March 4, 1952 J. J. BEVINGTON 2,588,198

LITTER CONTROL FOR VACUUM CLEANERS

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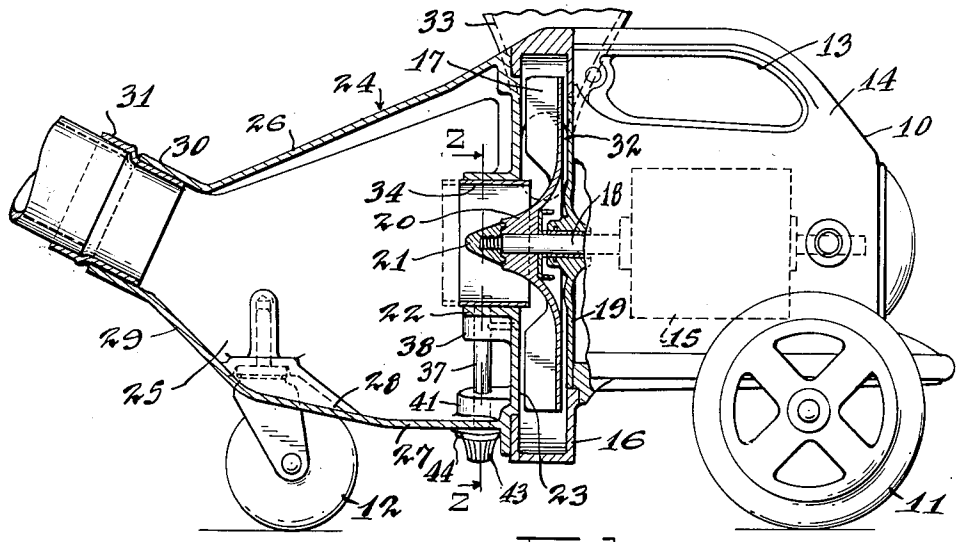

FIG-1-

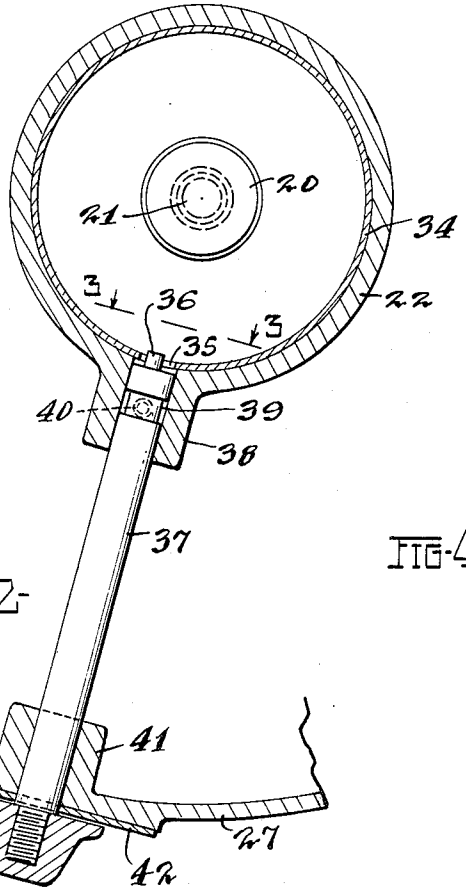

FIG-2-

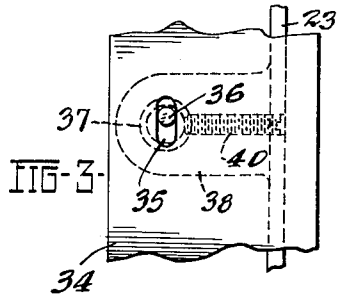

FIG-3-

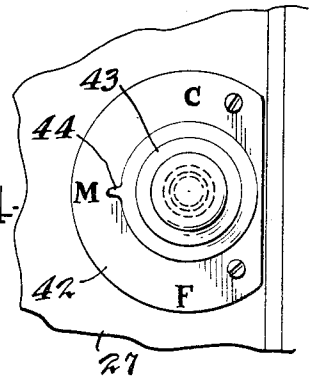

FIG-4-

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LITTER CONTROL FOR VACUUM CLEANERS

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6 Claims. (Cl. 209—142)

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This invention relates to portable suction cleaners, but more particularly to cleaners of that type employing a motor driven suction fan for use in cleaning floors, upholstery or the like.

An object is to produce a simple and efficient suction cleaner of the above type which is provided with new and improved means for collecting relatively large particles which might otherwise damage or injure the suction fan; which is provided with an adjustable device for controlling the size of particles in the dust laden stream which comes in contact with the suction producing fan; and which is provided with a sleeve adjustable relatively to the fan by a device accessible from the outside of the machine for controlling the size of particles admitted to the suction producing fan; and which has the new and improved features of construction, arrangement and operation hereinafter described.

