April 21, 1953 R. C. LAMPE 2,635,708

VACUUM CLEANER

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Fig. 1

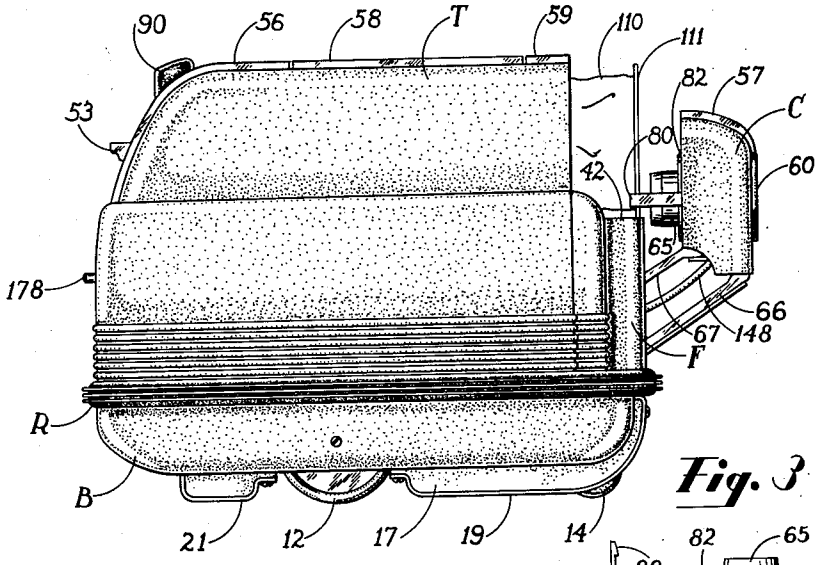


Fig. 3

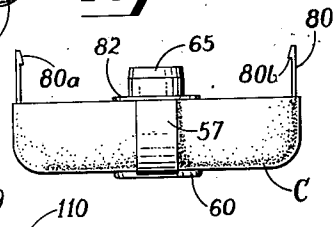
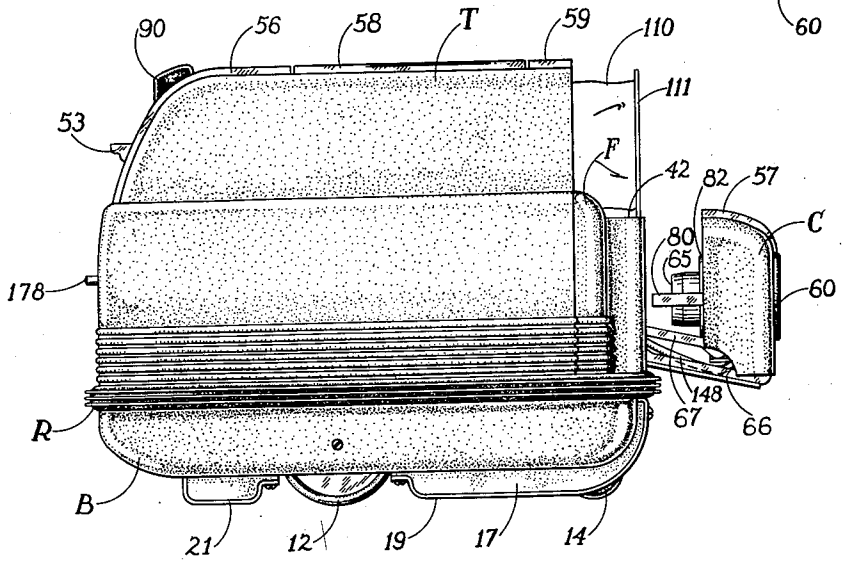


