

Oct. 28, 1952

O. L. ALLEN

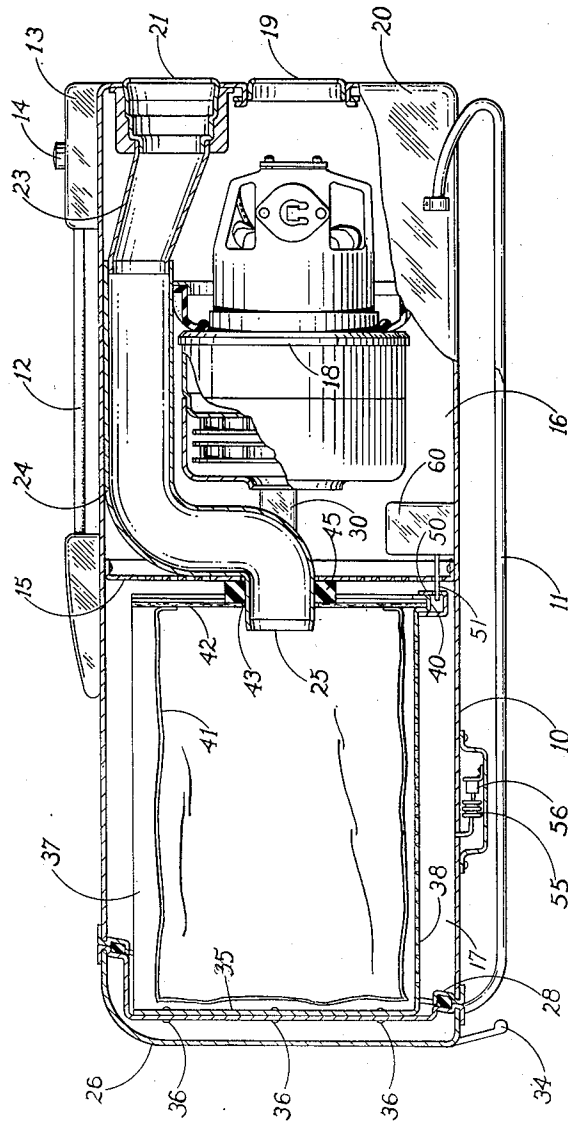
2,615,531

REARWARDLY DISCHARGING TANK TYPE SUCTION CLEANER

Filed July 26, 1947

3 Sheets-Sheet 1

Fig. 1



INVENTOR.
OLIVER L. ALLEN

BY

A. T. Sperry
ATTORNEY.

Oct. 28, 1952

O. L. ALLEN

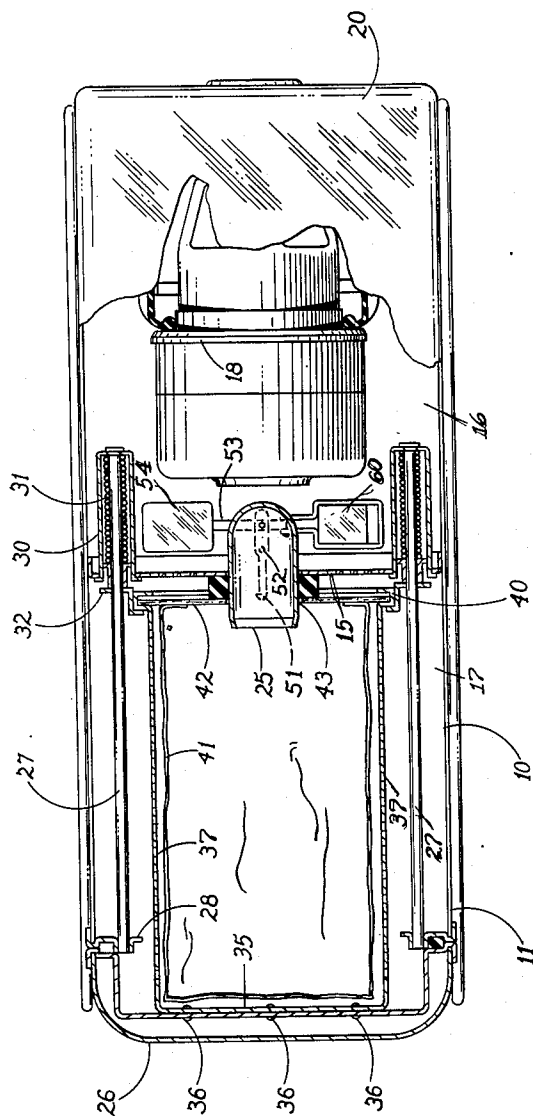
2,615,531

REARWARDLY DISCHARGING TANK TYPE SUCTION CLEANER

Filed July 26, 1947

3 Sheets-Sheet 2

Fig. 2



INVENTOR.

OLIVER L. ALLEN.

BY

A.T. Sperry
ATTORNEY

Oct. 28, 1952

O. L. ALLEN

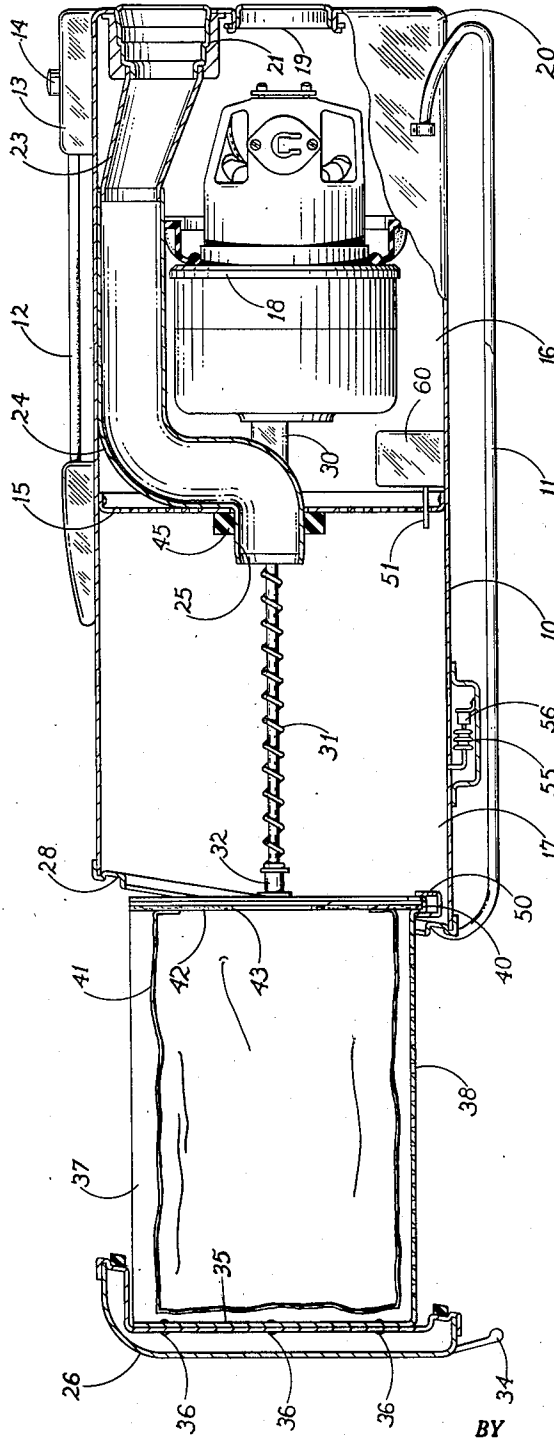
2,615,531

REARWARDLY DISCHARGING TANK TYPE SUCTION CLEANER

Filed July 26, 1947

3 Sheets-Sheet 3

Fig. 3



INVENTOR.
OLIVER L. ALLEN

BY *A.T. Sperry*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,615,531

REARWARDLY DISCHARGING TANK TYPE
SUCTION CLEANER

Oliver L. Allen, Riverside, Conn., assignor to Electrolux Corporation, Old Greenwich, Conn., a corporation of Delaware

Application July 26, 1947, Serial No. 763,832

13 Claims. (Cl. 183—37)

1

This invention relates to suction cleaners and is particularly concerned with tank type cleaners and means for the removal of the accumulated dirt therefrom.

