Nov. 8, 1955 W. G. SECK ET AL 2,722,996

SUCTION CLEANER

Filed June 5, 1953 3 Sheets-Sheet 1

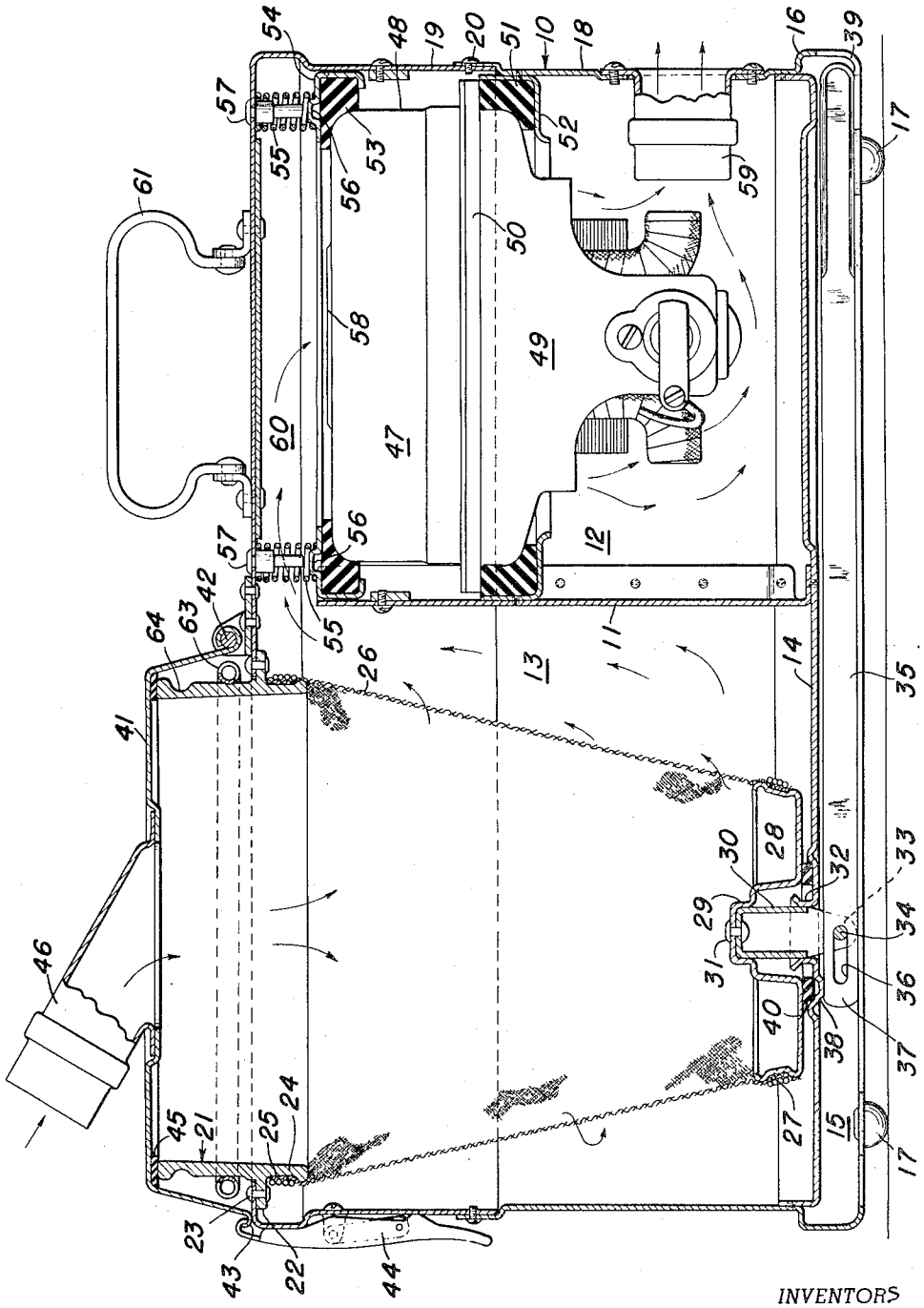


Fig. 1

INVENTORS
Werner G. Seck &
Dale C. Gerber

BY Geo. A. Race
ATTORNEY.

