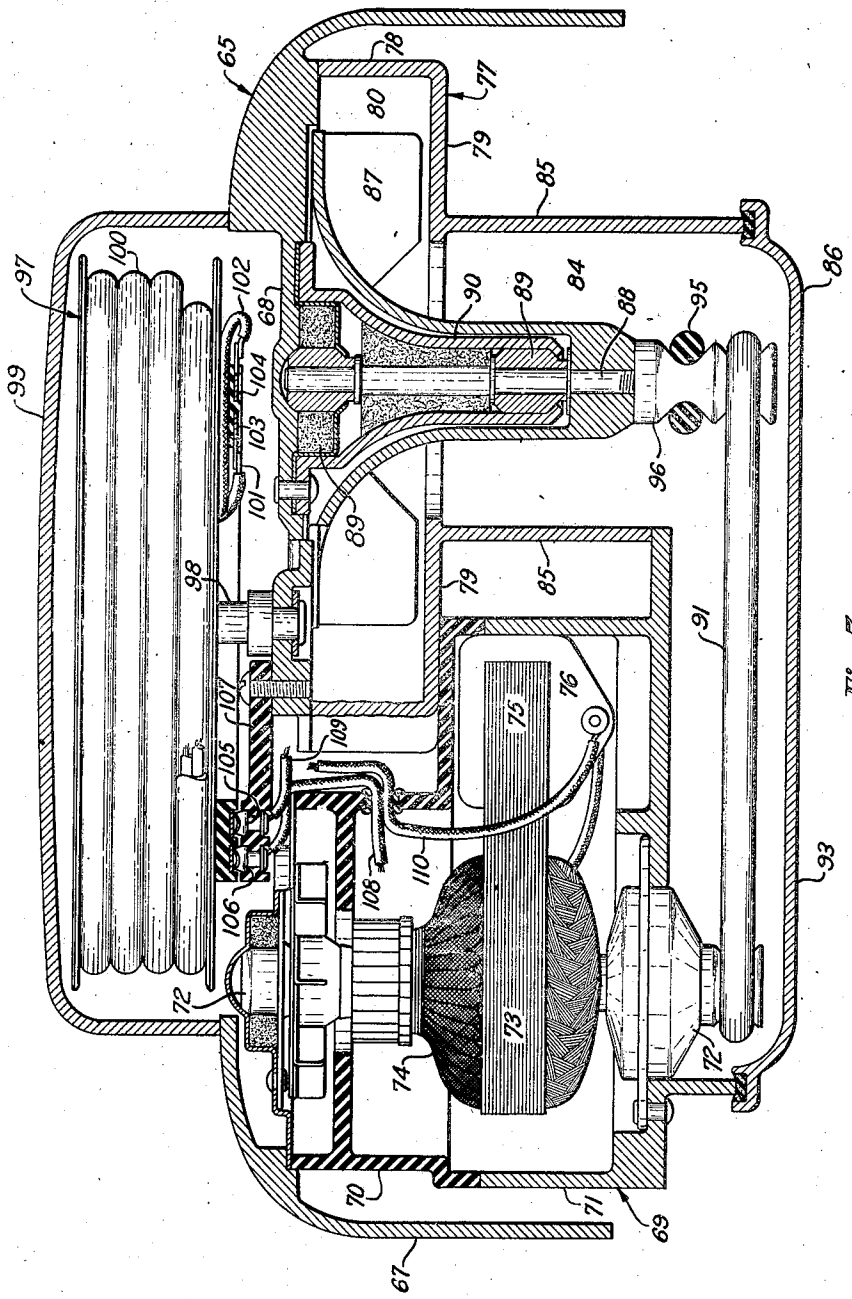



Fig. 7

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Patented Nov. 21, 1944 2,363,452

# UNITED STATES PATENT OFFICE

2,363,452

## SUCTION CLEANER

Edward R. Swann, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application December 26, 1941, Serial No. 424,503

5 Claims. (Cl. 15—16)

The present invention relates to suction cleaners and more particularly to a cord take-up for suction cleaners.

An object of the invention is to provide a new and improved suction cleaner. Another object is to provide an improved cord take-up for suction cleaners. A further object is to provide an improved suction cleaner body for the cord take-up to reduce the overall height of the cleaner. Other objects and advantages of the invention will be apparent from the following specification and drawings, wherein:

Figure 1 is a section along line 1—1 of Figure 2;

Figure 2 is a bottom plan view of the cleaner shown in Figure 1;

Figure 3 is a section along line 3—3 of Figure 2;

Figure 4 is an elevational view of the cleaner embodying the cord take-up;

Figure 5 is a section along line 5—5 of Figure 6 showing a modified suction cleaner;

Figure 6 is a bottom plan view of the cleaner shown in Figure 5, and

Figure 7 is a section along the line 7—7 of Figure 6.