Fig. 2



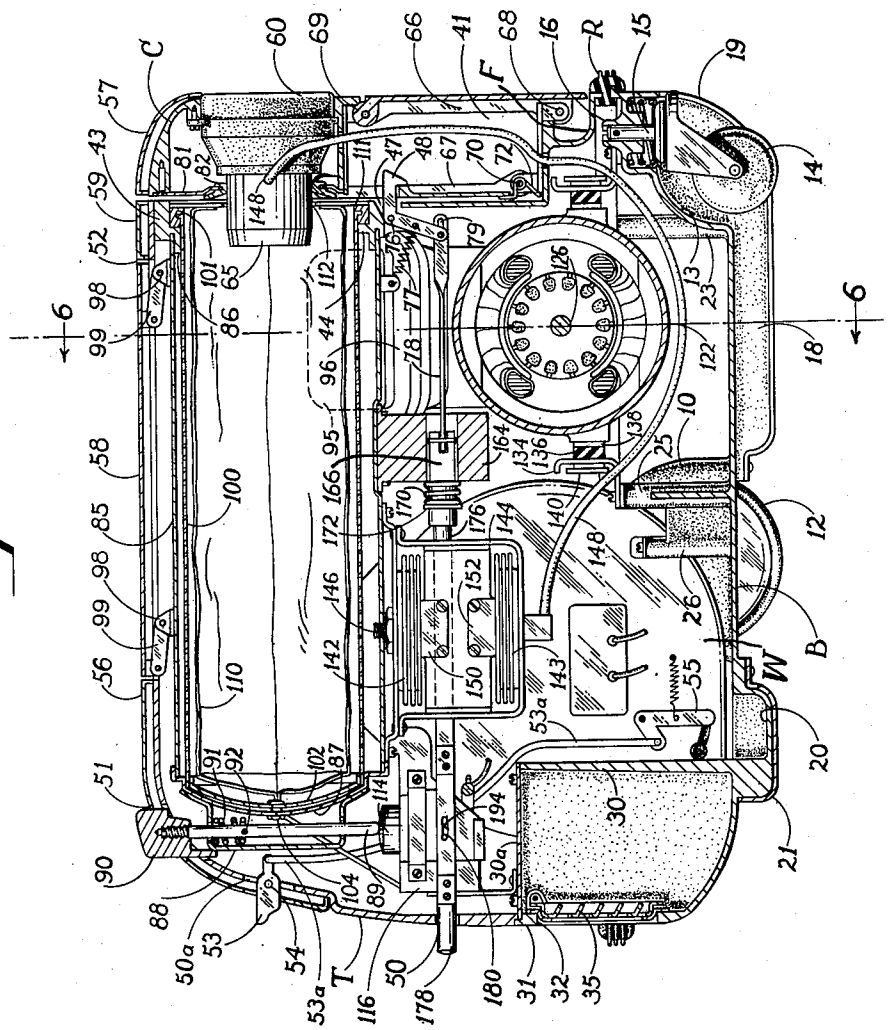
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VACUUM CLEANER

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Fig. 4



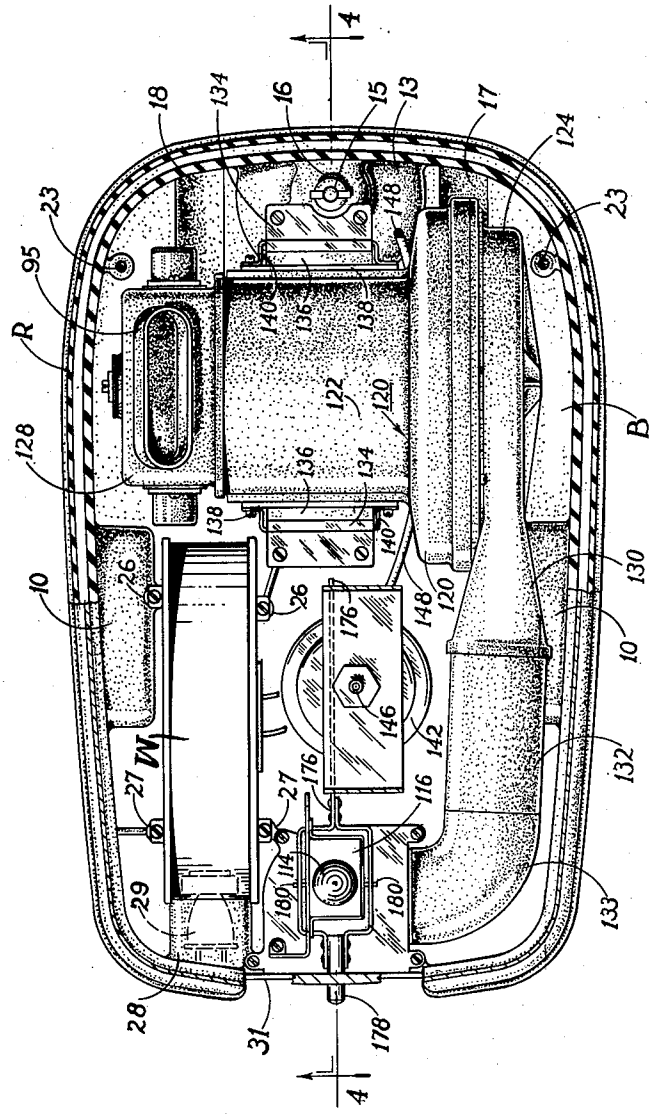
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VACUUM CLEANER