Nov. 8, 1955 W. G. SECK ET AL 2,722,996

SUCTION CLEANER

Filed June 5, 1953 3 Sheets-Sheet 2

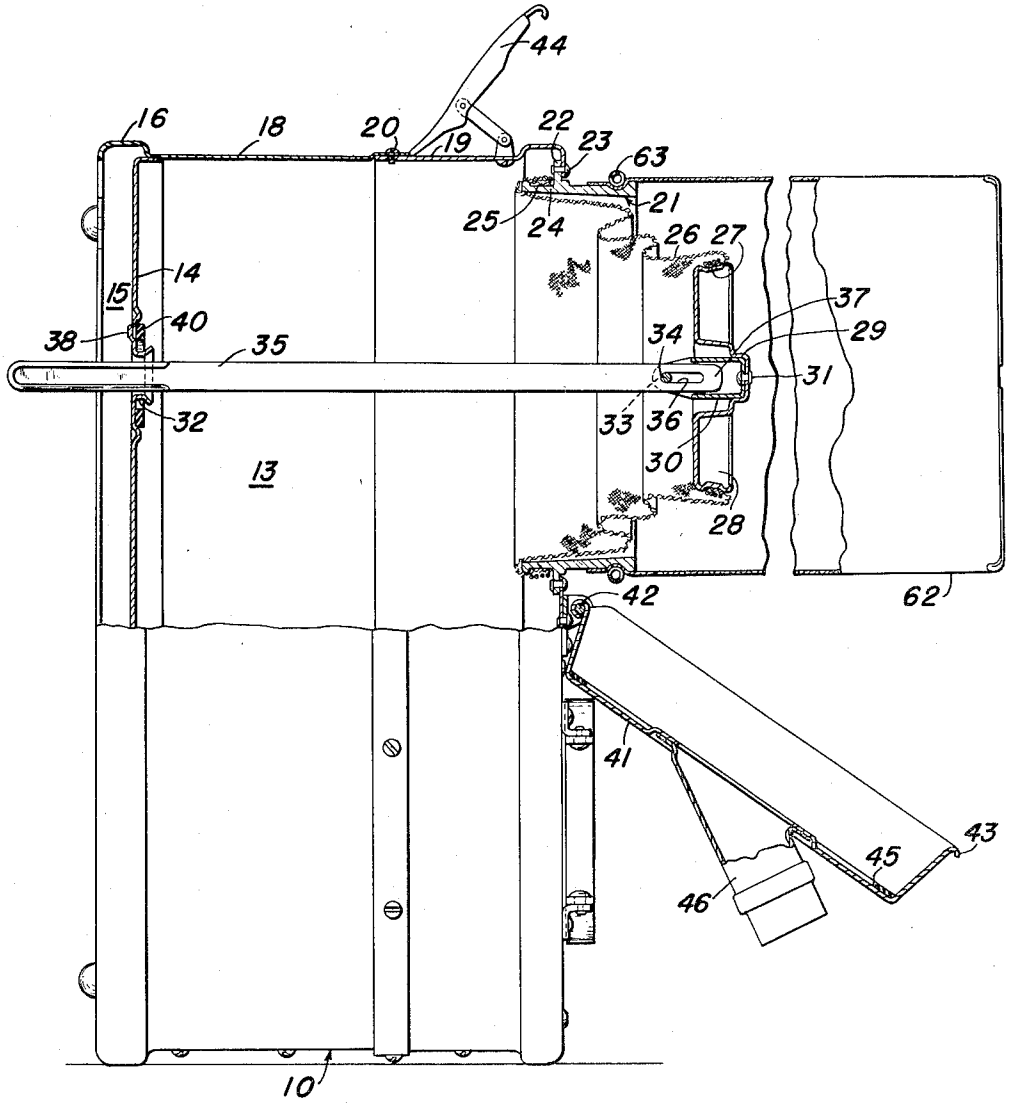


Fig. 2

INVENTORS
Werner G. Seck &
Dale C. Gerber

BY

ATTORNEY.

