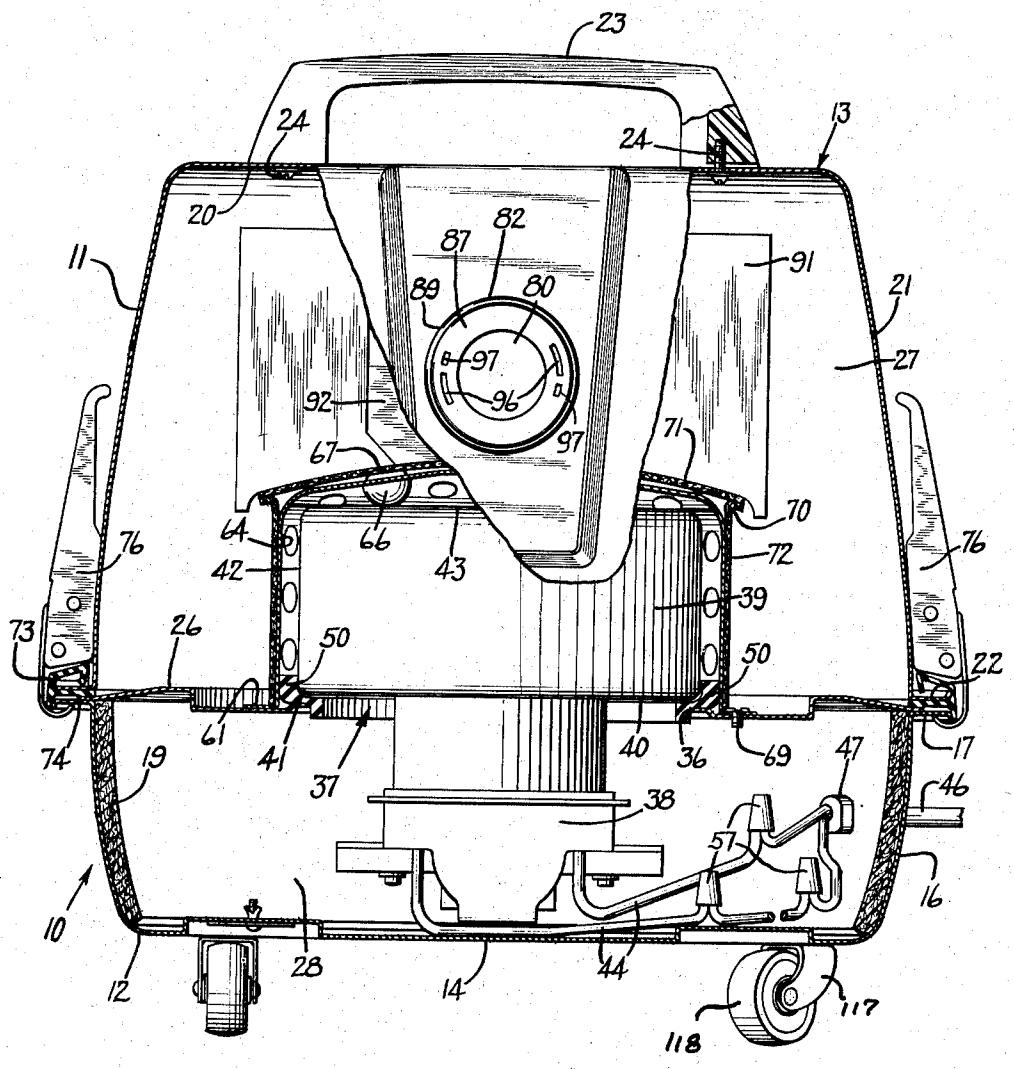
Jan. 13, 1959 G. M. KELLY 2,868,321

CANISTER-TYPE VACUUM CLEANER

Filed Oct. 18, 1957 3 Sheets-Sheet 1

Fig. 1

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CANISTER-TYPE VACUUM CLEANER