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Fig. 5



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VACUUM CLEANER

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Fig. 6

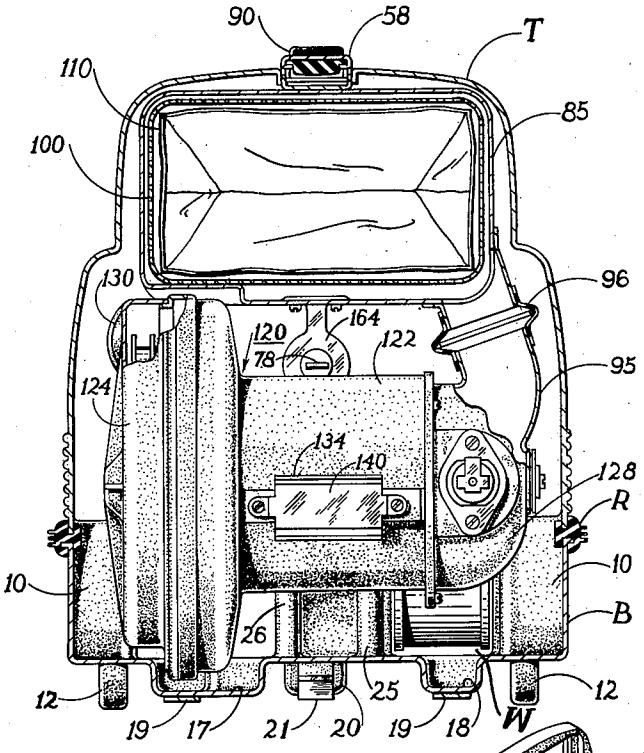


Fig. 7

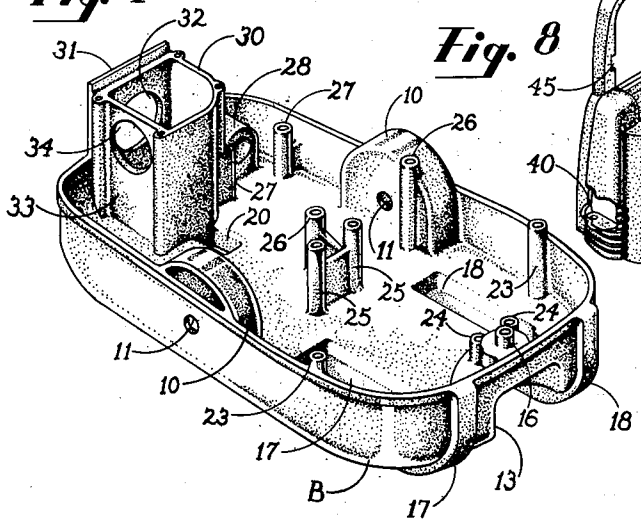
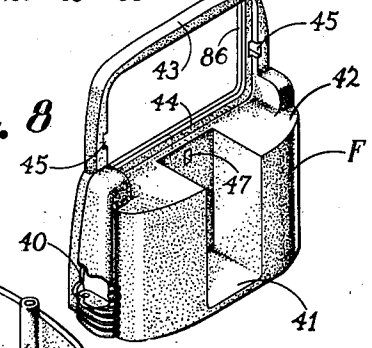


Fig. 8



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UNITED STATES PATENT OFFICE

2,635,708

VACUUM CLEANER

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Application June 29, 1948, Serial No. 35,845

7 Claims. (Cl. 183—37)

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This invention relates to suction cleaners and is particualrly concerned with portable self-contained units including a motor fan assembly and a dust separating mechanism, the device being particularly designed for domestic use.

It is to be understood that the device here presented is designed for use with a hose (not illustrated) to which may be selectively applied various cleaning tools through which dust-laden air is drawn from the surface being cleaned, the hose being removably applied to the present device to deliver such air to the dust separating and collecting receptacle where entrained dust, dirt and foreign matter is separated and retained while clean and purified air is discharged.

One of the objects of my invention is to provide in combination with a vacuum cleaner, a hose coupling so mounted with respect to the housing of the cleaner that when the coupling is moved with respect to the housing in order to permit insertion or removal of a dust collecting receptacle, the axis of the coupling remains substantially parallel to itself. This has the advantage that, inasmuch as a hose connected to the coupling does not have to be bent or twisted, the hose offers a minimum resistance to movement of the coupling. In addition, the coupling is always maintained in proper alignment so that the hose may be connected readily thereto.

Another object is to provide in combination with a cover member, means for moving the dust collecting receptacle to a position for ready removal from the housing as an incident to the movement of the cover.

Numerous other objects and features of the invention will become apparent from the following detailed description of the illustrative embodiment herein presented and shown in the accompanying drawings, which form a part of this specification, and of which;

Fig. 1 is a side elevation of a vacuum cleaner in accordance with my invention showing the cover in partially opened position and with the receptacle withdrawn;

Fig. 2 is a similar view showing the cover in fully opened position;

Fig. 3 is a top view of a front cover shown in Figs. 1 and 2;

Fig. 4 is a longitudinal vertical section taken on the line 4—4 of Fig. 5;

Fig. 5 is a horizontal sectional view of the vacuum cleaner shown in Fig. 4;

Fig. 6 is a transverse vertical section taken on the line 6—6 of Fig. 4;

Fig. 7 is an isometric view of the lower casting of a housing structure; and

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Fig. 8 is an isometric view of the front bracket.

It will be apparent from the following detailed discussion of structural features how the objects hereinbefore stated are accomplished.

