

Jan. 16, 1940.

A. ERIKSSON-JONS

2,187,654

VACUUM CLEANER

Filed Oct. 22, 1937

2 Sheets-Sheet 1

Fig. 1.

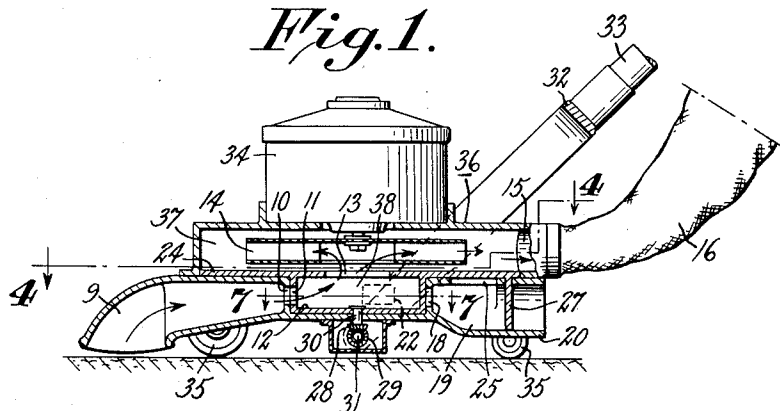


Fig. 2.

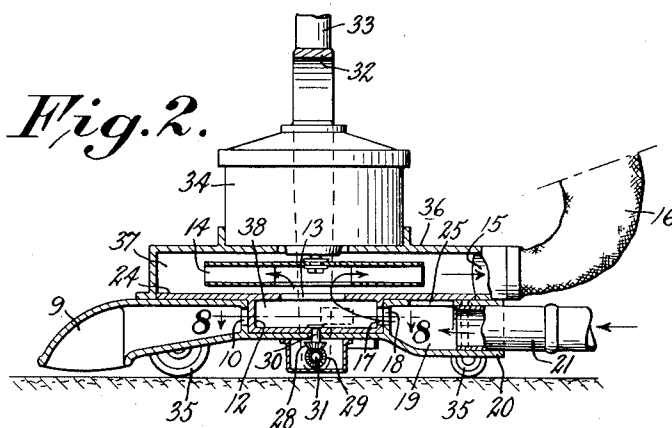
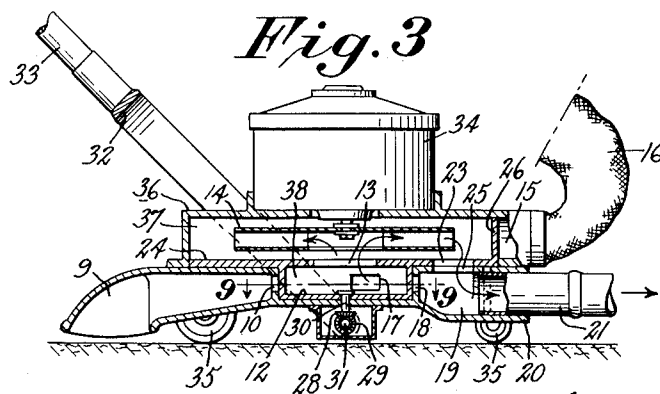


Fig. 3.



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Fig. 4.

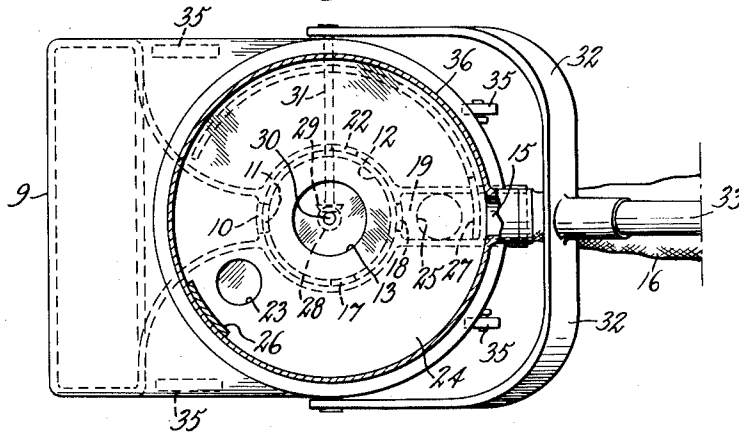


Fig. 5.

