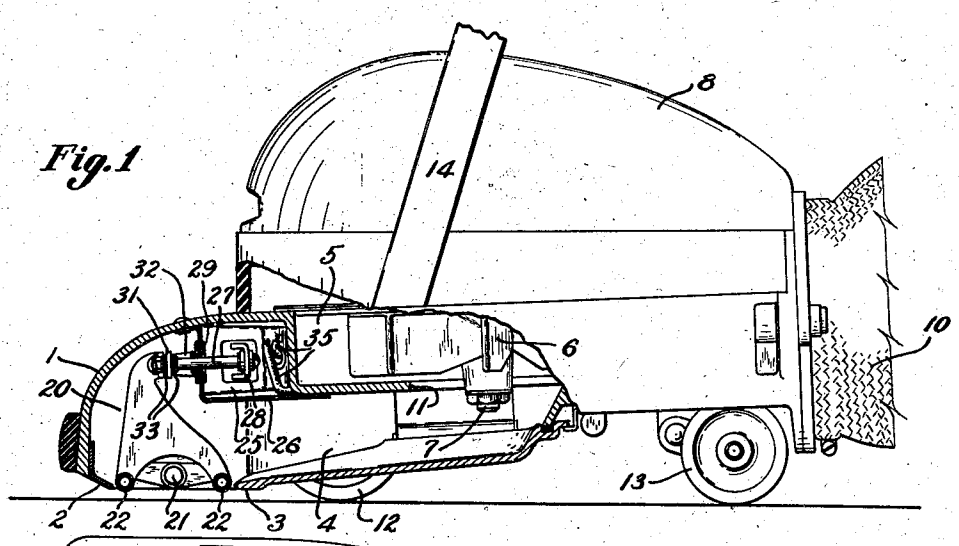
Oct. 15, 1940. H. L. SCHUG 2,218,180

SUCTION CLEANER

Filed April 14, 1938

Fig. 1



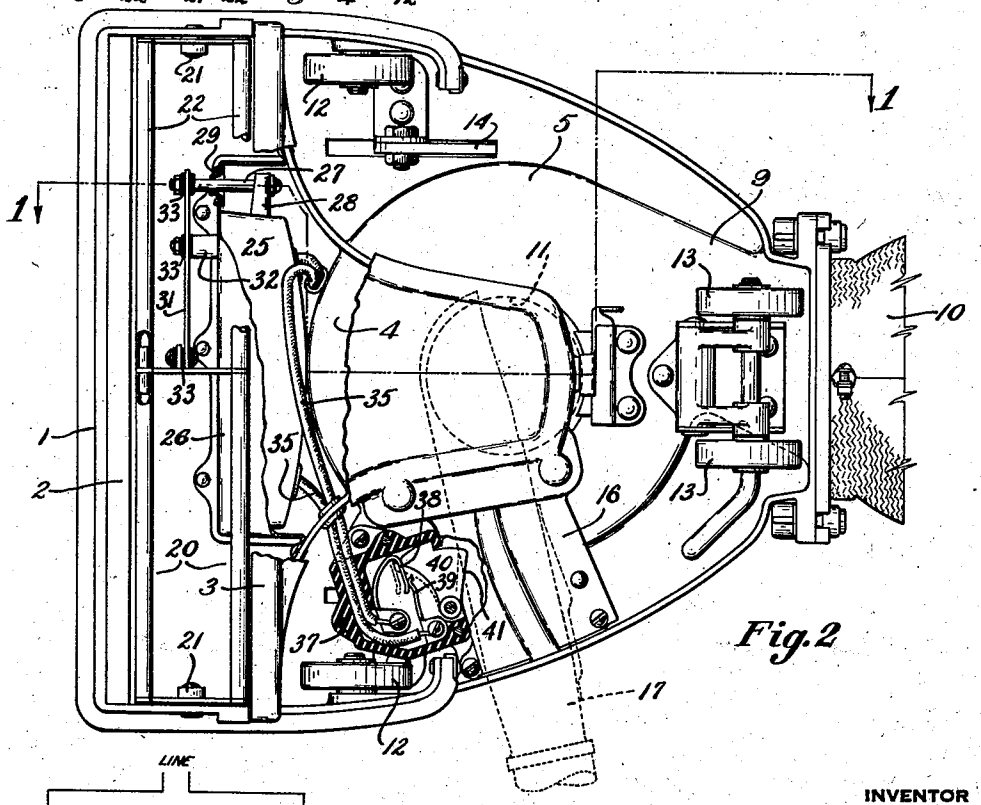


Fig. 2

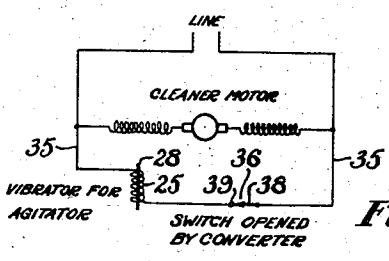


Fig. 3

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Patented Oct. 15, 1940 2,218,180

UNITED STATES PATENT OFFICE

2,218,180

SUCTION CLEANER

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Application April 14, 1938, Serial No. 201,965

4 Claims. (Cl. 15—8)

The present invention relates to suction cleaners in general and particularly to a new and novel cleaner in which the conversion of the cleaner from an on-the-floor unit to an off-the-floor unit automatically disconnects the agitator-driving means. More specifically the invention comprises a suction cleaner in which the surface-agitating means are actuated by a power unit separate from that which drives the suction-creating means of the cleaner, the cleaner circuit being so designed that the conversion of the machine to off-the-floor cleaning automatically disconnects the agitator-driving unit from the power source.

It is an object of the present invention to provide a new and improved suction cleaner. It is another object of the invention to provide a suction cleaner having new and improved surface-agitating means. A still further object of the invention is to provide a suction cleaner in which the conversion of the machine from an on-the-floor unit to an off-the-floor unit automatically disconnects the agitating means. A still further object of the invention is to provide a suction cleaner in which conversion of the machine from an on-the-floor unit to an off-the-floor unit automatically disconnects from the power source the separate driving means of the agitating unit. These and other more specific objects will appear upon reading the specification and claims and upon considering in connection therewith the attached drawing to which they relate.

