

Oct. 20, 1953

M. A. KENT  
SUCTION CLEANER

2,656,009

Filed Jan. 29, 1951

2 Sheets-Sheet 1

Fig. 1

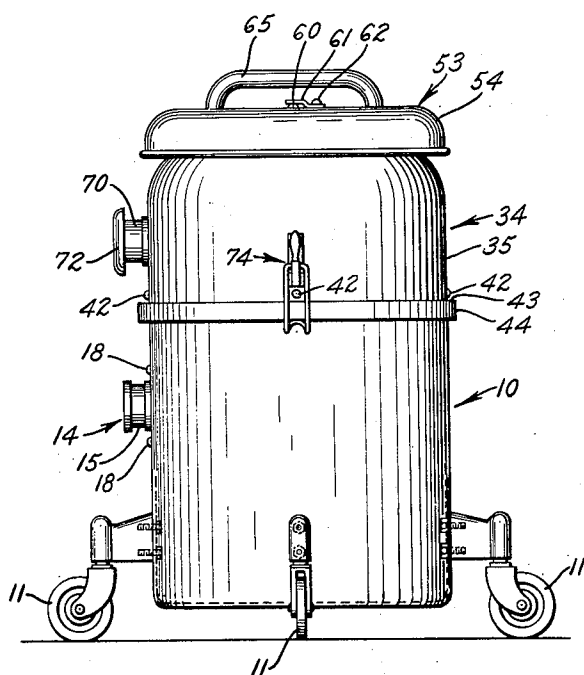
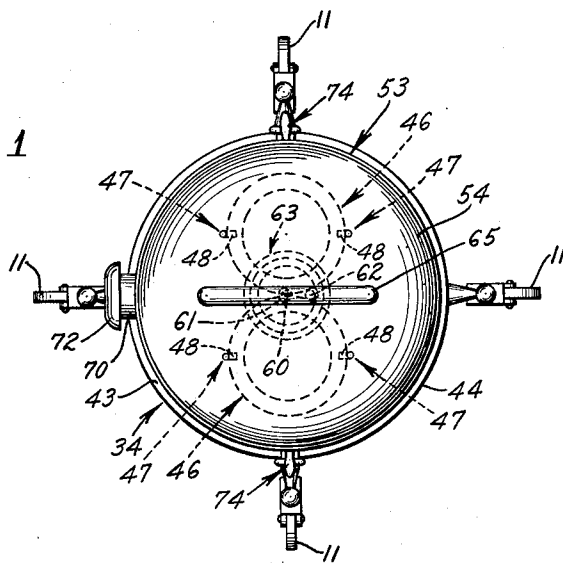


