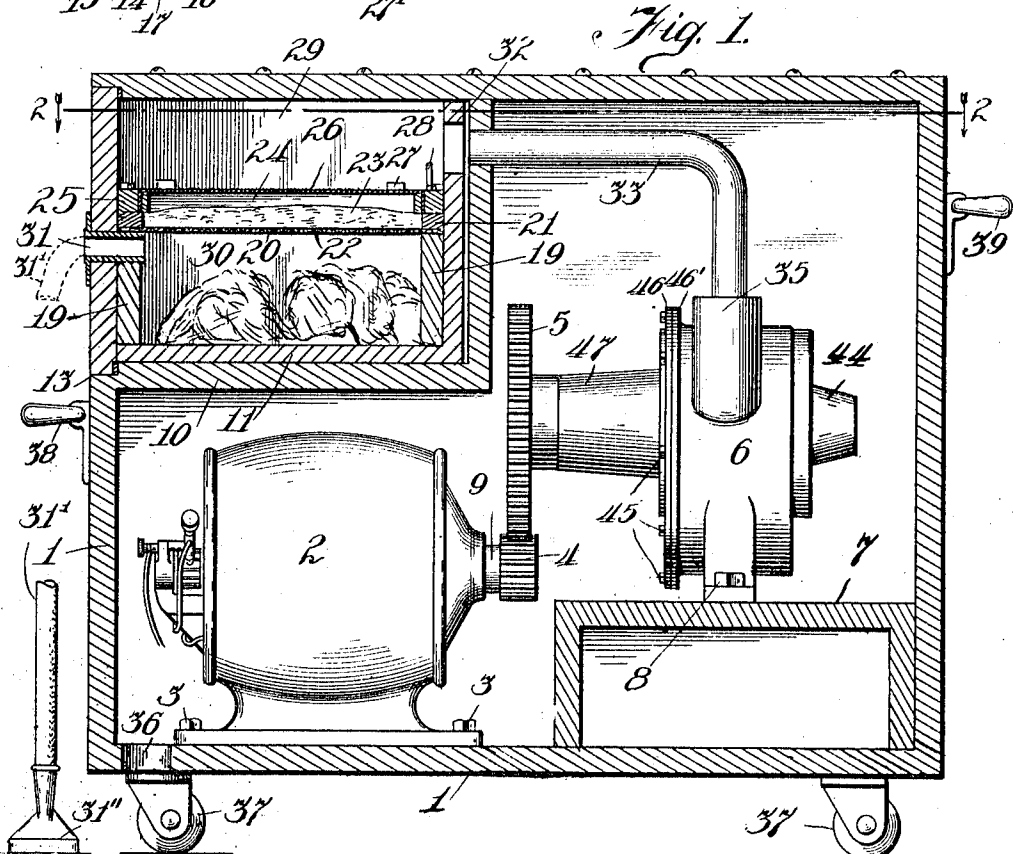
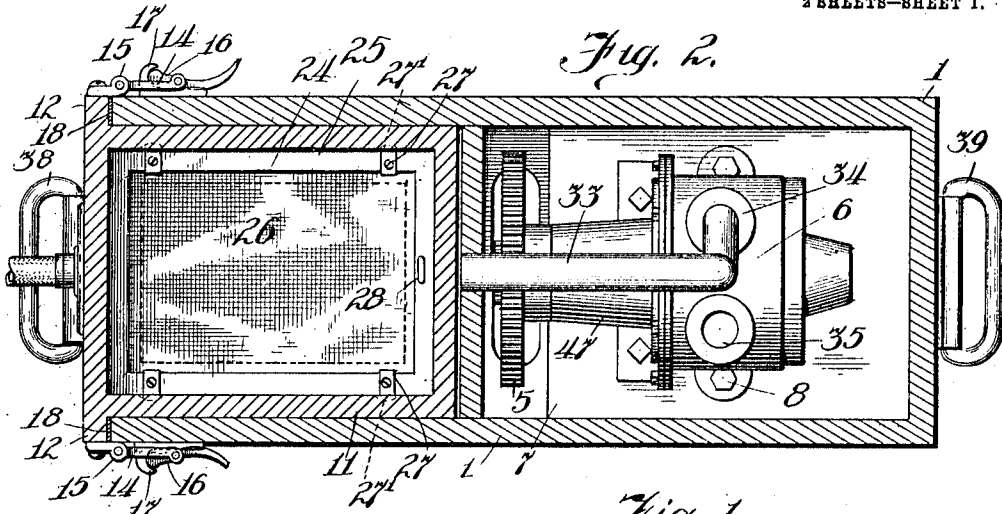


E. A. LAUGHLIN.
PNEUMATIC CLEANER.
APPLICATION FILED OCT. 15, 1908.

955,886.

Patented Apr. 26, 1910.

