G. W. ALLEN.

PNEUMATIC CLEANER.

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1,305,242.

Patented June 3, 1919.

Fig. 1.

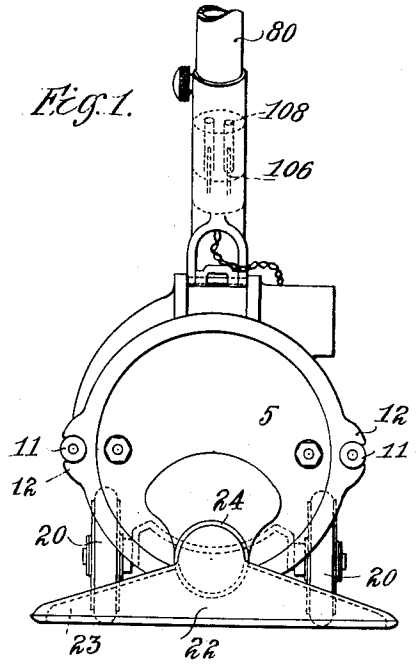


Fig. 2.

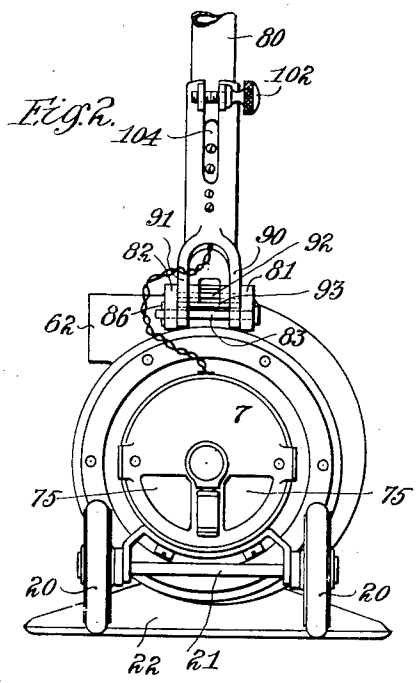


Fig. 4.

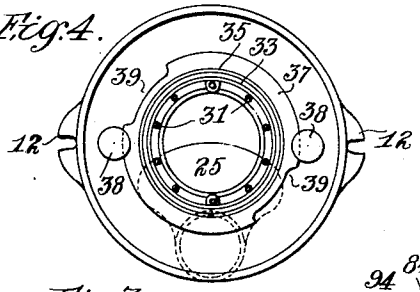
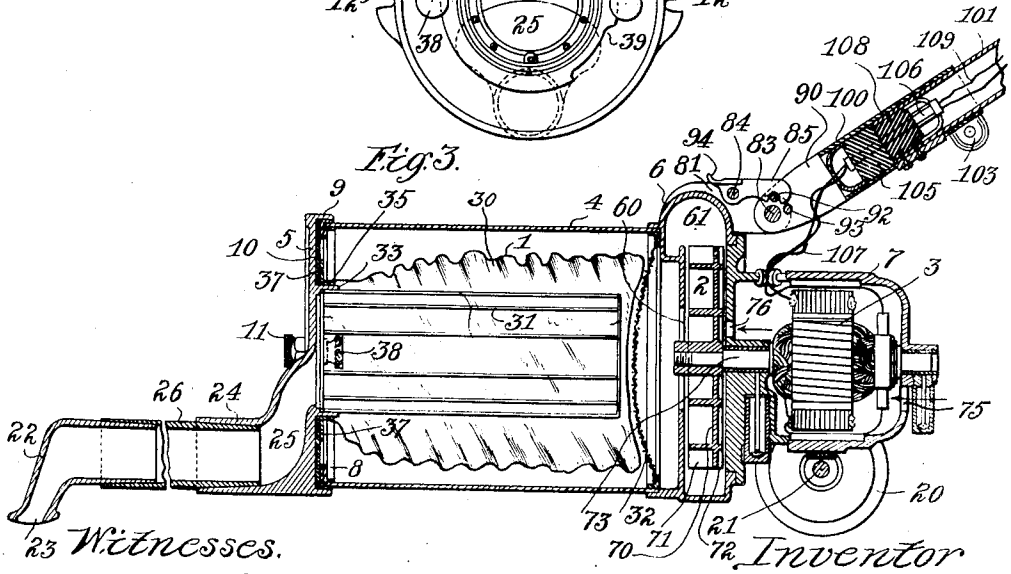


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC CLEANER.

1,305,242. Specification of Letters Patent. Patented June 3, 1919.

Original application filed October 13, 1913, Serial No. 794,841. Divided and this application filed October 26, 1914. Serial No. 868,676.

