

Dec. 26, 1950

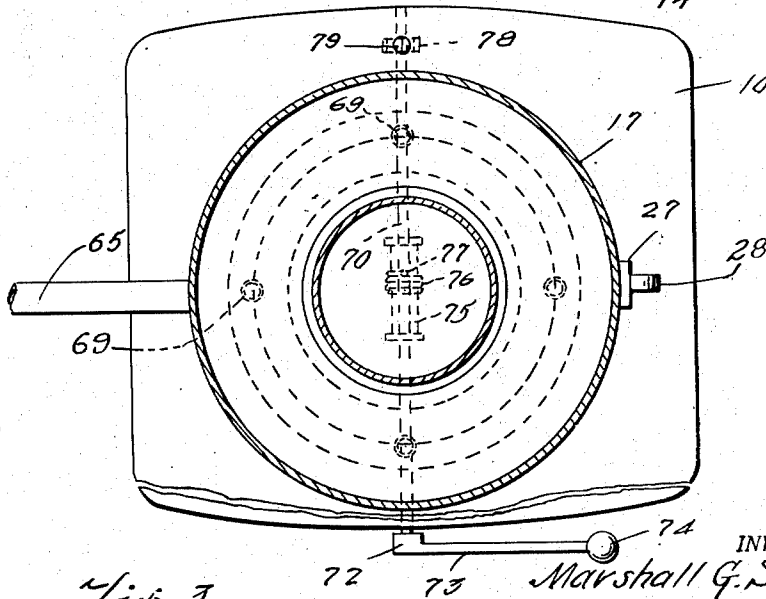
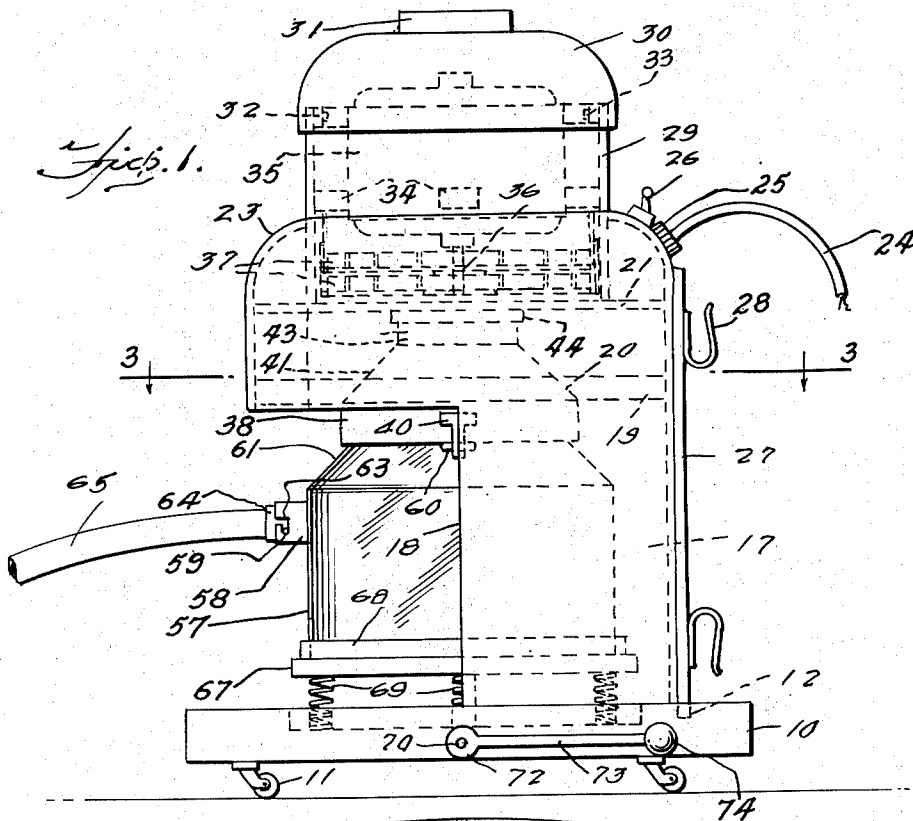
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2,535,963

