

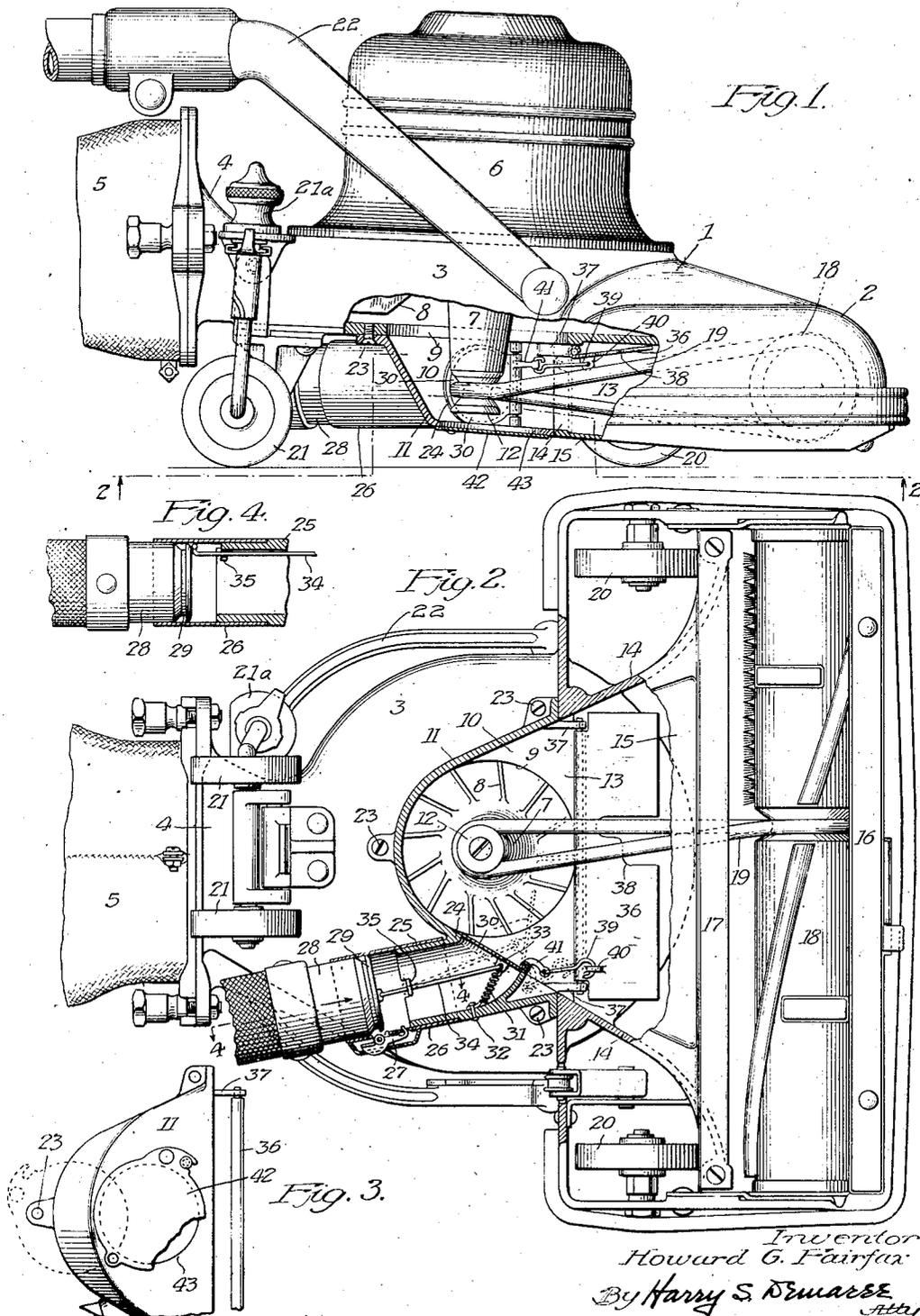
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H. G. FAIRFAX

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SUCTION CLEANER

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Inventor
Howard G. Fairfax
By Harry S. Dewarce
Atty.

UNITED STATES PATENT OFFICE

HOWARD G. FAIRFAX, OF NORTH CANTON, OHIO, ASSIGNOR TO THE HOOVER COMPANY,
OF NORTH CANTON, OHIO, A CORPORATION OF OHIO

SUCTION CLEANER

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The present invention relates to suction cleaners in general and particularly to new and novel improvements in permanently attached air directive valves in a suction cleaner which function to control the direction of air flow therein. More specifically the invention relates to converter mechanism in a suction cleaner, normally equipped for "on the floor" cleaning, which is permanently embodied therein and which is operable to convert the suction cleaner for use in "off the floor cleaning" with a dusting tool by simply attaching the dusting tool hose to the cleaner.