It is among the objects of the present invention to provide a novel, simple and improved cleaner of the type set forth in which accumulated dirt and foreign matter may be removed without disturbing the connection of a suction hose therewith.

Another object of the invention is to provide a cleaner of the type set forth including means by which accumulated dirt may be removed from the rear of the machine without manipulation of the front cover.

A further object of the invention is to provide a cleaner of the type set forth in which means are provided whereby the dirt receptacle may be moved from the confines of the casing so as to be presented for ready disposal.

A further object of the invention is to provide a cleaner having automatic control mechanism such that the cleaner may be automatically opened and the dust receptacle be presented for disposal in response to the accumulation of foreign matter in such receptacle.

Numerous other objects and features of the present invention will be apparent from a consideration of the following specification when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevation partly in section illustrating a preferred embodiment of the invention;

Fig. 2 is a top plan view partially in section of the devices as illustrated in Fig. 1 and;

Fig. 3 is a view similar to Fig. 1 showing the device open with the dust receptacle presented for disposal.

In that structural embodiment of the invention here presented by way of illustrating the inventive concept the numeral 10 represents a substantially cylindrical, horizontal disposed casing which is adapted to be supported upon the floor by means of sleighs 11 which are secured thereto. The sleighs provide for the movement of the casing over the supporting surface during the cleaning operation in response to pull exerted thereon by the cleaning hose (not shown). A handle 12 is also provided for lifting and carrying the device, the forward handle bracket 13 being provided with a control switch 14 by which the motor may be conveniently started and stopped by foot pressure control.

2

The casing 10 is centrally divided by a perforate transverse bulkhead 15 to provide a forward motor fan compartment 16 and a rear dust separating and collecting receptacle compartment 17. Within the compartment 16 there is mounted a conventional motor-fan unit 18 by which air is drawn forwardly from the compartment 17 and through the perforated bulkhead 15 to be discharged forwardly through an air outlet 19 in the forward end plate 20 of the casing.

The end plate 20 is also provided with an air inlet opening to which is applied a hose receiving fixture 21 to which may be removably attached to a suction hose through which dust-laden air is drawn.

Attached to the fixture 21 and extending rearwardly through the compartment 16 is an air conduit formed by the tubing 23 attached to the fixture 21 and the angled conduit 24 which engages the tubing 23 and which extends through the bulkhead 15 terminating in a rearwardly disposed terminal end 25 extending into the chamber 17.

The rear end of the casing 17 is adapted to be closed by a rectilinearly movable imperforate end closure member 26 which is mounted for guided movement by forwardly extending guide rods 27 rigidly secured thereto which are mounted for guided movement within apertured guiding brackets 28 extending inwardly from the sides of casing 10.

The inner ends of rods 27 extend into cylinders 30 carried by the bulkhead 15. Spiral springs 31 are contained within the cylinders 30 and are compressed between the closed bottoms thereof and stops 32 rigidly secured to rods 27, the arrangement being such that the rods together with the cover 26 to which they are rigidly secured are normally urged in a rearward outward direction so as to move the cover to the outer open position shown in Fig. 3. For supporting the cover in such outward movement a depending foot 34 is provided, the terminal end of which is in the lower plane of the sleighs 11 so that the cover is supported against downward movement as it is moved outwardly.

For mounting a dust collecting and receiving receptacle in operative position within the cleaner there is provided an inwardly and forwardly extending perforated receptacle support secured to and carried by the cover 26 and comprising a rear wall 35 which may be conveniently secured to the cover as by rivets 36. The body of the support is substantially U-shaped

in transverse cross section being open at the top and comprising side walls 37 and a bottom portion 33. The front of the support is also open and is provided with a circumferentially extending guide structure 40 which in turn is substantially U-shaped in cross section to provide a guide or trackway at the front terminal end of the sides 37 and the bottom 38.