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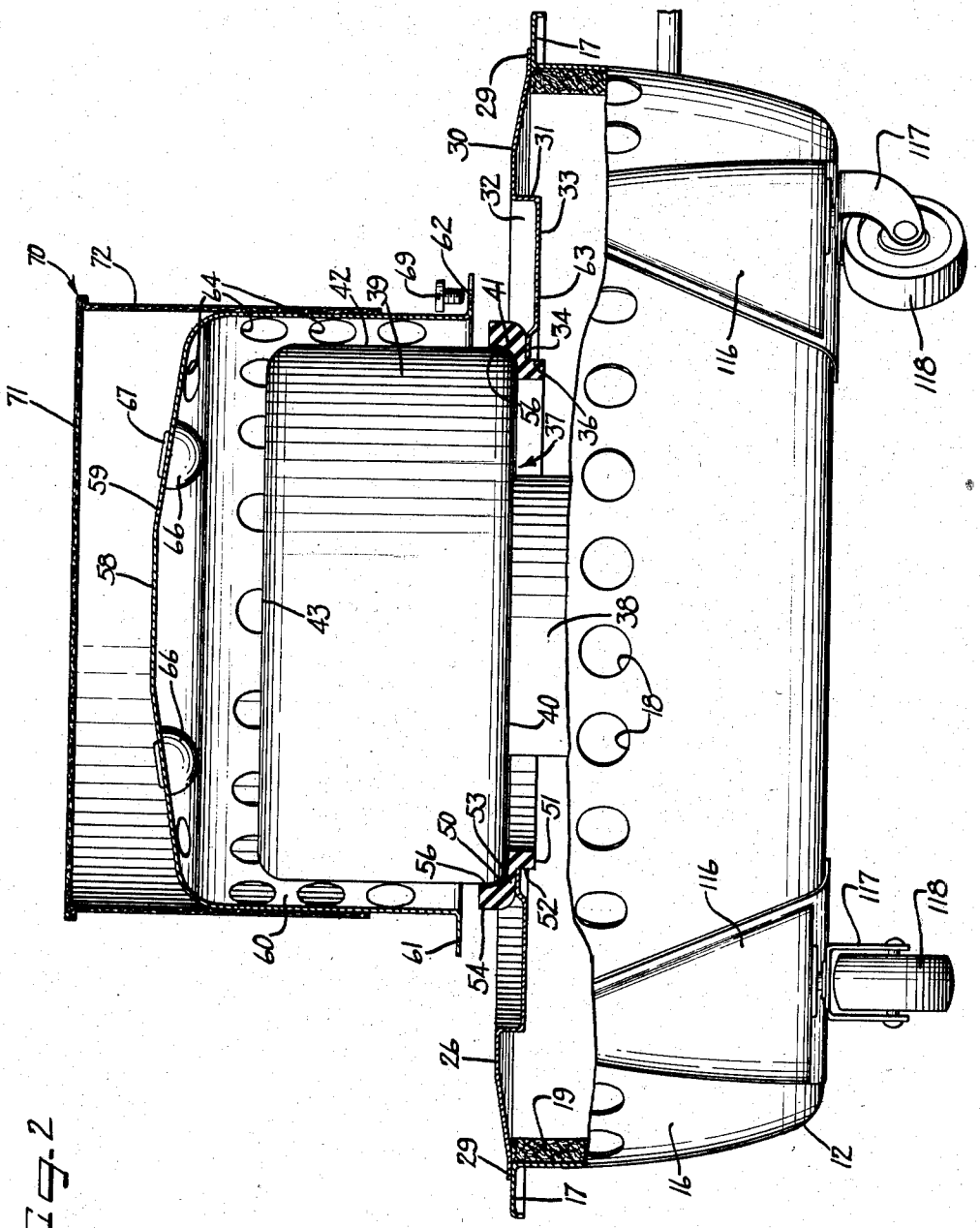


