

July 22, 1941.

E. R. SWANN

2,250,282

SUCTION CLEANER

Filed Nov. 17, 1938

2 Sheets-Sheet 1

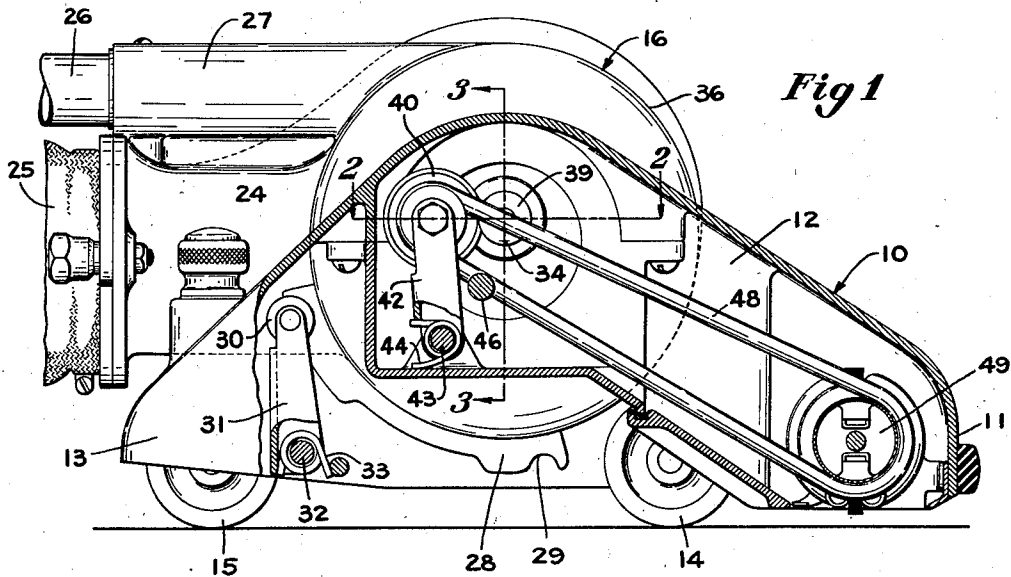
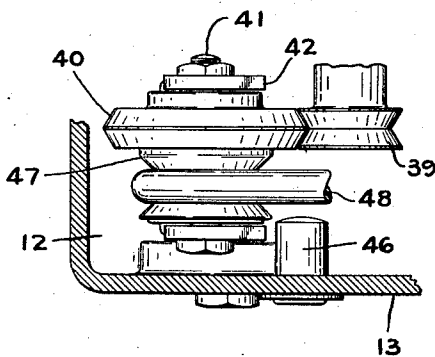