It is an object of the present invention to provide a new and improved suction cleaner. It is a further object of the invention to provide, in a suction cleaner, new and novel improvements in air directive valves. Another object is the provision of permanently connected air directive valves in a suction cleaner whose positions are determined by attaching or detaching the dusting tool hose. Still another object is the provision, in a suction cleaner of the vertical axis type including an agitator, of an air directive construction comprising a plurality of valves which are automatically positioned so that the cleaner is adapted for use with dusting tools immediately upon the attaching of the cleaner end of the dusting tool hose. Other and more specific objects will appear upon reading the following specification and claims and considering in connection therewith the attached drawing.

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

Fig. 1 is a side view of a suction cleaner in which the present invention is embodied, the cleaner being shown partly broken away and in section.

Fig. 2 is a bottom view upon the line 2—2 of Fig. 1.

Fig. 3 is a view of a detail.

Fig. 4 shows a detail comprising the dusting tool receiving member and is taken upon the line 4—4 of Fig. 2.

In the drawing a modern type suction cleaner is disclosed comprising a main cas-

ing 1 which includes a suction nozzle 2, a fan chamber 3, and an exhaust outlet 4 to which is attached a suitable dust bag 5. Supported upon the main casing 1 immediately above the fan chamber 3, and enclosing a driving motor which is not shown, is a motor casing 6. The lower end of the motor shaft 7 projects down from the motor casing 6 through the fan chamber 3, where it carries the fan 8, and thru the inlet 9 of the fan chamber into the inlet chamber 10, formed by the housing 11, where it carries the driving pulley 12. The housing 11 is a shell-like member which is open at its top and forward end and so shaped as to be co-extensive with the air passage 13 formed within the nozzle 2 by the side walls 14, 14 and the bottom plate 15. At the front end of the nozzle 2 is a mouth defined by the front lip 16 and the rear lip 17 carried by the bottom plate 15. Within the nozzle 2 and positioned above the nozzle mouth is a rotatable agitator 18 of a common and well known type which is driven by the belt 19 from the pulley 12.

The cleaner is movably supported upon the surface undergoing cleaning by front supporting wheels 20, 20 and rear supporting wheels 21, 21. Nozzle height-adjusting means are provided, which are indicated generally by the reference character 21a, by which the machine may be pivoted about the front supporting wheels 20, 20 thru raising or lowering the rear supporting wheels 21, 21 for the purpose of varying the height of the lips 16 and 17 above the supporting surface. There is also pivotally attached to the main casing 1 a handle 22 by which the cleaner may be propelled over the surface covering undergoing cleaning by the operator. The parts of the cleaner which have been described are those which comprise the usual suction cleaner and in the present application no invention is claimed in the general arrangement. The present invention lies in the improvements embodied in the construction heretofore described which will be hereinafter set forth and which are for the purpose of readily changing the function of the machine from one adapted for use upon surface coverings

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to one adapted for use with a dusting tool hose for the cleaning of drapes and similar articles positioned above the supporting surface.

In the cleaner constructed in accordance with the present invention the housing 11, which is semi-permanently attached to the under side of the fan chamber 3 by means of screws 23, 23 etc., is provided at one side with an inlet 24. Inlet 24 is defined by a tubular member 25 which is provided at its outer end with a permanently attached securing or coupling member 26, which includes a spring-pressed detent 27 which functions to retain, within the receiving member 26, the cleaner-end of the dusting tool hose which is indicated by the reference character 28 thru seating within the grooved inner end 29 thereof. In order that the inlet 24 in the housing 11 will be closed when the cleaner is being used as a surface-cleaning unit, the dusting tool hose being then detached, a valve or gate member 30 is provided at the inlet which is pivotally mounted upon a vertical axis and which, when in the closed position lies closely against the interior of the housing 11 and entirely seals the inlet 24 from the eye 9 of the fan chamber 3. A spring 31 of the coil type is provided for the purpose of holding the valve in its closed position which is secured at its outer end within the tubular member 25, by means of a pin 32, and at its inner end to a projection lug 33 formed on the valve 30. The tension of the spring 31 is sufficiently great that, in the absence of the positive force urging the valve inwardly, the valve will be retained in its inlet-sealing position, or that in which it lies against the side wall of the housing 11.