2 SHEETS—SHEET 1.



Witnesses
Milton Lenoir
Emilie Rose

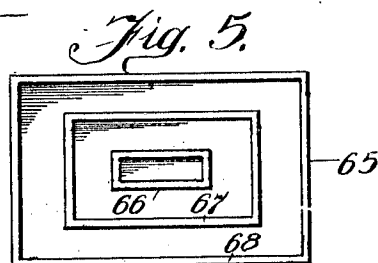
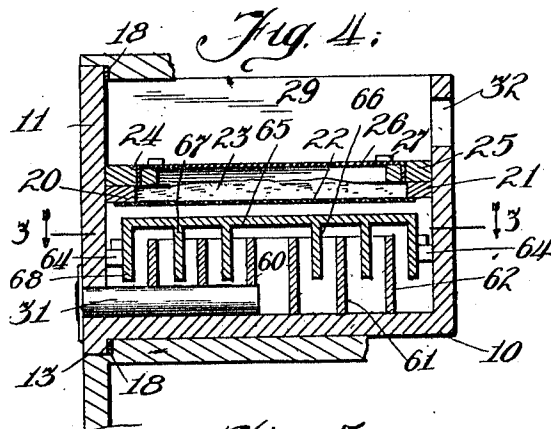
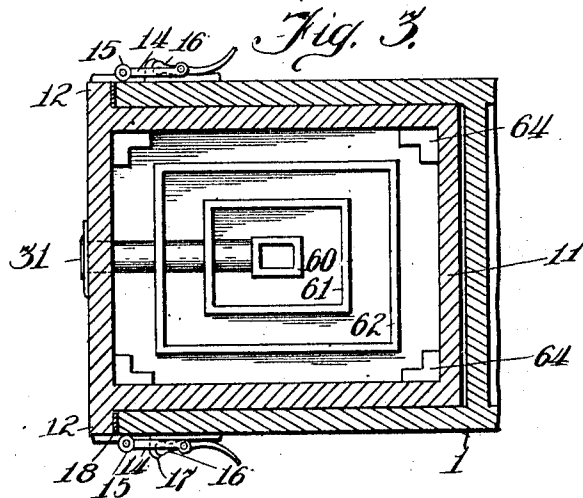
Inventor,
E. A. Laughlin
Albert N. Graves
Attorney.

E. A. LAUGHLIN.
PNEUMATIC CLEANER.
APPLICATION FILED OCT. 15, 1908.

955,886.

Patented Apr. 26, 1910.

2 SHEETS—SHEET 2.



Witnesses
Milton Lenoir
Emilie Rose.

Inventor,
E. A. Laughlin,
By Albert N. Chase
Attorney.

UNITED STATES PATENT OFFICE.

ELMYR A. LAUGHLIN, OF CHICAGO, ILLINOIS.

PNEUMATIC CLEANER.

955,886.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed October 15, 1908. Serial No. 457,771.

To all whom it may concern:

Be it known that I, ELMYR A. LAUGHLIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic Cleaners, of which the following is a specification.

This invention relates to improvements in pneumatic cleaners, and refers more particularly to that type of pneumatic cleaners in which the dust and air are sucked or drawn into the cleaner by the action of a rotary suction pump preferably operated by an electric motor.

Among the salient objects of the present invention are to provide a carpet cleaner of the above character which is so constructed as to secure a maximum vacuum or suction efficiency with a minimum consumption of power; to provide in such a device a settling chamber for the reception of dust and dirt wherein a large percentage of the dust is precipitated, thus greatly lessening the amount of dirt which must be filtered out and greatly decreasing the amount of power necessary to effectively operate the machine; to provide within the dust receptacle of the cleaner a novel filter or screen construction; to provide a device in which access can be readily had to the various parts for cleaning or inspection, and which is compact in form and economical both in construction and in operation; and in general to provide an improved construction of the character referred to.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 designates a vertical sectional view of my device; Fig. 2 is a horizontal sectional view taken on lines 2—2 of Fig. 1 and looking in the direction of the arrows; Fig. 3 is a view taken on lines 3—3 of Fig. 4 and showing a modified form of dust receptacle, the upper baffle support being removed and the casing being broken away to reduce the size of the drawing; Fig. 4 is a fragmentary vertical sectional view of the construction shown in Fig. 3; Fig. 5 is an inverted plan view of the upper baffle member shown in Fig. 4.

Referring to the drawings, 1 designates as a whole a rectangular frame-like casing, within the forward end of which is seated an electric motor 2 of any suitable type, which is fixed to the bottom of the casing

by suitable screws 3. This motor is adapted to drive a rotary exhaust pump, designated as a whole 6, which is supported in the rear end of the casing upon a raised platform 7 and is secured thereto by screws 8. This pump 6, the interior construction of which will be hereinafter described, has driving connection with the motor by means of a pair of intermeshing gears 4 and 5, the former being keyed to an extension 9 of the armature shaft of the motor and the latter to the driving shaft of the pump. The mounting of the pump upon the raised platform 7 permits of the use of a much narrower casing inasmuch as the pump can then be in substantial alinement with the motor.