Fig. 2

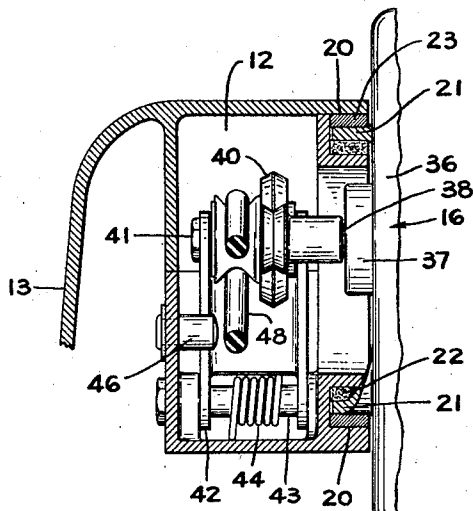


Fig. 3

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2 Sheets-Sheet 2

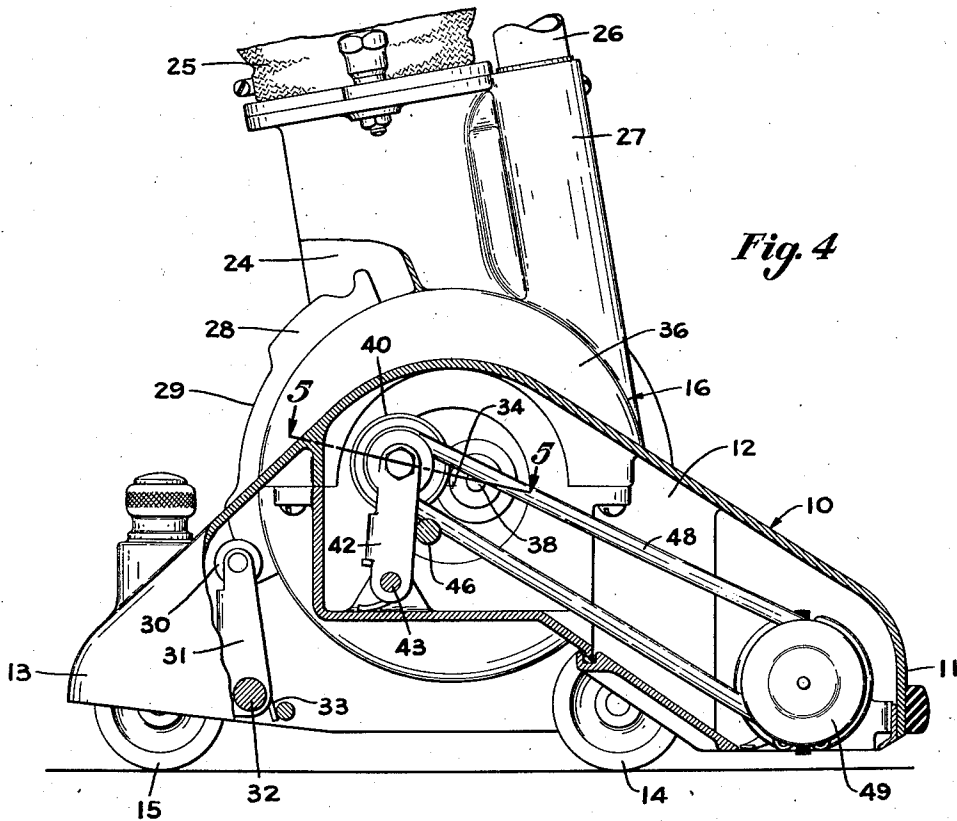


Fig. 4

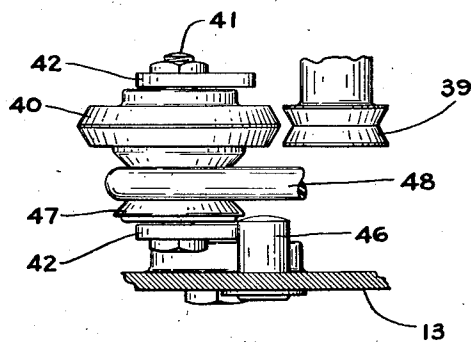


Fig. 5

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SUCTION CLEANER

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6 Claims. (Cl. 15—9)

The present invention relates to suction cleaners in general, and particularly to power-transmission means in suction cleaners. More particularly the invention comprises a suction cleaner in which the surface covering agitator can be completely disconnected from the driving motor.

It is an object of the invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved power-transmission means in a suction cleaner. A further object is to render the agitator inoperative when the cleaner is used for off-the-floor cleaning. Another object is to provide a suction cleaner in which the driving motor is moved about an eccentric to disconnect the driving pulley upon movement of the cleaner handle to storage position to thereby render the agitator inoperative. Another object is to provide a suction cleaner in which the driven pulley connected to the cleaner agitator by a belt is shifted to reduce the tension on the cleaner belt when the handle is in storage position. These and other more specific objects of the invention will appear upon reading the specification and referring to the drawings, in which:

Figure 1 is a side elevation of a suction cleaner showing the cleaner handle in one operative position, and parts of the casing broken away to show the power-transmission mechanism;

Figure 2 is an enlarged section along the line 2—2 of Figure 1;

Figure 3 is an enlarged section along the line 3—3 of Figure 1;

Figure 4 is a view similar to Figure 1 showing the cleaner handle in upright position, the drive and driven pulleys being out of engagement to disconnect the cleaner agitator, and

Figure 5 is an enlarged section along the line 5—5 of Figure 4.

One embodiment of the invention is shown in a cleaner having an ambulatory nozzle unit which pivotally carries a motor-fan-handle-bag unit, commonly referred to as the motor-fan unit. The nozzle unit 10 comprises a transversely extending nozzle 11 from the opposite ends of which passageways extend rearwardly and upwardly along opposite sides of the cleaner. One of the passageways 12 is a belt channel and the other, not shown, is an air passageway leading to a suction creating fan, not shown. The nozzle unit has a marginal depending wall 13 to conceal the front and rear wheels 14 and 15 respectively.