To all whom it may concern:

Be it known that I, GEORGE W. ALLEN, a citizen of the United States, residing at Hyde Park, Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to pneumatic cleaners, and more particularly to suction cleaners provided with a fan or pump and arranged to be propelled in the cleaning operation over the surface to be cleansed. The present application is a division of my application, Serial No. 794,841, filed October 13, 1913, Patent No. 1,124,684, granted January 12, 1915.

The principal object of the present invention is to increase the efficiency of cleaners of the above type by enabling them to clean under low articles of furniture without requiring the use of a flexible hose connection or a plurality of suction nozzles.

With this object in view the present invention consists in the pneumatic cleaner hereinafter described and more particularly defined in the claim.

In the accompanying drawings which illustrate what is now considered to be the preferred form of the present invention, Figure 1 is a front elevation, and Fig. 2 a rear elevation of my improved pneumatic cleaner. Fig. 3 is a longitudinal vertical section of the same. Fig. 4 is a view of the inside of the front cover showing the method of attachment of the dust collector.

The pneumatic cleaner illustrated in the drawings is of the traveling, self-contained, motor-driven type. The cleaner comprises at the front a dust collector 1, behind it a suction fan, or air pump 2, and behind the fan an electric motor 3 for driving it. The cylindrical dust collector chamber 4 is formed of sheet aluminum and is secured by rivets at its rear end to the fan casing 6 which is cast aluminum. Bolted to the rear of the fan casing 6 is the motor casing 7, also of cast aluminum. The front cover 5 has a rearwardly extending annular flange 9 which fits over the end of the dust collector chamber 4. The inner face of the front cover 5 is provided with an annular rubber gasket 10 which fits against the end of the chamber 4 to form a dust tight closure. The front cover 5 is held in place by means of swing bolts and thumb nuts 11 which are hinged to the sides of the chamber 4 and fit into slotted ears 12 on the sides of the front cover.

The rear of the cleaner is supported by means of two rubber-tired wheels 20 carried upon the ends of an axle 21 which is carried beneath the motor casing 7. The front of the cleaner is supported by means of the nozzle 22, the weight of the cleaner serving to hold the nozzle against the floor. The nozzle 22 has the long transverse slot 23 usual in carpet cleaning suction nozzles. The front cover 5 is provided at its lower edge with a socket 24 through which passes the intake opening 25 for the dust laden air. The rear end of the nozzle piece 22 is externally tapered to fit into the internally tapered socket 24 so that when the cleaner is ordinarily used, the nozzle piece 22 is frictionally connected directly with the front cover 5. In order to adapt the cleaner for cleaning the floor beneath radiators and low articles of furniture, an extension pipe 26 is provided. One end of this extension pipe is externally tapered so that it fits in the socket 24. The other end is internally tapered and is adapted to receive the rear end of the nozzle piece 22. Since the socket 24 is at the extreme lower edge of the front cover 5, the nozzle can be passed under articles having only a very few inches clearance above the floor, and the cleaner is thus adapted to clean under low articles of furniture without requiring the use of a flexible hose connection or a plurality of inspection nozzles. While the extension pipe 26 may be of any convenient length, it is found that the most satisfactory length for ordinary household purposes is about two feet.

The dust collector 1 comprises a cloth dust bag 30 which is loosely gathered over a wire cage 31 and is inclosed in a cylindrical dust collector chamber 4, having a screen 32 at the rear. The inlet passage 25 curves up from the mouth of the nipple 24 so that the inlet passage opens on the inside of the front cover 5 near its center. Surrounding the mouth of the inlet 25 is a rearwardly extending annular flange 33. The mouth of the dust bag is removably secured around

this flange by means of a dust bag ring or collar, having a cylindrical part 35 which fits loosely around the flange 33 and around which the mouth of the dust bag is secured, and also having a flat outwardly extending flange 37 which is held securely against the rubber gasket or packing 10 by means of thumb nuts 38 which are threaded on pins projecting from the inner face of the front cover 5. In order that the dust ring 34 may be easily put on and taken off to empty the dust bag, the flange 37 has two oppositely disposed cut-away portions 39.

The filtered air from the dust bag chamber passes to the center of the fan through an inlet 60 in the front wall of the fan casing. The air is discharged from the periphery of the fan into a scroll-shaped discharge chamber 61 terminating in a discharge nozzle 62 at the top of the cleaner.

