Dec. 1, 1942. W. V. PAINE 2,304,014

VACUUM CLEANER

Filed May 4, 1939 2 Sheets-Sheet 1

Fig. 1.

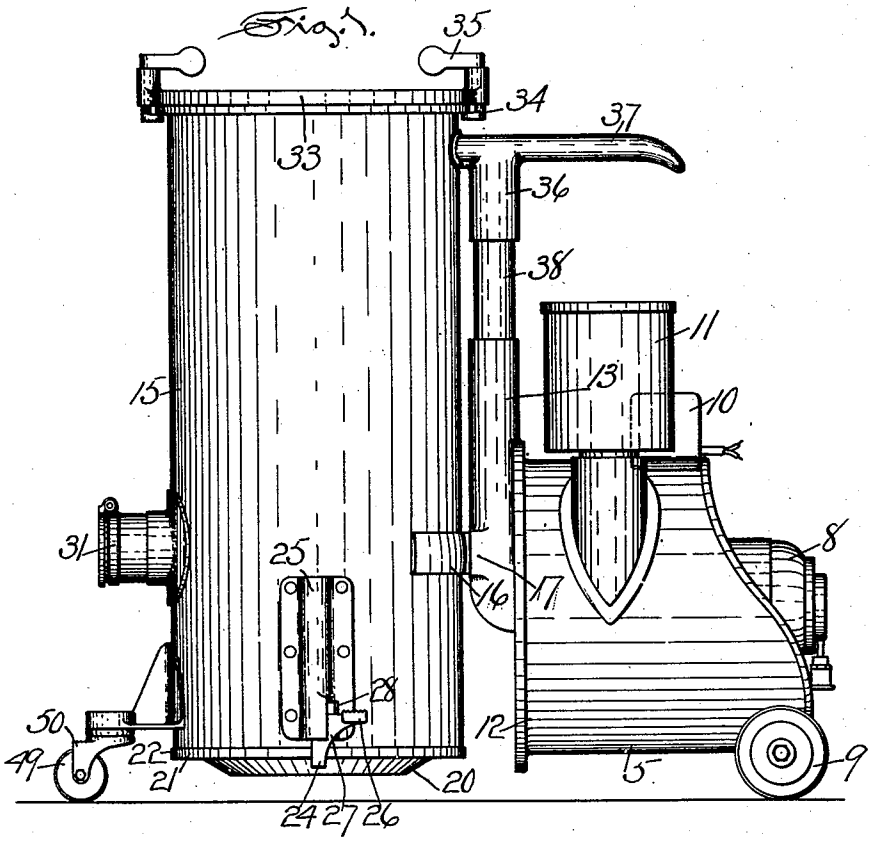

Fig. 2.

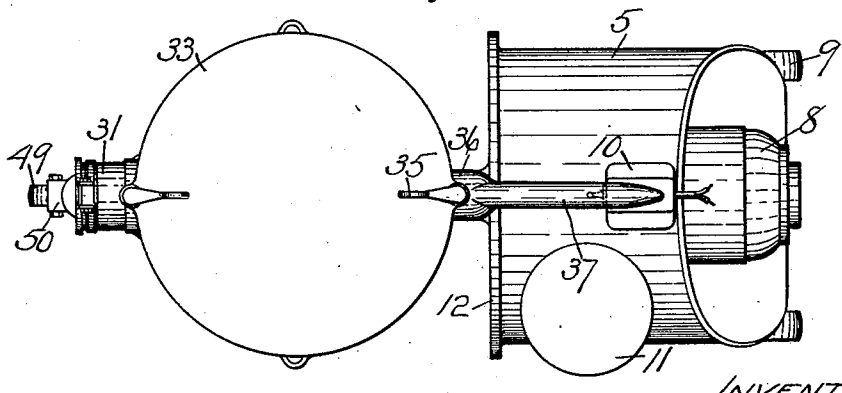

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Fig. 3.