In order to rotatably mount the motor-fan unit 16 on the nozzle unit 10, the latter is provided with an annular recess 20 which rotatively re-

ceives an annular rib 21 on the motor-fan unit, suitable sealing means 22 and bronze bearing means 23 being disposed in the recess 20 to provide an air tight seal between the relatively movable parts. The opposite side of the cleaner, not shown, is provided with an identical bearing construction whereby the motor-fan unit 16 is rotatably supported at its opposite ends in the nozzle unit 10. The motor-fan unit includes a fan chamber which communicates with the air passageway, not shown, and with an exhaust passageway 24 to which is removably secured a dirt filter bag 25, the upper end of which is secured to a handle 26 having its lower end disposed in a socket 27 forming part of the motor-fan unit 16.

The handle is retained in various operative positions by handle controlling means comprising an arcuate sector 28 carried by the motor-fan unit 16 and having detent seats 29 with which cooperates a roller detent 30 pivotally carried by an arm 31 rotatably mounted on a shaft 32 and is held in contact with the sector by a torsion spring 33. Thus upon manipulating the handle 26 the entire motor-fan unit is rotated in the nozzle unit about a horizontal axis indicated at 34 for movement to one of the on-the-floor cleaning positions shown in Figure 1 and to the storage or off-the-floor cleaning position shown in Figure 4.

The motor-fan unit includes a motor housing 36 which supports a horizontally arranged motor 37 having its armature shaft 38 arranged eccentrically with respect to the axis of rotation 34 of the motor-fan unit. A drive pulley 39 is rigidly attached to the armature shaft 38, and adapted to frictionally engage the latter is a driven pulley 40 rigidly mounted on a shaft 41 which is rotatably supported on a U-shaped arm 42 pivotally supported at its lower end on a shaft 43 carried by the nozzle unit 10 in the belt chamber 12. Also rigidly carried by the shaft 41 is a reduction pulley 47 which accommodates a relatively resilient belt 48 extending in the belt channel 12 to an agitator 49 rotatably mounted in the mouth of the nozzle 11. A spring 44 operates at all times to urge the arm 42 toward the agitator to move the driven pulley 40 into engagement with the drive pulley 39. A pin or stop 46 is rigidly secured in the nozzle unit 10 to limit forward movement of the driven pulleys 40 and 47 towards the agitator 49.

In operating the cleaner for on-the-floor cleaning the handle 26 is usually manipulated through an operating range from the low position shown

in Figure 1 upwardly to about an angle of 65°. Upon movement of the handle through this operating range the motor-fan unit 16 is rotated about its axis of rotation 34, and the motor shaft 38 and drive pulley 39 are bodily moved eccentrically about the axis of rotation 34 forwardly towards the agitator 49. During this forward movement the spring 44 urges the driven pulleys 40 and 47 forwardly to maintain the pulley 40 in frictional engagement with the drive pulley 39 to thereby rotate the driven pulleys and thus the agitator. The resiliency of the belt is such that the reduction in the distance between the centers of the belt pulley 47 and the agitator 49 does not render the agitator inoperative. At the same time the suction fan functions to draw dirt-laden air into nozzle and through the air passageway, not shown, into the fan chamber, not shown and is then discharged through the exhaust 24 into the bag 25.

When it is desired to employ the cleaner for off-the-floor cleaning the handle 26 and motor-fan unit 16 are rotated about the axis of rotation 34 causing the drive pulley 39 to be bodily moved eccentrically with respect to the axis of rotation 34, to the position shown in Figures 4 and 5. During this movement the spring 44 urges the driven pulleys toward the agitator 49 and maintains the driven pulley 40 in operative engagement with the drive pulley 39 until the arm 42 engages the stop 46, which prevents further forward movement of the driven pulleys. Further forward rotation of the handle 26 causes the drive pulley 39 to move out of engagement with the driven pulley 40, as is best shown in Figure 5, to render the agitator inoperative. When the handle is in this position suitable dusting tools may be connected to the eye of the fan, not shown, for off-the-floor cleaning.

To reconvert the cleaner to on-the-floor cleaning the handle is rotated rearwardly which bodily moves the drive pulley 39 eccentrically with respect to the axis of rotation 34 into operative engagement with the driven pulley 40 to thereby render the agitator operative.

It will be perceived that when the handle 26 is in storage or off-the-floor cleaning position the tension on the belt 48 is reduced to thereby prolong its useful life, and since the agitator is rendered inoperative during off-the-floor cleaning it is not necessary to raise the agitator out of engagement with the floor covering when using the dusting tools.