Fig. 2

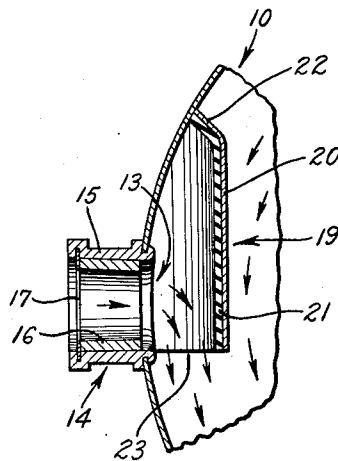


Fig. 4

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2 Sheets-Sheet 2

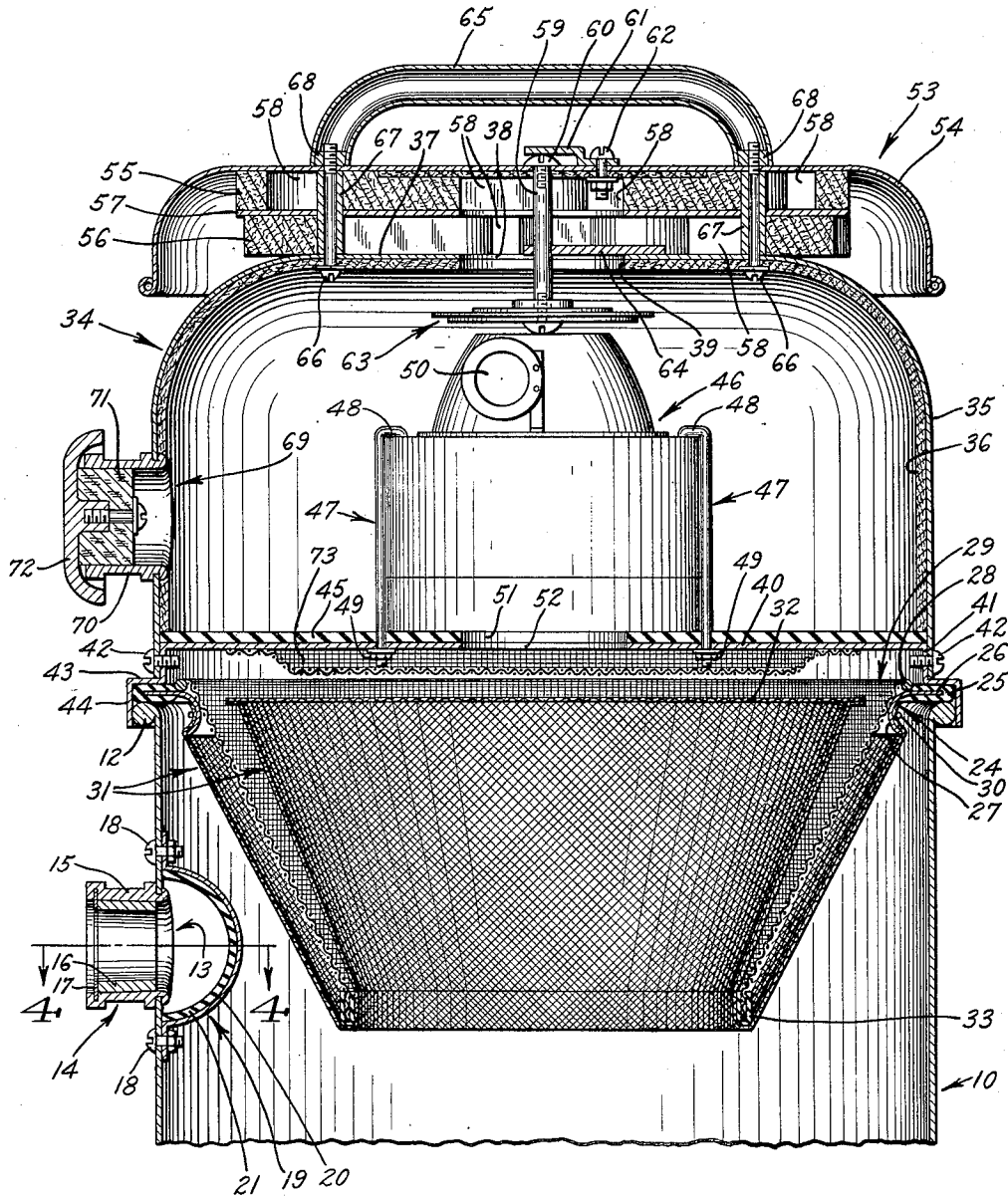


Fig. 3

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## UNITED STATES PATENT OFFICE

2,656,009

## SUCTION CLEANER

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Application January 29, 1951, Serial No. 208,304

2 Claims. (Cl. 183-37)

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This invention relates to new and useful improvements in cleaners and has particular relation to suction type cleaners.

An object of the invention is to provide a suction type cleaner including a dust bag and wherein the dust may, while remaining in place in the cleaner, readily be exposed to be grasped and agitated by the operator to shake dust and dirt therefrom into the dust and dirt receptacle of the cleaner.

Another object is to provide a suction type cleaner of simple and inexpensive construction and yet adapted for heavy use, as in office buildings, apartment houses, hotels and the like, and which is also suitable for use in large homes.

A further object is to provide a suction cleaner comprising, essentially, a receptacle and a cover device secured to the receptacle by ready releasable means and when in place serving to clamp in proper position a dust bag supporting frame and divider and when removed from position on the receptacle, exposing said parts for removal and cleaning.

Yet another object is to provide a suction cleaner of the character indicated and wherein suction creating means is mounted in a removable cover device and the latter also mounts a muffler.

An additional object is to provide a suction cleaner embodying many improvements, all looking toward a more efficient, useful and economical structure of long, useful life.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a top plan view of a cleaner constructed according to the invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is an enlarged vertical central sectional view through the upper portion of the cleaner; and

Fig. 4 is a detail sectional view taken as along the plane of the line 4-4 of Fig. 3.

Referring in detail to the drawings, my improved suction cleaner, as herein disclosed, comprises a receptacle generally designated 10, shown as supported for mobility on four castors 11.

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Receptacle 10 is a rigid structure, preferably of metal, and is open through its upper end at such and terminates in a continuous, as annular, bead 12.

In a side wall receptacle 10 is provided with an inlet opening or port generally designated 13, equipped with a fitting 14 to which one end of a flexible hose or the like (not shown) is readily attachable. On the other end of such hose or the like there will be attached any or the usual suction cleaning tools (not shown). As shown, fitting 14 includes an outer element 15 having its inner end spun over the edges of the opening 13 and within such element 15 is a swivel bushing 16 held in place by a retaining ring 17.