While the invention is not confined to the specific dust receptacle herein depicted, the structure shown by way of illustration comprises a flexible porous bag like body 41 which is preferably formed of paper or other inexpensive material which may be readily disposed of. The body is secured at its forward open end to a rigid centrally apertured end member 42 which is adapted to slidably fit within the guide structure 40 and to be secured therein against inadvertent movement with respect to the support during the operation of the cleaner. By reference to Fig. 3 it will be noted that with the cover and its support in the outward opened position shown therein the rigid bag end may be vertically lifted from the guide structure 40, a forwardly slanting construction of the cover being provided so as to fully expose the top forward end of the member 42 when the cover is in fully opened position. Similarly in the position shown in Fig. 3 an empty receptacle may be conveniently positioned within the support by downward sliding movement. Thereafter, inward movement of the cover and its support will move the receptacle forwardly. Location of the member 42 within the guide member is such that the central aperture 43 of the end 42 is positioned in registration with the end 25 of the tube 24 so that upon fully closing the end cover the opening 43 will receive therethrough end 25, a gasket 45 being provided so that in such position the receptacle is sealed to the tube 25 so as to insure the passage of all dirt laden air to the inside of the receptacle. The walls 41 of the receptacle constitute a filtering medium for extracting foreign matter from the air, thus permitting clean air to be drawn forwardly through the perforated bulkhead 15 by means of the motor-fan unit 18 and to be discharged forwardly through the exhaust port 19.

For securing the cover 26 in closed position sealingly engaging the rear open end of the casing 10 there is provided a catch member 50 extending forwardly from the inner forward end of the support 38 at the bottom central portion thereof which catch 50 is adapted to be engaged by a latch arm 51 mounted within the compartment 16 and extending rearwardly through the bulkhead 15 so that upon inner movement of the cover against the compression of the springs 31 the latch will engage the catch 50 to secure the cover closed. The latch 51 is pivotally mounted as at 52 and is adapted for actuation by a solenoid arm 53 of a solenoid 54. The arrangement is such that when the solenoid is energized the latch 51 will be pivotally moved to release the catch 50, and thus the cover 26, whereupon the springs 31 will move the cover to the opened position shown in Fig. 3, thus presenting the receptacle for removal.

For controlling the solenoid 54 there is provided a Sylphon 55 in combination with a switch 56 mounted within the chamber 17. When the interstices of the receptacle become clogged with dirt, thus diminishing the passage of air there-through, the suction in the chamber 17 will increase to such an extent as to move the Sylphon

55 past a critical point, whereupon the switch 56 will be closed to energize solenoid 54 and release the latch 51. Thus movement of the cover is responsive to the filling of the receptacle with dirt and thus to variations in the operating characteristics of the machine since such clogging of the receptacle reduces the flow of air through the intake.

It may also be desirable to automatically de-energize the motor-fan unit when the cover is released, since otherwise the suction created thereby may retain the cover closed in spite of the opening force applied by the springs 31. This may be readily accomplished by the connection of the solenoid arm 53 with a motor control switch 60, which switch may be arranged to open the motor circuit in spite of the setting of the switch 14.

In the operation of the device it will be seen that with the device in the position shown in Fig. 3 the dust receptacle may be conveniently inserted in the guide 40 whereby its aperture 43 is in line with the end 25 of the conduit 24. The cover may then be closed against the compression of the springs 31 and by such closing movement the inner end of the tube 25 is inserted through the opening 43 of the receptacle, the gasket 45 sealing the same. Such inward movement also engages the latch 51 with the catch 50 to secure the cover in sealingly closed position. Thereafter, upon operation of the machine, as dirt is accumulated in the receptacle, suction characteristics vary until such time as the Sylphon 55 actuates switch 56, whereupon the solenoid 54 is energized to release the latch 51 from the catch 50. The cover 26 is thus automatically opened by the springs 31 at which time the motor-fan unit is de-energized by action of the switch 60. The receptacle may thereupon be conveniently removed and replaced by a clean receptacle.

It will be understood that numerous changes and modifications and the full use of the equivalents may be resorted to in carrying out the present invention without departure from the spirit or scope of the invention as outlined in the appended claims.

