

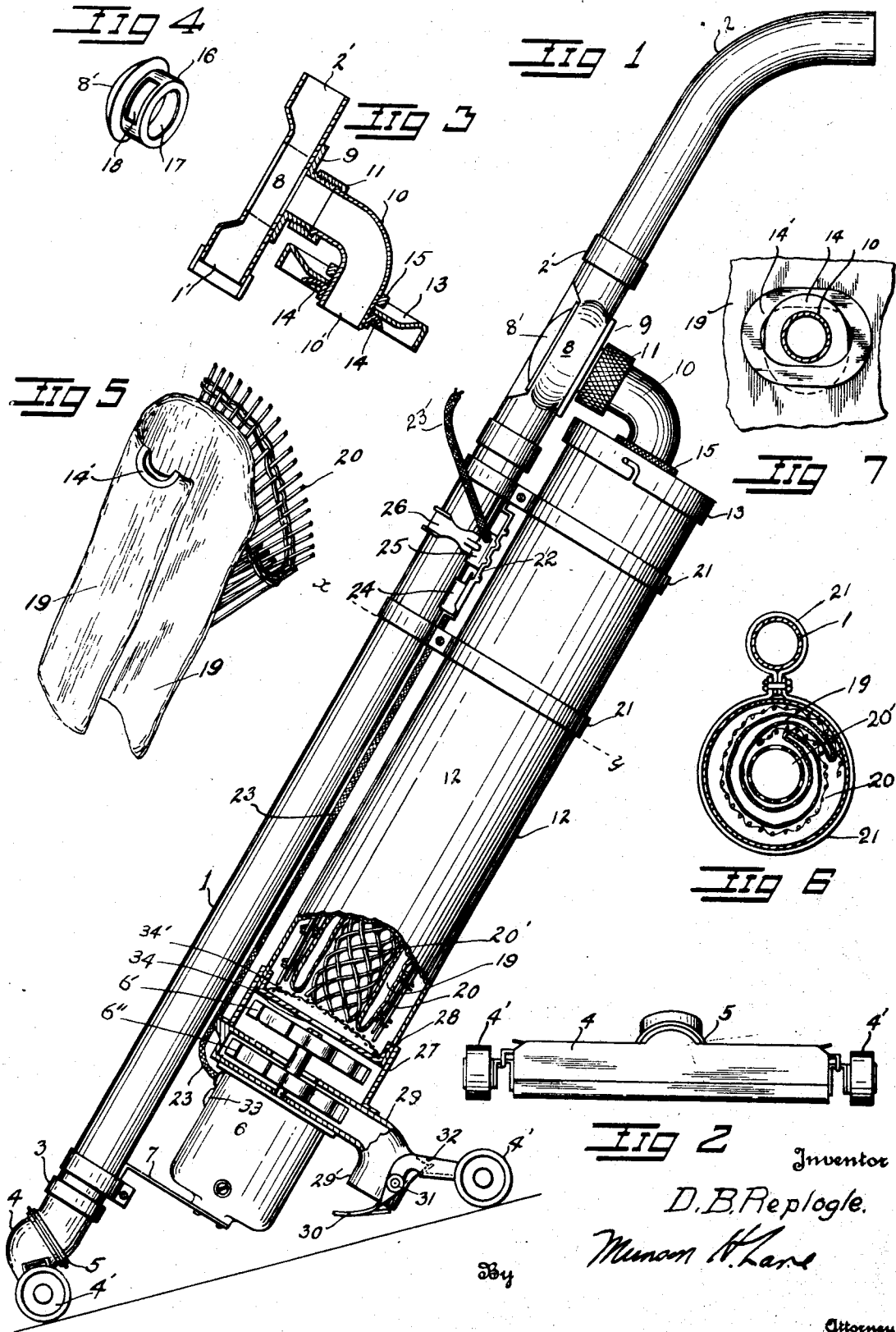
Nov. 15, 1932.

