

July 7, 1936.

H. E. HOOVER

2,046,684

SUCTION CLEANER

Filed June 22, 1934

3 Sheets-Sheet 1

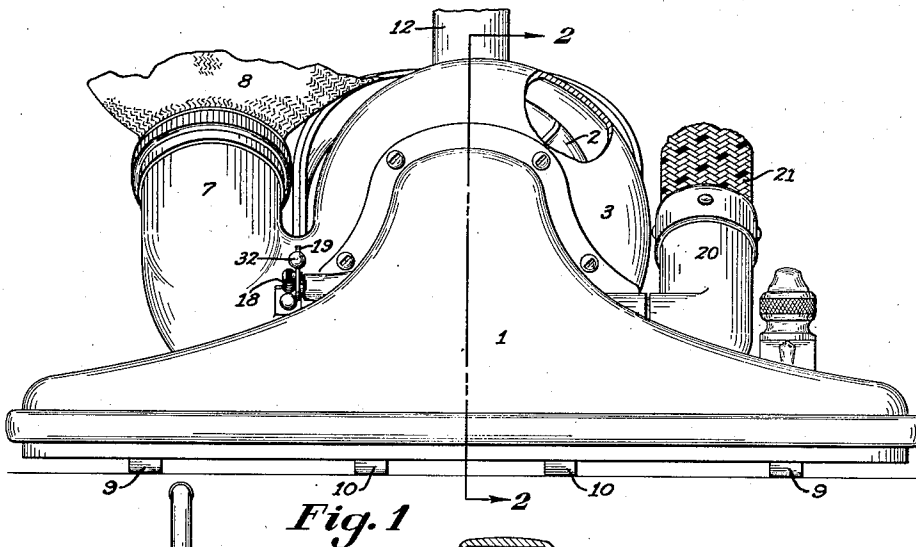


Fig. 1

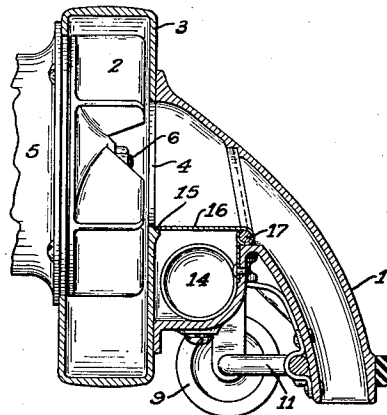


Fig. 2

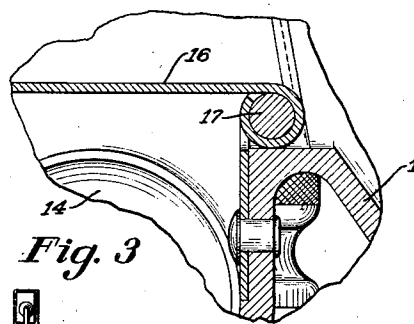


Fig. 3

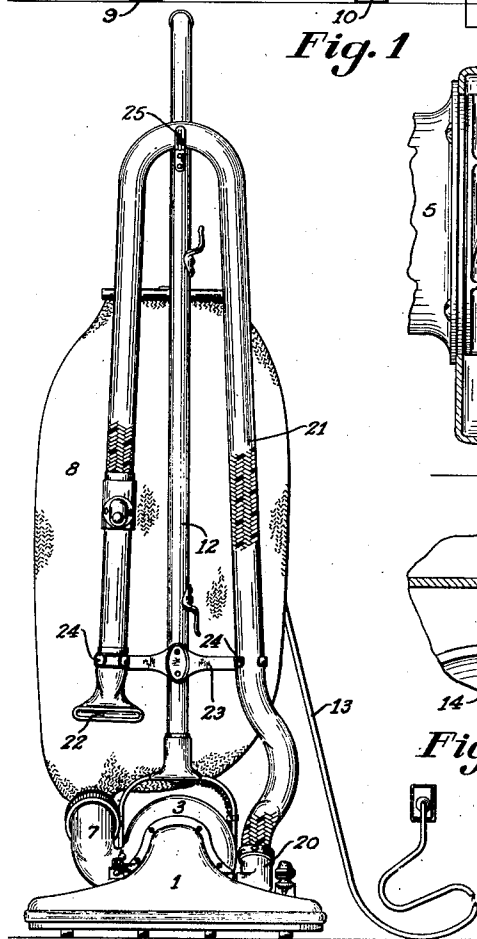


Fig. 4

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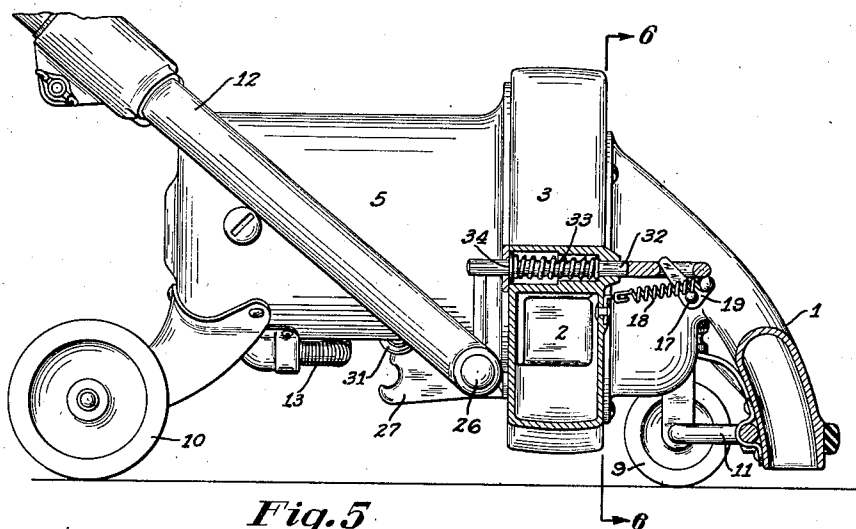