VACUUM CLEANER

Filed June 10, 1947

2 Sheets-Sheet 1



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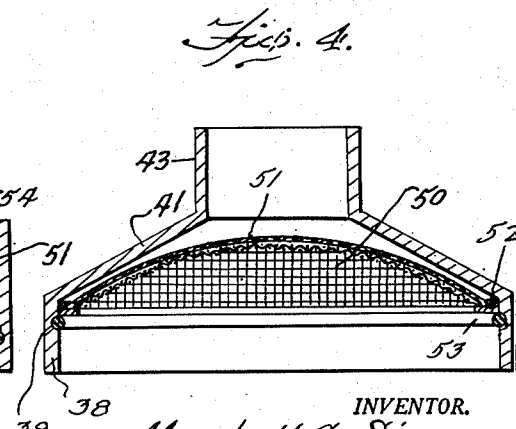
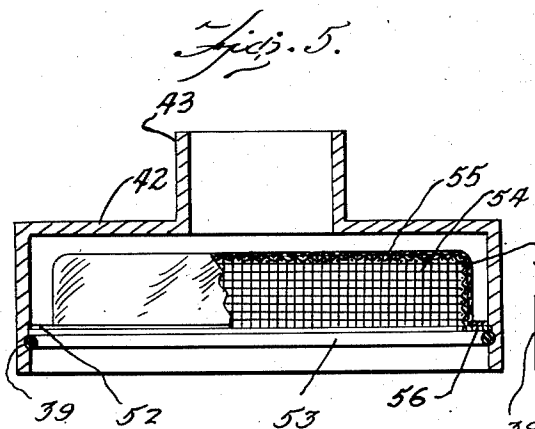
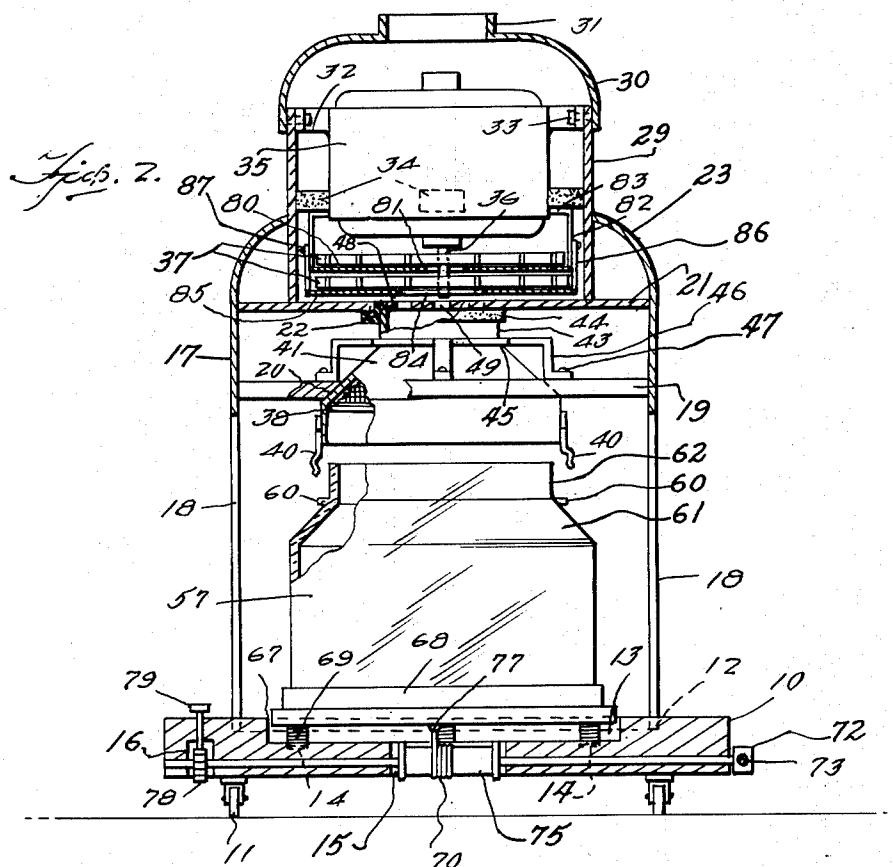
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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VACUUM CLEANER

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2 Claims. (Cl. 183—37)

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This application relates to a vacuum cleaner for household use.

In the vacuum cleaners of the prior art, the dirt-collecting receptacle is ordinarily a bag. It is often the case that the vacuum cleaner is damaged because the operator continues to run same after the bag has been filled. This can readily happen because the operator seldom knows when the bag has been filled. Operation of the machine for even a few minutes after the bag has been filled will severely damage the machine. This disadvantage is obviated in the vacuum cleaner of the present invention by providing a dirt-collecting receptacle in the form of a transparent glass container. It is well-known that people like to see machinery in operation and to see what they are doing when they are operating it, and a glass dirt container according to the present invention will encourage the operator to use the machine.

The principal object of the present invention is to provide a vacuum cleaner having a transparent dirt-collecting receptacle.

