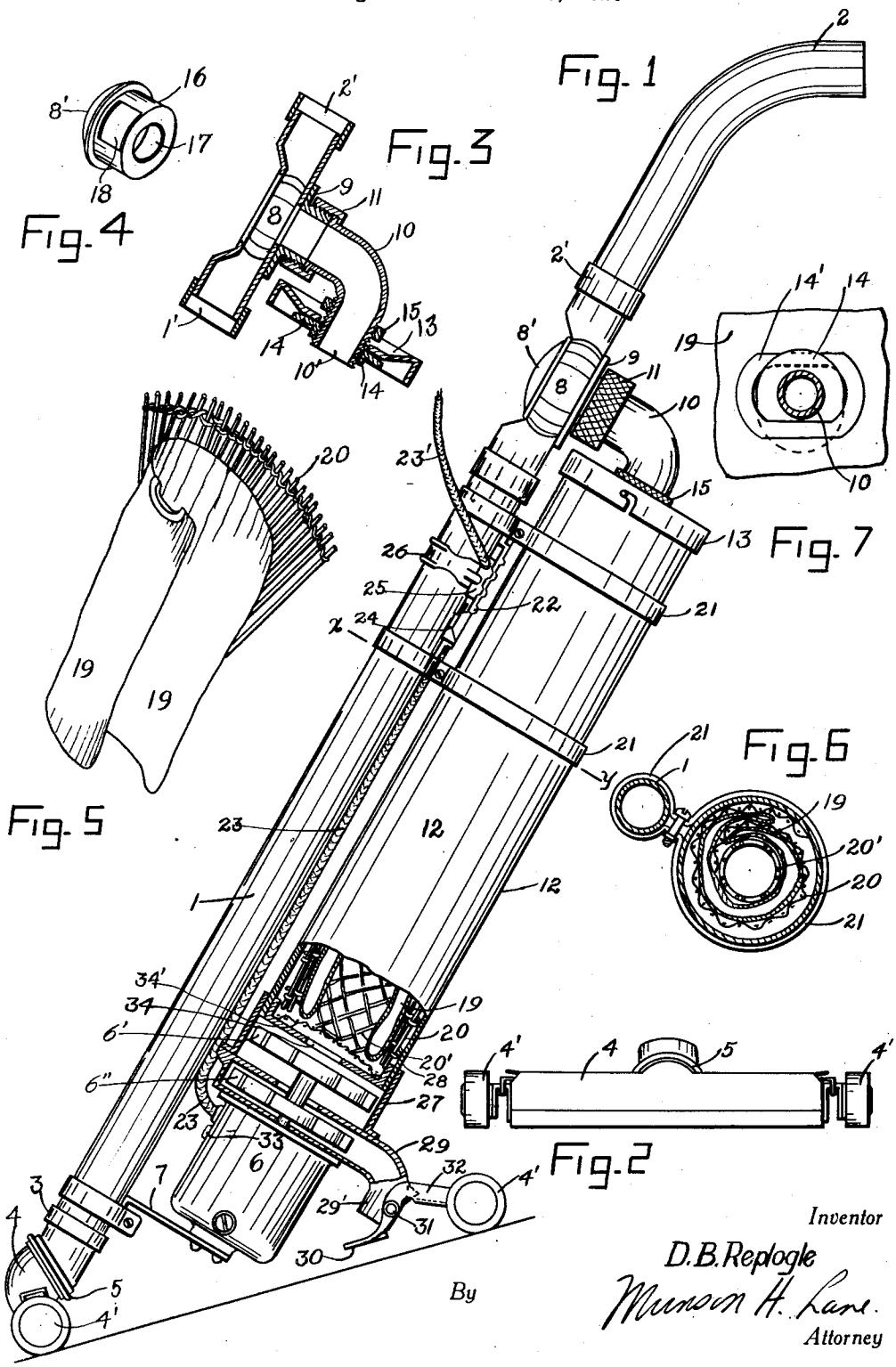
Nov. 15, 1932. D. B. REPLOGLE 1,887,601

DUST COLLECTING APPARATUS FOR SUCTION CLEANERS

Original Filed Feb. 3, 1928



Patented Nov. 15, 1932 1,887,601

UNITED STATES PATENT OFFICE

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DUST COLLECTING APPARATUS FOR SUCTION CLEANERS

Original application filed February 3, 1928, Serial No. 251,641. Divided and this application filed July 15, 1931. Serial No. 551,023.