What I claim is:

1. In a vacuum cleaner, an elongated casing formed with a motor fan chamber in one end and a dust receptacle compartment in the other end, said casing being formed with an opening at the end of said receptacle compartment which is remote from said chamber, means forming an inlet port and an outlet port at the motor fan chamber end of said casing, conduit means for conveying dust-laden air from said inlet port to said receptacle compartment, a motor fan unit in said chamber for delivering air from said receptacle compartment to said outlet port, a dust receptacle having an air pervious body and a stiff end wall formed with an inlet opening, a movable cover for said opening at the end of said dust receptacle compartment, and structure extending inwardly from said cover and including means for engaging said stiff wall to maintain the inlet opening thereof in communication with said conduit means when said cover is in closed position.

2. In a vacuum cleaner, an elongated casing formed with a motor fan chamber in one end and a dust receptacle compartment in the other end, said casing being formed with an opening at the end of said receptacle compartment which is remote from said chamber, means forming an inlet port and an outlet port at the motor fan

chamber end of said casing, conduit means for conveying dust-laden air from said inlet port to said receptacle compartment, a motor fan unit in said chamber for delivering air from said receptacle compartment to said outlet port, a dust receptacle having an air pervious body and a stiff end wall formed with an inlet opening, a movable cover for said opening at the end of said dust receptacle compartment, guide means for restraining movement of said cover relative to said casing to a rectilinear direction, and structure extending inwardly from said cover and including means for engaging said stiff wall to maintain the inlet opening thereof in communication with said conduit means when said cover is in closed position.

3. In a vacuum cleaner, an elongated casing formed with a motor fan chamber in one end and a dust receptacle compartment in the other end, said casing being formed with an opening at the end of said receptacle compartment which is remote from said chamber, means forming an inlet port and an outlet port at the motor fan chamber end of said casing, conduit means for conveying dust-laden air from said inlet port to said receptacle compartment, a motor fan unit in said chamber for delivering air from said receptacle compartment to said outlet port, a dust receptacle having an air pervious body and a stiff end wall formed with an inlet opening, a movable cover for said opening at the end of said dust receptacle compartment, guide means for restraining movement of said cover relative to said casing to a rectilinear direction, resilient means biasing said cover towards open position, structure extending inwardly from said cover and including means for engaging said stiff wall when the cover is open and for moving said wall into said receptacle compartment and bringing the inlet opening in the wall into communication with said conduit means upon closure of said cover, and releasable means for holding said cover closed against the bias of said resilient means.

4. In a vacuum cleaner, an elongated casing formed with a motor fan chamber in one end and a dust receptacle compartment in the other end, said casing being formed with an opening at the end of said receptacle compartment which is remote from said chamber, means forming an inlet port and an outlet port at the motor fan chamber end of said casing, conduit means for conveying dust-laden air from said inlet port to said receptacle compartment, a motor fan unit in said chamber for delivering air from said receptacle compartment to said outlet port, a dust receptacle having an air pervious body and a stiff end wall formed with an inlet opening, said wall having a flange portion extending outwardly beyond said body portion, a movable cover for said opening at the end of said dust receptacle compartment, guide means for restraining movement of said cover relative to said casing to a rectilinear direction, structure secured to said cover and extending horizontally inwardly therefrom for supporting said dust receptacle in all positions of said cover, and channel means engageable by said flange portion for maintaining the inlet opening in said wall in communication with said conduit means when said cover is closed.

5. In a vacuum cleaner, a casing forming a dust receptacle compartment having an opening to the atmosphere, an inlet conduit opening into said compartment at a point remote from said opening, a dust receptacle having an inlet aperture and being insertable into and removable

from said compartment through said opening, and structure movably mounted with respect to said casing for supporting said receptacle and for connecting the inlet aperture thereof to said conduit.

6. In a vacuum cleaner, a casing forming a dust receptacle compartment having an opening to the atmosphere, an inlet conduit opening into said compartment at a point remote from said opening, a dust receptacle having an inlet aperture and being insertable into and removable from said compartment through said opening, a movable closure member for said opening, and structure carried by said closure member for supporting said receptacle and for connecting the inlet aperture thereof to said conduit.