The base B of the structure is a shallow dish like member, preferably of aluminum or magnesium die casting, and is substantially rectangular in horizontal cross-section, being provided, slightly to the rear of the transverse center line, with wheel wells 10 which are centrally apertured at 11 to receive the axles of the supporting wheels 12. At the forward end of the casting there is provided a recess 13 for the reception of a front caster 14, the shaft 15 of which extends upwardly through an apertured boss 16. The bottom of the casting forwardly of the wheel wells 10 is provided with a pair of depressions 17 and 18. The left-hand depression 17 is relatively wide, its width permitting the reception therein of the lower edge of the fan housing 124 of the motor fan unit 120, as shown in Fig. 6, while the right-hand depression 18 is narrower. Each depression is fitted on the bottom exterior of the casting with runner surfaces 19 which extend forwardly up the front of the casting and are arranged to act as sleighs in the movement of the device over obstructions in the path of travel. Rearwardly of the wheel wells there is a central depression 20 also provided with a runner strip 21 which prevents tipping over of the machine when a lifting force is exerted thereon by the hose as a result of moving the device by a tug on the hose.

The casting is also provided with a pair of oppositely disposed forwardly positioned bosses 23 which are internally threaded for the reception of securing screws for a front member F. For mounting the motor fan unit on the base B there are provided a forward pair of threaded bosses 24 and an intermediate pair of threaded bosses 25 to which are bolted brackets of the motor fan unit, as will be hereinafter described. Slightly to the rear of the bosses 25 there is also provided a pair of threaded bosses 26 which are adapted to support the front portion of a cord reel W. Rearwardly of the bosses 26 there is a pair of bosses 27 arranged for supporting the rear portion of the cord reel. The casting also includes a hollow projection 28 forming an open recess at the rear of the base B for the reception of the conductor plug 29 at the end of the conductor when the latter is wound upon the cord reel. The outer end of the recess is of sufficient diameter to permit the passage therethrough of the plug, while the inner end of the recess is only large enough to permit the free passage of the conductor, but not the plug.

The casting also includes a rear outlet box 30 which extends upwardly beyond the normal plane of the top surface of the base, the rear upper extension 31 being provided with an air outlet aperture 32, while the left side wall 33 is provided with an air inlet aperture 34. The arrangement is such that air from the motor fan unit passes into the box 30 by way of the aperture 34 and is exhausted therefrom through the aperture 32. The aperture 32 is provided with a louvered pivotally mounted air discharge door 35 (Fig. 4) the louvers of which direct the air upwardly away from the floor, while the pivotal mounting thereof permits the member to move inwardly to permit the insertion and engagement of the air hose with the aperture 32 when the device is to be used as a blower. A plate 30*a* closes the upper end of box 30.

Mounted on the front of the base B is a front member F shown in Fig. 8. The member F is preferably a die casting of aluminum or magnesium and, as is indicated, is of thin cross-section presenting a hollow front member including inwardly projecting ears 40 which are apertured to be secured by suitable fastening means to the bosses 23 of the base. Member F stands vertically upright on the base casting B and is provided with a lower wide front section which corresponds to the top outline of the front portion of the base B, the central portion, however, being cut away to form a recess 41 into which the supporting arms of a cover C fit when the cover is closed. Above the recess 41 the member F is further inwardly recessed to form a horizontal platform, beyond which the member F extends vertically upward to form a ring 43 which has a radially inwardly extending flange 44 within which is seated the receptacle compartment hereinafter described. Oppositely disposed portions of the ring 43 are cut away as at 45 to provide for the reception of the extractor fingers of the cover C hereinafter described. The rear wall of the recess 41 is also cut away as at 47 to form an aperture therethrough for the accommodation of a front latching finger 48 also to be hereinafter described.

A top housing member T is supported from the base B by engagement with a packing and bumper ring R at its lower edge and is also in engagement with the front member F and constitutes an open fronted body, substantially U-shaped in inverted cross-section and is provided with apertures 50, 50*a*, 51 and 52 to permit extension therethrough of a front cover operating rod 178, the cord reel control lever 53, the motor switch pedal 90 and the handle 58, respectively. The control lever 53 is pivotally mounted on the top T as at 54 and is connected by means of the curved rod 53*a* with the cord rewind lever 55. The cover C has secured thereto a decorative strip 57 which may be formed of polished metal or other contrasting material, and which is in alignment with the handle 58 and with a similar decorative piece 59 forwardly of the handle and a decorative piece 56 to the rear of the handle. The piece 56 is not only decorative, but also serves to prevent marring and scratching of the surface of the top T by the operator's foot if the latter is used to actuate the lever 53 or the pedal 90.