For purposes of illustration but not of limitation, an embodiment of the invention is shown on the accompanying drawings, in which:

Figure 1 is a side elevation partly in vertical section of a suction cleaner, the usual floor tool being omitted and only a portion of the hose for dust laden air being shown;

Figure 2 is an enlarged sectional view substantially on the line 2—2 of Figure 1, showing the axially shiftable sleeve and the mechanism for adjusting same;

Figure 3 is an enlarged fragmentary view substantially on the line 3—3 of Figure 2, showing the detail of the sleeve adjusting means; and

Figure 4 is a fragmentary plan view showing the adjusting or control knob for actuating the shiftable sleeve.

The illustrated embodiment of the invention comprises a vacuum or suction cleaner having a casing 10, the rear end of which is mounted upon a pair of wheels 11 (only one of which is shown) and the front portion of which is mounted upon a caster 12 which may be suitably mounted for swiveling movements. The rear end of the housing is suitably formed to provide a hand hold 13 to facilitate the moving of the cleaner from place to place. The rear portion 14 of the cleaner constitutes a suction chamber in which is suitably disposed an electric motor indicated generally at 15, and forming an extension of the rear chamber is a member 16 providing an annular chamber in which a suction producing fan 17 is mounted for rotary movements on a horizontal axis. The fan 17 is a multi-bladed structure secured to the shaft 18 suitably driven by the motor 15.

As shown, the shaft 18 has bearing in a vertical wall member 19 and the hub 20 of the fan is of substantially frusto-conical shape with the walls thereof gently curved outwardly and rearwardly to the body of the fan. The shaft 18 has a reduced screw-threaded end portion to receive a nut 21 which is of conical shape and is suitably anchored to the forward end portion of the fan hub 20. A portion of the hub as well as the conical nut 21 projects into a sleeve-like extension 22 which projects forwardly from and is integral with a vertical partition wall 23. The wall 23 is integral with the forward casing portion 24 of the cleaner, the same providing a safety trap chamber indicated at 25. It will be observed that the upper wall of the casing part 24 inclines downwardly as indicated at 26 and the bottom portion extends horizontally for a short distance as indicated at 27, thence inclines gradually upwardly as indicated at 28, and thence inclines rather abruptly upwardly at 29, terminating in a nozzle-like portion 30. Engaging the nozzle-like portion 30 is a flexible hose 31 of any suitable length, carrying the usual wand and floor tool (not shown) at the opposite end. The wand and floor tool are well known to those skilled in this art and further description and illustration thereof are not considered necessary.

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In operation, the rotation of the fan 27 in response to the electric motor 15 creates a suction so that dust-laden air is drawn into the chamber 25 and due to the inclination of the nozzle-like portion 30, any heavy particles drop to the bottom of the chamber, the smaller dust particles being sucked through the sleeve-like extension 22 and into the chamber formed by the member 16 to be discharged through a suitable opening 32 in the side of the member 16 and into a dust collecting, foraminous bag 33 which, from time to time, may be emptied of its contents.

Inasmuch as some relatively large particles are carried along by the air stream toward the fan 17, it is desirable to provide means for limiting the size of the particles which can pass to the fan. For this purpose, a sleeve 34 is slidable within the sleeve-like extension 22 in directions toward and away from the fan. The distance between the inner edge of the sleeve 34 and the adjacent portion of the fan determines the size of the particles which may pass to the fan and be forced therefrom into the dust-receiving bag 33.

To effect axial shifting movement of the sleeve 34, a circumferentially elongate slot 35 is formed in the sleeve 34 and projecting into the slot 35 is a pin 36, the diameter of which is

slightly less than the transverse dimension of the slot 35. The pin 36 is rigid with a rotatable spindle 37 but is eccentrically mounted on the outer end of the spindle. The upper end of the spindle 37 is rotatable in a bearing extension 38 integral with the sleeve-like extension 22. Formed in the upper end portion of the spindle 37 is a reduced neck 39 into which fits a pin 40 carried by the bearing sleeve 38, thereby to afford turning movements of the spindle 37 but prevent longitudinal movements thereof.