Fig. 2

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Fig. 3

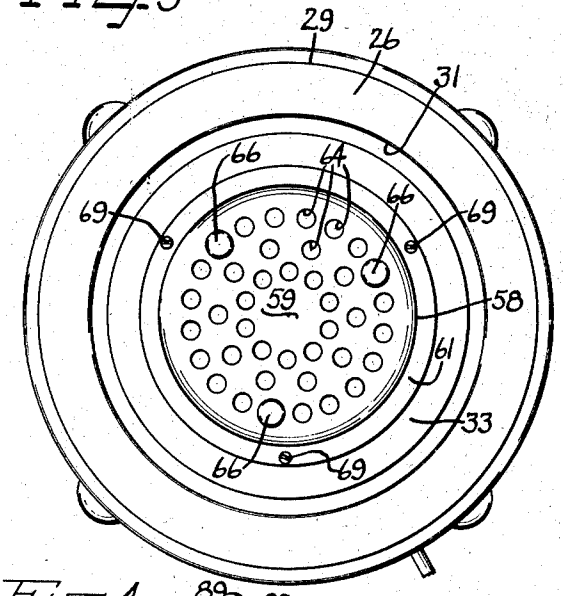



Fig. 6

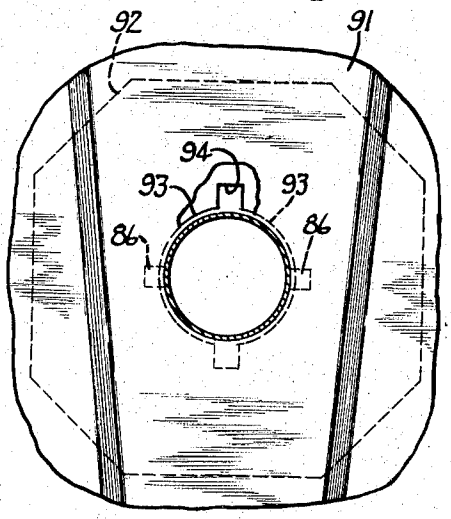



Fig. 4

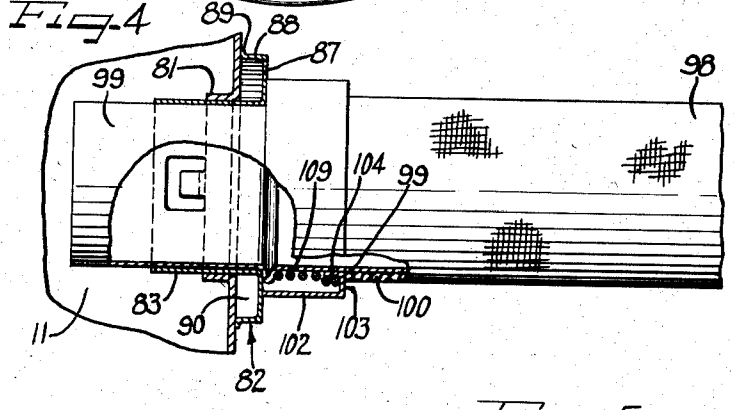
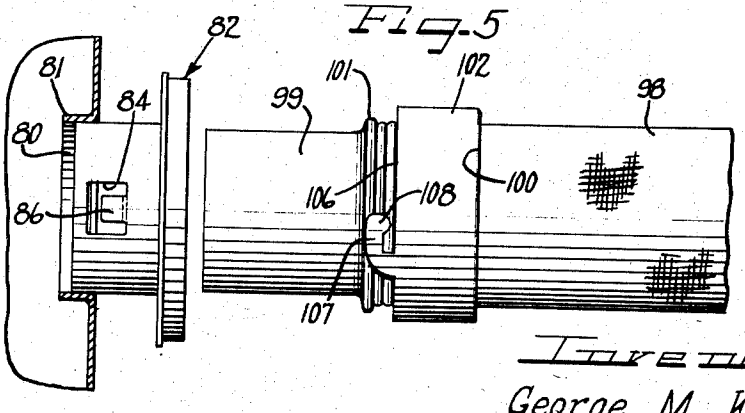



Fig. 5

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2,868,321

# CANISTER-TYPE VACUUM CLEANER

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Application October 18, 1957, Serial No. 690,919

7 Claims. (Cl. 183—37)

This invention relates generally to cleaning apparatus and more particularly to a canister-type vacuum cleaner, terminology which is used to describe an upright-type of a so-called tank-type vacuum cleaner.

