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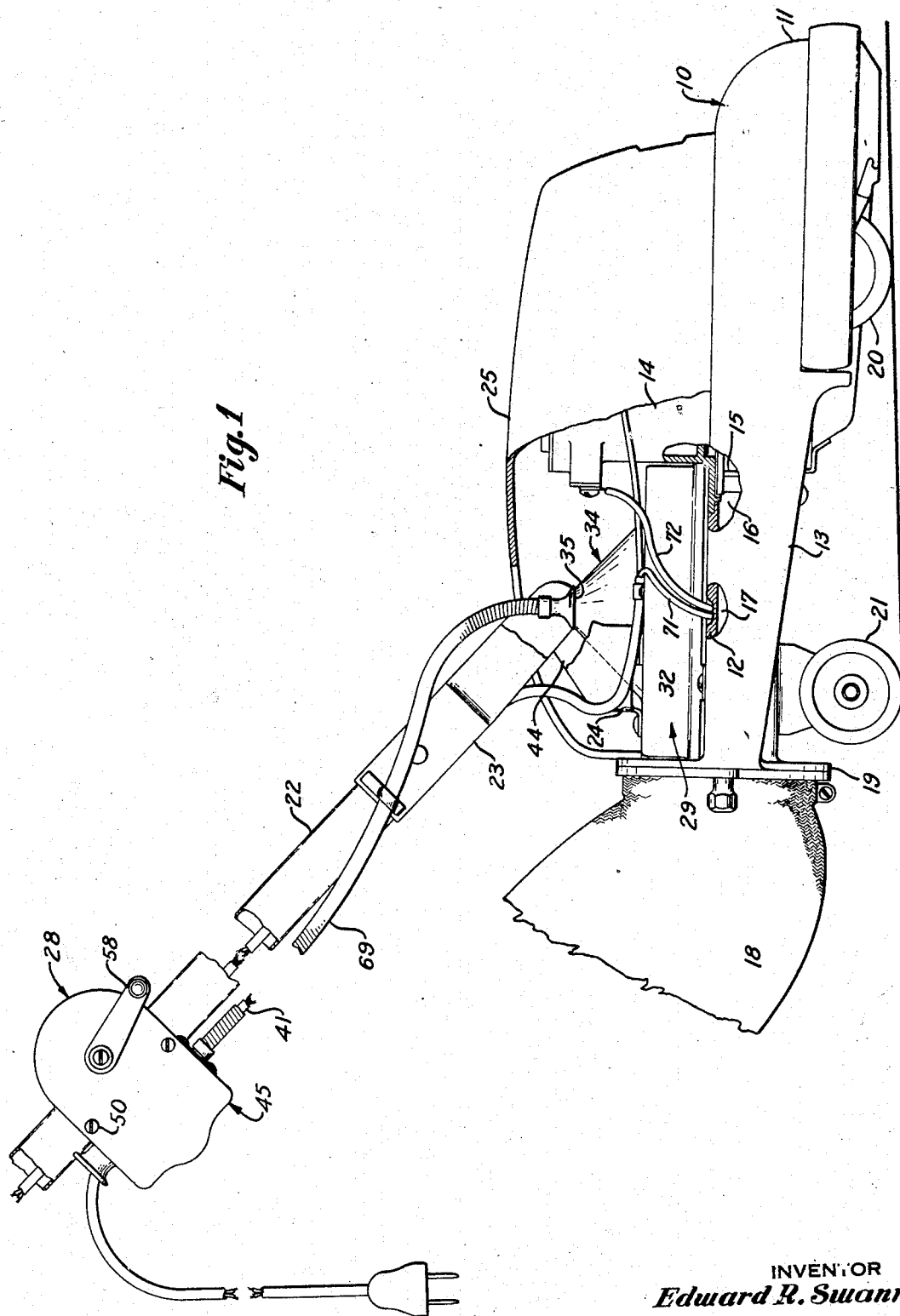
E. R. SWANN

