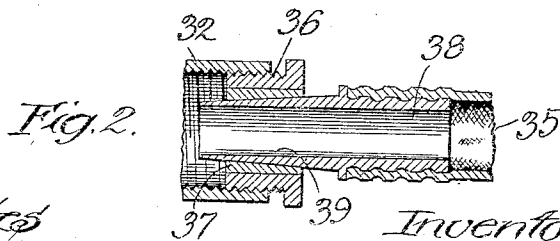
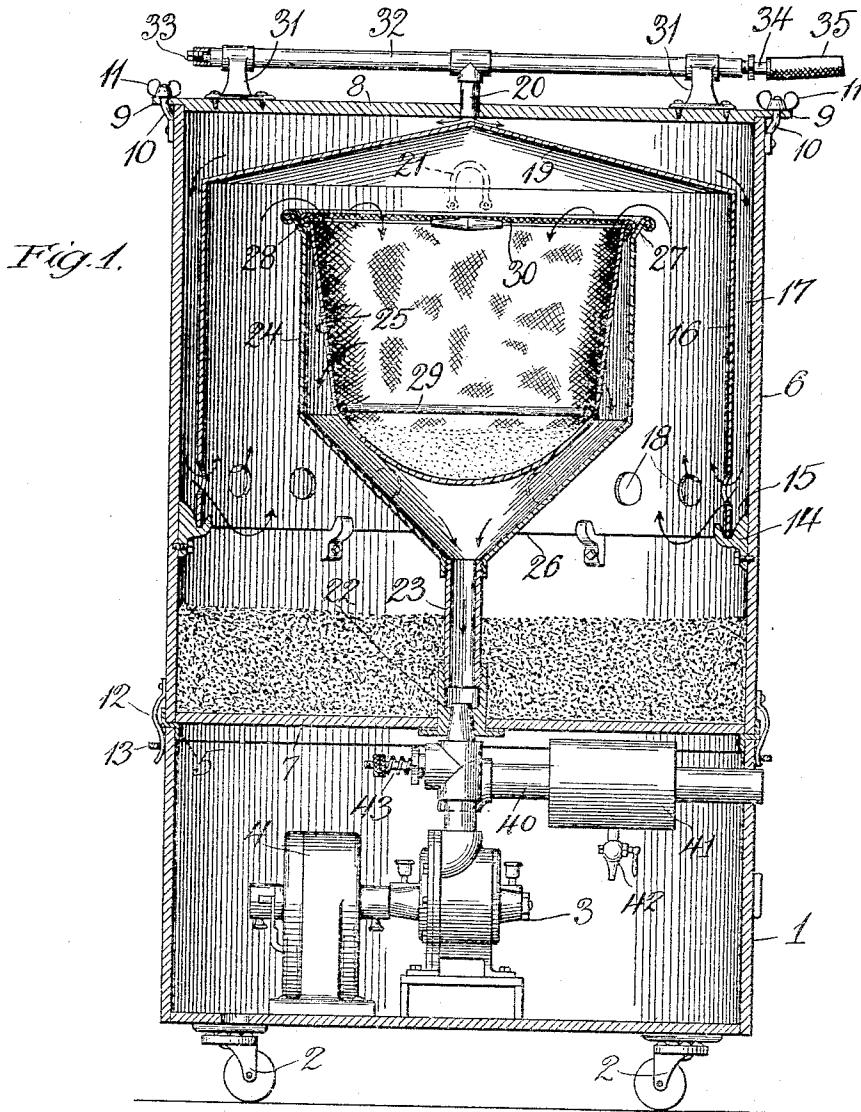


E. A. LAUGHLIN.
PNEUMATIC CLEANER.
APPLICATION FILED MAY 13, 1909.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC CLEANER.

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Specification of Letters Patent.

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To all whom it may concern:

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

The main object of this invention is to provide an improved form of pneumatic cleaner which is efficient in operation, simple and inexpensive in construction and so arranged that the collected dust and dirt may be easily and quickly removed therefrom. A specific construction for accomplishing this object is illustrated in the accompanying drawings, in which:

Figure 1 is a side view partly in section and partly in elevation of a portable pneumatic cleaner embodying this invention. Fig. 2 is an enlarged fragmentary section showing one of the pipe connections.