It is an object of the present invention to provide a canister-type vacuum cleaner having improved means for mounting and cushioning a motor fan unit.

Yet another object of the present invention is to provide improved filter connecting means for a canister-type vacuum cleaner.

A further object of the present invention is to provide improved coupling means between the housing and a conduit used in association with the cleaner.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheets of drawings in which a preferred structural embodiment of a canister-type vacuum cleaner incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

Figure 1 is a broken elevational view with parts shown in cross-section illustrating a canister-type vacuum cleaner incorporating the principles of the present invention;

Figure 2 is a fragmentary exploded view illustrating additional details of construction of the present invention and particularly with respect to the motor mounting improvements thereof;

Figure 3 is a reduced plan elevational view of the bottom of the machine, as shown in Figure 2, but with the parts assembled and in assembled relation with one another;

Figure 4 is a fragmentary cross-sectional view showing the conduit coupling connection details of the present invention;

Figure 5 is a view similar to Figure 4, but showing the parts in an exploded view to illustrate additional details of construction; and

Figure 6 is a fragmentary cross-sectional view showing additional details of the filter bag attaching means.

As shown on the drawings:

The canister cleaner of the present invention is indicated generally at 10 and comprises an upper housing 11 and a lower housing 12 together forming a unitary housing or casing 13.

The lower housing 12 comprises a sheet form member shaped to provide a bottom wall 14 and upstanding circumferentially extending side wall portions 16 terminating in a radially outwardly extending flange 17. The side wall portions 16 are particularly characterized by an annular row of outlet openings 18. An annular ring of sound-deadening insulating material such as is shown at 19 is fastened to the inner portion of the side walls 16.

The upper housing constitutes a sheet form member which has a generally inverted cup shape configuration including a top wall 20 and depending side wall portions 21 terminating in a radially outwardly extending flange



22 adapted to be positioned in overlying adjacency to the flange 17 of the lower housing 12. A handle for carrying the machine is shown at 23 and is fastened to the top wall 20 by suitable fastening means 24.

A generally horizontally disposed partition or wall 26 extends across the interior of the housing or casing 13 between the upper housing 11 and the lower housing 12, thereby to divide the interior of the casing 13 into a dirt-separating compartment 27 and an air discharge or outlet compartment 28.

More specifically, the partition or wall 26 constitutes a sheet for member of a generally annular configuration having an outer peripheral edge 29 of greater diameter than the diametral dimension of the side walls 16, thereby to overlie and abuttingly engage the flange 17 of the lower housing 12.

The partition or wall 26 is embossed, thereby to provide a generally arching portion 30 radially inwardly of the peripheral edge 29 and terminating in a vertical shoulder 31 which is offset to provide the side wall of an annular recess 32. Extending radially inwardly from the side wall portion 31 is a horizontal wall portion 33 which terminates in an offset inner rim 34 surrounding the edge of a centrally disposed opening 36. The embossed shape of the partition or wall 36 endows the sheet form member with additional rigidity and strength. The partition or wall 26 is preferably firmly assembled to the lower housing 12, for example, by spot-welding the peripheral edge 29 to the flange 17 at various circumferentially spaced points.

A motor fan unit indicated generally at 37 has an electric motor 38 drivingly connected with a fan unit enclosed within a casing 39, the casing 39 being of larger size than the motor end of the unit 37, thereby to provide a radially extending wall 40 terminating in a rounded corner 41 which is of a dimensional extent slightly larger than the diametral dimension of the opening 36 formed in the partition or wall 26. The casing 39 further includes a circumferentially extending side wall 42 and an end wall 43.