The cover C is of hollow construction as shown in Fig. 4, being apertured in front to receive a hose connection member 60 to which is attached an inlet tube 65 which, when the cover is closed, is inserted through a stiff front end 111 of a dust receptacle 110 as hereinafter explained. The cover C is supported by an outer plate 66 and an inner plate 67. The plates 66 and 67 fit within the recess 41 of the front bracket F when the cover is closed. The lower end of plate 66 is pivoted to the casting F at 68, while its upper end is pivoted to the member C at 69. Similarly, the lower end of the inner plate 67 is pivoted to the casting F at 70 and its upper end is pivoted to the cover C. A coil spring 72 is mounted about the lower pintle for the inner plate 67 and extends between the casting and the plate to urge the plate and with it the cover C and the outer plate 66 normally to the fully extended outer position shown in Fig. 2. When the device is in operation the parts are retained in the closed position shown in Fig. 4 by the latch member 48 which extends through the aperture 47 of the casting F, through a registering opening in the inner plate 67, and is pivotally mounted as at 76 to the casting. A spring 77 is arranged to normally hold the latch in clockwise rotated position and in engagement with the plate 67. An operating rod 78, which may be actuated either automatically or by hand as will hereinafter be described, engages the lower leg of the latch 48 through a lost motion connection indicated at 79.

With respect to this construction it will be noted that when the plate 67 is released by actuation of the latch 48 the plates 66 and 67 will move clockwise on their pivots 68 and 70, but will move in substantially parallel fashion to carry with them the cover C in an outwardly and downwardly directed arcuate path, as indicated in Figs. 1 and 2, the hose connector 60 thus remaining horizontal in all positions of the cover.

Extending inwardly from two sides of the cover C, as shown in Figs. 1, 2 and 3, there is provided a pair of hooked extractor fingers 80, the inner ends of which are formed with inclined surfaces 80*a* terminating in abrupt shoulders 80*b*. The inclined surfaces 80*a* enable the inner ends of the fingers to be sprung past the stiff front end 111 of the dust receptacle 110 during inward movement of the cover, the ends being received within the recesses 45 of the casting F. Upon outward movement of the cover C, the shoulders 80*b* of fingers 80 engage the stiff end of the receptacle to move the receptacle outwardly during the initial movement of the cover to the position shown in Fig. 1. During further movement of the cover to the fully open position shown in Fig. 2, the shoulders 80*b* slide off the lower edge of the end 111, leaving the receptacle 110 in the position shown in Fig. 2. The fingers 80 are preferably carried by an internal cover plate 81 which also carries a sealing gasket 82 surrounding the inlet tube 65 in such manner that when the cover is closed the inlet tube will be sealed into engagement with the front end 111 of the receptacle 110.

When the cover is closed it will be understood that in such closing movement the edges of the aperture of the internal plate 67 will cam back the latch 48 against the tension of the spring 77 so that the latch will be inserted through the opening of the plate and will be returned by spring force to the latching position shown in Fig. 4 to secure the cover in closed position until actuation of the latch.

For enclosing the dust receiving receptacle 110 there is provided an impervious receptacle compartment formed by an elongated casing 85 which is substantially oblong in transverse section. As best shown in Fig. 4, its open front end is mounted upon a rearwardly extending flange

86 of the member F, while the rear end is closed by an end cap 87 to which is secured an apertured vertical bracket 88 through which extends the vertical switch operating rod 89 to the upper end of which is secured the operating knob 90, which protrudes through the aperture 51 of the top T. A spring 91 encircles the rod 89 and abuts against a pin 92 thereon so as to lightly urge the rod downwardly against the button 114 of an electric switch 116.

The casing 85 is provided at the lower right-hand corner, as viewed in Fig. 6, and adjacent the front thereof with an air discharge tube 95 through which air is directed to the motor fan unit hereinafter described. A flexible coupling 96 is interposed in the tube 95 so as to preclude the transmission of vibration from the motor fan unit to the casing. The top external surface of the casing 85 is provided with handle brackets 98 to which are pivotally mounted links 99 which in turn pivotally engage the handle 58, which is normally retained by gravity, within the aperture 52 of the top T, but may be raised therefrom to permit grasping of the handle for bodily carrying the device.

Mounted within the casing 85 there is provided a perforated inner liner 100 which conforms in general configuration to that of the casing 85 and is provided at its opened front end with an outwardly extending flange which is seated within a rubber gasket 101 which in turn is mounted within the radial flange 44 of the member F, it being noted that the front surface of the gasket is inwardly spaced from the front surface of the member F at this point so that the stiff front plate 111 of the dust receptacle may be seated against the front face of the gasket 101 within the confines of the surrounding ring 43 of the member F.

The rear end of the liner 100 is closed by an impervious rigid end cap 102 which may be permanently secured thereto as by welding or the like. For securing the casing 85 and the liner 100 in the assembled position as shown in rigid relationship with the member F, there is provided a bolt 104 which extends through the rear end cap 87 of the casing 85 and the rear end cap 102 of the liner 100. By drawing the caps together by tension applied by bolt 104, the gasket 101 will be drawn tightly against its seat on the flange 44 of ring 43, while the casing 85 will in turn be thrust forwardly to secure it around the flange 86 and in abutment with the ring 43.