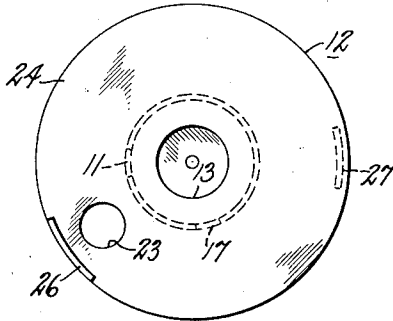


Fig. 6.

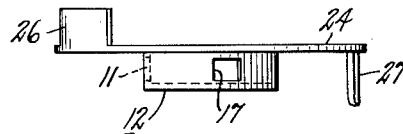


Fig. 7.

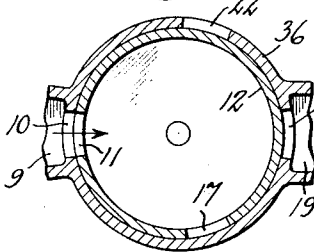


Fig. 8.

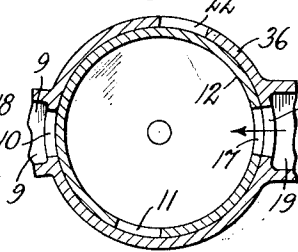
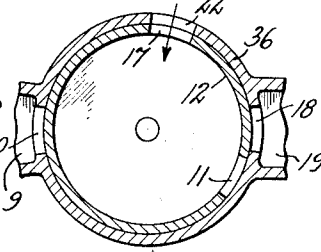


Fig. 9.



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UNITED STATES PATENT OFFICE

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VACUUM CLEANER

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Application October 22, 1937, Serial No. 170,329
In Great Britain October 28, 1936

3 Claims. (Cl. 15-9)

This invention relates to vacuum cleaners and more particularly to devices for controlling the direction of air flow through the said cleaners and/or conduits or nozzles associated therewith.

In order to enable vacuum cleaners to be used for suction purposes either through a main suction nozzle or through an auxiliary suction conduit disposed adjacent the handle of the apparatus, it has been proposed to provide the apparatus with two valves, one controlling the flow of air set up by the fan through the main nozzle and the other controlling the flow of air through the auxiliary conduit, the said valves being adjusted in position by angular displacement of a manipulating handle of the apparatus.

The object of the present invention is to provide simplified means operative by the manipulative handle for controlling the flow of air through a vacuum cleaner and its associated members.

According to the present invention in a vacuum cleaner provided with two suction channels or nozzles one or other of which is rendered operative by angular displacement of a pivoted handle mounted on the cleaner; transfer from suction operation to blowing operating is effected by a further angular movement of said handle.

By a further feature of the invention there is provided a single valve member controlled in its position according to the adjustment of the pivoted handle and adapted to control flow of suction air through one or the other respectively of the suction nozzles or channels.

In accordance with the preferred embodiment of the invention the pivoted handle is movable into one or other of three predetermined positions and its movement is transferred to a single valve member adapted to provide in said positions respectively either suction flow through said nozzle or suction flow through the auxiliary suction channel or exhaust air flow through said auxiliary suction channel.

The invention will be hereinafter more fully described with reference to the embodiment illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a cross-sectional view of a preferred embodiment of my invention with the valve member in one position;

Fig. 2 is a cross-sectional view, as shown in Fig. 1, but with the valve member in a second position;

Fig. 3 is a cross-sectional view similar to that shown in Figs. 1 and 2 but with the valve member in a third position;

Fig. 4 is a cross-sectional view taken on the line 4-4 of Fig. 1;

Fig. 5 is a top view of a valve member shown in Figs. 1 through 4;

Fig. 6 is a side view of the valve member shown in Fig. 5;

Fig. 7 is a cross-sectional view taken on the line 7-7 of Fig. 1;

Fig. 8 is a cross-sectional view taken on the line 8-8 of Fig. 2; and

Fig. 9 is a cross-sectional view taken on the line 9-9 of Fig. 3.