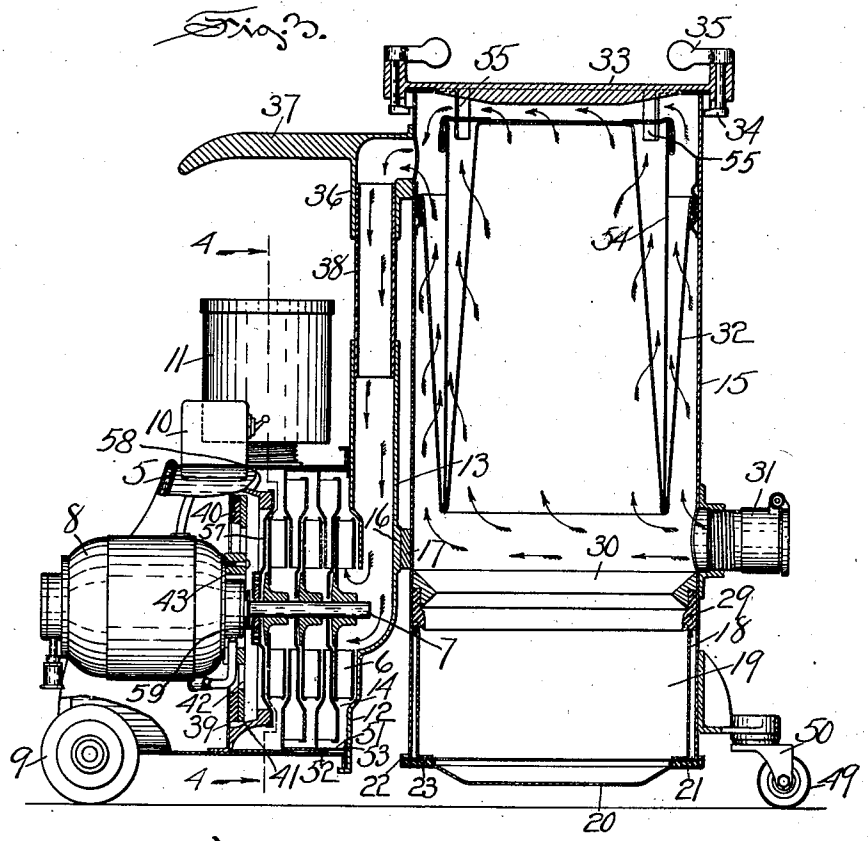


Fig. 4.

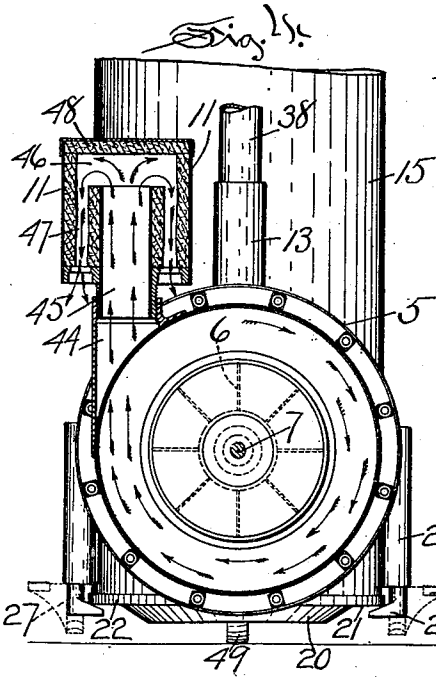


Fig. 5.

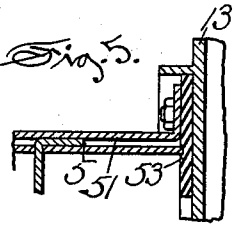


Fig. 7.

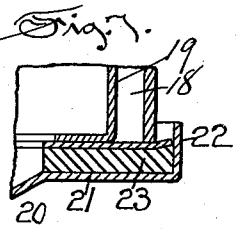
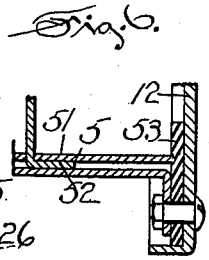


Fig. 6.