D. B. REPLOGLE
AIRWAY SUCTION CLEANER

1,887,600

Filed Feb. 3, 1928

2 Sheets-Sheet 1



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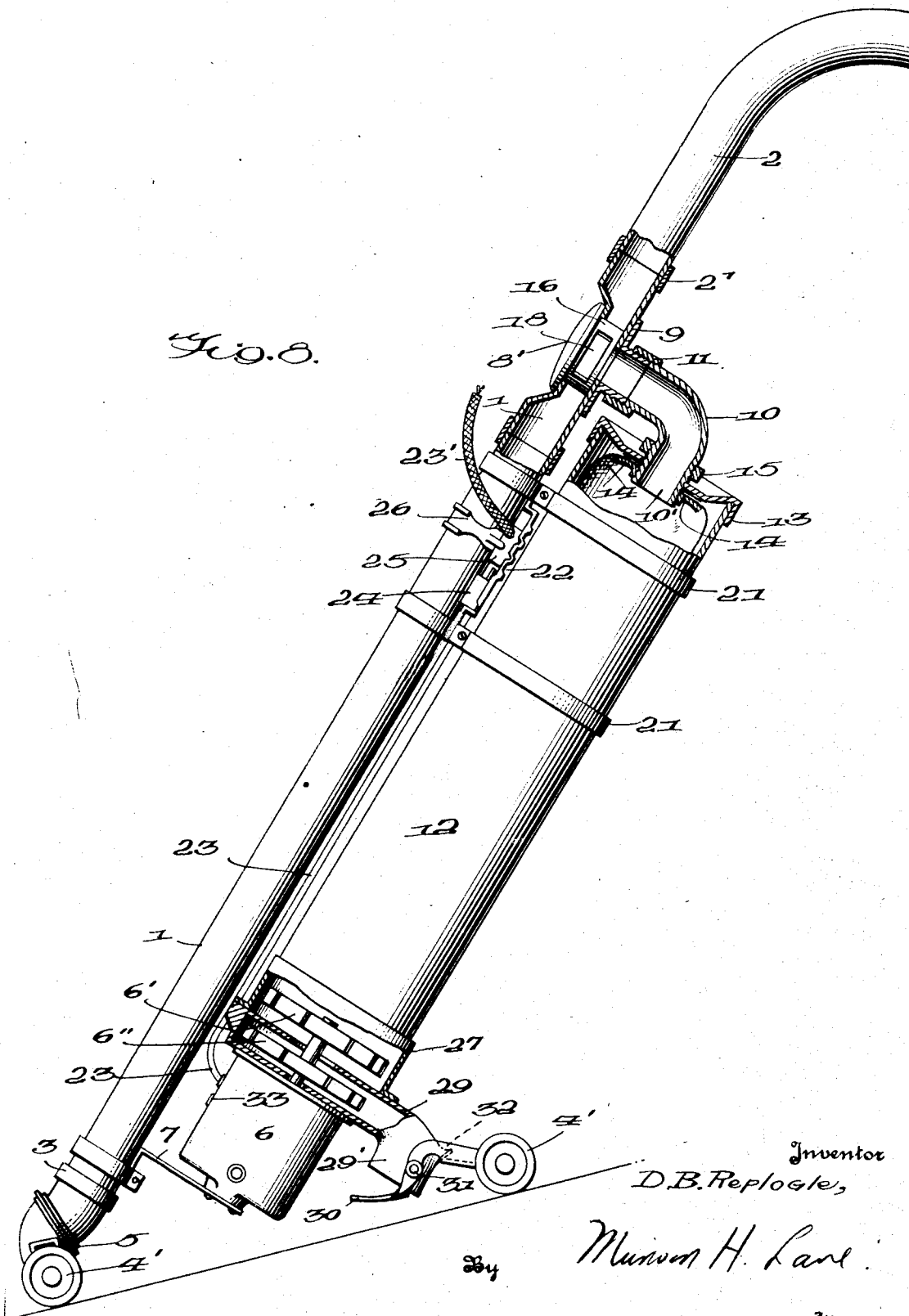
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UNITED STATES PATENT OFFICE

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AIRWAY SUCTION CLEANER

Application filed February 3, 1928. Serial No. 251,841.

This invention relates to manually portable electrically operated cleaners of the air-way type in which tools and hose pipe accessories are operatively attachable to a tubular handle thereof and is designed to utilize air-way cleaning tools and air-way cabinets such as are described in my co-pending application for patent, Serial No. 15,529, filed March 14, 1925, and in my Patent No. 1,651,624, granted August 21, 1928. By the term "air-way" as applied to cleaning devices I have reference to that type of cleaner having a hollow handle which provides an air passage or air-way communicating with a cleaning tool and with a source of suction, and in which the cleaning effect is obtained by the erosive-like action of swiftly moving air, as more fully set forth in my copending application Serial No. 15,529, filed March 14, 1925. The objects of the present invention are to improve the form, manner and convenience of attaching and removing of paper dust filtering receptacles, to provide better position for the dust indicator valve and the electric connections on the suction or tubular handle, to provide a means for cooling the motor and to otherwise improve the apparatus generally.

To these ends the invention consists of the form, construction and arrangement of parts as set forth herein, and as illustrated in the accompanying drawings in which:

Figure 1 is a view in side elevation of my assembled cleaner in working position for sweeping a floor, parts being broken away to show the interior arrangement of motor driven fans, and the dust collection element.

Figure 2 is a front view of a suitable air-way floor cleaning tool usable with the device.

Figure 3 is a central longitudinal cross section of the valve member and couplings thereof for connecting to the handle and dust collector.

Figure 4 is a detail perspective of the transparent-topped indicator valve removed from the parts shown in Figure 3.