The lower end portion of the spindle 37 has bearing in a boss 41 integral with the casing wall 27. On the outside of the casing wall 27 is a plate 42 which, in equi-distantly spaced relation, bears the letters F, M and C, and secured to the outer end portion of the spindle 37 is an operating knob 43 having a pointer 44. By turning the knob 43, the pointer may be brought into registry with any of the letters F, M and C which indicate the fully opened, medium and closed positions respectively of the litter controlling sleeve 34. By turning the knob 43, manifestly the spindle 37 is turned to actuate the eccentric pin 36 to shift the sleeve 34 in one direction or the other as desired. Manifestly, when the sleeve 34 is in its extreme right-hand position (Figure 1), it is in its closed position, at which time only the smallest particles in the dust-laden stream of air are permitted to pass to the fan. By turning the knob 43 so that the pointer 44 registers with the letter M, somewhat larger particles are permitted to pass to the fan, whereas upon turning the knob so that the pointer points to the letter F, the sleeve 34 is in its extreme left-hand position (Figure 1), at which time the larger size particles may pass to the fan. Thus it will be manifest that the inner edge of the sleeve 34 cooperates with the cone-like hub 20 of the fan for controlling or regulating the size of litter or foreign particles which are permitted to pass to the fan.

From the above, it will be manifest that I have produced an exceedingly simple and efficient suction cleaner, in which the heavier particles are first collected in a safety trap, this being due to the direction in which the dust-laden air enters the chamber 25. Any of the larger dust particles or litter which are carried along in the air stream pass to the fan before entering the dust-collecting bag, and the size of those which pass to the fan are readily and conveniently controlled by a simple manual adjustment accessible from the outside of the machine, enabling the operator to militate against large particles impinging against and injuring or damaging the fan.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention especially as defined in the appended claims.

What I claim is:

1. Litter control device for a vacuum cleaner having a casing adapted to receive dust laden air and a vertically disposed centrally apertured partition separating the interior of the casing into a safety trap chamber and a suction chamber, said control device comprising a suction producing fan disposed within the suction chamber in close juxtaposition to the partition and having a hub provided with a nose-like baffle portion projecting into the central aperture from behind the periphery thereof and in a direction toward the safety trap chamber, and means for driving the fan.

2. Litter control device for a vacuum cleaner having a casing adapted to receive dust laden air and a vertically disposed centrally apertured partition separating the interior of the casing into a safety trap chamber and a suction chamber, said control device comprising a suction producing fan disposed within the suction chamber in close juxtaposition to the partition and having a hub provided with a nose-like baffle portion projecting into the central aperture from behind the periphery thereof and in a direction toward the safety trap chamber, a sleeve within the partition aperture shiftable longitudinally to cooperate with said baffle portion for controlling the size of the litter passing through same, and means for driving the fan.

3. Litter control device for a vacuum cleaner having a casing adapted to receive dust laden air and a vertically disposed centrally apertured partition separating the interior of the casing into a safety trap chamber and a suction chamber, said control device comprising a suction producing fan having a hub provided with a nose-like baffle portion projecting into the central aperture of the partition and in a direction toward the safety trap chamber, said fan being disposed within the suction chamber and in close juxtaposition to the partition, a sleeve within the partition aperture shiftable longitudinally to cooperae with said baffle portion for controlling the size of the litter passing through same, means operable from the outside of the casing for effecting shifting movement of the sleeve, and means for driving the fan.

4. Litter control device for a vacuum cleaner having a casing adaped to receive dust laden air and a vertically disposed centrally apertured partition separating the interior of the casing into a safety trap chamber and a suction chamber, said control device comprising a suction producing fan disposed within the suction chamber in close juxtaposition to the partition and having a hub provided with a conically-shaped nose-like baffle portion projecting into the central aperture from behind the periphery thereof and in a direction toward the safety trap chamber, a sleeve within the partition aperture shiftable longitudinally to cooperate with said baffle portion for controlling the size of the litter passing through same, and means for driving the fan.

5. Litter control device for a vacuum cleaner having a casing adapted to receive dust laden air and a vertically disposed centrally apertured partition separating the interior of the casing into a safety trap chamber and a suction chamber, said control device comprising a suction producing fan disposed within the suction chamber in close juxtaposition to the partition and having a hub provided with a nose-like baffle portion projecting into the central aperture from behind the periphery thereof and in a direction toward the safety trap chamber, said baffle portion being cone-like and having curvilinear surfaces merging into the fan body, means for driving the fan, a sleeve disposed in the partition aperture, and means for adjusting the position of the sleeve toward and away from the hub for controlling the size of litter passing through the fan.

6. A control device as claimed in claim 5, in which the sleeve adjusting means comprises a rotatable spindle, an eccentric pin and slot con-

nection between one end of said spindle and the sleeve for shifting the latter upon turning movements of the spindle, and an operating element on the opposite end of the spindle on the outside of the casing.

JULIUS J. BEVINGTON.

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