Nov. 8, 1955 W. G. SECK ET AL 2,722,996

SUCTION CLEANER

Filed June 5, 1953 3 Sheets-Sheet 3

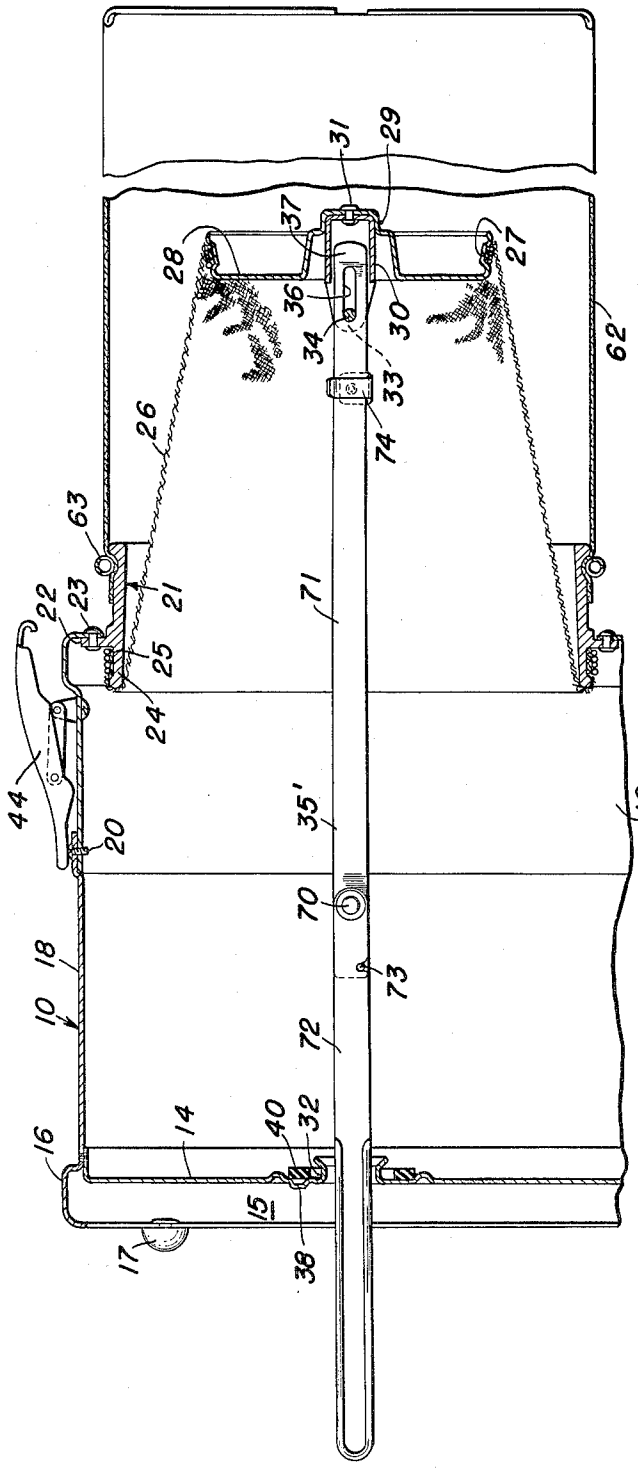


Fig. 4

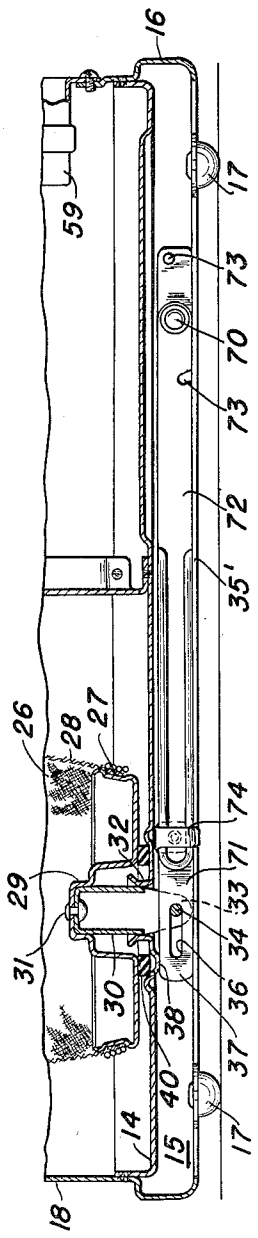


Fig. 3

INVENTORS
Werner G. Seck &
Dale C. Gerber

BY

ATTORNEY.

United States Patent Office 2,722,996 Patented Nov. 8, 1955

2,722,996

SUCTION CLEANER

Werner G. Seck, Canton, and Dale C. Gerber, North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application June 5, 1953, Serial No. 359,693

9 Claims. (Cl. 183—58)

This invention relates to suction cleaners and more particularly to a cleaner of the canister type having built-in facilities for shaking the filter bag and emptying its contents in a simple, sanitary and expeditious manner.

The invention deals with a suction cleaner construction employing a permanently installed cloth type filter, and features a simple and effective means of discharging the collected dirt into a grocery sack without permitting the escape of dirt and dust into the room. By the use of the invention, it is possible to thoroughly shake the cloth filter bag without removing it from the cleaner and without allowing any dust to escape. This is accomplished by opening the cover for the filter chamber, clamping the mouth of a grocery sack over the wide mouth of the filter, and then thoroughly shaking the filter into the paper container by means of a collapsing handle secured to the filter and normally concealed by the cleaner casing. After waiting a moment for the dust to settle, the bag is removed from the cleaner and thrown away. The filter cover is then relatched and the cleaner is ready for further cleaning operations.

Accordingly, it is a prime object of the invention to provide a new suction cleaner construction of the canister type having a permanently installed cloth filter with simple and effective means for discharging its contents into a throw-away container.

Another object is the provision of a cleaner having an installed cloth filter with means for turning the same wrong side out into a disposable receptacle separate from the cleaner and without allowing dirt to escape into the room.