Fig. 5

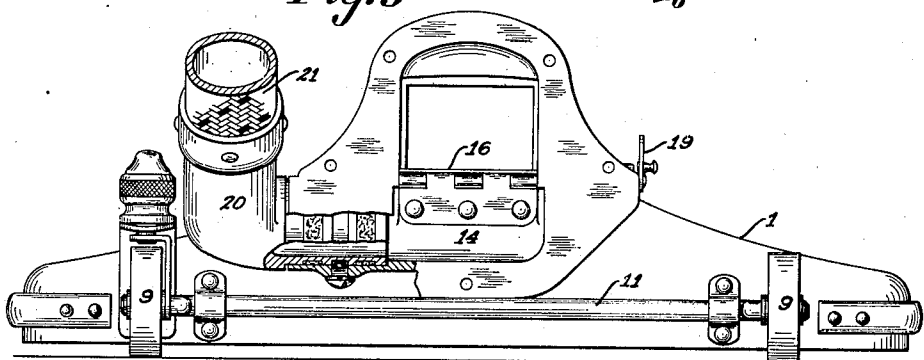


Fig. 6

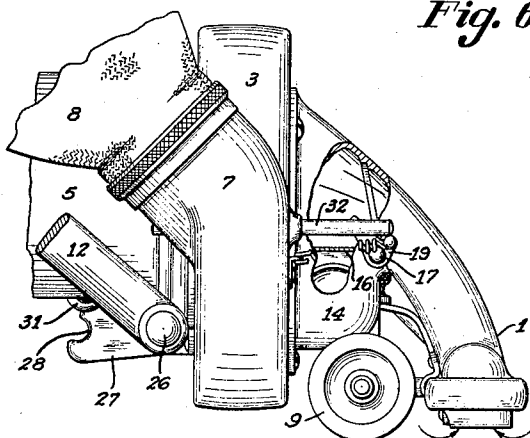


Fig. 7

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SUCTION CLEANER

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3 Sheets-Sheet 3

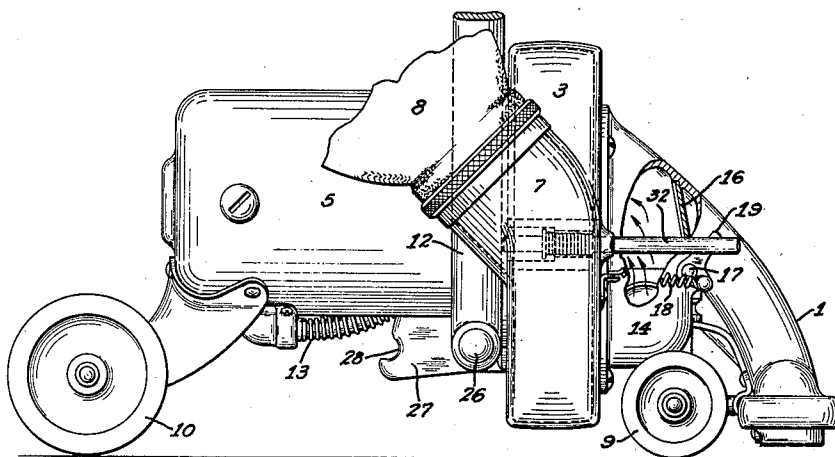


Fig. 8

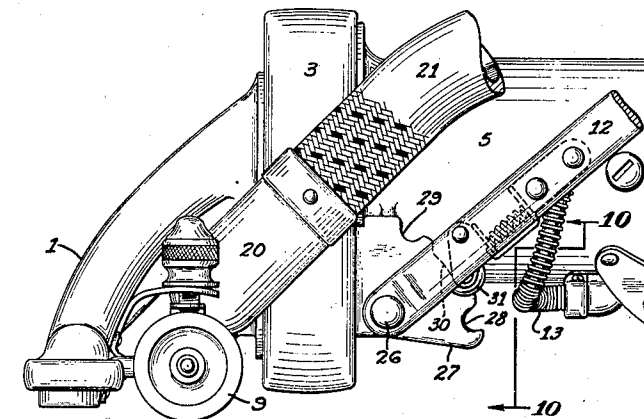


Fig. 9

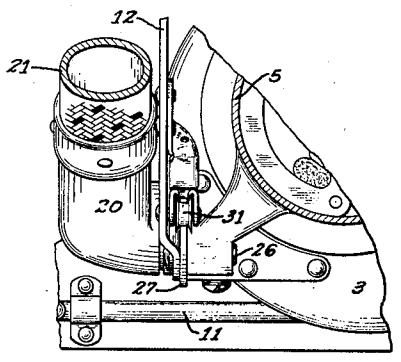


Fig. 10

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## UNITED STATES PATENT OFFICE

2,046,684

## SUCTION CLEANER

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Application June 22, 1934, Serial No. 731,809

## 10 Claims. (Cl. 15-9)

The present invention relates to suction cleaners in general, and particularly to new and novel means for converting a suction cleaner from a floor cleaning unit to an off-the-floor cleaning unit. More specifically the invention comprises a suction cleaner incorporating permanent valve means for converting the cleaner from an on-the-floor unit to an off-the-floor unit, the valve means being operated by the cleaner handle.

The modern suction cleaner is primarily designed to clean surface coverings. In order to increase its range of usefulness however, the cleaner is so constructed that it may be combined with dusting tools for the purpose of cleaning drapes etc., which are positioned above the supporting surface. Heretofore the efficient floor cleaning suction cleaner has required a relatively complicated manual mechanical change to accomplish the conversion. In the suction cleaner constructed in accordance with the present invention the alteration is a simple operation requiring no attachment or detachment of parts to the cleaner, the cleaner being capable of instantaneous conversion by simply moving the handle to a definite position.