The embodiment of the invention disclosed in Figures 1 to 4 comprises a suction cleaner including a body 10 mounted on wheels 11 and having a lower casing 12 and an upper overlying top casing 13. The lower casing 12 includes a downwardly opening nozzle 14, a horizontally arranged fan chamber 15 and a motor housing 16. The fan chamber 15 is defined by a vertical wall 17, a bottom wall 18 and a removable top wall 19 which is suitably secured by screws 20 to a shoulder 21 at the upper periphery of the fan chamber. The motor housing 16 is defined by a vertical wall 22, the fan chamber wall 17, a top wall 23 and a removable bottom wall 24, secured to the vertical wall of the housing. A motor 25 is vertically supported on bearings 26, mounted in the motor housing 16 and is provided at its lower end with a motor ventilating fan 27.

Above the fan chamber 15 is a cord reel housing 28 formed by the fan chamber vertical wall 17, fan chamber wall 19 and a top wall 29 removably secured by means of screws 30 to the top surface of the casing 12. The combined height of the fan chamber 15 and the cord reel housing 28 is substantially equal to the height of the motor housing 16 and they are arranged along side the latter, substantially parallel to the cleaner nozzle 14.

A fan shaft 31 is rotatably mounted in a bearing indicated generally at 32 which is supported in a hollow bearing housing 33 attached to the upper wall 29 and depending therefrom through the reel housing 28 into the fan chamber 15. A fan 34 in the fan chamber 15 is mounted on the shaft 31 and is rotated by a belt 35 extending between a motor pulley 36 and a shaft pulley 37. The upper casing 13 encloses the belt 35 and pulleys 36 and 37. Rotation of the fan 34 draws in dirt-laden air through the nozzle 14, and a suction passageway 38 into the fan chamber 15 and the dirt is discharged through an exhaust passageway 39 into a filter bag 40 removably attached to the casing 12. The upper end of the bag 40 is supported from a handle 41 pivotally mounted on a pin 42 supported on the casing 12 rearwardly of the reel housing 28. The exhaust passageway 39 is formed by the rearward extension of the bottom and top fan chamber walls 18 and 19, respectively, and the vertical wall 17. Rotation of the fan shaft 31 also drives a surface contacting member 43 in the nozzle 14 by means of a belt 44.

Rotatably mounted on the exterior surface of the bearing housing 33 are a pair of annular rings 46, 47 forming a portion of the hub 48 of a cord reel 49 provided with opposed cord confining end plates 50 extending radially from the hub 48. A helical spring 51 is disposed between the bearing housing 33 and the hub 48 and has one end attached to the stationary bearing housing 33 and the other end to the hub 48 for rotating the cord reel 49. An electric cord 52 is arranged about the cord reel 49 and extends therefrom beneath a guide-roller 53 on the handle pivot pin 42 and upwardly in the handle 41 and through an outlet 54 for attachment to a source of electric current.

The inner ends 55, 56 of the cord 52 are electrically connected to the motor 25 by a pair of collector rings 57, 58 insulatably mounted on one of the cord reel end plates 50 and slidably contact a pair of spring contacts 59, 60, the contact 59 being connected by a lead 61 to the motor, while the contact 60 is connected by a lead 62 to a switch 63 at the upper end of the handle, the switch 63 also being connected by a lead 64 to the motor 25.

In operation, assume the cord is wound about the reel 49 and it is desired to unwind the cord. A pull on the outer end of the cord causes the cord reel 49 to rotate and the cord passes along the guide-roller 53 until the desired length of cord is unwound. A suitable clamp may be positioned at the top of the handle 41 to hold the unwound cord paid out against the increased tension of the spring 51 which tends to rotate the reel 49

to wind the cord thereon. When it is desired to rewind the cord, the clamp is released and the spring 51 rotates the reel 49 to wind the cord thereon. Since the guide-roller 53 is journalled on the handle pivot 42 rearwardly of the cord reel 49, a constant length of cord will be maintained between the handle pivot 42 and the point of application of the cord on the reel 49 while the handle 41 is oscillated and the cord is wound and unwound on the reel.