7. In a vacuum cleaner, a casing forming a dust receptacle compartment having an opening to the atmosphere, an inlet conduit opening into said compartment at a point remote from said opening, a dust receptacle having an inlet aperture and being insertable into and removable from said compartment through said opening, a movable closure member for said opening, means for moving said member to open position, structure carried by said closure member for supporting said receptacle and for connecting the inlet aperture thereof to said conduit, means for producing flow of dirt laden air into said receptacle through said conduit, and means responsive to an increase in the amount of dirt in said receptacle for actuating said means for moving said member to open position.

8. In a vacuum cleaner, a casing forming a dust receptacle compartment open at one end to the atmosphere, an inlet conduit terminating in said compartment at the opposite end thereof, a dust receptacle having a relatively stiff end member formed with an inlet aperture therethrough, a movable closure member for said opening, means for mounting said member for rectilinear movement with respect to said opening, and structure extending inwardly from said closure member and engageable with said end member for supporting said receptacle and connecting the inlet aperture thereof to said conduit.

9. In a vacuum cleaner, a casing forming a dust receptacle compartment open at one end to the atmosphere, an inlet conduit terminating in said compartment at the opposite end thereof, a dust receptacle having a relatively stiff end member formed with an inlet aperture therethrough, a movable closure member for said opening, means for mounting said member for rectilinear movement outwardly from and inwardly towards said opening, and structure extending inwardly from said closure member comprising a supporting surface for said receptacle and means engageable with said end member for retaining the latter in fixed position relative to said closure member and in a position such that the inlet aperture in the end member is connected with said conduit when said closure member is moved to closed position.

10. In a vacuum cleaner, a casing forming a dust receptacle compartment open at one end to the atmosphere, an inlet conduit terminating in said compartment at the opposite end thereof, a dust receptacle having a relatively stiff end member formed with an inlet aperture therethrough, a movable closure member for said opening, means for mounting said member for rectilinear movement outwardly from and inwardly towards said opening, resilient means for moving said closure member outwardly, holding means for re-

taining said closure member closed, structure extending inwardly from said closure member and engageable with said end member for retaining the latter in fixed position relative to said closure member and in a position such that the inlet aperture in the end member is connected with said conduit, means for producing flow of dirt laden air into said receptacle, and means responsive to an increase in the amount of dirt in said receptacle for releasing said holding means.

11. In a vacuum cleaner, a casing forming a dust receptacle compartment having an opening to the atmosphere, means for supporting said casing on a horizontal surface with said opening in a substantially vertical plane, a member movably connected to said casing and movable from said compartment outwardly through said opening, a dust receptacle carried by said member, and means depending from said member for supporting the member from said surface when the member is moved to an outer position.

12. In a vacuum cleaner, a casing forming a dust receptacle compartment having an opening to the atmosphere, means for supporting said casing on a horizontal surface with said opening in a substantially vertical plane, a member slidably connected to said casing and movable in a substantially horizontal direction outwardly through said opening, a dust receptacle carried by said member, and means depending from adjacent to the outer end of said member for supporting the latter from said surface when the member is moved to an outer position.

13. In a vacuum cleaner, a casing forming a

dust receptacle compartment having an opening to the atmosphere, means for supporting said casing on a horizontal surface with said opening in a substantially vertical plane, a member slidably connected to said casing, resilient means tending to move said member in a substantially horizontal direction outwardly through said opening, releasable means for retaining said member in an inward position, a dust receptacle carried by said member, and means depending from said member for supporting the member from said surface when the member is moved to an outer position.

OLIVER L. ALLEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,037,027	Lendberg	Aug. 27, 1912
1,219,756	Meridith-Jones	Mar. 20, 1917
1,415,773	Bimm	May 9, 1922
1,719,174	Eppler	July 2, 1929
1,880,665	Barker	Oct. 4, 1932
2,018,207	Giambertoni	Oct. 22, 1935
2,022,250	Lofgren	Nov. 26, 1935
2,116,233	Cole	May 3, 1938
2,192,224	Forsberg	Mar. 5, 1940
2,327,810	McAnerney	Aug. 24, 1943
2,400,217	White	May 14, 1946
2,444,809	Cranmer	July 6, 1948
2,497,581	Brown, Jr.	Feb. 15, 1950