The primary use of a suction cleaner is to clean floor coverings. A secondary use of suction cleaners is to clean articles and fixtures which are positioned above the floor. To enable the cleaner to perform this second function it is so designed that it is convertible from an on-the-floor unit to an off-the-floor unit by the connection thereto of dusting tools. When in off-the-floor use the normal surface-agitating means which function in on-the-floor cleaning serve no useful function. According to the present invention a separate driving unit is provided for the agitating means and the conversion of the machine to an off-the-floor unit automatically disconnects the agitator-driving unit from the source of electric power thereby rendering the agitating means inoperative.

Referring now to the drawing in which a preferred embodiment of the invention is disclosed:

Figure 1 is a side view of a suction cleaner embodying the present invention with certain parts broken away and shown in section on the line 1—1 of Figure 2;

Figure 2 is a bottom view of the cleaner illustrated in Figure 1 with certain parts broken away;

Figure 3 is a diagrammatic view of the electrical circuit of the cleaner illustrated in Figs. 1 and 2.

A modern suction cleaner is illustrated in the drawing and is seen to comprise a casing having a nozzle 1 which is formed with surface-contacting front and rear lips 2 and 3, respectively. The nozzle is interiorly connected by an air passageway 4 to a fan chamber 5 within which is positioned a suction-creating fan 6 carried upon the lower end of the motor shaft 7. The driving motor is unshown but is positioned within the motor casing 8 immediately above the fan chamber 5. An exhaust outlet 9 is open to the fan chamber and has connected to it a dirt filter bag 10 which is adapted to receive dirt-laden air exhausted through the outlet from the fan chamber and to filter the dirt therefrom permitting the clean air to escape into the surrounding atmosphere. The cleaner is movably supported upon front wheels 12, 12 and rear wheels 13, 13 while, as in the usual suction cleaner, a pivoted handle 14 is provided by which the operator may exert a propelling force. The air passageway 4 is provided at one side, and near the eye 11 of the fan chamber, with a converter seat 16 which is adapted to receive a removable dusting tool converter member 17 which connects to the eye 11 of the fan chamber when the machine is functioning as an off-the-floor cleaner. The precise relationship of the converter seat and converter is not the essence of the present invention except insofar as hereinafter explained.