As is shown in Figure 1, suitable conductor wires 44 are connected electrically to the motor 38. The wires 44 are connected to a conventional sheathed cord 46 which passes through the side wall portions 16 of the lower housing 12 via an appropriate gasket 47, thereby to facilitate electrical connection to a domestic supply source of electricity for energizing the motor 38 and actuating the fan unit within the casing 39.

According to the principles of the present invention, the motor fan unit 37 is assembled with the lower housing 12 and in the partition or wall 26 by the mere simple act of inserting the motor portion 38 through the opening 36 so that the casing 39 will overlie the inner rim 34. In this connection, a resilient gasket 50 is provided which has a generally cylindrical pilot portion 51 having an outer diameter provided by a side wall 52 of the same dimension as the opening 36.

A supporting portion 53 extends radially outwardly from the pilot portion 51 and overlies and seats against the rim 34. The support portion 53 is provided with an upstanding flange 54 which extends in axial direction generally parallel to the pilot portion 51, but spaced concentrically outwardly thereof. The inner surface of the gasket 50 is curved as at 56 to conform to the configuration of the rounded corner 41 of the casing 39.

Thus, in assembly, the gasket 50 is merely inserted in place in the opening 36 of the partition or wall 26, whereupon the motor fan unit, having been electrically connected by means of the quick fastening couplers 57 (Figure 1), is conveniently set down in place on top of the gasket 50. The upstanding flange 54 of the gasket 50 closely embraces the side wall 42 and the motor

fan unit 37 rests in place in proper alignment with the fan casing projecting on one side of the partition or wall 26 into the dirt-separating compartment 27, and the motor end 38 projecting on the other side of the partition or wall 26 into the discharge or outlet compartment 28.

Thereafter, a shroud member indicated generally at 58 is placed over the casing part 39 projecting on the one side of the wall 26. The shroud member 58 comprises an end wall 59 and side wall portions 60 which depend therefrom, there being further provided an outwardly projecting flange 61 suitably apertured at circumferentially spaced points as at 62.

The horizontal wall portion 33 of the partition or wall 26 is likewise provided with apertures 63 corresponding in number and location to the apertures 62. It will be noted that the end wall 59 and the side walls 60 of the shroud member 58 have formed therein air flow openings 64, thereby rendering the shroud member foraminous.

The shroud member 58 is particularly characterized by the provision thereon of a plurality of resilient bumpers or buttons indicated at 66. The bumpers or buttons 66 conveniently comprise a generally semi-spherical knob portion which preferably projects inwardly for resilient abutting engagement against the end wall 43 which adjoins the end wall 59 of the shroud member 58. A neck portion of reduced diameter sufficiently small to pass through one of the openings 64, or a separate opening, if desired, is provided on the bumpers or buttons 66 and there is further provided a flat retainer portion 67 which overlies the edges of the corresponding opening, thereby locking the bumpers or buttons 66 in place on the end wall 59 of the shroud member 58.

By virtue of such arrangement, simple fastening means such as a metal screw 69 is provided for each set of openings 62 and 63 and the shroud member 58 is drawn into firm assembly with the partition or wall 26, while the motor fan unit is resiliently and firmly clamped between the gasket 50 and the resilient bumpers or buttons 66.

In the embodiment shown, there are three bumpers or buttons 66 and three metal screws 69. Thus, the entire motor mounting assembly requires only three simple metal screws and yet a fully cushioned assembly is provided.

In order to form a secondary filter for the cleaner, there is provided a generally cup-shaped filter cap 70 which includes an end wall 71 and a cylindrical side wall 72, the filter cap 70 comprising any suitable filtering material such as a porous felt, or the like. The flexible filter cap 70 generally conforms in size and configuration to the shroud member 58 and as shown in Figures 1 and 2, fits over the shroud member 58 in snug relationship therewith.

The upper housing 11 carries a peripheral gasket 73 on the flange 22, which gasket is shaped to provide a circumferentially extending bumper for the machine, as well as a sealing gasket portion 74 which extends between the flange 22 and the flange 17.