In the upper end of the casing 1 and directly above the motor is formed a drawer compartment 10 in which is adapted to slide a drawer 11, which, in connection with its interior construction hereinafter described, forms the dust receptacle. In order that this drawer 11 may fit closely within its compartment and then be rigidly locked in position, the former is provided at either side with a flange-like extension 12 adapted to fit within suitable shoulders 13 upon the compartment 10. To secure an air-tight connection between the drawer and the casing, a packing 18 is preferably inserted between the flanges 12 and the shoulders 13. This drawer may be locked in closed position by any suitable locking device. In the present instance each of these locking devices comprises an arm 14, one end of which is pivotally connected to a bracket 15 secured to the corresponding flange 12, and the other end of which is provided with a cam lever 16 adapted to have locking engagement with a socket member 17 fixed to the side wall of the casing 1. From the foregoing it will be seen that I provide means for securing an air-tight connection between the drawer and the casing.

Describing, now, the interior construction of the drawer, which forms an important feature of my invention, upon the inner wall of the drawer is fixed a pair of transversely extending cleats 19, upon which is removably seated a screen 20 comprising side and end frame members 21 and a suitable wire mesh 22. Upon the upper side of this mesh 22 is placed suitable filtering material 23, such as waste, cotton batting or other porous material. This cotton waste is confined in position by means of a second screen 24, said

screen comprising a usual frame 25 and a screen 26 of porous material, such as cotton flannel or the like. Preferably these screens are confined in position by means of suitable turn-buttons 27 fixed upon the upper screen 24 and adapted to engage suitable recesses 27' in the side walls of the drawer 10. In order to more readily remove the upper screen, it may be provided with a thumb-handle 28, as shown. The above described arrangement of these screens is such as to secure a dust-proof filter, which at the same time permits the air to pass freely there-through under the action of the exhaust pump 6, as will hereinafter more clearly appear.

From the foregoing it will be seen that the filter or screens divide the drawer into upper and lower chambers, designated 29 and 30, respectively. In the forward end of the lower chamber 30 is seated a relatively short pipe 31, to which is connected the usual air tube or hose 31'. The latter is, of course, provided with a dust collecting head 31" of any desired construction. As seen in Fig. 1, the pipe 31 is seated so as to be approximately flush with the wire mesh 22 of the lower screen 20, for a purpose to be hereinafter described. The rear end of the upper chamber 29 is provided with a port or passage 32 which registers with an air pipe or conduit 33, one end of which extends through the rear wall of the drawer compartment 10, and the other end of which is connected to the inlet port 34 of the pump 6. After the air has been drawn into the pump through the pipe 33 it passes out through the exhaust port 35 into the interior of the casing 1.

The exhaust air passes out of the casing through a series of exhaust ports 36 seated in the lower forward end of the casing, as shown, thus compelling the air to sweep by the motor before it leaves the casing. Preferably the latter is mounted on suitable casters or rollers 37 and is also provided with handles 38, 39. One advantage of mounting the device on casters is that it allows it to be readily moved from place to place, thus permitting of the use of a relatively short air tube, which increases the efficiency of the device inasmuch as it has been found in practice that the longer an air tube is the less is the vacuum pressure with a given power. The various parts above described are so arranged as to secure a very compact device, which may be readily carried about by means of the handles.

Describing, now, the operation of the device, the motor is first connected to any ordinary electric lamp socket and the current then turned on. The suction head of the tube is then applied to the carpet, and, as the pump is operated through the action of the intermeshing gears 4 and 5, the air is

sucked in through the tube, passing through the pipe 31, thence through the filter to the pipe 33, and out through the exhaust port 34 of the pump into the casing 1. As heretofore stated, the pipe 31 is seated near the top of the lower chamber 30, and the incoming current of air following the line of least resistance will flow horizontally toward the rear end of the filter and thence pass upwardly through the latter through the outlet port 32. The heavier dust and dirt, however, will fall down onto the floor of the drawer, the lower chamber 30 thus acting in effect as a settling chamber. This, of course, tends to keep the filter substantially free from the greater part of the dust while at the same time permitting the air to pass freely through the screens.