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Patented Dec. 1, 1942

2,304,014

UNITED STATES PATENT OFFICE

2,304,014

VACUUM CLEANER

Wilbur V. Paine, East Hartford, Conn., assignor to The Spencer Turbine Company, Hartford, Conn., a corporation of Connecticut

Application May 4, 1939, Serial No. 271,754

1 Claim. (Cl. 15—15)

My invention relates to apparatus which are employed more particularly for removing dust and dirt from floors and similar places, and an object of my invention, among others, is the production of an apparatus that is simple in construction, that is particularly efficient in operation, and that may be readily moved from place to place for cleaning operations.

One form of an apparatus embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of my improved cleaner.

Figure 2 is a top view of the same.

Figure 3 is a view partially in central vertical section.

Figure 4 is a view in section on a plane denoted by the dotted line 4—4 of Fig. 3.

Figure 5 is a detail fragmentary view on enlarged scale illustrating the connection of the upper side of the blower shell with the end plate and conducting tube secured thereto.

Figure 6 is a similar view showing the connection at the lower side of the blower shell.

Figure 7 is a similar view showing the connection between the separator shell and its bottom.

In the accompanying drawings the numeral 5 denotes the shell of a vacuum producer and blower of the fan type and comprising a number of fans 6 that may be of any common and ordinary construction, said fans being mounted upon the shaft 7 of a motor 8 supported in any suitable manner within the shell. A pair of wheels 9 are attached to the shell in any suitable manner. A switch box 10 is mounted on the top of the shell 5 and a muffler 11 is also secured to the top of said shell.

An end plate 12 is secured to close that end of the shell 5 opposite the motor 8 and a tube 13 extends from said plate, being preferably integrally formed therewith, said tube opening into an inlet chamber 14 of the blower.

A separator shell 15 is rigidly attached to the blower shell 5 as by means of a strap lug 17 secured to the shell 15 as by welding or otherwise, said strap lug abutting a lug 16 formed on the tube 13. The bottom of the shell 15 constitues a dust can chamber 18 for a dust can 19 which is insertable into the opening in the bottom of said shell. The bottom 20 of the dust can has a rim 21 with an upturned flange 22 within which a packing 23 is secured, said rim, flange, and packing extending beyond the side of the can in position to engage the packing with the lower edge of the shell 15. The can is held in place by spring pressed clips 24 located in sockets 25 fastened to opposite sides of the shell 15, each of said clips having a pad 26 by means of which the clips may be operated, as by pressure of the foot to release the bottom 20, a pad support 27 for the pad 26 extending through a slot 28 in the side of the socket 25 to retain the clips in engagement with the bottom 20. Pressure upon the pad 26 will disengage the support 27 from the slot 28 whereupon the clip may be turned to disengage it from the bottom 20. Upon again positioning the support 27 to register with the slot 28 the spring within the socket 25 will return the clip into engagement with the bottom 20. A packing ring 29 is secured to the inside of the shell 15 in position to be engaged by the top of the dust can 19, as shown in Fig. 3 of the drawings, this packing ring engaging the top of the can 19 to prevent dust and dirt from entering the space between the can and the side of the shell 15. This packing ring is held in place by means of a ring 30 secured to the inside of the shell 15 in any suitable manner and having a groove to receive the edge of the packing ring to retain the latter in place. An inlet fixture 31 for attachment of a hose is secured to and projects from the side of the shell, said fixture being of any suitable form common to structures of this class.

A dust screen 32 of any suitable fabric common to separators of this class is suspended within the upper portion of the shell 15 in any suitable manner, this screen comprising no part of the present invention and a further and detailed description therefore is omitted. A cap 33 of any suitable type is removably secured to the top of the shell 15 as by means of clips 34 having clamp handles 35 of any suitable construction.