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 in which dusting tools are permanently incorporated. It is another object of the invention to provide a suction cleaner in which a single valve accomplishes the conversion of the machine from an on-the-floor cleaner to an off-the-floor cleaner. A further object is the provision of a suction cleaner in which a single valve, which is controlled by the cleaner handle, accomplishes the conversion of the unit from an on-the-floor cleaner to an off-the-floor cleaner. These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings to which they relate:

In the drawings in which a preferred embodiment of the present invention is disclosed:

Figure 1 is a partial front elevation of a suction cleaner body constructed in accordance with the present invention;

Figure 2 is a section through the cleaner upon the line 2-2 of Fig. 1;

Figure 3 is an enlarged section showing the pivotal connection of the valve shown in Figure 2;

Figure 4 is a front view of the suction cleaner incorporating the present invention and shows the dusting tool hose carried by the cleaner handle;

Figure 5 is a side elevation of the suction

cleaner, certain parts being in section to show the valve actuating mechanism;

Figure 6 is a view upon the line 6-6 of Figure 5;

Figure 7 is a partial side view of the suction cleaner with part of the casing broken away and showing the cleaner in its on-the-floor relationship;

Figure 8 is a side elevation with certain parts of the cleaner broken away and shows the cleaner in its off-the-floor cleaning relationship;

Figure 9 is a partial side elevation showing the opposite side of the cleaner and the handle position controlling means;

Figure 10 is a section upon the line 10-10 of Figure 9.