Figures 5 to 7 disclose a modification of the invention and comprises a suction cleaner having a body 65 provided with a downwardly opening nozzle 66 from which extends a vertical wall 67 and a top wall 68. Depending from the body top wall 68 is a motor housing 69 formed of a section 70 of electric insulating material and a section 71 in each of which is mounted a bearing 72 for supporting a motor 73 having a vertically arranged armature 74 and a substantially U-shaped field core 75 of the unicoil type supporting a coil 76.

Depending from the body top wall 68 is a casing 77 having a vertical wall 78 and a bottom wall 79 which cooperate with the body top wall 68 to form a fan chamber 80. The casing 77 and the body top wall 68 also cooperate to form an exhaust passageway 81 which discharges dirt-laden air into a filter bag 82 removably attached to a flange 83 formed by the body top wall 68 and the casing 77. A suction passageway 84 extends from the nozzle 66 to the fan chamber 80 and is formed by a wall 85 extending downwardly from the fan chamber bottom wall 79 and the body top wall 68, and a cooperating removable plate 86. A fan 87 is disposed in the fan chamber 80 and is rigidly supported on a shaft 88 rotatably mounted in spaced bearings 89, 89 carried in a bearing housing 90 depending from the body top wall 68. A belt 91 extends below the motor housing 69 and between the armature shaft 92 and the fan shaft 88 to rotate the fan 87, and the belt 91 is enclosed by a lateral extension 93 of the cover plate 86. A rug vibrator 94 in the nozzle 66 is rotated by a belt 95 extending from a pulley 96 on the shaft 88 to the vibrator 94.

A cord reel 97 is rotatably mounted on a pin 98 rigidly supported on the body top wall 68, the reel overlying the motor 73 and the fan chamber 80 and being enclosed by a casing 99. An electric cord 100 has its inner end rigidly attached to the hub of the reel 97 and extends therefrom along the guide-roller 53 through the handle 41 and outwardly from the latter at its upper end. The inner ends 101, 102 of the cord are connected to the motor by means of a pair of collector rings 103, 104 insulatably mounted on the reel 97 for slidable contact with spring contacts 105, 106, respectively, which are mounted on an insulating block 107 supported on the body top wall 68. A lead 108 connects the contact 106 with the motor, and a lead 109 extends from the contact 105 to the switch 63 at the upper end of the handle, and another lead 110 extends from the switch to the motor to complete the motor energizing circuit.

In operation, if it is desired to unwind the cord 100, a pull is exerted thereon causing the reel 97 to rotate against the force of an unshown helical spring, and thereafter the cord is maintained paid out by a suitable cord clamp on the handle 41. In order to rewind the cord, the clamp is released and the helical spring rotates the reel 97 to wind the cord about the reel.

I claim:

1. In a suction cleaner, an ambulatory body, a motor mounted on said body, a fan chamber in said body and laterally offset with respect to said motor and alongside the latter, a cord take-up rotatably supported on said body and overlying said motor and fan chamber, and an electric cord carried by said take-up and connected to said motor.

2. In a suction cleaner, an ambulatory body, a handle pivotally mounted on said body, a motor on said body, a cord take-up rotatably mounted on said body on an axis different from the pivotal axis of said handle, an electric cord carried by said take-up and connected to said motor and slidably supported on said handle, and guide means rotatably supported on said handle pivot for guiding said cord during oscillation of said handle to maintain a constant length of the cord between said handle and the point of application of said cord on said take-up as said cord is wound and unwound.

3. In a suction cleaner, an ambulatory body, a motor on said body, a fan chamber in said body, a cord take-up rotatably supported on said body said fan chamber and take-up being in superposed relation alongside said motor to substantially equal the height of said motor, and an electric cord carried by said take-up and connected to said motor.

4. In a suction cleaner, a motor, a fan chamber, a fan in said chamber, a housing rotatably supporting a shaft for said fan on an axis laterally offset with respect to the axis of said motor and alongside the latter, a cord take-up rotatably supported on said fan shaft housing, an electric cord carried by said take-up and connected to said motor, and drive means from said motor to said fan shaft for rotating said fan.

5. In a suction cleaner, an ambulatory body, a motor in said body, a fan casing in said body, a fan in said fan casing, a cord take-up rotatably supported in said body on an axis aligned with the axis of said fan, an electric cord carried by said take-up and connected to said motor, said fan casing, fan and cord take-up arranged in laterally offset relation with respect to the axis of said motor and alongside the latter, and means connecting said motor and fan for rotating the latter.

EDWARD R. SWANN.