The invention relates to manually portable, electrically operated cleaners, and more particularly to the arrangement and form of dust collecting and filtering apparatus. One of the objects of the present invention is to improve the form of the dust collector, manner and convenience of attaching and removing dust filtering receptacles, and to provide an improved location of the electrical connections between the suction handle and the dust collector in order to protect the electric connections and terminals from injury during the operation of the machine.

The present application is a division of my prior application Serial No. 251,641, filed February 3, 1928.

The invention will be made apparent from a consideration of the accompanying drawing, which sets forth an illustrative embodiment of the invention.

In the drawing:

Fig. 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;

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

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

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

Fig. 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;

Fig. 6 shows a cross section taken on the line x—y of Fig. 1, and

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

In the drawing, 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 ends 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 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 mouth 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 mouth 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″.

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 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 cylindrical extensions 27 of the fan case 29 has fitted to it, the lower end 28 of the body 12, in such a 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 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 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 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 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 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 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 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 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 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 a hose pipe or any suitable cleaning tool.

During the cleaning operations the transparent-topped valve 8′ must of course be 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 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 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 that the dust and litter of cleaning is 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 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 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 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 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′ thereof over the shield 14 as detailed in Fig. 7, then before reinserting into the body 12, laying it in laterally with the mat 20 and coiling the two into spiral form. Then the coiled filter and mat are slid within the body 12 and around the distender 20′, as shown in detail in cross section Fig. 6. The cap 13 is replaced and again secured by suitable means against leak, the rings 11 and 15 are again screwed up, and the device is ready for further service.

It will be noted that the mat 20 is in contact with and serves to strengthen and reinforce the paper bag or filtering envelope 19. The fibers of the mat are widely spaced and of large size, as compared with the fibers of the paper bag. As herein shown the mat is formed separate from the paper bag and is composed of straw or other light-weight material.

The extender 20′, as shown in the drawing, is of diamond-shaped mesh in contact with the paper surface and is preferably composed of straw or other light-weight cellulose material. The function of the extender is similar to that of the mat, namely, to reinforce the paper and to prevent collapsing of the bag. If desired, an extender might be formed within the bag as by adhesively securing the diamond-shaped mesh to the paper surface.

What I claim is:

1. In a suction cleaner having a suction handle adapted for attachment to dust collecting tools, a suction producing means, and a dust collecting cylindrical body operatively connected at opposite ends to the suction handle and to the suction producing means; the improvement which comprises a filtering paper envelope coiled within and conforming in shape to said cylindrical body, and a mat of openwork material coiled with

said paper body to space apart the folds of said envelope.

2. In a suction cleaner having a suction handle adapted for attachment to dust collecting tools, a suction producing means, and a dust collecting cylindrical body operatively connected at opposite ends to the suction handle and to the suction producing means; the improvement which comprises a filtering paper envelope coiled within and conforming in shape to said cylindrical body, a mat of openwork material coiled with said paper body to space apart the folds of said body, and a cylindrical extender placed centrally within the dust collecting body to prevent collapsing of the envelope.

3. In a suction cleaner having a cylindrical body, air suction means for exhausting the air from said body, a suction pipe adapted for attachment to dust collecting tools, parallel with the cylindrical body, rigidly connected to and movable with said body; the improvement which comprises a filtering paper envelope coiled within and conforming in shape to the interior of said cylindrical body, and operatively connected with an intake tube leading from said suction tube, and a mat folded with said envelope to separate the fold of the envelope.

4. In a suction cleaner having a suction handle adapted for attachment to duct collecting tool, a suction producing means, and a dust collecting cylindrical body operatively connected at opposite end to the suction handle and to the suction producing means; a filtering paper envelope coiled within and conforming in shape to said cylindrical body, a mat of openwork material coiled about said paper body to space apart the folds of said envelopes, and an intake pipe connected with the suction handle and communicating with the interior of the envelope.

In testimony whereof I affix my signature.

DANIEL BENSON REPLOGLE.