The dust receptacle itself is here disclosed as comprising a flexible air pervious body 110 which in transverse section conforms in shape to the oblong transverse configuration of the liner 100. While the material of the body may be of any pervious structure which will prevent the passage of dust and dirt, it is preferably formed of inexpensive disposable material, such as paper. The front end of body 110 is secured to a stiff front plate 111 which is preferably of inexpensive material, such as cardboard, and which is centrally apertured at 112 to receive the inlet tube 65 of the cover C. The peripheral configuration and dimensions of the front plate 111 are such that it will be snugly received within the ring 43 of the member F and will lie against the front face of the gasket 101 and be sealed thereagainst when the cover C is closed. By this construction, in conjunction with the sealing gasket 82 of the front cover, it will be seen that with the cover closed, all of the air passing through the tube 65 is introduced into the pervious body 110, from which it flows through the pervious walls of the body and through the perforated liner 100 and thence from the casing 85 to the discharge tube 95. Inasmuch as this closed passageway does not include the outer casing T, the latter need not be airtight.

In the operation of the device it will be understood that with the cover opened as shown in Fig. 2 a dust receptacle 110 may be inserted into the liner 100, the front plate 111 of the receptacle being guided towards seating within the member F by the platform 42 formed by the forward extension of the member F. As the cover is moved to closing position through the position shown in Fig. 1 and to the position shown in Fig. 4, the tube 65 is introduced into the aperture 112 of the receptacle and on final inward movement the gasket 82 engages the front plate 111 to clamp the latter in sealing engagement with the gasket 101 to complete the sealing securement of the receptacle. During such inward movement the extractor fingers 80 are sprung out by engagement of the inclined surfaces 80*a* with the front plate 111 so that the inner ends of te fingers push past the plate and come to rest within the recesses 45 with the shoulders 80*b* seated behind the plate 111. When the motor fan unit is energized to draw air therethrough, it produces a suction in the chamber 85 to cause an inflow of air through the inlet tube 65, and passage of dust-laden air through the air pervious body 110 will extract dust and dirt therefrom which dust and dirt is retained within the receptacle 110. When the receptacle is sufficiently loaded with dirt whereby resistance to the flow of air therethrough is such as to reduce the desired cleaning efficiency the cover C is released by operation of the latch 48 and is opened by pressure from the spring 72. The cover moves in the arcuate path shown in Figs. 1 and 2 and in such movement the inner ends 80*b* of the extracting fingers 80 which are seated behind the plate 111 draw the front plate 111 and with it the body 110 of the receptacle forwardly to the position shown in Fig. 1 where it may be readily grasped to be further and fully withdrawn and disposed of. Further movement of the cover to the position shown in Fig. 2 will cause the inner ends 80*b* of the extracting fingers 80 to slide from the bottom of the plate 111 and be released therefrom.

The motor fan unit, designated generally by reference character 120 comprises a motor housing 122 and a fan housing 124. An electric motor is contained within the housing 122, the shaft 126 of which motor projects into the fan housing 124 where it carries a conventional centrifugal fan rotor. The air conduit 95 communicates with an opening formed in an end cap 128 secured to the end of the motor housing opposite from the fan housing. The fan housing is provided with an air discharge passage 130 which communicates with the interior of the outlet box 30 by means of a section 132 of rubber tubing connected between passage 130 and elbow 133 secured to the outlet box in alignment with opening 34 therein. From here the air is discharged through the opening 32 in the outlet box, the vanes 35 directing the air upwardly and away from the surface supporting the cleaner. The rubber tubing 132 is interposed between the fan housing and the outlet box in order to prevent transmission of vibration from the motor fan unit to the base B.

The motor fan unit 120 is supported on the bosses 24 and 25 of the base B by means of a

pair of brackets 134. As shown more particularly in Figs. 4 and 5, blocks 136 of rubber or other suitable resilient material are vulcanized to the brackets 134 and to plates 138 secured to the sides of the motor housing 122. Straps 140 are also secured to plates 138 and extend outside the brackets 134, being normally spaced therefrom, but located close enough thereto so that under shock the straps will contact the brackets before the shear or tension forces acting on the rubber become sufficient to damage it.

In order to open the front cover C automatically when the pressure drop through the receptacle 110 has reached a predetermined value, a pair of Sylphon bellows 142 and 143 is mounted on a bracket 144 secured to the underside of the bottom wall of chamber 85. The interior of bellows 142 is in communication with the interior of chamber 85 through a hollow bolt 146. The interior of bellows 143 is in communication with the interior of the receptacle 110 through a flexible rubber tube 148 which extends from the bottom of the bellows 143, below the motor housing 122, through a suitable opening in the front casting F into the recess 41 thereof, and thence through an opening in the lower wall of the cover C to connect with an opening in the side of the inlet tube 65, the interior of which tube is in direct communication with the interior of the receptacle 110. The bellows 142 and 143 are arranged to actuate limit switches 150 and 152, respectively. Switch 150 is normally open, that is when atmospheric pressure is applied to both the exterior and interior of bellows 142. However, when the bellows is collapsed by sufficient reduction of the interior pressure, switch 150 is closed. Switch 152, on the other hand, is closed when both sides of bellows 143 are subjected to atmospheric pressure, and is opened by collapse of the bellows resulting from sufficient reduction of the interior pressure.