Figure 5 shows the paper dust filter receptacle accompanied by a mat with which

it is designed to be coiled within the body of the device.

Figure 6 shows a cross section taken on the line $x-y$ of Figure 1.

Figure 7 is a detail designed to illustrate how the filtering receptacle is attached to receive the exhaust of dust laden air.

Figure 8 is a view similar to Figure 1, but with the upper portion of the dust collector broken away for the purpose of illustrating the internal connections between parts, including the suction handle, the dust collector and the filtering receptacle.

In the drawings like characters of reference denote like and corresponding parts throughout the several views.

The straight section 1 of the tubular handle is intermediately joined to the curved section 2 thereof by slip joints at the open end 1' and 2' respectively, of the valve member 8 and it is further connected to the floor tool 4 at the slip joint 3. The said floor tool 4 is arranged to turn on the swivel joint 5 so as to conform with the floor regardless of variations in the angle of the handle which is rigidly secured to the machine as a whole.

The motor 6 is rigidly attached with its axis parallel to the handle by means of the brace 7, and the valve housing 8 which is aligned with the handle, has the nipple piece 9, connecting it with the L 10 by means of the knurled coupling screw 11. The other end of the L 10 connects with the body 12 by means of the cap 13 which is designed to fit down on the concentric shield 14 so as to clasp the periphery of the hole 14' of the paper filter 19 over the end 10' of the connecting L 10, so as to lead within the filtering receptacle.

The knurled ring 15 runs on the threaded end of the L 10 back of the cap 13 and is adapted to clamp the periphery of the hole 14', sealing against leakage and supporting the upper end of the filter 19.

A suitable mat 20 which may be made of straw or other light material is coiled with the filtering envelope 19 to keep it from being pressed against the inner walls or against its own folds; thus insuring free passage of air through its pores during inflation. Also

to prevent collapsing and shutting off the air flow from the interior of the filter, the extender 20' is placed centrally of the body 12 and directly over the passage leading to the fan 6' and 6''.

5 Bands 21, 21 are used to further secure the body 12 to the handle 1 and they also support the ends of a truss 22 carrying the terminals 24 and 25 of the electric conduction
10 cords 23 and 23' respectively. The terminal 24 is rigidly held fast while the terminal 25 is arranged to be slid into and out of electric contact by means of the sliding ring 26, which encircles the handle. The arrangement of
15 the terminals and conduction cords is being claimed in my copending application 592,392, filed Feb. 11, 1932.

The cylindrical extension 27 of the fan case 29 has fitted to it, the lower end 28 of the
20 body 12, in such manner that the intake of the fan 6', 6'' is from the body 12 through a central port 34 in the lower end 28 thereof.

The exhaust port 29' of the fan-case is equivalent in design to the end of the handle
25 tube 2 so that a hose pipe suitable for suction on the end of the handle may be attached to the exhaust 29', and used as a blower. Ordinarily, however, a deflector plate 30 stiffly hinged at 31 is arranged to throw exhaust air
30 against the motor 6 for the purpose of cooling the same when in service.

The reason for hinging the deflector plate is to permit the same to be moved out of the way of the exhaust port 29' of the fan case to
35 permit a hose pipe or suitable attachment to be secured to said exhaust.

A bracket 32 carrying a pair of rollers similar to the rollers 4', 4' of the floor tool is also secured at the hinge 31 and serves to
40 support the device as a whole in the working position. The bracket 32 and the deflector plate 30 may be formed integral or separately, as desired.

The device in operation is designed to be
45 drawn back and forth over the floor with the rear rollers elevated ordinarily above the floor for general sweeping; but may be tilted over the edges of rugs and the like by dropping the handle straight down so as to
50 fulcrum on the rear rollers when they reach the floor. For running under furniture, the handle and body are swung over sidewise, swivelling at the joint 5.

The floor tool being removable, the lower
55 end of the pipe or handle 1 may be provided with any approved modern tools such as may be used for stationary cleaning systems, including such as may have independently electrically driven parts. An outlet 33 on the
60 motor 6 is provided so as to connect electrically from any independent source, or to furnish further extension of the current brought through the conduction cords 23, 23'.

In addition to the operative connection
65 made with the cleaning tools at the lower

end of the handle, the outer end of the curved handle tube is adapted to connect with hose pipe or any suitable cleaning tool.

During the cleaning operations the transparent-topped valve 8' must of course be
70 kept within the housing 8, its port 17 registering with the open upper end of the L 10, the cylindrical portion 16 being adapted to interchangeably open and close the handle passages as the port 18 is rotated to register
75 with either.

It is to be noted that by my present arrangement of the parts, the transparent-topped valve is brought near to the hand and
80 eye of the operator of the device, as a sweeper, and facilitates observation of results when the dust laden air whirls through the valve 8'.

