

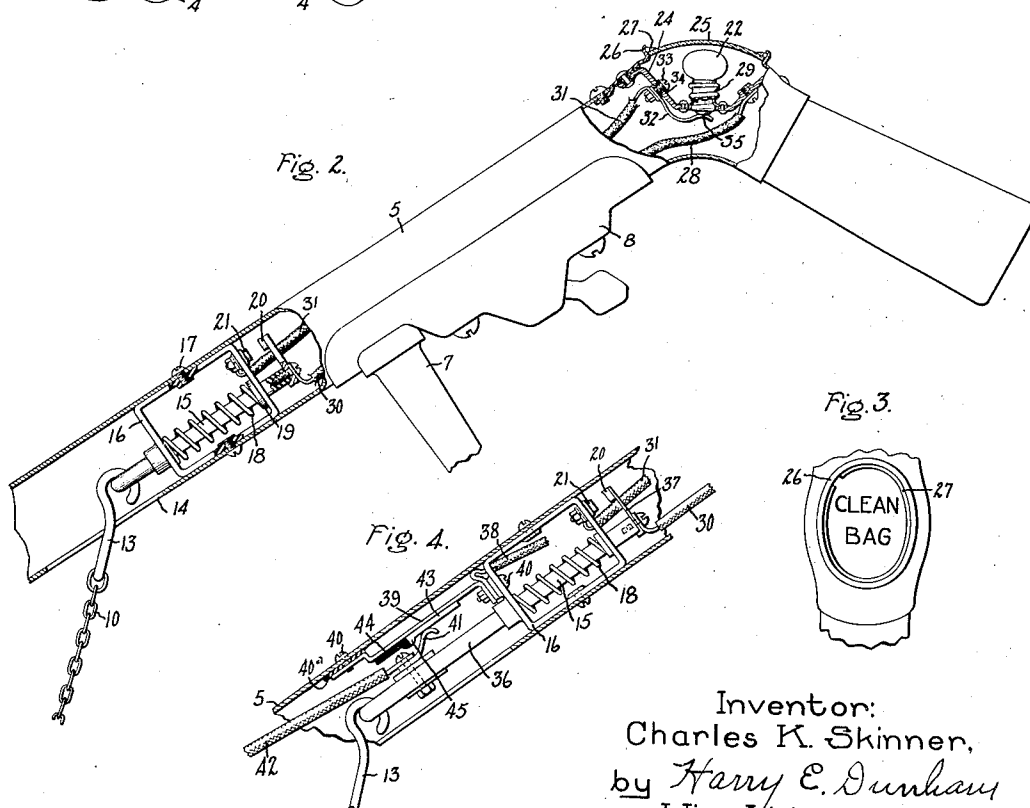
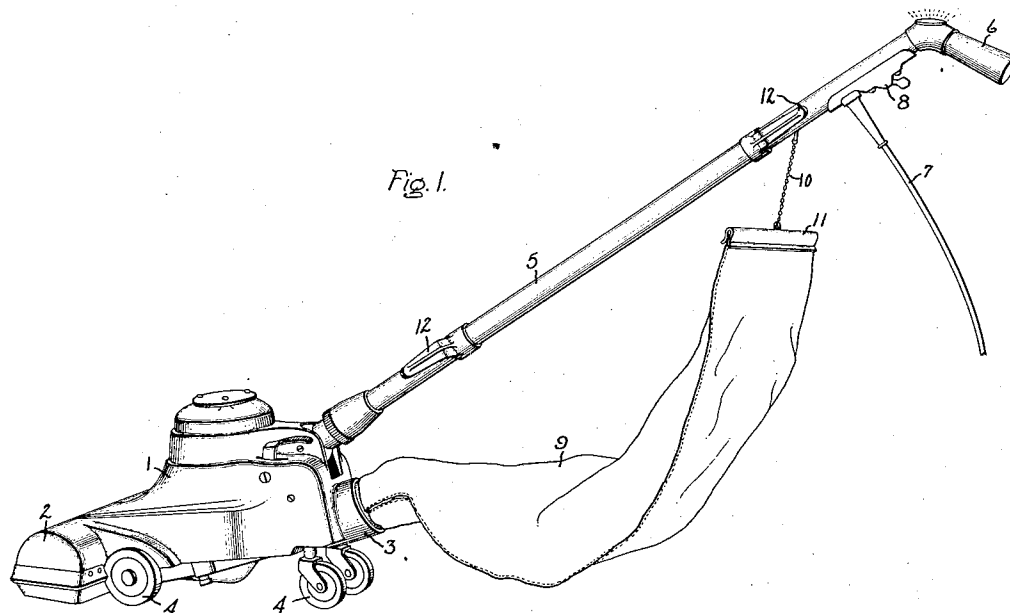
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VACUUM CLEANER

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VACUUM CLEANER

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5 Claims. (Cl. 177—311)

My invention relates to vacuum or suction cleaners for household use.