The switches 150 and 152 are connected in series with a solenoid 164 which is likewise mounted on the underside of the bottom wall of compartment 85. This solenoid includes an armature 166 to which is connected the rod 78 by means of a pin. A spring 170 bears against a washer 172 on the armature 166, thus tending to move the armature and connected parts to the left, as viewed in Fig. 4. Connected to the left end of the armature is a rod 176 which terminates in a button 178 projecting through the opening 50 in the rear end of the casting T. In the neighborhood of switch 116 the rod 176 is divided into two branches which extend on opposite sides of the switch, as is shown in Fig. 5.

Switch 116 is of the usual snap toggle type provided with the actuating button 114. The toggle pin 180 of the switch is extended through the side walls of the switch housing and the projecting ends of the pin are received in slots 194 formed in the two branches of rod 176, as shown in Figs. 4 and 5.

The switch thus may be actuated in two different manners. First, depression of the switch button 114 by means of the knob 90 and rod 89 serves to operate the switch in well known manner. When the switch is actuated in this manner the pin 180 may travel through the slots 194 without moving the rod 176. The second way in which the switch may be operated is by lengthwise movement of the rod 176, caused either by the solenoid 164 or manual depression of the button 178. Such movement of the rod 176 to the right, as viewed in Fig. 4, moves the pin 180 in the same direction and the switch is so constructed that movement of the pin in this direction opens the switch.

Switch 116 is connected in the motor circuit in the usual manner so as to start and stop the motor. Switch 116 also is in series with the limit switches 142 and 143 and the solenoid 169 so that the solenoid is deenergized whenever switch 116 is open, regardless of the condition of the limit switches 150 and 152.

The automatic controls operate in the following manner. It is assumed that the switch 116 has been manually thrown by means of the knob 90 to the closed position so that the motor is operating to draw air into the receptacle 110. When there is little or no dirt within the receptacle, the pressure drop through the porous walls thereof is at a minimum and consequently, the suction outside the receptacle 110, which acts on the interior of bellows 142 is but a slight amount greater than the suction within the receptacle which acts on the interior of bellows 143. Under these conditions both the bellows 142 and 143 will be partially collapsed, and the construction and arrangements of the parts are such that the bellows 143 will be collapsed sufficiently to open the circuit through the switch 152. Bellows 142 may or may not be collapsed sufficiently to close the circuit through switch 150, but this is immaterial inasmuch as the two switches are in series and hence the fact that switch 152 is open assures that the solenoid 164 is not energized. Consequently, the spring 170 holds the armature 166 in the position shown in Fig. 4 and spring 77 is able to hold the latch 48 in engagement with the front cover C so as to hold the latter in closed position. As more and more dirt is collected within the receptacle 110, the pressure drop through the porous walls of the receptacle 110 increases so that the absolute pressure within the bellows 142 decreases, while that within the bellows 143 increases. This causes the bellows 142 to collapse further until the circuit through the switch 150 is closed. The increase in absolute pressure within the bellows 143 causes this member to expand until the circuit through switch 152 is closed. When both of these switches are closed the circuit is completed to the solenoid 164, and the energization thereof moves the armature 166 and the rods 78 and 176 connected therewith to the right. This movement of rod 78 pivots the latch 48 against the bias of spring 77 so as to release the front cover C, whereupon the spring 72 associated with the hinge 70 tends to pivot the arm 67 in a direction to open the cover. However, the suction existing within the compartment 85 and acting on the sealing gasket 82 tends to hold the cover closed and consequently the latter does not immediately open all the way. Movement of rod 176 by the armature of the solenoid causes pin 180 of switch 116 to be moved to the right, thus throwing the switch to the off position. This shuts off the power to the motor, thus causing the fan to slow down and hence the suction within the chamber 85 is reduced and the cover is opened by the force of spring 72 aided by gravity.

Opening of switch 116 also opens the solenoid circuit so that the armature 166 is returned to its left-hand position by the spring 170. The consequent movement of rod 176 does not, however, move the pin 180 so as to close the switch 116, inasmuch as the length of slot 194 is at least as great as the throw of the pin 180. Movement of rod 78 to the left enables the spring 77 to pivot the latch 48 to latching position, but by this time

the cover has been opened sufficiently so as to be free of the latch.

As the cover opens, the abrupt surfaces 80b on the extractor fingers 80 engage the rear face of the stiff plate 111 of the receptacle 110, thus drawing the receptacle out of the compartment 85 to the position shown in Fig. 1. As was previously described, upon further movement of the cover C, the extractor fingers 80 slip off the lower end of the plate 111, leaving the receptacle 110 in the position shown in Fig. 2, while the cover opens all the way to the position likewise shown in this figure.