2,340,440

SUCTION CLEANER

Filed March 29, 1941

3 Sheets-Sheet 1



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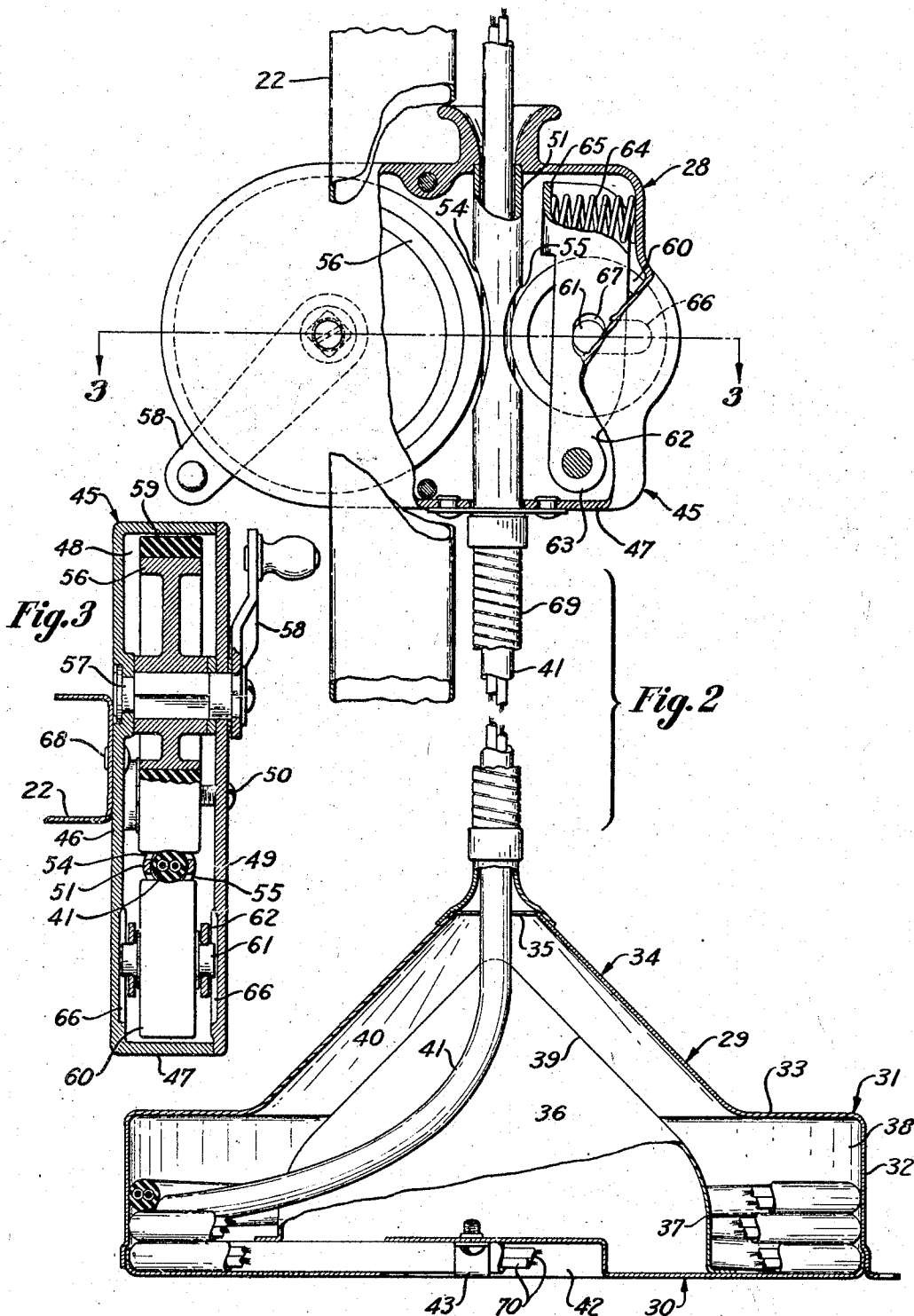
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 4