A further object is the provision of a manually operable shaking of the suction cleaner designed to hold the filter properly centered in the cleaner normally and which is manually operable as an incident to the removal of the dirt therefrom for thoroughly shaking and reconditioning the filter.

Numerous other objects and advantages of the invention will become apparent from the following detailed specification of two illustrative embodiments for practicing the invention, taken in connection with the accompanying drawings, wherein:

Fig. 1 is a vertical sectional view through a canister suction cleaner incorporating the invention;

Fig. 2 is a view partly in section showing the cleaner up-ended and the disposition of parts when emptying the filter bag;

Fig. 3 is a vertical, sectional view through the bottom portion only of the second embodiment; and

Fig. 4 is a vertical sectional view through the top half of the cleaner while the filter is being cleaned.

Referring now to Figs. 1 and 2, it will be seen that the first embodiment comprises an elongated, generally rectangular casing **10** divided by a vertical partition **11** into a power unit chamber **12** and a filter chamber **13**. As shown, chambers **12** and **13** are approximately of the same size. The bottom **14** for both chambers is spaced somewhat above the floor to provide a shallow

chamber **15** opening downwardly to the floor and serving normally to conceal the collapsing manual operator for the filter bag, as will be described more fully below. The lower rim of casing **10** has an inturned flange **16** to the lower edge of which rubber feet **17** are secured.

It will be observed from Fig. 1 that the casing comprises a lower section **18** and a removable upper section **19** having their overlapping rims held in assembled position by screws **20**. The top wall of casing section **19** overlying the filter chamber has a large opening through which a large diameter but short conduit **21** extends. A flange **22** projecting radially from the outer wall of this conduit is rigidly connected to the rim of the filter chamber opening as by rivets **23**. The inner end **24** of conduit **21** has a channel **25** providing a seat for the open upper end of the cloth filter bag **26**. The filter bag may be secured in channel **25** in any suitable manner.