In the construction shown, the casing 1 is mounted on trucks or caster wheels 2 to enable it to be readily moved about, and contains a rotary air pump 3 and a motor 4 for operating said pump. Both the motor and the pump may be of any preferred construction, and the casing 1, which is made of sheet metal or other light material, is preferably cylindrical in shape to enable it to be constructed cheaply. Said casing is provided at its top with a peripheral seat 5 for the dust receptacle. The dust receptacle 6, which is also cylindrical in shape, is seated in said seat 5, and is provided with a closed bottom 7, and a removable cover 8. Said cover is adapted to fit tightly to the top of the receptacle and is provided with ears 9 adapted to receive the threaded bolts or lugs 10 which are rigidly secured to the outer side of the receptacle and are provided with winged nuts 11 adapted to secure the cover tightly in place. The receptacle is secured to the casing 1 by slotted straps or hasps 12 which are hinged to the receptacle near its bottom and are adapted to engage rotatable buttons or headed pins 13 on the casing 1.

Rigidly secured to the inner side of the receptacle, at a distance above the bottom 7, are a plurality of brackets or shoulders 14, each having a V-shaped seat 15 in its top and beveled upwardly on its under side. Mounted in said seats 15 is the cylindrical hood 16 which is of slightly less diameter

than the receptacle so as to afford an annular passage 17 between it and the receptacle. Said hood is provided near its bottom with a plurality of apertures 18 through which air and dirt may escape from the passage 17 into the hood. The walls of said hood extend upwardly to near the top of the receptacle, and secured thereon is the conical top 19, whose apex is immediately beneath the inlet 20 in the cover. The hood is provided with handles 21 by means of which it may be easily removed from its seat or replaced thereon when the cover 8 is off.

The inlet pipe of the pump extends upwardly through the bottom 7 of the receptacle at the middle thereof, said pipe being provided at its upper end with a tapered spigot fitting an inverted funnel shaped socket in the fitting 22 which is secured to the bottom of the receptacle 6. A short pipe section or neck 23 extends upward from the fitting 22. On the upper end of said pipe section 23 and opening into it, is an urn-shaped baffle wall 24 serving also as a support for the screen 25. Said urn is cylindrical in form for part of its height and is provided with a hopper bottom 26 and a flaring or bell shaped mouth 27.

The screen or bag 25 is preferably made of comparatively thick, loosely woven, woolly material, which will permit air to readily pass through but will filter out dust particles. This screen is preferably of flexible material and is provided at its top with a ring 28 adapted to hold it open and of such diameter that it will lie in the mouth 27 and suspend the bag in the urn. A spreading ring 29 is contained in the bag and acts to keep the lower portion of the bag spread out. The bag is provided with a handle 30 which extends diametrically across the top thereof and is connected at its ends to the ring 28. By means of said handle the bag may be readily removed when it is desired to clean the same.

Extending diametrically across the top of the cover 8, and secured thereto by means of brackets 31 is a pipe 32 which is closed at one end by a plug 33 and opens centrally into the pipe 20. The pipe 32 serves as a handle for carrying the whole device, for lifting the receptacle from the casing, or for removing the cover 8. Connected in the open end of the pipe 32 by means of a coupling 34 is the suction pipe 35, which may be provided with any suitable suction nozzle

or dust collector, not shown, by means of which the dust is collected from the surface being cleaned. The coupling 34 may be of any desired construction, but preferably it comprises a collar 36 having threaded engagement in the pipe 32 and having a sleeve or bushing 37 therein with an inwardly tapering bore. The adjacent end of the pipe 35 is provided with a sleeve 38, which is rigidly secured therein, and is provided with a conically tapered outer end 39 adapted to extend into the bushing 37 and to be held therein by the suction of the pump acting on the pipe 35.

The outlet or exhaust pipe 40 of the pump is provided with a muffler 41 of any desired construction, adapted to muffle the noise of the exhaust and to catch any oil or moisture which may escape from the pump and prevent its discharge into the room. Said muffler is provided with a faucet 42 by means of which the oil may be drawn from the muffler. A relief valve 43 is provided in the inlet pipe 22, at a point beneath the bottom 7, and serves to permit of adjusting the suction to suit the character of the surface which is to be cleaned.