In the suction cleaner constructed in accordance with the present invention cleaning air is drawn through a nozzle 1 by a rotating fan 2 positioned within a fan chamber 3 into which the nozzle 1 opens at the fan chamber eye 4. The fan is driven by an electric motor which is unshown but which is positioned within the motor casing 5 abutting the fan chamber. The end of the motor shaft 6 extends within the fan chamber 3 and carries the fan 2. An exhaust outlet 7 is formed on fan chamber 3 to which a dust bag 8 is removably secured. Spaced front wheels 9, 9, and spaced rear wheels 10, 10, movably support the cleaner, the front wheels being carried upon a crankshaft 11.

A handle 12 is pivotally connected to the cleaner casing and provides means by which the operator can propel the machine over a surface covering undergoing cleaning. The end of the handle also serves to support the upper end of the dust bag 8, as in the usual cleaner construction. The incoming power leads 13, 13 enter the upper end of the handle and pass downwardly therethrough to enter the motor casing 5.

According to the present invention nozzle casing 1 is formed with a transversely extending air passageway 14 which opens to the interior of the nozzle immediately below the eye 4 of the fan chamber, as indicated at 15. Opening 15 is normally closed as illustrated in Figure 2 by a valve 16 which is pivotally carried by the nozzle upon a transversely extending shaft 17, a coil spring 18 outside the casing being provided which acts through a lever arm 19, mounted on the extended end of the shaft, to urge normally the valve into passageway closing relationship. Valve 16 is adapted to assume a second position, that shown in Figure 8, in which it opens the passageway 14 to the eye 4 of the fan chamber while closing the nozzle mouth therefrom.

The air pasageway 14 extends to the side of the fan chamber where it is provided with a rotatable L-shaped connector 20. To connector 20 is secured an elongated flexible dusting tool hose 21 which is provided at its opposite end with a nozzle 22. Hose 21 is adapted to be carried by the cleaner handle 12 in the operation of the machine in on-the-floor cleaning, the handle 12 being provided near its lower end with a transverse arm 23 having U-shaped spring clips 24, 24 which are adapted to be expanded to seat removably the hose. The hose is adapted to extend upwardly to a point near the upper end of the handle, as shown in Figure 4, there being a supporting hook 25 at that point which supports the mid-portion of the hose. The dusting tool hose being permanently attached to the cleaner is ready for instant use upon being detached from the retaining clips. Obviously suction is available to the hose, and to the nozzle 22 at the end thereof, when valve 16 is in nozzle closing relationship so that the passageway 14 is directly open to the eye 4 of the fan chamber.

The cleaner handle 12 is forked at its lower end to form a bail which extends around the motor casing 5 to be pivoted upon pins 26, 26. The handle is adapted to be moved from a horizontal position to a vertical position, and to control the position of the handle and prevent its displacement unintentionally from certain definite positions or a range of movement handle position controlling means are provided. These means comprise an arcuate sector 27 positioned adjacent the lower end of handle 12 and fixedly carried by the cleaner casing. The outer edges of sector 27 is provided with spaced detent seats 28 and 29 and an intermediate seat 30 of relatively great extent. On the handle 12 immediately adjacent the sector is provided a spring pressed roller detent 31 which is adapted to seat selectively in the seats 28, 29 and 30 when the handle is in a horizontal position, in a vertical position, or in an intermediate range of positions, respectively. With the roller detent positioned in any of the seats displacement therefrom is prevented except upon the exertion through the handle of a predetermined pivoting force.

Upon the opposite side of the cleaner casing from the handle controlling means is a plunger 32 which is slidingly mounted in the casing and which is normally pressed by a coil spring 33, acting on a collar 34 on the plunger, to a position in which the end of the plunger extends into the pathway of the pivoted handle 12 as it moves into the vertical position. The forward end of plunger 32 is bifurcated and encloses slidingly an extension of the lever 19 carried by valve shaft 17. Upon the handle 12 being pivoted to the vertical position the plunger 32 is contacted by one arm of the handle bail and is moved forwardly, against the force exerted by coil spring 33, and pivots the lever 19 to move valve 16 from its passageway closing position (Figure 7) to its nozzle closing position (Figure 8). With the handle in the vertical position, in which it is retained by the handle controlling means and more specifically by the spring pressed roller detent 31 seating within the seat 29, the valve is in the nozzle sealing relationship shown in Figure 8 and the machine is then adapted for off-the-floor cleaning. The operator need only disconnect the dusting tool hose from the cleaner handle which supports it to perform the necessary work.