A nipple 36 having an opening leading from the chamber within the shell 15 is rigidly secured to the upper portion of the shell and extends downwardly therefrom in spaced relation thereto and in line with the tube 13. This nipple has an extension therefrom forming a handle 37 by means of which the apparatus as a whole may be lifted and carried as desired, the structure being light enough for manual transport when desired. The nipple 36 is connected with the tube 13 as by means of a section 38 of tubing, as shown in Fig. 3.

A plate 39 creating a circulation space between the end plate of the fan chamber and the motor chamber and dividing said space from the motor

chamber has an insulating ring 40 of any suitable insulating material secured thereto and a motor supporting plate 41 is secured against said insulating ring, the motor supporting plate having openings 42 between the fan chamber and the motor chamber. Said fan chamber is closed by an end plate 57 mounted on a supporting ring 58 secured to the end plate 39 on the inner surface of the shell, said end plate having an opening for the shaft 7 of the motor and said opening having an annular groove containing a packing 59 that seals the opening around the shaft, thereby closing the opening at this point between the motor and the fan chamber casing. A hub 43 formed on said motor supporting plate affords means of support for the motor 8, as shown in Fig. 3. The outlet 44 from the fan or compression chamber opens through a passage 45 into the muffler 11, and into a muffler chamber 46 which exhausts through a passage or passages 47 as shown in Fig. 4 of the drawings. The entire inner surface of the muffler has a lining 48 of felt or other suitable insulating material. A caster 49 is pivotally attached to a bracket 50 secured to the lower front end of the separator shell 15 as a means for guiding the apparatus when it is rolled along a surface.

An important feature of the invention resides in the means for reducing the noise created within the apparatus and particularly by the motor and rotating fans and especially by the rush of air through the apparatus. In accomplishing this purpose it will be noted that the motor and the fans are supported by the plate 41 which in turn is supported by the end plate 39 of the shell of the fan. In order to reduce the amount of vibration and noise communicated by the rotating parts to the shell of the blower the insulation 40 is interposed between the plate supporting the motor and parts driven thereby and the blower shell. As shown the inner shell 51 of the blower is separated from the outer shell by separating flanges 52 as shown in Fig. 6 of the drawings. Again insulating strips 53 are placed between the shell of the blower and the end plate 12 thereof together with the tube 13.

While, as hereinbefore mentioned, the dust screen 32 of itself comprises no part of the present invention, the manner of supporting this screen is of importance. This comprises a support 54 of perforated material stiff enough to maintain the screen in its extended position. This support is rigidly attached to the cap 33 as by means of brackets 55 projecting downwardly from the inner face of the cap, as shown in Fig. 3 of the drawings. This construction enables the screen 32 to be shaken and relieved of dust while contained within the shell 15, it being required merely to loosen the clamps 34 and lift the cap 33 slightly from the shell, said cap then being used to impart a shaking movement to the support 54 and the screen supported thereby. The dust in this manner is removed from the screen within the shell and is carried away with the escape of little if any dust from said shell.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

A suction cleaner comprising a shell for a pneumatic apparatus enclosed therein, a thin sheet metal plate separately formed from and secured to the end of said shell to close this end of the chamber therein, a separator shell disposed laterally of the aforesaid shell extending far above the top of said first mentioned shell, a removable cover for the upper end of the separator shell, a tube separately formed from said separator shell and extending lengthwise thereof and spaced therefrom, said tube being rigid at the lower end with said end plate and extending radially thereof with the opening therein communicating through an eye at the center of said plate with said chamber, a rigid connection between the lower end of said tube and the separator shell to support the adjacent sides of the shell, a nipple comprising the upper end of said tube and secured to the side of the separator shell slightly below the extreme upper end thereof and in spaced relation to said cover and including a horizontal portion secured to said separator shell and a vertical part extending substantially parallel with and spaced from the side of said separator shell, a handle rigid with and extending in prolongation of the horizontal part of said nipple and extending horizontally therefrom, and roller supports located at the outer side of said separator shell and the outer end of said shell for the pneumatic apparatus and comprising the sole support for said structure.

WILBUR V. PAINE.