The operation of the device shown is as follows: When the pump is operated air is sucked into the pipe 35 and its nozzle with considerable force. The dust from the surface being cleaned is picked up by the air current, and as the air enters the receptacle 6 it is deflected by the conical top 19, whence it passes downwardly through the annular passage 17, and then passes upward around the lower edge of the hood and through the apertures 18. The air coming from the small confined area around the hood and turning upward into the larger area within the hood loses a great deal of its power to carry the dust and the particles of dust, which are heavier than the air, having gained a considerable momentum in their downward passage through passage 17, are not turned from their course as easily as is the conveying air current and therefore continue their downward course until they have passed out of the influence of the air current and fall into the bottom of the receptacle. Such of the finer and lighter particles of dust as may be carried by the air current into the bag are filtered from the air as it passes through the bag on its way to the pump. The clean air is exhausted from the pump through the exhaust pipe 40.

When it is desired to remove the dust from the receptacle and bag, the cover 8 is removed and the hood lifted from the seats 15. The bag may then be lifted from the urn and the dust emptied out and the bag may be cleaned (preferably by going over its inner surface with the suction tool after another bag has been substituted and the apparatus reassembled). The urn is also

removed from its seat in the fitting 22, and when the hasps 12 are released the receptacle may be lifted from its seat 5 and emptied.

The cylindrical construction of the parts permits them to be manufactured at a minimum cost, and the method of assembling the various parts permits of the device being set up and taken apart with a minimum amount of time and labor. Both the simplicity of the device and the ease with which the parts may be taken apart and put together render the cleaner an exceedingly convenient household article which may be operated and cared for by ordinary unskilled labor.

While but one specific embodiment of this invention is herein shown, it will be understood that many details of the construction shown may be varied or omitted without departing from the spirit of this invention.

I claim:

1. A pneumatic cleaner, comprising a dust receptacle having a centrally disposed air inlet in its top, a deflecting hood in the receptacle beneath the inlet and open at its bottom, a screen in the hood, and supporting means for said screen adapted to direct air upwardly in the hood then downwardly through said screen and supporting means.

2. A pneumatic cleaner, comprising a dust receiving receptacle having an inlet in its top, a seat on the inner side of the walls of the receptacle, a hood open at its bottom and supported on said seat, said hood having side walls parallel with the side walls of the receptacle, and having a conical top with its apex beneath the inlet, a screen supported in the upper portion of said hood and out of contact therewith, a cup shaped support for the screen, and an outlet pipe connected to the bottom of said support.

3. A pneumatic cleaner, comprising a dust receiving receptacle, a deflecting hood therein, a screen within said hood, baffling means within said hood supporting said screen and spaced away from the walls of the hood, said receptacle having an air inlet and an air outlet, said air outlet communicating with the space adjacent to said baffling means, and air exhausting means connected with said outlet, said hood and baffling means being arranged for directing a current of air through the interior of said receptacle then through the interior of said hood, and finally through said screen.

4. A pneumatic cleaner, comprising a dust receiving receptacle having a removable top, an inlet pipe opening through said top and affording a handle for the receptacle, a hood concentrically arranged in the receptacle and having a conical top with its apex beneath the inlet, a hollow baffle wall concentrically arranged in the hood, a cup shaped

screen supported in and concentric with said baffle wall, an outlet pipe extending downwardly from said baffle wall, and air exhausting means connected with said outlet and adapted to conduct a current of air downwardly between the receptacle and hood, upwardly between the hood and baffle wall, and downwardly through the screen, baffle wall and outlet pipe.

5. A pneumatic cleaner, comprising a receptacle, a pump tending to create a vacuum in said receptacle, a suction pipe opening into the top of said receptacle and adapted to admit a dust laden current of air into the receptacle, a deflecting hood removably supported in said receptacle and spaced away from the walls thereof and provided with a conical top beneath the opening from the suction pipe, an urn shaped support seated in the inlet of said pump and extending up into the hood, and an air filter mounted in said support.