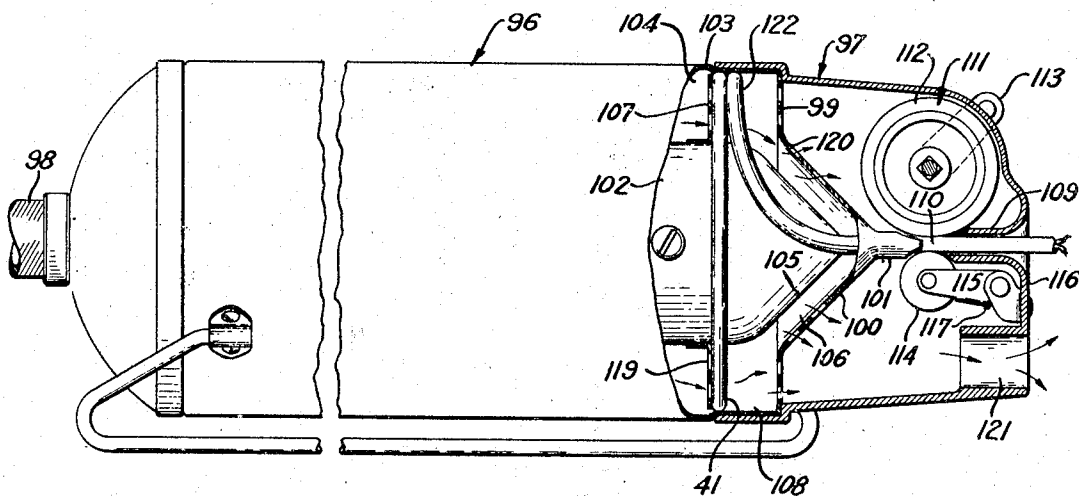
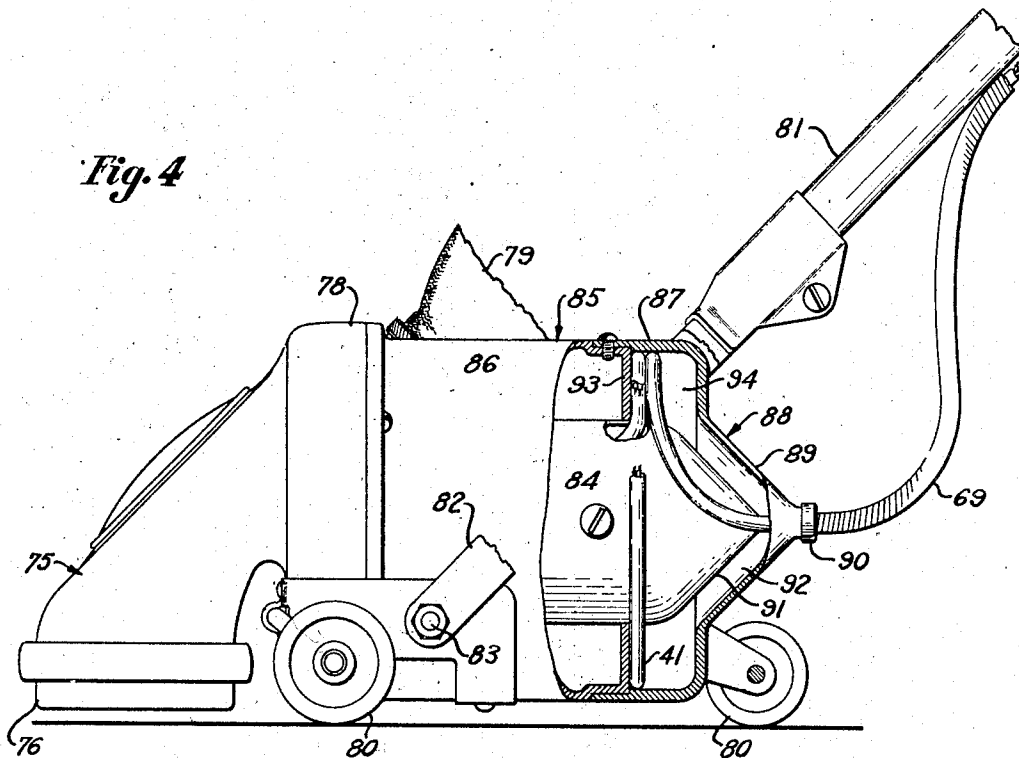


Fig. 5

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2,340,440

SUCTION CLEANER

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Application March 29, 1941, Serial No. 385,835

6 Claims. (Cl. 191—12)

This invention relates to suction cleaners in general, and more particularly to cord take-up devices for the electric cord which carries current to the cleaner motor.