Inwardly of the port 13, but secured to the receptacle wall as by bolts 18, is a deflector shield generally designated 19. As such shield is herein disclosed, the same comprises a transversely arcuate or semi-cylindrical body portion 20 of rigid material, such as metal, and within such portion is a deflector shield lining 21, preferably of rubber. While the described deflector shield will be hereinafter further considered, it is noted that the same extends across the inlet port or opening 13, is closed at one end as by an angular bent portion 22 in cooperation with a wall receptacle 10, but is open through its other end 23.

Resting on the upper end or bead 12 of receptacle 10 is a frame generally designated 24 and comprising a continuous, as an annular, member 25 of rubber or other compressible material and also a continuous, as annular, metal member 26 comprising, in transverse section, a horizontal portion embedded in the rubber member 25 and then a downwardly and outwardly curved or arcuate portion 27.

Resting on the metal member 26 and centered by an inner edge portion of the compressible member 25 is a continuous metal ring 28, as an annulus. Ring 28 supports and has depending therefrom a foraminous truncated cone-shaped member 29 shown as formed of a relatively heavy wire. A wire or other means 30 is disposed about the upper end portion of a dust bag, generally designated 31, and anchors such portion and thereby the dust bag to the curved portion 27 of the frame 24. This dust bag is generally in the shape of an hourglass and while it has an open end secured by the means 30, it extends downwardly at the outer side of the foraminous member 29, about the lower edge of the latter, and then up into such member.

In Fig. 3, the bag is shown as positioned when the cleaner is in operation and there it is noted

that the portion of the bag within the member 29 is in fully opened or spread relation although closed at its then top end by a wall 32. The lower end of the member 29 is received in a transversely channel-shaped ring or the like 33 whereby the edges of the wires forming the member are covered and it is about the lower edge of this ring that the dust bag 31 is folded.

When the machine is not in operation and there is no suction on the dust bag, its portion within the member 29 will fall from the position of Fig. 3 but nevertheless such portion will not fall through the smaller diameter lower end portion of the member. In addition to the described structure, the cleaner includes a cover device generally designated 34. Such device comprises a hollow metal shell 35 having an interlining 36 of felt or other sound absorbing material. Shell 35 is open through its lower end but includes a top wall 37 having a central opening 38 there-through and the lining 36 of the shell has an opening 39 registering with said opening 38.

Mounted in the lower end portion of the shell 35 is a motor supporting plate 40 of a diameter to span the open end of the shell and provided with a depending wall portion 41 located against the inner surface of the lower end portion of the shell and secured to the shell as by screws 42. Then extending outwardly from the wall portion 41 is a horizontal flange 43 from the outer periphery of which depends a skirt-like portion 44.

The parts are of such diameter that when the cover device is in place, as in Fig. 3, the flange 43 is disposed on the upper side of the compressible member 25 of frame 24 and the depending skirt 44 is about the outer periphery of the bead 12 of the receptacle. Thus, the skirt 44 serves to insure a centering of the frame 24 on the bead 12.

On the upper side of the motor supporting plate 40 is a sponge rubber pad 45 against the upper side of which suction creating units, generally designated 46, are secured as by clamping bolts 47 having hook-like portions 48 engaged over the upper edges of the walls of the units 46 and having their lower ends passing through the pad 45 and the motor supporting plate 40 and anchored as by nuts 49. The desired number of the units 46 may be employed, i. e., one or more such units, depending upon the size cleaner being made.

These units are those described in my co-pending application Ser. No. 172,758, filed July 8, 1950. Mounted on a unit 46 is a thermally operated switch 50, the purpose of which is that set forth in the co-pending application of Moss A. Kent, Ser. No. 199,429, filed December 6, 1950.

Through the motor supporting plate 40 and the pad 45 are registering openings 51 and 52, respectively, such openings placing the interior of the receptacle 10 in communication with the cover device 34 through the respective motor units when the cover device is positioned on the receptacle.

On the upper side of the cover device 34 and mounted thereon to form part thereof is a muffler generally designated 53. This muffler includes an outer metal shell 54 and upper and lower felt structures 55 and 56 separated as by a disc 57 and having radially extending passages 58 there-through all communicating at the center of the device. This muffler 53 is more particularly disclosed in my above mentioned co-pending application.

Extending upwardly through the muffler device

is a rod or post 59 at its upper end provided with a head 60 normally located under a latch device 61 pivoted for swinging movement as at 62. To the lower end of the post 59 there is attached a valve structure generally designated 63. A bracket piece 64 serves as a guide limiting movements of the post 59 to vertical movements.