The lower end of the filter bag is of somewhat smaller diameter than the inlet end and is securely permanently to a recess **27** formed in the upstanding rim of a cup-shaped metal stamping **28**. Projecting upwardly from the center of cup **28** is a boss **29** having a downwardly projecting thimble member **30** secured to the upper end of the boss by a rivet **31**.

The means for holding the filter normally centered within filter chamber **13** and for reconditioning the filter will now be described. Note that the bottom wall **14** of the filter chamber is punched upwardly to form an outwardly flaring circular collar **32**. This collar provides a pilot for guiding the lower end of thimble **30** into the opening provided by the collar and also serves as a guide and fulcrum for the filter shaking handle. Projecting downwardly from the opposite sides of thimble **30** are a pair of bearing tabs **33** through which a bearing pin **34** for the shaker handle projects.

The inner end of the filter shaking handle **35** is provided with an elongated slot **36** through which the assembly pin **34** extends. When the pin **34** is located at the right hand end of the lost motion connection provided by slot **36**, end **37** of the shaker handle bears against a depressed portion **38** of the filter chamber bottom. Accordingly, it will be clear that button **38** acts to hold the filter in its proper operating position as well as to hold the handle **35** captive against bottom wall **14** of the cleaner. The handle can be released to its operating position by shifting it to the right in slot **36**, this movement being permitted by a downwardly opening slot **39** in rim **16** of the cleaner casing. When pin **34** is located at the left hand end of slot **36**, the handle can be pivoted freely about the pin so that end **37** can be brought into axial alignment with thimble **30**. The handle **35** can then be shifted axially so that end **37** is seated within the thimble, as best illustrated in Fig. 2.

Note that a rather thick and resilient gasket ring **40** is secured to the bottom **14** of the filter chamber in the area closely surrounding collar **32**. The bottom of the cup **28** seats against this gasket when the shaker handle is locked in its collapsed position and forms an air-tight seal so that air cannot enter the filter chamber through the opening provided by flanged collar **32**. The gasket also assists in holding the handle collapsed in a manner made apparent by the drawings.

The filter chamber is provided with a cover **41** hinged to the top wall of the casing at **42**. The rim of the cover opposite the hinge is turned up at **43** and cooperates with a conventional type toggle clamp **44** to hold the cover in closed position. A resilient gasket ring **45** secured to the inner wall of the cover bears against the outer end of conduit **21** to form an air seal when the cover is in closed position. A suitable tubular coupling fitting **46** projects upwardly at an angle from the center of cover **41** and serves to conduct the dirt laden air into the filter bag.

Referring now to the power unit end of the cleaner casing, it will be seen that this chamber houses a vertical axis motor-fan unit generally designated **47**. This unit comprises a conventional multi-stage fan **48** below which is located the electric driving motor **49**. The flanged junction **50** between the fan chamber and motor is seated on a rubber collar **51** supported, in turn, by a flange ring **52** secured to the inner wall of the cleaner casing. A second rubber ring **53** seated in a metal ring **54** rests against the upper rim of the fan casing. It will, therefore, be clear that the motor power unit is cradled in the two rubber rings **51** and **53**, and is held firmly seated on the flanged ring **52** by a plurality of compression springs **55** positioned between bosses **56** on ring **54** and the top wall of the cleaner casing. Rings **53**, **54** are held against displacement by bosses **56** in cooperation with pins **57** carried by the cleaner cover.

The fan chamber has a central inlet eye **58**. The discharge port for the fan is not shown but will be understood to open into the upper end of motor **49** so that the clean air discharged by the fan passes over the motor to cool it. Thereafter, the air is exhausted from the cleaner casing as through the hose coupling socket **59**. The air passage **60** formed by the top wall of the power unit chamber and the top wall of the fan casing is in communication with the filter chamber through an opening in the upper end of partition **11**. A suitable carrying handle **61** is secured to the upper wall of the casing as clearly shown in Figure 1.