An object of the invention is to provide a new and improved suction cleaner. Another object is to provide a suction cleaner embodying a cord take-up device. A further object is to provide a suction cleaner in which the cord storage chamber is non-rotatable. Another object is to provide a suction cleaner embodying novel means for feeding a cord into the cord storage chamber. Other objects and advantages of the invention will be apparent from the following specification and drawings, wherein

Figure 1 is a side elevation partly in section of a suction cleaner including one embodiment of the invention;

Figure 2 is a broken sectional view of the cord feeding and storage means shown in Figure 1;

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

Figure 4 is a side elevation partly in section of another embodiment of the invention, and

Figure 5 is a side elevation partly in section of a suction cleaner including another embodiment of the invention.

One embodiment of the invention is disclosed in Figures 1 to 3 and comprises a suction cleaner having a body 10 provided with a nozzle 11, a top wall 12 and depending side walls 13. Supported on the body 10 at the forward end thereof is a vertically mounted motor 14 which operates a fan 15 disposed in a fan chamber 16 formed in the body 10. Rotation of the fan 15 removes dirt from the surface being cleaned through the nozzle 11 into the fan chamber 16 and discharges the dirt through an exhaust passageway 17 into a dirt bag 18 removably attached to a flange 19 at the rear end of the cleaner body 10. The cleaner is supported on front and rear wheels 20 and 21, respectively, and is propelled over the surface being cleaned by a handle 22 in a ball 23 pivotally supported on a handle bracket 24 mounted on the body 10 rearwardly of the motor 14. A housing 25 is supported on the body 10 and encloses the motor 14 and handle bracket 24.

The cord take-up embodied in the suction cleaner comprises a cord controlling or feeding means 28 on the cleaner handle 22 and a cord container 29. The cord container 29 comprises a bottom section 30 and an upper section 31, the latter having an annular side wall 32 and a top

wall 33 from which upwardly projects a centrally disposed conical section 34 having a cord opening 35 at its upper end. Disposed within the container 29 is a member 36 of conical configuration having its lower peripheral wall 37 spaced from the side wall 32 to form therewith an annular cord storage chamber 38, and having its conical portion 39 spaced from the conical portion 34 of the upper casing section 31 to form therewith an annular space 40 through which the cord 41 travels into and out of the cord storage chamber 38. The lower end of the cord 41 extends through an opening 42 in the bottom casing section 30 of the container 29 and is rigidly attached to the exterior thereof by a clamp 43. Mounted on the top wall 33 of the cord container is the handle bracket 24 which has a pair of spaced arms 44 to pivotally support the handle 22 adjacent the cord opening 35 in the cord storage container 29.

The cord controlling or feeding device 28 functions to removably store the cord 41 in the container 29 and comprises a casing 45, one portion of which has a rear wall 46 and an annular wall 47 defining a chamber 48 which is closed by a cover plate 49 removably attached to the casing side wall 47 by screws 50. A hollow tube 51 extends through the casing 45 and its opposite ends are disposed in the casing side wall 47, whereby the cord 41 may travel through the tube 51. Diametrically opposed portions of the hollow tube 51 are cut away as at 54 and 55 to expose the cord 41 as it travels through the tube.

A relatively large friction wheel 56 is mounted on a shaft 57 journaled in the casing 45, and is rotated by a crank 58 attached to the shaft 57. The periphery of the wheel 56 is provided with a friction material 59 which engages that portion of the cord exposed in the opening 54 in the tube 51. A relatively small friction wheel 60 is journaled on a shaft 61 carried by a bracket 62 having one end 63 pivotally supported on the casing side wall 47, and the wheel 60 is forced into engagement with the cord exposed in the opening 55 by means of the spring 64 interposed between the opposite end 65 of the bracket 62 and the casing side wall 47. The opposite ends of the shaft 61 slide in adjacent elongated depressions 66, 66 in the casing 45 when the bracket 62 moves on its pivot, and the opening 67 in the bracket 62 is elongated to accommodate any translatory movement of the shaft 61 in the depressions 66, 66. The cord feeding means 28 is rigidly attached to the upper end of the handle 22 by means of rivets 68. A flexible conduit 69 extends from

the tube 51 to the opening 35 at the top of the conical section 34 of the cord storage container to guide the cord 41 between the cord feeding means and the cord storage container. Current is supplied to the motor 14 by means of the cord 41, the lower ends 70 of which are attached to leads 71 and 72 extending to the motor and an unshown switch in the handle 22.