The operator may now withdraw the receptacle 110 from the compartment 85 and replace it by a new receptacle. The cover C is thereupon closed by lifting it and pushing it rearwardly until it is engaged by the latch 48. Due to the slot 79 in the rod 78, the latch may be pivoted sufficiently to engage the front cover without having to move the rod 78 and the parts connected thereto. The motor may again be started by depressing the knob 90 so as to close the switch. During this movement the pin 180 merely travels through the slot 194 without having to move the rod 176.

If for any reason it is desired to remove the receptacle 110 before the automatic controls open the front cover, this may be done by pressing the button 178 inwardly. This has exactly the same effect as though the armature 166 were moved to the right by energization of the solenoid 164, and hence it is not necessary to repeat the description of the operation of the various parts.

While there has been shown one more or less specific embodiment of the invention, it is to be understood that this has been done for the purpose of illustration only, and that the scope of the invention is not to be limited thereby, but is to be determined from the appended claims.

What I claim is:

1. In a vacuum cleaner, a housing enclosing a dust receptacle compartment, an opening in said compartment in a substantially vertical plane, a dust receptacle insertable into and removable from said opening, a closure member for said opening, and means including an arm secured to said closure member and adapted to engage the dust receptacle and to move the dust receptacle through said opening upon opening said closure member.

2. In a vacuum cleaner, a housing enclosing a dust receptacle compartment, an opening in said compartment in a substantially vertical plane, a dust receptacle having a rigid end plate insertable into and removable from said opening, a closure member for said opening, and means including a resilient arm secured to said closure member having a hooked end positioned to snap behind said plate upon closure of said closure member and to withdraw said dust receptacle outwardly through said opening upon opening of said closure member.

3. In a vacuum cleaner, a housing enclosing a dust receptacle compartment, an opening in said compartment in a substantially vertical plane, a dust receptacle having a rigid end plate insertable into and removable from said opening, a closure member for said opening, means for movably securing said closure member to said housing including parallel linkage for maintaining said closure member parallel to itself during opening and closing thereof, and a pair of resilient arms secured to said closure member and extending into said compartment when said member is closed, said arms having hooked ends positioned to snap behind said plate upon closure of said member and to engage said plate upon opening of said member to withdraw said dust receptacle outwardly through said opening.

4. In a vacuum cleaner, a housing enclosing a dust receptacle compartment, an opening in said compartment in a substantially vertical plane, a dust receptacle having a rigid end plate insertable into and removable from said opening, a closure member for said opening, means for movably securing said closure member to said housing including parallel linkage for guiding said member parallel to itself in an arcuate downward path from closed position to an open position in which the top of said member is below the bottom of said opening, and a pair of resilient arms secured to said member and extending into said compartment when said member is closed, said arms having hooked ends positioned to snap behind said plate upon closure of said member and to engage said plate to withdraw said dust receptacle outwardly through said opening during the first portion of the downward opening movement of said member and to thereafter be disengaged from said plate by the continued downward movement of said member.

5. In a vacuum cleaner, a housing having a dust receptacle compartment therein with an opening to the exterior, a dust receptacle insertable into and removable from said opening with an inlet located at substantially said opening, a hose coupling member having a conduit adapted to communicate with said inlet and having a pivotal mounting on said casing, and an arm on said member having a lost motion connection to said receptacle whereby upon withdrawal movement of said member communication with said inlet is first broken and thereafter said arm is effective to draw the dust receptacle outwardly.

6. In a vacuum cleaner, a horizontal housing having a dust receptacle compartment therein with an end opening to the atmosphere, a dust receptacle insertable into and removable from said compartment through said opening, a movable member associated with said compartment end, hose coupling means carried by said member for connecting one end of a suction hose thereto, and parallel linkage means interconnecting said housing and said member for movably supporting said member with respect to said housing so that said member and said hose coupling means move together through an arc from a first position adjacent said opening where the axis of said coupling means is horizontal to a second position remote from said opening where the axis of said coupling means is also horizontal.

7. In a vacuum cleaner, a horizontal housing having a dust receptacle compartment therein with an opening to the atmosphere, a dust receptacle insertable into and removable from said compartment through said opening, a movable end member for said housing adjacent the opening therein, hose coupling means carried by said member for connecting one end of a suction hose thereto, parallel linkage means interconnecting said housing and said member for movably supporting said member with respect to said housing so that said member and said hose coupling means move together through an arc from a first position adjacent said opening where the axis of said coupling means is horizontal to a second position remote from said opening where the

axis of said coupling means is also horizontal, spring means for operating said linkage means to move said hose coupling means from said first to said second position, releasable means for holding said member and said hose coupling means in the first of said positions, and means for releasing said releasable means whereby said spring means operates said linkage means to move said hose coupling means and the end of the hose attached thereto to said second position away from said opening.

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