It is another object of the present invention to provide a vacuum cleaner having a dirt-collecting receptacle in the form of a commercially available transparent container.

It is another object of the present invention to provide a dirt-collecting receptacle for a vacuum cleaner which is readily removable for emptying and cleaning.

It is a further object of the present invention to provide a vacuum cleaner having the dirt-collecting receptacle in the form of a rigid container of quick action means for securing the container in place and releasing same.

It is an additional object of the present invention to provide a vacuum cleaner having a uni-flow passage for the air in suspended dirt.

It is still another object of the present invention to provide a vacuum cleaner having a dirt-collecting receptacle in the form of a rigid container with a novel form of filter for separating the suspended dirt from the air stream and causing same to deposit in the dirt-collecting receptacle.

Additional objects, advantages, and improvements will become apparent from the following specification, taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevational view of the vacuum cleaner of the present invention, showing the dirt-collecting receptacle locked in position;

Figure 2 is a vertical sectional view of the vacuum cleaner showing the dirt-collecting receptacle in released position;

Figure 3 is a sectional view on the section line 3—3 of Figure 1, showing the releasing means for removing the dirt-collecting receptacle;

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Figure 4 is a vertical sectional view through one form of dirt-collecting filter;

Figure 5 is a vertical sectional view through another form of dirt-collecting filter.

Referring now to the drawings in detail, and to Figure 1 in particular, the vacuum cleaner of the present invention is here shown as being mounted on a portable base 10 which is preferably of streamlined construction, as shown in Figure 2. The base 10 is carried on four rollers 11 for movement over the floor. In the top of the base 10 there is formed a semi-cylindrical groove 12 within which is received the main housing 17 of the vacuum cleaner. The housing 17 is of generally circular contour, but is cut away at 18 for 180° for more than half of its height. The top of the housing 17 is of dome shape at 23 and has a large central aperture therein which receives an auxiliary or motor casing 29. The motor casing 29 at its bottom rests on a plate 21 secured within the housing 17 in any suitable manner, as by welding. Over the top of the motor casing 29 there is fitted a domed cap 30 having an apertured central boss 31 which forms an air exit.

Within the auxiliary casing 29 there is mounted an electric motor 35, preferably of the totally-enclosed type. The motor frame is formed with integral radially extending legs 32 adjacent its upper end, which legs are secured to the casing 29 by short stud bolts 33. Adjacent the lower end of the motor frame, there are provided a plurality, four being shown, of arcuately-spaced, shock-absorbing members 34, preferably of soft rubber, which resiliently mount the motor 35 within the casing 29. The shaft 36 and the motor 35 mount either a single or a double fan 37, a double fan 37—37 being illustrated. Intermediate the upper and lower fan sections 37—37, there is positioned a plate 80 having a central aperture 81 therein, through which the shaft 36 of the electric motor 35 extends. The plate 80 has integral upwardly extending arms 82 thereon which at their tops are turned inwardly to form fingers 83. The fingers 83 are secured to the frame of the electric motor 35 either by force fit or by welding. Similarly, under the lower fan section 37, there is positioned a plate 85 having a central aperture 84 therein through which the shaft 36 of the electric motor 35 also extends. The plate 85 likewise has integral upwardly extending arms 86 formed thereon, and these are secured to the arms 82 on the top plate 80 by screws 87. The area of the central aperture 84 in the lower plate 85 is approximately twice the area of the central aperture 81 in the upper plate 80.

A supply cord extends through a suitable insulating bushing 25 in the dome top 23 of the housing. Also positioned in the top 23 of the housing there is a switch 26 for controlling the circuit of the motor 35. The electrical connec-

tions from the cord 24 to the switch 26 and the motor 35 are not shown, as these form no part of the present invention. Mounted on the side of the housing 17 there is a cord rack comprised of a metal strap 27, which may be secured to the housing in any suitable manner, as by welding. Cord clips 28—28 are secured to the cord rack 27 in any suitable manner, also by welding, these clips being positioned in oppositely-disposed relationship. As is obvious, the supply cord 24 may be wound around the cord clips 28—28 when the vacuum cleaner is not being used.