In the operation of the cleaner, the crank 58 is rotated in clockwise direction, as viewed in Figure 1, and causes the wheels 56 and 60 to rotate and exert a force longitudinally along the cord 41 to uncoil the latter from the storage chamber 38, and as it does so the cord moves upwardly and circumferentially in the annular passageway 40 about the conical member 39. If it is desired to store the cord, the crank 58 is rotated in counterclockwise direction, as viewed in Figure 1, which causes the friction wheels 56 and 60 to move the cord downwardly through the flexible conduit 69. As the cord is stored, it moves downwardly and circumferentially about the conical member 39 and is coiled, as indicated in Figure 2. Due to the relative stiffness of the cord 41 and the longitudinal force exerted on the cord by the wheels 56 and 60, the cord is placed under a compression force which moves the cord radially outwardly from the member 36 and forms in horizontal coils along the outer peripheral wall 32 of the storage chamber 38 and remains in coils unsupported by the member 36. During rotation of the crank 58, the wheel 60 is rotated by movement of the cord 41 in the tube 51 and the spring 64 exerts a force on the wheel 60 whereby the latter urges the cord into frictional engagement against the feed wheel 56 with uniform pressure.

Another embodiment of the invention is disclosed in Figure 4 and comprises a suction cleaner having a body 75 provided with a nozzle 76 communicating with a vertical fan chamber 78 in which is an unshown fan for exhausting dirt-laden air into a dust bag 79. The cleaner body is mounted on wheels 80 and is propelled over the surface to be cleaned by a handle 81 supported in a bail 82 pivotally mounted at 83 to the cleaner body. A horizontally mounted motor is enclosed in a housing 84 disposed within and spaced from the rearwardly extending body portion 85 and extends rearwardly from the fan chamber 78.

The body portion 85 is formed in two removable sections 86 and 87, and the rear wall 88 of the latter is provided with a rearwardly extending conical section 89 having a cord opening 90 at its extreme end. The motor housing 84 is provided with a rearwardly extending conical section 91 spaced from the conical portion 89 of the body section 87 to form therewith an annular space 92 through which the cord 41 travels. An annular partition 93 extends from the motor housing 84 to the inner periphery of the body section 87 and forms therewith and with the housing 84, an annular cord storage chamber 94.

The cord controlling means for feeding the cord 41 with respect to the cord storage chamber 94 is similar to that shown in Figure 3 and is mounted at the upper end of the handle 81.

In operation of the cleaner, the crank 58 is rotated in one direction to rotate the friction wheels 56 and 60 whereby the cord is fed into the cord chamber 94, and causes the cord 41 to form in vertical coils about the motor housing 84. Due to the relative stiffness of the cord 41 and the pressure exerted at all times longitudinally

along the cord 41 by the friction wheels 56 and 60, the cord is placed under compression and travels circumferentially in the annular passageway 92 to form in coils along the outer peripheral wall of the body section 87 and remains spaced from the motor housing 84 whereby the cord will not tangle in the cord storage chamber 94. When the crank 58 is rotated in the opposite direction to pay out the cord, the latter is always under the longitudinal pressure set up therein by the friction wheels 56 and 60 and will uncoil without collapsing.

A further embodiment of the invention is shown in Figure 5 and comprises a conventional cylinder type suction cleaner having a body formed in two sections 96 and 97. In one end of the body section 96 is a hose 98 provided with an unshown floor engaging nozzle, and the opposite end of the body section 96 has a radial wall 99 from which rearwardly projects a conical section 100 terminating in a tubular member 101. Arranged in the body section 96 is an unshown dirt bag, suction creating fan, and a horizontal motor enclosed in a housing 102 which is spaced from the peripheral wall 103 of the body section 96 to form an annular discharge air passageway 104. The rear end of the motor housing 102 has a conical section 105 spaced from the conical section 100 and forms with the latter an annular space 106 in which the cord 41 travels. A partition 107 is arranged between the body wall 103 and the motor housing 102 to form therewith an annular cord storage chamber 108 for the cord 41.