Operation

The operation of our suction cleaner will be quite apparent from the foregoing description. The usual cleaning tools and suction hose may be connected to coupling **46** in the usual way and the motor switch, not shown, is turned on to start the motor-fan unit. The dirt laden air stream enters the top of the filter bag and the dirt separates out in the filter bag. The clean air escapes through the bag and passes through passageway **60** into fan eye **58**. The air then passes over the motor to cool it and exits from the cleaner through hose coupling **59**.

When it becomes desirable to clean the filter, latch **44** is released and cover **41** is swung to its open position. The mouth of a grocery sack is then telescoped over the outer end of conduit **21** and clamped thereto by rolling the garter spring clamp **63** upwardly until it seats in groove **64**. The cleaner may then be up-ended onto the power unit end as shown in Figure 2. This exposes shaker handle **35** concealed within chamber **15** in the base of the cleaner. The handle is slid downwardly on pin **34**, swung to a horizontal position, and then shifted axially so as to seat in thimble **30**. The handle can then be pushed inwardly through collar **32** so as to turn the filter inside out and dumps its contents into the grocery sack **62**. As this occurs, the operator manipulates the handle so as to shake the filter vigorously and dislodge all of the dirt into the paper bag.

After the reconditioning of the filter has been completed in this manner, the handle is withdrawn from the cleaner and swung backward into its collapsed position. This operation includes sliding the handle out of the thimble and then pivoting it into chamber **15**. It is also shifted axially to the left thereby pulling cup **28** tightly against sealing gasket **40**. The resiliency of this gasket serves to hold the handle against displacement and also acts to prevent air from entering the filter chamber through collar **32**.

While this operation is taking place the dust has settled in sack **62**. The operator then rolls clamp **63** downwardly on conduit **21** thereby releasing sack **62**. When the sack has been withdrawn, the cover is latched in closed position and the cleaner is restored to operation.

The second embodiment, shown in Figs. 3 and 4, is substantially identical with that described except for the filter shaker handle. Accordingly, the identical parts of the second embodiment are designated by the same characters as in Figs. 1 and 2 and need not be redescribed.

The only element which differs from the first construction is the shaker operating handle **35'**. This handle is made in two parts **71** and **72** pivoted together by a friction hinge **70**. This arrangement permits the use of a much longer handle than is possible in the first embodiment. The slot and pin connection **73** provide together with friction hinge **70** a relatively rigid filter shaker handle when it is in its open operating position. A spring clip keeper **74** is carried by section **71** and grips the end protection **72** to hold the handle folded. When the shaker mechanism is not in operation, the handle is of course folded to its collapsed position, as illustrated in Fig. 3. However, when the shaker is being used, the handle is unfolded to its extended position illustrated in Fig. 4 to provide a much longer and more convenient handle for shaking the filter bag. Note that the longer handle permits the filter bag to be turned completely wrong side out and, in addition, enables the operator to tension the walls as a further aid in dislodging the dirt quickly.

While we have shown and described but two modifications of our invention, it is to be understood that these modifications are to be taken as illustrative only and not in a limiting sense. We do not wish to be limited to the particular structures shown and described, but to include all equivalent variations thereof, except as limited by the scope of the claims.

We claim:

1. In combination with a tank type suction cleaner having a motor-fan suction unit therein, a filter chamber in said cleaner, an air pervious cloth filter bag in said filter chamber having a large area inlet mouth, the filter chamber including a tubular member forming a large area inlet having the mouth of the filter secured thereto, said tubular member projecting outwardly beyond said mouth to provide a seat for the mouth of a dirt receiving receptacle, means for clamping the mouth of a dirt receiving receptacle to the outer end of said tubular member exteriorly of the filter chamber, and manually operable means connected to the bottom of said filter exteriorly thereof to project the filter into the dirt receiving receptacle to discharge the contents of the filter thereinto when the receptacle is clamped in place over the inlet mouth of said filter.