Heretofore the mixed air and dust have been drawn into a bag, which caught the dirt and permitted the air to pass through the pores or meshes of the fabric. However, as the air and dust are agitated throughout the bag, the pores of the latter soon become clogged or stopped up. Because of this tendency to clog the pores of the fabric, it has been found necessary in practice to materially increase the amount of power in order to secure the necessary vacuum or suction to effectively clean the carpet. In the present construction the tendency of the filter to become clogged or fouled is reduced to a minimum, and it has been found in practice that applicant's construction, with a much smaller current supply, will secure a much higher vacuum pressure than will the constructions now in use. Some of the finer particles of dust will, of course, in time accumulate on the cotton waste between the two screens and in time tend to clog the filter. In such event the upper screen can be removed and a new batch of cotton waste or other material inserted. This, of course, can be done at a very low cost. It might be here noted that this cotton waste serves to protect the fabric of the upper screen from the dust and dirt, thus preserving the life of the latter indefinitely. When the settling chamber 30 of the piston has become filled with dirt, the screens can be readily removed and the drawer cleaned.

In Figs. 3 to 5, inclusive, I have shown a slightly modified construction of the drawer or dust receptacle. In this modification the pipe 31 communicates with the lower part of the settling chamber 30, and the latter is provided with a tortuous passage which causes the dust to settle upon the bottom of the chamber but permits the air to pass out through the filter, as before. This tortuous passage is formed by a series of alternated baffles. Describing this construction, upon the floor of the settling chamber 30 is a series of upstanding spaced apart baffle plates 60, 61 and 62, respectively, each of

these baffle members being rectangular in shape, as shown more clearly in Fig. 3. Upon suitable brackets 64 fixed in the respective corners of the drawer 11 is supported an opposed baffle support 65 provided with downwardly extending baffle members 66, 67 and 68, respectively, similar in construction to the lower baffle plates and extending between the latter. These upper baffle members terminate short of the bottom of the drawer, and in conjunction with the lower baffle members form a continuous tortuous passage, as seen more clearly in Fig. 4. The lower baffle plates are, of course, suitably apertured to permit of the insertion of the pipe 31. When the air is drawn in through the pipe 31 it will pass freely through the tortuous passage formed by these baffle members, and thence out through the filter as before described. The heavier dust and dirt, however, will be obstructed in its passage by the baffle plates and will gradually settle on the floor of the chamber 30. When it is desired to clean the drawer, the filter and upper baffle support 65 can be removed and the drawer cleaned.

It might be here noted that while I have described my device for use as a carpet cleaner, it can, of course, be used to clean books, upholstery, furniture, curtains and analogous articles as well as carpets.

While I have herein shown what I consider a preferred embodiment of my invention, it is, of course, not limited to the details of construction except as set forth in the claims.

I claim as my invention:

1. In a pneumatic cleaner, the combination with a portable casing, of an exhaust pump within said casing, a motor for operating said pump, a drawer mounted to slide into and out of said casing and adapted to serve as a dust receptacle, a dust-proof filter dividing said receptacle into upper and lower chambers, said lower chamber being provided with an air-inlet port and the upper chamber with an outlet port, and an air-conduit connected at one end to the inlet side of the pump and at its other end to the outlet port of said upper chamber.

2. In a pneumatic cleaner, the combination with a dust receptacle, of a filter dividing said receptacle into upper and lower chambers, the upper chamber being provided with an exhaust port, and the lower one with an inlet port, opposed baffle supports in said lower chamber, one of said

baffle supports being formed by the base of said receptacle, and the other being removably mounted, telescoping baffle members carried by said baffle supports, one end of each baffle member terminating short of the opposed baffle support, and a conduit connecting the inlet port with the innermost chambers formed by said baffle members and at the closed lower side thereof.

3. In a pneumatic cleaner, the combination with a dust receptacle, of a filter dividing said receptacle into upper and lower chambers, the former chamber having an exhaust port and the latter an inlet port, opposed baffle supports in said lower chamber, one of said baffle supports being formed by the bottom of the dust receptacle, a plurality of baffles connected to each support and alternately interspaced, each baffle terminating short of the opposed baffle support, and said inlet port being connected with the innermost chamber formed by said baffle members and at the closed lower side thereof.

4. In a pneumatic cleaner, the combination with a dust receptacle, of a filter interposed in said receptacle and dividing the latter into upper and lower chambers, said filter comprising a pair of spaced apart screens having a filler of porous material between them, opposed baffle supports in said lower chamber, one of said baffle supports being formed by one wall of said receptacle, telescoping baffle members carried by said supports, one end of each baffle member terminating short of the opposed baffle support whereby there is formed a continuous tortuous passage of greatly increasing area, said passage being connected to an inlet port, and an exhaust pump connected to the upper chamber.

5. In a portable pneumatic cleaner, the combination with a portable casing, of a drawer compartment formed therein, a drawer mounted to slide into and out of said compartment, a filter removably seated in said drawer and dividing the latter into two chambers, one of said chambers having an inlet port and the other an outlet port, an exhaust pump mounted in said casing and connected to said outlet port and a motor likewise seated in said casing and connected to said pump.

ELMYR A. LAUGHLIN.

Witnesses:

LOIS FORCE,
P. G. BELKNAP.