An object of my invention is to provide a signal device which will indicate the amount of dirt contained in the bag so that the operator may know when it is necessary to clean the bag.

Another object of my invention is to provide a control device for a vacuum cleaner which will prevent operation of the cleaner when the cleaner bag contains a predetermined amount of dirt.

In the accompanying drawing, Fig. 1 is a perspective view of a vacuum cleaner embodying my invention; Fig. 2 is a fragmentary sectional view through the handle of the cleaner showing the signal device for indicating the amount of dirt in the bag of the cleaner; Fig. 3 is a plan view of the signal device; and Fig. 4 is a sectional view of the control device for preventing operation of the cleaner when the bag contains a predetermined amount of dirt.

Referring to the drawing, the vacuum cleaner is contained in a casing 1 having a suction nozzle 2, a discharge conduit 3, and front and rear supporting wheels 4. A tubular handle 5 is pivotally connected at one end to the casing and has a grip 6 at the other end for the operator. The power supply for the vacuum cleaner is fed through a two-conductor cord 7 to a control switch 8 mounted on the handle adjacent the grip. From the switch 8, the conductors are led through the handle to an electric motor which is mounted within the cleaner casing 1. The electric motor drives a fan mounted within the casing and creates a suction at the suction nozzle 2 which draws dirt through the suction nozzle 2 into a bag 9 connected to the discharge conduit. The bag is made of porous material, such as a textile and filters the air discharged through the discharge conduit so that the dirt remains in the bag. The bag is supported from the handle by a chain 10 which is attached to a metal clip 11 on the upper end of the bag. Hooks 12 are provided on the handle on which the cord 7 may be coiled when the vacuum cleaner is not in use.

The upper end of the chain 10 which supports the bag from the handle is provided with a hook 13 which passes through an opening 14 in the under side of the handle and is hooked into an eye formed in the end of a plunger 15. The plunger is slidably carried in a frame 16 secured inside the handle by screws 17. A spring 18 between the lower end of the frame 16 and a collar 19 on the plunger biases the plunger toward the upper end of the frame. The plunger 15 extends

through the upper end of the frame and the extended end carries a contact 20 which is adapted to engage a contact 21 on the upper end of the frame 16 when the plunger is moved downwardly against the force of the spring 18. The strength of the spring 18 is proportioned so that when the bag is clean, the collar 19 of the plunger is held against the upper end of the frame, and the contacts 20 and 21 are spaced apart as shown in Fig. 2. As the cleaner is used, dirt accumulates in the bag and the weight of the dirt causes the plunger 15 to be moved downwardly against the force of the spring 18 and to close the contacts 20 and 21. The closing of contacts 20 and 21 closes a circuit through a signal lamp 22 which is carried in a well 24 secured within the handle adjacent the grip 6. A glass 25 having a suitable legend thereon is held in place above the signal lamp in an opening 26 in the handle above the well 24 by a snap ring 27. The signal lamp when illuminated illuminates the legend on the glass 27 and calls the operator's attention to the fact that the bag should be cleaned. It is important that the operator be informed of this since the amount of dirt in the bag affects the suction developed at the suction nozzle 2 of the cleaner and also affects the efficiency of the bag in filtering the air forced through the bag. The signal lamp is placed adjacent the grip so that the lighting of the lamp readily attracts the attention of the operator.

The circuit for controlling the signal lamp will now be described. One of the conductors from the power supply is connected to a conductor 28 which is connected to the well 24 and conducts electricity to one side of the lamp through a socket 29 secured to the well. The lamp 22 is screwed into the socket. The conductor from the other side of the line is connected to conductor 30 which is connected to contact 20. A conductor 31 leads from contact 21 to a spring contact 32 which is secured to the well 24 by a bolt 33 and is insulated from the well 24 by an insulating bushing 34. The end of the spring clip 32 bears on a terminal 35 on the lower end of the lamp 22 and conducts current to the other side of the lamp. When the contacts 20 and 21 are closed by the weight of the dirt in the cleaner bag, the contacts 20 and 21 close a circuit from the power supply through the indicating lamp 22 and indicate to the operator that the dirt in the bag should be emptied.