2. In combination with a tank type suction cleaner having a filter chamber with a large area inlet opening, an open topped filter bag having the rim of its open top secured to said filter chamber inlet opening, manually operable filter shaking means secured to the wall of said filter at a point remote from the open top thereof, means for temporarily securing the mouth of a dirt receiving receptacle to the open top of said filter when it is desired to empty the contents thereof, said filter shaking means being operable to turn said filter bag inside out and to empty its contents into a dirt receptacle secured to the open top thereof, and means for rendering said filter shaking means inoperative and simultaneously concealing said filter shaking means within said cleaner when not in use.

3. In combination, an elongated suction cleaning casing having a motor-fan unit compartment in one end and a filter compartmet in the opposite end thereof, a motor-fan unit in said first named compartment, an open topped filter bag having its rim secured to a large area opening in the wall of said filter compartment, means for temporarily clamping the mouth of a dirt receiving receptacle to the open top of said filter bag, and filter shaking means secured to the bottom of said filter, said shaking means being normally folded against said cleaner, and means for extending said shaking means from its folded position to a position wherein it is manually operable to empty the contents of said filter into a dirt receiving receptacle secured to the open top thereof.

4. In combination, an elongated suction cleaner cas-

ing having a motor driven suction unit and a filter compartment in the opposite ends thereof, a large area opening in the top of said filter compartment, an open topped filter bag suspended within said filter compartment and having its mouth secured to the rim of said large area opening for the reception of litter within the confines of the bag, means for temporarily securing the mouth of a dirt receiving receptacle to the filter compartment over the open top of said filter, and manually operable means secured to the bottom of said filter projecting out of said casing and operable from the exterior thereof for dislodging the dirt from said filter and discharging the same into a dirt receiving receptacle secured to the open top thereof.

5. The combination defined in claim 4 including an operating handle for said manually operable means, and means for normally concealing said handle within the base of said elongated cleaner casing.

6. Filter shaking mechanism for the filter bag of a suction cleaner of the type having a casing, a filter compartment and an open topped filter bag suspended across an inlet opening of said casing, said mechanism comprising a long handle pivotally secured to the bottom of said filter bag, said handle extending through an opening in said casing in a wall thereof remote from said filter inlet opening, and being manipulatable through said casing wall opening to shake said filter vigorously to dislodge dirt therefrom, and means for normally holding said handle folded against the exterior wall of said casing, and means cooperating with said handle folding means for sealing said handle opening against the entrance of air into said casing.

7. Filter shaking mechanism as defined in claim 6 wherein said handle is provided with a lost motion connection with said filter.

8. Filter shaking mechanism as defined in claim 6 wherein said handle is formed in two sections, and a hinge connection between said handle sections whereby said handle can be folded for compact storage and extended to provide a long operating handle to shake said filter bag.

9. In combination, an elongated suction cleaner casing divided into a motor-fan unit compartment at one end and a filter chamber at the opposite end, said filter chamber having a large area opening through a wall thereof which is normally closed by a releasable cover, a filter bag having a large inlet opening secured across said filter chamber opening and suspended in said chamber in spaced relation to the side walls thereof, a handle having one end connected to the bottom of said filter bag and projecting through an opening in said casing to the exterior thereof, means for normally holding said handle folded against said casing, means for securing a dirt receiving receptacle to the filter chamber opening across the inlet opening of said filter bag when said cover is released, and said handle being manipulatable from the exterior of said casing for emptying the contents of said filter into a dirt receiving receptacle secured across the inlet of said filter.

References Cited in the file of this patent

UNITED STATES PATENTS

1,864,622	Sutherland	June 28, 1932
2,060,776	Bender	Nov. 10, 1936
2,077,572	Lofgren	Apr. 20, 1937
2,084,492	Houser	June 22, 1937
2,222,077	Kahn	Nov. 19, 1940
2,286,421	Kahn	June 16, 1942
2,555,231	Gerber	May 29, 1951

FOREIGN PATENTS

294,501	Great Britain	July 23, 1928
410,524	Great Britain	May 24, 1934