There is further provided on the upper housing 11, a pair of toggle clamps 76, 76 which engage the underside of the flange 17 on the lower housing 12 to lock the upper housing 11 in firm sealed-together assembly with the lower housing.

As shown in Figures 4 and 5 taken in conjunction with Figure 1, the upper housing 11 has formed in the side wall portions 21 thereof, an inlet opening 80 particularly characterized by an inwardly extending embossed flange 81.

Received within the inlet opening 80 is a ferrule 82 which more particularly includes a cylindrical barrel potion 83 struck out as at 84 at one or more circumferentially spaced points to provide an offset radially outwardly projecting lug or tongue 86. The ferrule



82 further includes a flange 87 which overlies the edges of the opening 80 on the outside of the upper housing 11, but which is retained in spaced relationship with respect thereto by an annular axially extending wall 88 terminating in an edge portion 89 engaging against an adjoining wall surface of the upper housing 11. There is thus formed an annular clearance space 90 between the upper housing 11 and the flange 87.

It will be understood that after the ferrule 82 is inserted into the opening 80, the lugs or tongues 86 are offset behind the embossment 81 on the inside of the housing 11, while the flange 87 overlies the edges of the opening 80 on the outside of the housing, thereby to place the ferrule 82 in firm assembly with the upper housing 11.

Although other forms of filtering means could be employed, it is contemplated that the present cleaner can advantageously utilize a disposable filter bag made of a porous paper filter material, such a filter bag being indicated generally at 91. The filter bag is characterized by a reinforcement 92 having an inlet opening 93 formed therein. As shown in Figure 6, at selected circumferential points on the opening 93, radially outwardly extending slots 94 are formed corresponding in number and location to the lugs or tongues 86 on the ferrule 82. Thus, to attach the filter bag 91 to the inlet opening 80, the reinforcement 92 is merely placed in register with the inlet opening and the lugs or tongues 86 are passed through the slots 94 whereupon the reinforcement and the bag 91 are twisted to effect a bayonet-locking action, the respective lugs 86 underlying the edges of the opening 93 in the reinforcement 92.

As shown on Figures 1, 4 and 5, the flange 87 of the ferrule 82 is particularly characterized by the formation therein of a pair of circumferentially spaced slots 96 and a corresponding pair of circumferentially spaced openings 97, each slot and each opening 96 and 97 constituting a matched pair of slotted openings for cooperative engagement with a latching mechanism of a hose coupling connector provided in accordance with the principles of the present invention.

Thus, as shown in Figures 4 and 5, a fabric hose 98 is provided by means of which the cleaner 10 may be operated with the usual accessories, such as cleaning wands and the like. At the end of the fabric hose 98, there is provided a terminal tube 99. The fabric of the hose 98 forms a shoulder 100 along the length of the terminal tube 99 and there is further provided an embossed annular bead 101 forming a second shoulder which is axially spaced from the shoulder 100.

Slidably mounted between the bead 101 and the shoulder 100, there is provided a locking ring 102 having a radially extending wall 103 reversely flanged as at 104. The axially extending wall of the ring 102 terminates in a forward edge 106 characterized by the formation therein of two circumferentially spaced lugs 107 each having a finger extremity formed thereon.

A coil spring 109 is bottomed at one end against the bead 101 and is bottomed at its opposite end against the radial wall 103, thereby to normally bias the locking ring against the shoulder 100 provided by the fabric hose 98.

In order to assemble and lock the hose in the inlet opening 80, the terminal tube 99 is inserted in the inlet opening through the barrel portion 83 of the ferrule 82. At the same time, the locking ring 102 is manipulated to pass the respective lugs 107 through the corresponding set of slots 96. Upon proper location and a partial twist, the finger extremities 108 will be return-biased into the corresponding openings 97 in the flange 87 of the ferrule 82.