The upper plate 21 is formed with a central aperture which is surrounded on the under face of the plate by a circumferential bead 22. Below the plate 21 there is positioned a lower plate 19, likewise secured in the housing 17 in any suitable manner, as by welding. A funnel-shaped hood is comprised of a bottom cylindrical section 38, a frusto-conical intermediate section 41 and a cylindrical top section 43. The frusto-conical intermediate section 41 of the hood is fitted within the central aperture in the plate 19, which is suitably beveled at 20 to receive same. The hood is held in place by a spider which is comprised of an aperture top plate 45, and arcuately-spaced, downwardly-dependent legs 46 which are secured to the plate 19 by screws 47. The top plate 45 receives the cylindrical top section 43 of the hood, which latter may be secured therein by spot welding, if desired. The cylindrical top section 43 of the hood is received within the central aperture in the upper plate 21 and secured therein by an annular gasket 44, which is U-shape in cross section, fitted over the circumferential bead 22 on the plate and which abuts the top section of the hood. The upper end of the cylindrical top section 43 of the hood is partially restricted by a plate 48 which is force-fitted therein, this plate having a plurality of holes 49 therethrough.

The dirt-retaining filters are shown in Figures 4 and 5. In Figure 4, the inner wall of the lower cylindrical section 38 of the hood is formed with an internal bead 39, adjacent the juncture of the lower cylindrical section and the frusto-conical intermediate section 41. The filter element is comprised of a screen or reticulated grid member 50 formed as the segment of a spherical surface. This screen is covered by a cloth member 51, preferably of silk. The periphery of the screen is flattened, and together with the periphery of the top member 51 is held against the under surface of the frusto-conical intermediate section 41 of the hood by a flat ring gasket 52, which in turn is held in place by a circular ring gasket force-fitted in the groove 39.

In the modification shown in Figure 5, the frusto-conical intermediate section 41 of the hood is replaced by a plain horizontal section 42. The filter element is here also comprised of a screen or reticulated grid member 54, but of cylindrical shape with a flat top 55. As before, the screen element is covered by a cloth bag 51. Around the lower periphery of the screen element 54, there is a circumferential flange 56 which is held in the groove 39 by the flat ring gasket 52 and a circular ring gasket 53, as in the previous construction.

The dirt-collecting receptacle is comprised of a glass jar having a cylindrical body 57, a frusto-conical neck section 61, and a cylindrical upper or mouth section 62. The cylindrical upper section 62 is adapted to fit within the lower cylindrical section 38 of the funnel-shaped hood and to be encompassed by the ring gasket 53 therein to form an air-tight joint. For mounting the

dirt-collecting receptacle in place, the lower cylindrical section 38 of the hood is provided with diametrically-spaced, snap detents 40—40 adapted to cooperate with diametrically-spaced lugs 60—60 at the junction of the neck section 61 and the cylindrical upper section 62 of the dirt-collecting receptacle. The body 57 of the dirt-collecting receptacle is formed with a radially-extending hollow boss 58 having a bayonet slot 59 in its wall. A hose 65 extends to the usual nozzle or dirt-pick-up device (not shown), and this hose has a coupling 64 at its inner end with a bayonet pin 66 thereon, this pin cooperating with the bayonet slot 59 in the hollow boss 58 to secure the hose thereto.

The direct-collecting receptacle is supported by a platform 67, which is mounted for reciprocation in a recess 13 in the base 10. The dirt-collecting receptacle is held in position on the platform 67 and against sliding movement by a cup 68 which is secured to the platform by any suitable means, such as screws (not shown). The platform 67 is mounted on a plurality of arcuately-spaced coil compression springs 69, four of these being shown. The springs 69 are seated in wells 14 formed in the platform 10 and extending downwardly from the bottom of the recess 13.

A reeling mechanism is provided for raising and lowering the platform 67. A shaft 70 is rotatably mounted in a transverse bore in the platform 10, which bore crosses a central aperture 15 in the platform communicating with the recess 13. The shaft 70 has an operating arm or handle 73 on one end which is secured thereto by a radially-positioned set screw 71 passing through an integral boss 72 on one end of the handle. A knob 74 is secured on the other end of the operating handle. At its central section, and within the central aperture 15, a winding drum 75 is secured to the shaft 70, as by a set screw or a key (not shown). A cord 76 is secured at one end to the drum 75, (the attachment means not being shown) and at its other end to an eyelet 77 on the bottom of a platform 67. Adjacent the opposite end of the shaft 70 from the operating handle 73, there is mounted a ratchet gear 78, which is received within a recess 16 extending upwardly from the bottom of the platform 10. A gravity-biased detent 79 extends downwardly through a suitable hole in the platform 10 and cooperates with the ratchet gear 78 to secure the shaft 70 in either of two pre-selected positions of the operating handle 73.