In Fig. 4, I have shown a fragmentary view of a modification of the signal device illustrated in

Fig. 2 which will deenergize the electric motor and prevent further operation of the vacuum cleaner if the operator disregards the signal and does not clean the bag. In this modification, the plunger 15 is provided with an extended shank 36 which extends below the lower end of the frame 16 and has an eye at the lower end in which the hook 13 for supporting the cleaner bag is placed. The weight of the dirt in the cleaner bag causes the plunger 15 to be moved toward the lower wall of the frame 16, thereby causing contact 20 carried on a resilient member 37 attached to the upper end of the plunger 15 to engage the contact 21 carried on the upper side of the frame 16. This closes the circuit through the indicating lamp 22 in the same manner as the device shown in Fig. 2 and indicates to the operator that the bag should be cleaned. If the operator disregards this signal and does not clean the bag, additional dirt will be drawn into the cleaner bag and cause still further downward movement of the plunger 15 with respect to the frame 16. In the device illustrated in Fig. 4, this additional movement is used to open the circuit to the motor, thereby deenergizing the motor and preventing further operation of the cleaner.

In the arrangement shown in Fig. 4, conductor 38, which leads current to one side of the motor, is connected to a plate 39 which is supported on the inside of the handle 5 by screws 40. A sheet 40a of insulating material insulates the plate 39 from the handle. From the plate 39 the circuit to the motor passes through a resilient contact 41 attached to the shank 36 of the plunger 15 and through a conductor 42 extending from the contact 41 to one side of the motor. The circuit to the motor is completed by another conductor (not shown) which leads from the power supply to the other side of the motor. The surface of the plate 39 adjacent the contact 41 comprises a conducting portion 43 and an abutting insulated portion 44. The abutting ends of the conducting portion 43 and the insulated portion 44 are thickened to provide a projecting shoulder 45. When the bag contains enough dirt to cause the plunger 15 to be moved downwardly so that contacts 20 and 21 are closed, the contact 41 on the extended shank 36 of the plunger 15 is moved to a position on the conducting portion 43 of the plate 39 adjacent the projection 45. If the operator disregards the signal which is given by the closing of contacts 20 and 21 and continues to use the cleaner, a predetermined additional amount of dirt drawn into the bag will cause the plunger 15 to be moved still further downwardly against the force of spring 18 and will cause the contact 41 to ride over the projection 45 to the insulated portion 44 of the plate 39. This will open the circuit to the motor and deenergize the motor, thereby preventing further operation of the cleaner until the bag is cleaned.

The projection 45 causes the contact 41 to be moved to the insulated portion of the plate 39 with a snap action. The resilient member 37 which carries the contact 20 permits the plunger to be moved downwardly relative to the frame 16 in order to open the circuit of the motor and maintains the contacts 20 and 21 closed to indicate to the operator the reason for shutting down the cleaner. When the bag is cleaned, the spring 18 returns the contact 41 to the position shown in Fig. 4.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In a suction cleaner having a suction nozzle and means for creating a suction at the nozzle, a bag for receiving the dirt drawn through said nozzle, and means responsive to the weight of the bag and contents for indicating that the bag contains a predetermined quantity of dirt.

2. In a suction cleaner, a suction nozzle, means for creating a suction at the nozzle, a handle for the cleaner, a bag for receiving the dirt drawn through said nozzle, means for supporting the bag from the handle, and means connected to said supporting means and responsive to the weight of the bag and contents for indicating that the bag contains a predetermined quantity of dirt.

3. In a suction cleaner, a suction nozzle, means for creating a suction at the nozzle, a handle for the cleaner, a bag for receiving the dirt drawn through said nozzle, means for supporting the bag from the handle, a signal device, and weight responsive means including a switch connected to said supporting means for energizing said signal device when the bag contains a predetermined amount of dirt.

4. In a suction cleaner, a suction nozzle, a hollow handle for the cleaner having a grip portion for the operator, a bag for receiving dirt drawn through the nozzle, a switch mounted within the handle, bag supporting means connected to said switch including weight responsive means for operating the switch in response to the weight of the bag and contents, and an indicating device within the handle adjacent said grip and operated by said switch for indicating when the bag contains a predetermined amount of dirt.

5. In a suction cleaner, a suction nozzle, a hollow handle for the cleaner having a grip portion for the operator, a bag for receiving dirt drawn through the nozzle, a switch mounted within the handle, bag supporting means connected to said switch including weight responsive means for operating the switch in response to the weight of the bag and contents, an indicating lamp within said handle adjacent said grip, and wires within said handle extending from said switch to said lamp whereby the lamp may be operated by the switch to indicate when the bag contains a predetermined amount of dirt.

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