Within the nozzle 1 is an agitator 20 pivotally mounted upon pivot pins 21, 21 and adapted to be reciprocated so that the agitating elements 22, 22 contact and beat a surface covering between the nozzle lips 2 and 3. Agitator 20 is actuated by an electrical vibrator 25 mounted within the nozzle in its casing 26 and through which a reciprocated rod 27, driven by the vibrating armature 28 of the vibrator, extends at an air-tight seal 29. Rod 27 connects within the nozzle proper to a pivoted lever 31 by means of a rubber flexible bushing, the lever itself being connected by such a bushing to its support 32 and to the agitator 20. These resilient, flexible bushing connections, indicated by the reference character 33, permit the lever 31 to have a limited pivotal movement about its support 32 under the actuation of the vibrator driven rod 27.

As is clearly illustrated diagrammatically in

Figure 3 the electrical vibrator 25 is connected by leads 35, 35 across the terminals of the cleaner motor and in series with a switch 36 which is adapted to open the vibrator circuit. This electrical switch is converter-actuated and is physically illustrated in Figure 2 in which it is seen that within the switch casing 37 of insulating material contacts 38 and 39 are normally in contact with each other under the resilient spring force of the contact 38. When in contact the circuit through the vibrator is closed and with the cleaner connected to the incoming power line, current passes through the vibrator. An actuator 40 is pivoted to the casing 37 and extends within the converter seat 16 with a cam surface 41 so positioned that the insertion of the converter 17 functions to force the actuator 40 inwardly into the casing 37 to move the resilient contact 38 from the contact 39. This inner position of the actuator 40 is illustrated in dotted lines in Figure 2, as is the open position of contact 38. In this dotted line position no current flows through the vibrator and the agitator remains inactive.

In the operation of the cleaner constructed in accordance with the present invention in on-the-floor cleaning the suction-creating fan 6 is rotated by the unshown driving motor and is effective to create a reduced pressure within the nozzle which lifts against the surface-contacting lips 2 and 3 the surface covering undergoing cleaning. Cleaning air is drawn under the lips, passes through the air passageway and fan chamber to be exhausted from the outlet 9 into the filter bag 10. Electrical current passes through the vibrator 25, the armature 28 of which reciprocates to pivot the lever 31 which in turn causes the agitator 20 to pivot about the pin 21 and the beater elements 22, 22 to vibrate in contact with the lifted surface covering. As long as the machine remains in on-the-floor cleaning relationship the machine functions as described. Upon conversion to off-the-floor cleaning, however, the insertion of the converter 17 into its seat 16 causes the actuator 40 to be forced inwardly into the switch casing 37 resulting in the opening of the switch contacts 38 and 39 and the disconnection of the vibrator 25 from the current source. Thereafter the agitator 20 remains inactive and the cleaner motor alone is energized. This result is desirable as in off-the-floor cleaning the surface-agitating means accomplish no useful function.

I claim:

1. In a suction cleaner adapted for on-the-floor and for off-the-floor cleaning and having means adapted to receive and seat a dusting tool, a suction-creating fan, a driving motor therefor, an agitator, independent electrical driving means therefor, and means in the electrical circuit of said independent driving means responsive to the seating of a dusting tool on said cleaner to convert said cleaner from an on-the-floor unit to an off-the-floor unit to disconnect electrically the driving means for said agitator.

2. In a suction cleaner adapted for on-the-floor and for off-the-floor cleaning, a suction-creating fan, a driving motor therefor, a nozzle connected to said fan, an agitator in said nozzle, independent electrical driving means for said agitator, and means operative upon the closing of said nozzle to said fan to open the circuit of said independent driving means.

3. In a suction cleaner, suction-creating means adapted to be connected to an on-the-floor cleaning passageway or to an off-the-floor cleaning passageway, a surface agitator adapted to contact a surface covering simultaneously with said on-the-floor cleaning passageway, an electrical vibrator connected to said agitator, a switch in the circuit of said vibrator, and means to open said switch to disconnect said vibrator upon connection of an off-the-floor cleaning passageway to said suction-creating means.

4. In a suction cleaner, a body having a nozzle and a fan chamber, a fan in said chamber, an electric motor to drive said fan, a reciprocating agitator in said nozzle, an electric vibrator having its reciprocating element connected to said agitator, a dusting tool seat adapted to receive a dusting tool to be connected to said fan chamber, a switch in the circuit of said vibrator, an actuator adapted to be contacted by a dusting tool inserted in said seat and to open said switch to render said agitator inoperative.

HOWARD L. SCHUG.