The body portion 97 is provided at its extreme end with a re-entrant tubular member 109 spaced from the end of the tubular member 101 to form a space 110 in which the cord 41 is exposed. Arranged in the body portion 97 is a cord controlling device 111 for feeding the cord to and from the storage chamber 108. The cord feeding device comprises a relatively large friction wheel 112 rotatably mounted in the side walls of the body section 97 and is rotated by a crank 113. The periphery of the wheel 112 is provided with a friction material which engages that portion of the cord which is exposed in the space 110. A relatively small friction wheel 114 is arranged diametrically opposite the large wheel 112 and is journaled on a bracket 115 pivotally supported on the wall 116 of the body portion 97. A torsion spring 117 at all times urges the wheel 114 into contact with the cord exposed in the space 110 and forces the cord into frictional engagement with the large wheel 112.

When the motor is operating, the dirt is removed from the surface being cleaned and passes through the hose 98 into the dirt filtering bag within the body portion 96 and thereafter the air is expelled through the openings 119 and 120 in the partition 107 and body rear wall 99 respectively, and is discharged into the atmosphere through an opening 121 in the rear wall of the body section 97.

In operation of the suction cleaner, the cord 41 is removed from the storage chamber 108 by rotating the crank 113 which rotates the friction wheels 112 and 114, whereby the latter exert a force longitudinally along the cord in a direction away from the cleaner without causing the coils 122 to collapse about the member 105. After the cleaning operation is completed, the crank 113 is rotated in the reverse direction causing the friction wheels 112 and 114 to exert a force longitudinally along the cord 41 to force the latter

into the storage chamber 108. Due to the relative stiffness of the cord 41 and the longitudinal force exerted by the friction wheels 112 and 114, the cord is placed under compression and travels circumferentially in the annular passageway 106 to form the coils 122 along the outer peripheral wall of the storage chamber 108 and remains unsupported by the member 105.

From the foregoing it will be perceived that the corn take-up comprises a cord feeding and storage device which may be combined as a unit or separately arranged in different locations on the cleaner, that the cord storage means is non-rotatable and that the cord feeding means function to exert a longitudinal force on the cord whereby the latter remains in coils in the storage chamber without the necessity of a center support.

I claim:

1. A suction cleaner, comprising an ambulatory body, a motor on said body, an electric cord connected to said motor, a housing for said motor, said motor housing being spaced from walls of said body to form a reelless stationary cord storage chamber, and means for feeding a cord about said motor housing into said storage chamber.

2. A suction cleaner, comprising an ambulatory body, a motor on said body, an electric cord connected to said motor, a housing for said motor, said motor housing being spaced from walls of said body to form a cord storage chamber, and rotatable cord feeding means formed in said cleaner body including means for guiding the cord to said storage chamber, said feeding means engaging the cord to impart movement to the cord to coil the latter about said motor housing in said storage chamber.

3. A suction cleaner, comprising an ambulatory body, a motor on said body, an electric cord connected to said motor, a housing for said motor, said motor housing being spaced from walls of said body to form a cord storage chamber, a handle pivotally mounted on said body, and cord feeding means mounted on said handle, said feed-

ing means engaging the cord to impart movement thereto to coil the cord about said motor housing in said storage chamber.

4. A suction cleaner, comprising an ambulatory cleaner body, a motor on said body, an electric cord connected to said motor, a non-rotatable casing on said body and having a cord storage section and a projecting cord entrance casing section having an annular interior surface and an aperture for said cord, said cord arranged in said casing and passing through said aperture, and means engaging said cord exteriorly of said casing for feeding said cord through said aperture and circumferentially along the interior of said stationary projecting casing section during the linear travel of said cord to form said cord in coils which press radially outwardly against the inner periphery of said storage casing section.

5. A suction cleaner, comprising an ambulatory cleaner body, a motor on said body, an electric cord connected to said motor, a handle pivotally connected to said body, a non-rotatable cord storage casing on said body and having an annular space for movement of said cord circumferentially in said annular space during linear movement of said cord, and cord-feeding means on said handle, said feeding means engaging said cord for feeding said cord circumferentially in said annular space in said stationary cord storage casing during linear travel of said cord into said casing to form said cord in coils in said casing.

6. A suction cleaner, comprising an ambulatory body, a motor on said body, an electric cord connected to said motor, a casing concentric with said motor to form a stationary cord storage chamber and an annular space therebetween for circumferential travel of said cord in said annular space, and means engaging said cord to impart linear movement thereto to move said cord circumferentially in said annular space during linear travel of said cord to form the latter in coils in said casing.

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