The operation of the vacuum cleaner of the present invention should be apparent from the above description. It may, however, be summarized as follows: The electric motor 35 drives a fan 37, which, as previously stated, may be either a single or a double fan, but is here shown as of double construction. The fans 37—37 drive air and suspended dirt from the nozzle or dirt-pick-up device (not shown) through the hose 65. The suspended dirt is removed from the air stream by the screen or reticulated grid member 50, or 54, as the case may be, and by the cloth bag 51 over the top of the screen and falls into the dirt-collecting receptacle 57. The operator is able to see the dirt-collecting receptacle 57 through the cut-out section 18 in the housing 17 and to observe the dirt falling into the jar during the operation of the vacuum cleaner and to know when the jar is filled. The air, after being relieved of its suspended dirt, passes on upwardly through the upper cylindrical section 43 of the funnel-shaped hood, and the apertured plate 48.

The air drawn by the lower fan section 37 passes through the central aperture 84 in the lower plate 85, along the blading, between the vertical arms 86 and upwardly through the spaces between the shock-absorbing members 34, the annular space between the auxiliary casing 29 and the frame and the motor 35, the spaces between the motor legs 32, and out through the opening 31 in the dome cap 30; similarly, the air drawn by the upper fan section 37 passes through the central aperture 84 in the lower plate 85, the hub of the lower fan section 37, the central aperture 81 in the upper plate 80, and upwardly between the fingers 83 on the vertical arm 82 and between the shock-absorbing members 34 joining the first air stream in the annular space between the auxiliary casing 29 and the frame of electric motor 35. In passing around the frame of the electric motor 35, the combined air streams incidentally aid in keeping same cool.

In order to remove the dirt-collecting receptacle 57 for emptying, the operator releases detents 40—40 on the lower cylindrical section 38 of the funnel-shaped hood from engagement with the lugs 60—60 on the upper cylindrical section 62 of the dirt-collecting receptacle, raises the detent 79 and rotates the operating handle 73 180° in a counter-clockwise direction from the position shown in Figure 1. The cord 76 will be wound around the drum 75, drawing the platform 67 and dirt-collecting receptacle 57 downwardly against the compression of the springs 69—69 to the position shown in Figure 2. The detent 79 will engage with the ratchet gear 68 to lock the shaft 70 in a corresponding position. The hose 65 may be readily detached from the dirt-collecting receptacle 57 by unscrewing the bayonet connection 59—63. After the dirt-collecting receptacle has been emptied, the converse procedure is followed to replace same. With the dirt-collecting receptacle 57 removed, the filter bag 51 may also be removed for cleaning by taking out the top ring gasket 53, in which case the screen or reticulated grid member 50 or 54, as the case may be, and the bag 51 will fall downwardly.

While the above description and annexed drawings set forth the preferred embodiment of the present invention, it will be understood that various changes may be resorted to in the sizes, shapes, and relative arrangements of the various parts without departing from the spirit of the invention as defined by the appended claims.

Having now described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. In a vacuum cleaner, a base, a housing mounted upon the base and having an opening formed in its side near its bottom, a substantially horizontal platform mounted upon the base within the housing, a transparent dirt collecting receptacle mounted upon the platform and provided at its top with a neck, springs arranged beneath the platform to elevate it and permit the lowering of the platform for removal of the receptacle, a hose detachably connected with the side of the receptacle beneath its neck, a hood mounted within the housing above the transparent recep-

tacle and having its lower end open to receive the neck and having an upper reduced end, a compressible gasket within the hood to receive the neck therein and form therewith an air tight joint, a horizontal plate within the upper end of the housing and having an opening to receive the upper reduced end of the hood, a suction device within the housing above the horizontal plate including rotary fan means, a motor to drive the fan means, and a dirt strainer within the hood above the gasket.

2. In a vacuum cleaner, a base, provided upon its upper face with a recess, a housing mounted upon the base and surrounding the recess and having an opening formed in its side near its bottom, a substantially horizontal platform mounted for movement within the recess, springs arranged within the recess and beneath the platform to raise the platform and permit its lowering into the recess, a horizontal shaft carried by the base and arranged beneath the platform, a winding device operated by the shaft and including a flexible element connected with the platform to draw the platform downwardly, a transparent dirt collecting receptacle mounted upon the platform and provided at its top with a neck, a hose detachably connected with the side of the receptacle beneath the neck, a hood mounted within the housing above the transparent receptacle and having its lower end open to receive the receptacle and having an upper reduced end, a compressible gasket within the hood to receive the neck therein for forming therewith an air tight joint, a dirt filter arranged within the hood above the gasket, a horizontal plate within the upper end of the housing and having an opening to receive the upper reduced end of the hood, a vertical casing extending through the top of the housing and contacting the horizontal plate and surrounding the opening in the plate, fan means within the casing, and a motor to drive the fan means.

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