6. A pneumatic cleaner, comprising a receptacle, a pump acting to create a vacuum in said receptacle, a suction pipe connected in said receptacle and adapted to admit the dust laden air current into the receptacle, a seat in said receptacle, an inverted deflecting hood removably supported on said seat, having communication near the bottom thereof with said receptacle, an urn shaped baffle connected at its lower end with the inlet of the pump, being open at the top, and extending up into said hood, all being arranged to cause the air current to flow downwardly around the walls of said hood, then upwardly between said hood and urn and then downwardly through said urn, a fibrous screen supported in said baffle and adapted to separate the lighter dust particles from the air current.

7. A pneumatic cleaner, comprising a casing having a peripheral seat at its top, a receptacle seated in said seat, a pump in said casing having its inlet extending upwardly into the receptacle, an urn shaped support seated in the inlet of the pump and opening into said inlet, a fibrous screen suspended in said support, a seat on the inner side of the receptacle, a hood on said seat, spaced a distance from the sides of the receptacle and inclosing said support and screen, said hood being provided with a conically shaped top and having apertures near its bottom, and a suction pipe opening through the top of the receptacle onto the apex of the hood.

8. A pneumatic cleaner, comprising a casing having a peripheral seat at its top, a receptacle seated in said seat, a removable cover on said receptacle, a pump in said casing having its inlet extending into the receptacle, an urn shaped support connected with said inlet, a bag of fibrous material suspended in said support, a hood supported on the inner side of said receptacle and

affording an air passage around the same to the bottom of the receptacle and inclosing said support and screen, a conically shaped top on said hood, and a suction pipe extending across said cover and affording a handle therefor and opening through said cover onto the apex of said hood.

9. A pneumatic cleaner comprising a cylindrical casing open at the top, a cylindrical receptacle serving as a closure for said top and being also open at the top, a cover for said receptacle, an inlet pipe adapted to discharge dust-laden air into said receptacle near the middle of said cover, a cylindrical hood closed at the top and open at the bottom, being removably mounted within said receptacle and having depending side walls spaced away from the walls of the receptacle and having its top spaced below said inlet pipe, a pump mounted in said casing and having a suction inlet extending upwardly through the bottom of said receptacle, a baffle connected with said pump suction inlet and having upwardly directed annular walls extending into said hood and spaced away from the walls thereof for directing air into said suction inlet, a seat near the top of the walls of said baffle, a ring seated on said seat, and a filter bag having its rim secured to said ring and being shaped to hang into said baffle clear of the walls thereof.

10. A pneumatic cleaner comprising a cylindrical casing open at the top, a cylindrical receptacle serving as a closure for said top and being also open at the top, a cover for said receptacle, having a central opening therein, an inlet pipe communicating with said central opening and adapted to direct dust laden air into said receptacle, a cylindrical hood, closed at the top and open at the bottom, removably mounted within said receptacle and having depending side walls spaced away from the walls of the receptacle and having its top spaced below said inlet pipe, a pump mounted in said casing and having a suction inlet extending upward through the bottom of said receptacle, an urn shaped baffle having upwardly directed annular walls extending into said hood and spaced away from the walls thereof, a seat formed on the walls of said baffle, a ring seated on said seat, and a filter bag having its rim secured to said ring and being shaped to hang within said baffle clear of the walls thereof, the lower rim of said hood being spaced a considerable distance above the bottom of said receptacle and said baffle having a contracted neck extending upwardly a considerable distance from the bottom of said receptacle to provide an inlet chamber below said hood for the accumulation of dust and dirt.

11. A pneumatic cleaner comprising a pair of separable superimposed cylindrical casings, a seat on the top of the lower casing

adapted to receive the upper casing, a central air inlet in the top of the upper casing, an air outlet extending through the bottom of said upper casing and having a tapered
5 socket therein, air exhausting mechanism mounted in the lower casing having a tapered pipe fitting in said socket and communicating with the outlet from said upper casing, and means in said upper casing for

removing dust from the air in its passage 10 between said inlet and outlet.

Signed at Chicago this 5th day of May 1909.

ELMYR A. LAUGHLIN.

Witnesses:

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