I claim:

1. In a suction cleaner, a nozzle unit, a motor-fan unit rotatably mounted on said nozzle unit, a motor carried by said motor-fan unit and eccentrically mounted with respect to the axis of rotation of said motor-fan unit, a drive pulley carried by the motor shaft, driven pulley means pivotally carried by said nozzle unit, means for urging said driven pulley means into engagement with said drive pulley, surface agitating means, a belt connecting said driven pulley means and surface agitating means, a handle on said motor-fan unit for moving the latter about its axis with respect to said nozzle unit during on-the-floor cleaning and for moving said unit to a position for off-the-floor cleaning, said eccentric arrangement of said drive pulley being so arranged with respect to said driven pulley means as to tend to move out of engagement from the latter upon movement of the motor-fan unit to off-the-floor cleaning position, and means to limit movement of said driven means to disengage

the latter from said drive pulley upon movement of said motor-fan unit to said off-the-floor cleaning position to thereby render said surface agitating means inoperative.

2. In a suction cleaner, a nozzle unit, a motor-handle unit oscillatably mounted on the nozzle unit, a handle rigidly carried by said motor-handle unit for oscillating the latter during movement of said cleaner over the floor surface being cleaned and for moving said unit to off-the-floor cleaning position, a motor in said motor-handle unit and having its shaft eccentric with respect to the axis of rotation of said motor-handle unit, drive means on said shaft, driven means pivotally mounted on said nozzle unit, means urging said driven means into engagement with said drive means, surface agitating means in said nozzle unit, a belt connecting said driven means and surface agitating means, movement of said handle to said off-the-floor cleaning position causing said drive means to be moved about its eccentric axis and out of engagement with said driven means to render said agitating means inoperative and means for holding said driven means out of engagement with said drive means when the latter is disengaged from said driven means.

3. In a suction cleaner, a body, a casing rotatably mounted on said body, motor-drive means carried by said casing and movable about an axis eccentric with respect to the axis of rotation of said casing, a handle rigidly carried by said casing for oscillating the latter about its axis of rotation during normal on-the-floor cleaning and movable to an inoperative floor cleaning position, driven means carried by said body and in engagement with said motor-drive means during said on-the-floor cleaning, surface agitating means in said body, a belt connected to said driven means and to said surface agitating means, movement of said handle to said inoperative position causing said motor-drive means to move about the axis of rotation of said casing and out of engagement with said driven means to render said agitating means inoperative and means for holding said driven means out of engagement with said motor-drive means when the latter is disengaged from said driven means.

4. In a suction cleaner, a body, motor-drive means mounted for rotation on said body, driven means mounted on said body and normally in engagement with said motor-drive means, surface agitating means in said body, means connecting said driven means and said surface agitating means, a handle rigidly connected with respect to said motor-drive means for oscillating the latter about its axis of rotation during normal on-the-floor cleaning, said handle being movable to an inoperative floor cleaning position, movement of said handle to said inoperative position causing said motor drive means to move about its axis and out of engagement with said driven means to render said agitating means inoperative and means for holding said driven means out of engagement with said motor-drive means when the latter is disengaged from said driven means.

5. In a suction cleaner, a body, a nozzle in said body, surface agitating means in said nozzle, motor-drive means rotatably mounted on said body rearwardly of said nozzle, driven means carried by said body, said driven means being rearwardly of said drive means and engageable with the latter during on-the-floor cleaning, a belt connecting said driven and said surface agitating means, and a handle oscillatably mounted on said body

for movement with respect to the latter during normal on-the-floor cleaning, said handle having an inoperative floor cleaning position, said handle being rigidly mounted with respect to said motor-drive means for oscillating the latter about its axis during on-the-floor cleaning, and movement of said handle to said inoperative floor cleaning position causing said motor-drive means to move about its axis towards said agitating means and out of engagement with said driven means to render said surface agitating means inoperative and means for holding said driven means out of engagement with said motor-drive means when the latter is disengaged from said driven means.

6. In a suction cleaner, a body, surface agitating means in said body, motor-drive means

5 mounted on said body for bodily movement with respect thereto, driven means pivotally mounted on said body, means for moving said driven means into engagement with said motor-drive means, a belt connecting said driven means and agitating means, a handle connected to said motor-drive means for bodily moving the latter to an inoperative position out of engagement with said driven means to render said agitating means inoperative, and means for limiting movement of said driven means toward said motor-drive means to hold said driven means out of engagement with said motor-drive means when said handle bodily moves said motor-drive means to said inoperative position.

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