It is also to be observed by this present construction, the dust and litter of cleaning is
85 arrested before the air carrying it passes through the fan. This arrangement favors compounding of the fan as shown, whereby the air passes through the centrifugal fans 6' and 6'' consecutively and is thereby much
90 accelerated and made more effective. To prevent the litter from reaching the fans in case of rupture of the filter 19, the first port 34 leading to the fan is covered by an arched circular screen 34' arranged in the lower end
95 of the body 12.

When the filter 19 has become fouled or sufficiently filled, it is removed by first unscrewing the ring 11 so as to detach the L
100 end from the member 8, then unhooking the cap 13 connected with the said L, lifting them away with the filter attached. After the filter is outside the body it is released by unscrewing the ring 15 and sliding inward
105 the end of the L carrying the shield 14. The filter envelope 19 with its contents is designed to be thrown away or destroyed and replaced with a new similar envelope made of porous paper on which advertising may be printed.

Replacing the filtering envelope is accomplished by first slipping the mouth 14' there-
110 of over the shield 14 as detailed in Figure 7, then before reinserting into the body 12, laying it in laterality with the mat 20 and coiling the two into spiral form. Then the coiled
115 filter and mat are slid within the body 12 and around the distender 20' as shown in detail in cross section Figure 6. The cap 13 is replaced and again secured by suitable means against leak, the rings 11 and 15 are
120 again screwed up, and the device is ready for further service.

Having now described the device and the manner of using the same, what I claim is:

1. An air-way cleaner having a dust collecting body, air suction means for exhaust-
125 ing the air from said body, a filtering envelope arranged within said body and detachably connected at its mouth to an intake tube adapted to direct dust-laden air

into the interior of the filter envelope, means for preventing collapsing of said envelope, a suction pipe extending along the full length of and parallel with said dust collecting body rigidly connected thereto and movable therewith, the said suction pipe being adapted to be attached to dust collecting tools and being connected to said intake tube.

2. An air-way cleaning device comprising electrically operated suction means, a suction pipe handle, a dust collector body parallel with said suction pipe, a filtering receptacle within said body, a valve intermediate of the ends of said handle and an L pipe leading laterally from said valve and projecting downwardly into said body, a cap lid secured to an end of said L pipe and adapted to close the end of said body, and the same end of said L pipe adapted to connect with and lead dust laden air into said filtering receptacle.

3. In a suction cleaning device, a motor, a motor driven fan, a fan-case having a downwardly directed exhaust port, a supporting bracket and deflector plate hinged on a common axis to said fan case, and said supporting bracket arranged to support the device in a working position and the deflector plate curved to direct the exhaust air from the fan-case against the said motor.

4. In a suction cleaning device, a motor, a motor driven fan, a fan case having a downwardly directed exhaust port, and a supporting bracket and deflector plate hinged to the exhaust portion of said fan case from a common axis.

5. In a suction cleaning device, a motor, a motor driven fan, a fan case having a downwardly directed exhaust pipe, and a deflector plate extending from the lower end of the exhaust pipe and curved to direct exhaust air from the fan case against the motor for cooling the same.

6. A pneumatic cleaner having a dust collecting body, air suction means connected at one end of the body for exhausting air therefrom, a filtering envelope arranged within said body and detachably connected at its mouth to an intake tube, said intake tube communicating with said body at the end thereof opposite said air suction means; and said intake being adapted to direct dust laden air into the interior of the filter envelope, means for preventing collapsing of said envelope, a suction pipe parallel with said dust collecting body, rigidly connected thereto and movable therewith, the said suction pipe being adapted to be attached to dust collecting tools and being connected to said intake tube.

7. In combination with a pneumatic cleaning device, a motor, a motor driven fan, a fan case having a downwardly directed exhaust pipe, and a deflector plate hingedly secured to the lower end of said exhaust pipe, said

plate being curved to direct exhaust air from the fan case against said motor to cool the same.

8. A suction cleaning device comprising a source of suction, an open-ended suction handle, a floor tool operatively connected at one end of the handle, said end being adjacent to the source of suction, a dust collector body parallel with the suction handle, an open-mouthed dust filter carried within the dust collector body, said dust collector body having an exhaust outlet at the end adjacent the floor tool communicating with the source of suction, an L-shaped intake pipe leading from the suction handle to the end of the dust collector body opposite the source of suction and discharging dust-laden air downwardly into the interior of the dust filter through said open mouth, the juncture between said intake pipe and the suction handle being located adjacent the end of the handle opposite the floor tool, a transparent-topped valve located at said juncture serving to connect said dust collector selectively to opposite ends of the suction handle, and being at a height convenient to the hand and eye of the operator when the floor tool is in use and the handle in normal working position, whereby the amount of dust passing through the machine may be conveniently observed.

In testimony whereof I affix my signature.
DANIEL BENSON REPLOGLE.

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