At the upper side of the muffler shell 54 is a handle 65 shown as formed of a piece of hollow tubing. A pair of bolts 66 have their heads located at the inner side of the shell 36 of the cover device and then these bolts pass upwardly through tubular spacer elements 67 and at their upper ends are threaded into nuts 68 fixed within the end portions of the handle 65. In this way, the muffler device 53 is secured to the shell 35 so as to with the latter form part of the cover device 34 and at the same time the handle 65 is secured in place. The spacers 67 prevent excessive tightening of the bolts in the nuts and thereby prevent collapse or compression of the sound absorbing materials 55 and 56 in the muffler.

In a side wall of the shell 35 of the cover device is an opening 69 about which is secured a radially extending nipple 70 normally closed as by a plug 71 fixed to a handle device 72. When the present machine is being used as a suction unit, the plug 71 will be in place completely closing the outlet 69. However, at certain times, the machine may be used as a blower when a hose (not shown) may be attached to the nipple 70, the plug 71 and its handle 72 having been removed.

At such time, or when the machine is being set up for such use, the latch device 61 is swung on its pivot 62 so as to clear the head 60. Then, as the units 46 are operated, the flow of air toward and through the openings 38 and 39 results in the valve 63 being drawn upwardly to seat about the edges of the opening 39. This prevents movement of air from the interior of the cover device to the muffler and causes the air to blow out through the outlet 69, the plug 71 having been removed.

A hose or the like on the nipple conducts the air as desired for the operation of a cleaning tool or otherwise. Instantly the units 46 are stopped, there is no longer any pressure of air within the shell 35 and the valve 63 drops to the position shown in Fig. 3 when the latch 61 is swung back to the position of that figure. At this time, the plug 71 will be returned to a position closing off passage through the nipple 70.

In assembling the machine for use, the frame 24 carrying the dust bag 31 is disposed on the upper end of the receptacle 10, the dust bag depending into such receptacle. Then the ring 28 carrying the foraminous member 29 is dropped into place and thereafter the operator reaches through the lower end of the member 29, grasps the lower portion or bottom wall 32 of the dust bag and draws the lower portion of the same upwardly into said member. Now, the operator positions the cover device 34 and, as above noted, the flange 43 of such cover device is located against the upper side of the compressible member 25 of frame 24 and the skirt 44 for the cover device centers said member with respect to the receptacle.

At this time, it is noted that on the underside of the motor plate 40 there is secured a cupped screen 73. This screen closes the registering openings 51 and 52 through the motor plate 40 and the pad 45 whereby there is no possibility of any portion of the dust bag being drawn up

through any of the units 46 or of any article getting into the units through such registering openings. In fact, when the cover device is separated from the receptacle, this screen will prevent the operator or user from getting his fingers into the fan or fans of the suction unit or units.

The cover device having been positioned, draw-pull catch devices 74 are operated and draw the cover device tight down onto the receptacle slightly compressing the compressible member 25 whereby the upper end of the receptacle is closed in an air-tight fashion. Now, the machine is ready for use and it is merely necessary that the operator attach the desired tool to the nipple 14 and start the units 46.

If the machine is being used for picking up dust and dirt, the dust and dirt is carried into the machine along with the flow of air created through the machine by the units 46 and as the dust and dirt laden air enters the inlet or intake 13, it engages the deflector shell 19 and is deflected laterally losing some of its momentum. All the air and dirt or dust is deflected in the same direction through the open end 23 of the deflector shell. The dirt and dust laden air then tends to travel about the vertical wall of the receptacle losing its momentum and dropping the dust and dirt to the bottom of the receptacle 10. The air passes through the dust bag and is screened by the latter and then through the registering openings 51 and 52, through the suction creating units 46 and out through the exhaust or discharge openings 38 and 39 of the shell 35 and liner 36 into the muffler device 33. Dirt laden water may be somewhat similarly taken up by the machine and the water collects in the bottom of the receptacle 10.

When using the device for taking up dirt and dust in an air stream, should the dust bag become substantially clogged with dust, a temporary job of increasing the efficiency of the machine may be accomplished by releasing the draw-pull catch device 74 and lifting off the cover device 34 and then reaching in through the open upper end of the receptacle and grasping a portion of the dustbag within the member 29 and shaking the dust bag. A substantial part of the loose dirt and dust is shaken from the bag and will settle at the bottom of the receptacle 10, the bag having been shaken, the operator replaces the cover device and resets the draw-pull catches 74 and proceeds to use the machine.