The apparatus comprises a main casing 36, supported on wheels or casters 35 and movable by means of a handle 33, upon which is mounted a housing 34 enclosing an electric motor which drives a fan 14 contained within a fan chamber 37 disposed immediately below said motor. A portion of the base of the fan chamber is depressed to form a well or valve chamber 38 in which a valve member 12 is rotatably mounted on a vertical spindle 30. The valve chamber 38 communicates with a main nozzle member 9 and also with an auxiliary chamber 19 formed in the main casing 36.

The valve member 12 comprises a hollow cylindrical portion which is disposed within the well and a radially extending flange 24 which contacts with the base of the fan chamber 37. In the walls and flange of the valve 12 are openings or ports 13, 11, 17 and 23. The opening 13 provides constant communication between the interior of the cylindrical portion of the valve member and the fan chamber 37 while the openings 11 and 17 are movable on rotation of the valve member 12 respectively into and out of register with openings 10 or 22, and 18 provided in the main casing 36. These latter openings enable communication to be established between the interior of the valve member and the main nozzle 9, the atmosphere and the chamber 19 respectively. The latter is formed with a socket 20 to receive an auxiliary conduit 21 for suction or blowing purposes as hereinafter described. The opening 23 in the flange 24 of the valve member is similarly movable into and out of register with an opening 25 in the base of the fan chamber 37.

To facilitate movement over the object being cleaned the apparatus as above mentioned is mounted on wheels 35 while the handle 33 is forked as at 32, the end of each arm being pivotally mounted on the casing (Fig. 4). A spindle 31 rotatably supported in casing 36 engages with one arm of the forked member 32 and car-

ries at its other end a bevel pinion 29. Pinion 29 meshes with a further bevel pinion 28 secured to the vertical valve spindle 30.

The operation of the apparatus is as follows:

With the handle 33 in the position shown in Fig. 1 and assuming the machine is in use air as shown by the arrows is drawn by means of the fan 14 through the nozzle 9, aperture 10 in the wall of the valve chamber and further openings 11 and 13 in the periphery and top respectively of the cylindrical portion of the valve member 12 into the fan chamber and is finally expelled therefrom through the exhaust aperture 15 in the casing of the aperture into the dust bag 16.

When it is desired to change over from the main nozzle 9 to an auxiliary cleaning tool which is inserted in the socket 20 the handle 33 is moved from the inclined position shown in Fig. 1 to the vertical position shown in Fig. 2 rotatably mounted valve member 12 being rotated in a counter-clockwise direction through an angle of, for example, between 75° and 80° by means of the bevel gears 28, 29.

In this position, the aperture 11 in the cylindrical portion of the valve member 12 has moved out of register with the aperture 10 communicating with the nozzle 9 thus closing this latter aperture by the cylindrical wall of the valve member 12 (see Fig. 8). Simultaneously the aperture 17 in said wall has come into register with the aperture 18 in the casing of the cleaner which communicates with the chamber 19. Further, the downwardly extending flange 27 of the valve member 12 which previously closed said chamber against insertion of an auxiliary conduit has now been removed by rotation of the valve member. An auxiliary suction conduit carrying any suitable cleaning tool (not shown) can now be inserted. Air is now drawn in the direction of the arrows through the tool and suction conduit 21, chamber 19, apertures 18 and 17, aperture 13 and is finally expelled from the fan chamber through the aperture 15 into the dust bag 16.

Further movement of the handle 33 from the position shown in Fig. 2 to that shown in Fig. 3 effects further rotation of valve member 12 in a counterclockwise direction. As will be seen from Figs. 3 and 9, such rotation causes the aperture 10 of the main nozzle 9 to remain closed by the wall of the cylindrical portion of the valve member 12 and in addition the apertures 17 and 18 causing communication between the valve member and the chamber 19 have moved out of register. In this position the aperture 17 in the valve member 12 now registers with the further aperture 22 in the main casing 36 and establishes communication between the interior of the valve member 12 and the outer atmosphere. The further rotation of the valve member 12 has also caused the aperture 23 in the flange 24 of the valve member 12 to register with the aperture 25 in the upper wall of the chamber 19. In addition the aperture 15 hitherto providing communication between the fan chamber and the dust bag 16 has been closed by a flange rim 26 which extends vertically upwards from the periphery of the flange 24.