To disassemble the hose from the cleaner, the locking ring 102 is again manipulated to unseat the finger extremities 108 from the openings 97 whereupon the lugs 107 are withdrawn from the flange 87 via the slots 96, and the terminal tube 99 is withdrawn from the ferrule 82.

As shown in Figure 4, when the hose 98 is assembled with the cleaner, the terminal tube 99 actually extends

into the filter bag **91** through the reinforcement **92**, thereby to discharge dirt-laden air into the interior of the filter bag.

The filtered air then passes through the secondary filter **70** and through the opening **64** of the shroud member **58**, through the motor fan unit **37**, whereupon the air is discharged into the discharge compartment **28** and is diffused through the sound-deadening bat of material **19**, and through the outlet openings **18** in the lower housing **16**.

As shown in Figure 2, the lower housing **12** may be provided with embossments **116**, each carrying a swivel caster **117** equipped with roller wheels **118**, thereby enhancing the portability of the cleaner **10** in the course of operation thereof.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such modifications as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. In a canister cleaner, a housing having a dirt-separating compartment with an inlet opening formed in the walls thereof, said housing having an edge portion extending inwardly into said dirt-separating compartment at said inlet opening, a ferrule in said opening having a barrel portion projecting through said opening into said housing and a flange overlying the edges of said opening outside of said housing, said barrel portion having struck-out lug portions underlying said edge portion on the inside of said housing, and a dirt-separating filter bag in said compartment made of flexible porous filter material and having rigidified reinforcement means forming an inlet opening sized to receive said barrel portion and having slots formed in said rigidified reinforcement means extending radially outwardly from said inlet opening corresponding in number and placement to said lug portions for effecting a bayonet coupling connection of said filter bag therewith.

2. In a canister cleaner, a housing having a dirt-separating compartment with an inlet opening formed in the walls thereof, said housing having an edge portion extending inwardly into said dirt-separating compartment at said inlet opening, a ferrule in said opening having a barrel portion projecting through said opening into said housing and a flange overlying the edges of said opening outside of said housing, said barrel portion having struck-out lug portions underlying said inwardly extending edge portion and the inside of said housing, said flange having a transverse wall spaced from said housing and having circumferentially spaced slots formed therein, and a conduit member connected to said ferrule comprising a terminal tube inserted into said barrel portion, said terminal tube having an annular bead projecting radially outwardly thereof, a fabric hose connected to said terminal tube and forming an annular shoulder spaced axially from said bead, a locking ring slidably carried by said tube between said bead and said shoulder, and a spring bottomed against said bead and against said locking ring to normally bias said locking ring against said shoulder, said locking ring having axially projecting lug portions corresponding in number and location to said slots and engaging said flange to lock said conduit in said ferrule.

3. In a canister cleaner, a housing having a dirt-separating compartment with an inlet opening formed in the walls thereof, said housing having an inwardly extending edge portion at said inlet opening, a ferrule in said opening having a barrel portion projecting through said opening into said housing and a flange overlying the edges of said opening outside of said housing, said barrel portion having struck-out lug portions underlying said inwardly extending edge portion on the inside of said housing, a dirt-separating filter in said compartment having means forming an inlet opening sized to receive said barrel portion and having slots extending radially



outwardly from said inlet opening corresponding in number and placement to said lug portions for effecting a bayonet coupling connection of said filter therewith, said flange of said ferrule having a transverse wall spaced from said housing and having circumferentially spaced slots formed therein, a conduit member connected to said ferrule comprising a terminal tube inserted into said barrel portion and projecting into the interior of said filter, said terminal tube having an annular bead projecting radially outwardly thereof and engaging on one side against said flange of said ferrule, a fabric hose connected to said terminal tube and having an annular shoulder spaced axially from said bead, a locking ring slidably carried by said terminal tube between said bead and said shoulder, and a spring bottomed against said bead and against said locking ring to normally bias said locking ring against said shoulder, said locking ring having axially projecting lug portions corresponding in number and location to said slots in said flange of said ferrule to lock said conduit in firm assembly with said housing, thereby to discharge dirt-laden air into said filter within said dirt-separating compartment.