When the dust bag is to be more thoroughly cleaned, the cover device is removed as above described and the operator then lifts out the ring 28 with the truncated cone-shaped foraminous member 29 and then lifts out the frame 24 with the dust bag 31 attached thereto. Alternatively, he may simply lift out the frame 24 and the dust bag and this same operation will result in a lifting out of the ring 28 and the member 29. The parts being out of the receptacle, the ring 28 and member 29 are separated from the dust bag. Thereafter, the dust bag may be thoroughly beaten or swept and cleaned before the cleaner is reassembled. At such times, that is, when the cover device is removed and the dust bag and member 29 are dismounted, the receptacle 10 may be emptied.

The machine is adapted for use with a variety of tools such as are well-known in the art, and where these tools are suction operated, they are placed in communication with the interior of the receptacle 10 through the attaching device 14. With the tools operated by air under slight pres-

sure or by blowing action, the tools are attached to the nipple 14 and catch 61 is moved on its pivot to permit closing of the valve 63.

In any event, air is taken in through the inlet opening in a side wall of the receptacle and then moves into the cover device only through the dust bag 31, the interior of the cover device being otherwise sealed off from the interior of the receptacle. The castors 11 are shown as permanently secured to the receptacle and when the machine is assembled, the handle 65 provides a convenient means for rolling the machine from one place to another. The whole machine is of comparatively light weight and may readily be made more or less powerful in its action, depending upon the number of units 46 employed therein.

Having thus set forth the nature of my invention, what I claim is:

1. In a suction cleaner, a receptacle having an annular side wall open at its upper end, an annular frame seated on the upper end of said receptacle and forming an annularly continuous air-tight seal therewith, an annular rigid screen member of truncated cone-shape with its larger end being the upper end, said screen member being open at its upper and lower ends and supported at its upper end by said frame and depending into said receptacle, a flexible dust bag having an open end and a closed end and of generally hourglass shape when extended, said open end being engaged and secured about said annular frame outwardly of said screen member, said bag extending in downwardly convergent relation about the outer side of said screen member, in folded relation about the lower end of said screen member, and in upwardly divergent relation within said screen member with its closed end facing upwardly and freely disposed within the open upper end of said screen member, said closed end being of less diameter than the diameter of the upper end of said screen member and of greater diameter than the diameter of the lower end of said screen member, a cover device normally closing the upper end of said receptacle in air-tight fashion and removable therefrom to expose the upper open end of said screen member supported within said receptacle, a suction unit in said cover device for creating a suction upwardly through said dust bag to draw the closed end of said dust bag upwardly within said screen, an inlet in a wall of said receptacle, an outlet in said cover device, means for detachably securing said cover device to said receptacle in air-tight relation with said open upper end thereof, and said dust bag adapted upon removal of said cover to have its closed end exposed for shaking purposes and being free to be grasped and moved downwardly through the open lower end of said screen member.

2. In a suction cleaner, a housing having a lower receptacle part and an upper cover part including a top wall and a side wall, said lower receptacle part having an air inlet and said upper cover part having an exhaust outlet in said top wall and a blower outlet in said side wall, a suction unit within said housing having a lower inlet end and an upper outlet end for creating a suction through said air inlet of said receptacle part, a removable means for normally closing said blower outlet, valve means for opening and closing said exhaust outlet comprising a vertically movable post within said exhaust outlet, guide means for said post, a valve head upon the lower end of said post adapted in a relatively raised

position to close said exhaust outlet and in a relatively lowered position to open said exhaust outlet, and said valve head being movable by gravity to its lowered position and being in the path of movement of air from said outlet end of said suction unit and movable thereby to close said exhaust outlet by the pressure of said air, a movable means normally in the path of upward movement of said post for maintaining said valve head in open position, and said movable means shiftable to release said post for movement of said valve head to closed relation with said exhaust outlet.

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References Cited in the file of this patent

#### UNITED STATES PATENTS

Number	Name	Date
1,198,968	Stevens	Sept. 19, 1916

Number
2,044,827
2,047,594
2,380,382
2,441,365
2,500,832
2,507,672
2,516,707

Number
256,407
379,506
908,627

Name	Date
Adams	June 23, 1936
Paine	July 14, 1936
Baker	July 31, 1945
McAllister	May 11, 1948
Kirby	Mar. 14, 1950
McAllister	May 16, 1950
Lewyt et al.	July 25, 1950

#### FOREIGN PATENTS

Country	Date
Great Britain	Aug. 12, 1926
Great Britain	Sept. 1, 1932
France	Oct. 1, 1945