The air flow now takes the direction as shown by the arrows from the outer atmosphere through the apertures 22 and 17 into the valve chamber 12, through the aperture 13 into the fan chamber and is expelled by the fan 14 through the apertures 23, 25, into chamber 19 and thence into

conduit 21 and, if desired, any suitable tool usable for blowing purposes.

The positions of the valve member 12 and the various apertures mentioned above are clearly illustrated in Figs. 7, 8 and 9, the positions of the above mentioned members shown therein corresponding to the positions occupied thereby in Figs. 1, 2 and 3 respectively.

The handle 32 may be maintained in its various predetermined positions by any known means such as a catch, stop or the like.

A vacuum cleaner constructed in accordance with the present invention is particularly applicable to cleaning by the application of alternate suction and blowing actions. This is possible when using the auxiliary suction or blowing conduit connected to chamber 19 and operating according to Figs. 2 and 3. To change over from suction to blowing operation this is effected by simple movement of the handle of the apparatus from the operative position of Fig. 2 to that of Fig. 3 and vice versa, there being no necessity to disconnect the dust bag from the apparatus nor to attach to the cleaner separate tools usable for blowing purposes.

While I have shown and described one more or less specific embodiment of my invention, it is to be understood that this has been done for purposes of illustration only and that the scope of my invention is not to be limited but is to be determined by the appended claims viewed in the light of the prior art.

What I claim is:

1. In a vacuum cleaner having a body, a fan within said body including an impeller rotatably mounted in a casing, said casing having inlet and an outlet openings, means forming a suction channel, within said body, a suction nozzle communicating with said channel, means forming a suction and blowing channel within said body, hose connection means communicating with said suction and blowing channel, a clean air intake formed in said body, a dust separating member connected to said body, a single rotatably mounted valve member in said body shiftable to one position to connect said suction channel with said inlet and said outlet with said dust separating member, and to a second position to connect said suction and blowing channel to said inlet and said outlet to said dust separating member, and to a third position to connect said clean air intake with said inlet and said outlet to said suction and blowing channel, a handle pivotally connected to said body for moving said vacuum cleaner, and means operative to rotate said valve upon pivoted movement of said handle.

2. In a vacuum cleaner having a body, a fan within said body including an impeller rotatably mounted in a casing, said casing having inlet and an outlet openings, means forming a suction channel within said body, a suction nozzle communicating with said channel, means forming a suction and blowing channel within said body, hose connection means communicating with said suction and blowing channel, a clean air intake formed in said body, a dust separating member connected to said body, a single rotatable mounted valve member in said body having a disc portion and a hollow portion formed with ports, said disc portion being at the outlet and said hollow portion being permanently in communication with said inlet, said valve being shiftable to one position to align a port in said hollow portion with said suction channel and to con-

nect said outlet with said dust separating member, and to a second position to align a port in said hollow portion with said suction and blowing channel and to connect said outlet to said
5 dust separating member, and to a third position to align a port in the hollow portion with said clean air intake and to align the port in said disc portion with said suction and blowing channel, a handle for moving said vacuum cleaner
10 pivotally connected to said body, and means operative by pivoted movement of said handle for rotating said valve to said positions.

3. In a vacuum cleaner having a hollow body including a fan housing having inlet and outlet
15 openings, a centrifugal fan in said housing mounted for rotation about a vertical axis, said body being formed with a suction nozzle opening, hose connection opening, clean air intake opening and a dust laden air exhaust opening,
20 a dust separating member connected to said dust laden air exhaust opening, a single valve member mounted for rotation about a vertical axis

within said body and having a disc portion and a hollow portion formed with ports cooperating with said outlet and inlet openings, respectively, the hollow portion being permanently in communication with the inlet opening, said valve being shiftable to one position to connect said suction nozzle with said hollow portion through a port therein and to connect said outlet with said
5 dust separating member, and to a second position to connect said hose connection means with
10 said hollow portion through a port therein and to connect said outlet to said dust separating member, and to a third position to connect said clean air intake to said hollow portion through a port therein and to connect said outlet to said
15 hose connection means, a handle for moving said vacuum cleaner pivotally connected to said body on a horizontal axis, and mechanical motion transmitting means for transmitting rotary motion from said handle to said valve member. 20

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