In order that the valve may be opened when the dusting tool hose is attached a plunger 34 is provided which is pivoted upon the lug 33 and slidably projects thru a suitable seat 35, carried by the tubular member 25 within the tool-receiving member 26, where its outer end is adapted to be contacted by the incoming edge of the dusting tool hose and to be pushed inwardly toward the inlet 24 as that member advances to its final position in which it extends substantially adjacent the outer end of tubular member 25.

To close the air passage 13 from the fan chamber when the cleaner is being used as a dusting tool unit a valve or gate member 36 is provided which is pivoted about a horizontal axis and is carried by forwardly-projecting lugs 37, 37 upon the housing 11. Valve 36 is carried by the lugs 37, 37 within the rear end of the air passage 13 and, in its passage-sealing position, extends in a vertical plane making contact with both the top and bottom of the air passage 13 as well as with the sides formed by the walls 14, 14. To accommodate the driving belt 19, which remains in position independently of the use of the cleaner, the

valve 36 is provided with a cutaway portion the outlines of which are indicated by 38. Thru this cutaway portion a small amount of air will leak when the air passage 13 is sealed from the fan chamber but the quantity of this air is relatively small and is insignificant.

Connecting the valve 36 to the valve 30, and so to the actuating plunger 34, is a link 39 which is pivotally mounted at each end to one of the valves; at the valve 36 thru being extended thru an aperture in the projecting lug 40; and at the valve 30 thru being pivotally mounted at the end of a projecting arm 41 rigidly carried by said valve.

In the ordinary use of the cleaner as a surface covering cleaning machine, and with the dusting tools unattached, the spring 31 holds the valve 30 adjacent the wall of the housing 11 and so in sealing relationship with the inlet 24. With the valve 30 in this position the arm 41 carried thereby has forced the link member 39 forward and has resulted in the suspension of the valve member 36 adjacent the upper wall of the air passage where it provides no obstruction thereto. This position is clearly shown in full lines in Figures 1 and 2. Having finished the cleaning of the surface covering if the operator desires to clean drapes or curtains, or to use the cleaning air provided by the machine in the removal of dirt or dust at any point above the surface covering, he must resort to the attachment of dusting tools in order that the draft of cleaning air can be directed to the point of cleaning with greater advantage than could be obtained by the handling of the entire cleaner. Under such a condition the cleaner-end 28 of the dusting tool is inserted within the receiving member 26 on the cleaner. As the dusting tool advances within the member 26 it contacts the outer end of the plunger 34 and, as it continues to advance to its final seat against the outer end of the tubular member 25, forces that plunger inwardly resulting in the pivoting of the valve 30 about its vertical axis against the tension in the spring 31. Upon the pivoting of valve 30 the arm 41, which is rigidly carried thereby, is also pivoted to a position which is indicated in dotted lines in Figure 2 in which position its forward end is considerably in the rear of its original position. This movement of the arm 41 results in the drawing to the rear of the link member 39 and the consequent pivoting downwardly of the valve 36 from its position adjacent the top of the air passage, it being pulled thru the lug 40 to which the link member 39 is attached. With the valve 30 in its open position, that indicated by dotted lines in Figure 2, the link 39 has been pulled sufficiently to the rear by the arm 41 so that the valve 36 has assumed a position in a vertical plane, as indicated by dotted lines in Figure 1, and has completely sealed the air passage 13, and so the nozzle mouth defined by the lips 16

and 17, from the eye of the fan chamber with the exception of the small leakage which takes place thru the cutaway portion 38 provided for the driving belt.

5 From the foregoing it is clear that the improvements embodying the present invention, when incorporated in a modern suction cleaner, do not materially complicate the construction thereof. The usual and ordinary
10 general cleaner construction can be used with no change in the agitator position or the position of the driving belt access being had to the latter, according to the present invention, thru merely pivoting a finger plate 42 carried
15 on the underside of the housing 11 immediately below the driving pulley 12 thereby uncovering the finger hole 43. This relationship is clearly shown in Figure 3. The present invention eliminates the use of any valves
20 which the operator must manually actuate in addition to the attaching of the dusting tool hose to the cleaner and comprises a simple construction by which the cleaner is automatically converted to a dusting tool unit by the
25 simple medium of attaching the dusting tool hose.