4. In a canister-type vacuum cleaner, a casing including a lower housing, an upper housing and an intermediate wall therebetween dividing the casing into an upper dirt-separating compartment and a lower outlet compartment, a motor fan unit in said wall having first and second oppositely projecting parts in said upper and lower compartments, respectively, and a shroud member having an end wall overlying said first part, side walls circumjacent said first part and a flange spaced from an adjoining surface of said intermediate wall, fastening screws between said flange and said intermediate wall, resilient cushioning means between said end wall of said shroud member and said unit and between said intermediate wall and said unit, whereby said motor fan unit is clamped in assembly by drawing up said flange against said intermediate wall with said fastening means, said upper housing having an inlet opening formed in the walls thereof, said housing having an edge extending inwardly at said inlet opening into said dirt-separating compartment, a ferrule in said opening having a barrel portion projecting through said opening into said dirt-separating compartment and a flange overlying the edges of the opening outside of said upper housing, said barrel portion having struck-out lug portions underlying said edge portion on the inside of said upper housing, and a dirt-separating filter in said compartment having means forming an inlet opening sized to receive said barrel portion and having slots extending radially outwardly from said inlet opening corresponding in number and placement to said lug portions for effecting a bayonet coupling connection of said filter therewith.

5. In a canister-type vacuum cleaner as defined in claim 4, a cup-shaped member made of filter material enclosing said shroud member to form a secondary filter for the cleaner.

6. In a canister-type vacuum cleaner, a casing including a lower housing, an upper housing and an intermediate wall therebetween dividing the casing into an upper dirt-separating compartment and a lower outlet compartment, a motor fan unit in said wall having first and second oppositely projecting parts in said upper and lower compartments, respectively, and a shroud member having an end wall overlying said first part, side walls circumjacent said first part and a flange spaced from an adjoining surface of said intermediate wall, fastening screws between said flange and said intermediate wall, resilient cushioning means between said end wall of said shroud member and said unit and between said intermediate wall and said unit, whereby said motor fan unit is clamped in assembly by drawing up said flange against said intermediate wall with said fastening means, said upper hous-

ing having an inlet opening formed in the walls thereof, said housing having an edge extending inwardly at said inlet opening into said dirt-separating compartment, a ferrule in said opening having a barrel portion projecting through said opening into said dirt-separating compartment and a flange overlying the edges of the opening outside of said upper housing, said barrel portion having struck-out lug portions underlying said edge portion on the inside of said upper housing, and a dirt-separating filter in said compartment having means forming an inlet opening sized to receive said barrel portion and having slots extending radially outwardly from said inlet opening corresponding in number and placement to said lug portions for effecting a bayonet coupling connection of said filter therewith, said flange of said ferrule having a transverse wall spaced from said upper housing and having circumferentially spaced slots formed therein, a terminal tube inserted into said barrel portion and extending into said filter, said terminal tube having an annular bead projecting radially outwardly thereof, a fabric hose connected to said terminal tube and forming an annular shoulder spaced axially from said bead, a locking ring slidably carried by said terminal tube between said bead and said shoulder, and a spring bottomed against said bead and against said locking ring to normally bias said locking ring against said shoulder, said locking ring having axially projecting lug portions corresponding in number and location to said slots to lock said hose in firm assembly with said cleaner.

7. In a canister cleaner, a housing having a dirt-separating compartment with an inlet opening formed in the walls thereof, means forming a barrel portion projecting through said inlet opening into said housing, said barrel portion having struck-out lug portions extending radially outwardly of said barrel portion on the inside of said housing, and a dirt-separating filter bag in said compartment made of flexible porous material and having rigidified reinforcement means forming an inlet opening sized to receive said barrel portion and having slots formed in said rigidified reinforcement means extending radially outwardly from said inlet opening corresponding in number and placement to said lug portions for effecting a bayonet coupling connection of said filter bag therewith.

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