The fan 2 consists of a flat circular web 70 and curved air-impelling blades 71 and 72 formed on the front and rear faces of the web respectively. The blades 72 are similar in shape to the blades 71 except that they are much shallower. The fan is mounted on the forward end of the motor shaft 73. The rear end of the motor casing has an air inlet opening 75 therein and the front wall of the motor casing, which forms the rear wall of the fan casing, has therein a small opening or air passage 76 near the center of the fan. The passage 76 serves as an inlet opening for the shallow blades 72 which cause a circulation of air as indicated by the arrows through the openings 75 and 76 to air cool the motor. The air sucked through the motor by the blades 72 is discharged into the common discharge chamber 61.

The cleaner is drawn back and forth across the floor to be cleaned by means of a handle 80, which is hinged to the cleaner casing. Cast integral with the top of the fan casing 6 are two backwardly extending ears 81 and 82 which are bored and through which is passed a pintle pin 83, one end of which is headed and which is removably retained in place by means of a cotter pin 86 passed through its other end. A second pintle pin 84 extends between the two ears 81 and 82 and forms a pivot for a latch 85. The lower end of the handle is bifurcated to form two projections or ears 90 and 91 which fit inside of the ears 81 and 82 and are loosely mounted to turn about the pintle pin 83. The ears 90 and 91 have two pins 92 and 93 extending between them in position to be engaged by the latch 85. When the cleaner is in use, the pin 92 is engaged by the latch 85, as shown in Fig. 3, so that the handle is inclined at about 45° to the horizontal and the cleaner can be tilted up on its wheels for more convenient manipulation, or the nozzle pressed more firmly against the surface being cleaned. When the cleaner is not in use, the latch 85 may be lifted by pressing down with the foot on the toe piece 94 to release the latch and the handle may be lifted so that the pin 93 is engaged by the latch to hold the handle upright over the cleaner, as shown in Figs. 1 and 2 for the convenience of the operator in carrying the cleaner about or to economize floor space in storing the cleaner when not in use, for example as in a closet or behind a door. By releasing the handle entirely from the latch, the former may be swung down into a more nearly horizontal position, thus enabling the cleaner to be operated beneath a bed, table, or other similar article of furniture. When the handle is in a horizontal position the cleaner may be stored away beneath a lounge or bed.

The handle 80 is made in two parts, one a sleeve 100 which is permanently secured to the machine and a removable part 101 which forms the main length of the handle. As shown in the drawings, the upper part of the handle is broken away. The removable portion 101 of the handle is about three or four feet long. The hinged ears 90 and 91 are formed integrally on the lower part of the sleeve 100. The upper part of the sleeve is split, as shown in Fig. 2, and is tightened by means of a screw 102 passing through the ears 103 to clamp the removable handle 101 in the sleeve. A lug 104 on the back of the lower part of the removable portion 101 serves to properly position it with relation to the sleeve 100. In the sleeve 100 is a block of hard rubber insulation 105 from which project into the open upper end of the sleeve two contact plugs 106 which are connected to the motor 3 by means of the wires 107 which emerge from the lower end of the sleeve between the ears 90 and 91. These ears 90 and 91 serve to protect the wires 107 and decrease the chance of accidental breakage. In the lower end of the removable portion of the handle 101 is a block of hard rubber insulation holding two socket members 108 in which fit the plugs 106. The socket members 108 are connected to wires 109 which extend through the removable tubular portion of the handle 101 and are adapted to be connected to some suitable source of current. The removable portion of the handle is thus easily taken off so that the cleaner can be more easily stored when not in use, and without requiring the disconnection of any wires or liability of improper replacement. If desired the usual flexible hose with cleaning tool at its extremity may be connected to the nipple 24, or if a blast is required, such hose may be connected with the discharge 62.

While the preferred embodiment of the present invention has been specifically illustrated and described, it is to be understood

that the present invention is not limited to its illustrated embodiment, but may be embodied in other constructions within the purview of the invention as set forth in the following claim:—

A vacuum cleaner having a fan mounted to turn upon a horizontal axis, a fan-casing provided with an axial intake opening, a motor for actuating the fan, a dust conduit having one end communicating with the intake opening of the fan and the other end having a forwardly-projecting socket offset below the intake opening of the fan-casing, wheels for supporting the rear end of the cleaner, a suction-nozzle for supporting the front end of the cleaner, and a rigid tubular extension member having its opposite ends formed to provide an air-tight extension member having its opposite ends formed to provide an air-tight fit between the socket and the member and between the member and the suction nozzle, said extension tubular member being adapted to rigidly support the nozzle against lateral and fore-and-aft displacement in extended position to permit the cleaner to clean under low articles of furniture, the tubular extension member being readily disconnectible from the socket and from the nozzle, and the end of the nozzle which engages the tubular extension member being formed to fit the socket so that the nozzle may be mounted directly upon the cleaner-body.

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