To reconvert the cleaner from an off-the-floor unit to an on-the-floor unit it is only necessary to pivot the handle rearwardly from the vertical

position. The plunger 32 is automatically moved rearwardly under the force exerted by spring 33 and valve 16 is again moved to passageway closing relationship by its spring 18. Air is then drawn into the suction-creating means from the nozzle 1 and the machine is again an on-the-floor cleaner.

I claim:

1. In a suction cleaner, a movable cleaner propelling handle, suction creating means, a floor nozzle connected to said means, an air passageway connected to said means, a single valve selectively connecting and sealing said nozzle and said passageway to and from said suction creating means, and cleaner-propelling handle operated means controlling the position of said valve.

2. In a suction cleaner, a movable cleaner propelling handle, suction creating means, a floor nozzle connected to said means, an air passageway connected to said means, a single valve selectively connecting said nozzle and said passageway to said suction creating means, means normally retaining said valve in position to connect said nozzle to said suction creating means, and means operable upon the movement of said handle to move said valve to connect said passageway to said suction creating means.

3. In a suction cleaner, a movable cleaner propelling handle, suction creating means, a floor nozzle connected to said means, an air passageway open to said means and to said nozzle, a valve at the junction of said nozzle and passageway to seal selectively said nozzle or said passageway from said means, and cleaner propelling handle operated means to actuate said valve.

4. In a suction cleaner, a movable cleaner propelling handle, suction creating means, a floor nozzle connected to said means, an air passageway open to said means and to said nozzle, a valve at the junction of said nozzle and passageway to seal selectively said nozzle or said passageway from said means, means normally retaining said valve in passageway sealing position, and cleaner propelling handle operated means to move said valve to open said passageway to said suction creating means and to seal said nozzle therefrom.

5. In a suction cleaner, a movable cleaner propelling handle, a nozzle, a fan chamber open to said nozzle, a driven fan in said chamber, an air passageway open to said fan chamber, a movable valve selectively connecting said nozzle or said passageway to said chamber, and a plunger connected to and adapted to move said valve and extended into the path of said handle and adapted to receive a valve moving force therefrom.

6. In a suction cleaner, a movable cleaner propelling handle, a nozzle, a fan chamber open to said nozzle, a driven fan in said chamber, an air passageway open to said fan chamber, a movable valve selectively connecting said nozzle or said passageway to said chamber, means connected to said valve and operable by said handle to actuate said valve by movement of said handle to certain positions, and means to move said valve to connect said nozzle to said chamber upon the movement of said handle from said certain positions.

7. In a suction cleaner a movable cleaner propelling handle, a nozzle, a fan chamber open to said nozzle, a driven fan in said chamber, an air passageway open to said fan chamber, a movable valve selectively connecting said nozzle or said passageway to said chamber, and a plunger connected to and adapted to move said valve, said

plunger being extended to a position to be contacted and moved by said handle to move said valve upon the movement of said handle to a vertical position.

5 8. In a suction cleaner, a casing including a fan chamber, a nozzle, and a secondary air passageway; means movably supporting said casing; a cleaner propelling handle pivotally connected to said casing; a single valve to selectively open and close said fan chamber to said nozzle and to said passageway; and means operable by said handle in certain movements to actuate said valve.

10 9. In a suction cleaner, a pivoted cleaner propelling handle, a nozzle, a fan chamber open to said nozzle, an air passageway open to said fan chamber, a valve pivoted about an axis substantially parallel to the pivotal axis of said handle

adapted to seal selectively said nozzle or said passageway from said fan chamber, means normally retaining said valve in passageway sealing position, and means actuated by the movement of said handle to move said valve to its nozzle sealing position. 5

10 10. In a suction cleaner, suction creating means, a nozzle interiorly connected to said means, an air passageway interiorly connected to said means, a single valve to seal selectively said nozzle or said air passageway from said suction creating means, a dusting tool hose connected to said air passageway, and a cleaner propelling handle supporting said hose, and means controlled by the position of said handle to operate said valve. 15

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