Having clearly described and disclosed the present invention, I claim:—

1. In a suction cleaner, a passageway, a second passageway, suction-creating means to draw air thru said passageways, a plurality of valves controlling the flow of air thru said passageways, means interconnecting said valves preventing independent relative movement, means operable upon the connection of a dusting tool hose to one of said passageways to operate said valves, and means to reverse the relationship of said valves upon the withdrawal of said dusting tool hose.

2. In a suction cleaner, a passageway, a second passageway, suction-creating means to draw air thru said passageways, a valve controlling the flow of air thru said first-mentioned passageway, a second valve controlling the flow of air thru said second-mentioned passageway, means operable upon the attachment of a dusting tool hose to open said second valve, means to move said first-mentioned valve to close its passageway upon the movement of said second-mentioned valve, and means to return said valves to initial position upon the removal of said dusting tool hose.

3. In a suction cleaner, a passageway, a second passageway, suction-creating means to draw air thru said passageways, a valve controlling the flow of air thru said first-mentioned passageway, a second valve controlling the flow of air thru said second-mentioned passageway, means operatively connecting said valves, means to automatically position and retain said second-mentioned valve in sealed relationship to its passageway and said first-mentioned valve in unsealed relationship
65 to its passageway, and additional means oper-

able upon the attachment of a dusting tool hose to reverse the relationships of said valves to their passageways.

4. In a suction cleaner, a passageway, a second passageway, suction-creating means to draw air thru said passageways, a valve controlling the flow of air thru said first-mentioned passageway, a second valve controlling the flow of air thru said second-mentioned passageway, means operatively connecting said valves, resilient means to retain said second-mentioned valve in sealed relationship to its passageway and said first-mentioned valve in unsealed relationship to its passageway, and means positioned in said second-mentioned passageway operable upon the attachment of a dusting tool hose thereto to move said valves to reverse their relationships to their passageways.

5. In a suction cleaner, a passageway, a second passageway, suction-creating means to draw air thru said passageways, a valve controlling the flow of air thru said first-mentioned passageway, a second valve controlling the flow of air thru said second-mentioned passageway, means pivotally connected between said valves to retain them in synchronous adjustment, means resistingly maintaining said second-mentioned valve in closed position and said first-mentioned valve in open position, and sliding means pivotally connected to said second-mentioned valve and mounted in said second-mentioned passageway to actuate said valves upon the insertion in said second-mentioned passageway of a dusting tool hose.

6. In a suction cleaner, suction-creating means, a plurality of passageways leading to said suction-creating means, valves positioned adjacent said suction-creating means and controlling the flow of air thru said passageways, means pivotally mounting said valves about spaced axes, means resistingly maintaining said valves in a normal position with one valve open and one valve closed, and means to automatically reverse the positions of said valves upon the attachment of a dusting tool hose to said cleaner.

7. In a suction cleaner, suction-creating means, a nozzle including a mouth, an agitator in said nozzle, an air passageway leading from said mouth to said suction-creating means, a second passageway open to the first at the inlet to said suction-creating means, a driving shaft at the junction of said air passageways, power transmitting means from said shaft positioned in said first-mentioned passageway, a plurality of valves controlling the flow of air thru said passageways normally positioned to open the passageway containing said power-transmitting means and to close said other passageway, and means to automatically change said valves from open to closed position and vice versa upon the

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attachment of a dusting tool hose to said cleaner, and means to return said valves to normal position upon removal of said dusting tool hose.

5 8. In a suction cleaner, a fan casing, a fan in said fan casing, a nozzle including an air passageway leading to said fan casing, a chamber at the junction of said fan casing and said air passageway, a second passageway opening into said chamber, a gate-member pivoted about a horizontal axis controlling the flow of air in said first-mentioned passageway, a valve pivoted about a vertical axis controlling the flow of air in said second-mentioned passageway, means interconnecting said valves, and means operable upon the attachment or detachment of a dusting tool hose to said cleaner to control the positions of said valves.

20 9. In a suction cleaner, a fan casing, a fan in said fan casing, a nozzle including an air passageway leading to said fan casing, a chamber at the junction of said fan casing and said air passageway, a second passageway opening into said chamber, a gate-member pivoted about a horizontal axis controlling the flow of air in said first-mentioned passageway, a valve pivoted about a vertical axis controlling the flow of air in said second-mentioned passageway, means interconnecting said valves and preventing independent relative movement therebetween, and means operable upon the attachment of a dusting tool hose to said second passageway to control the positions of said valves.

35 Signed at North Canton, in the county of Stark and State of Ohio, this 26th day of November A.D. 1930.

40 HOWARD G. FAIRFAX.

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